Geophysical Terranes of the Great Basin and Parts of Surrounding Provinces

By Jonathan M.G. Glen, Edwin H. McKee, Steve Ludington, David A. Ponce, Thomas G. Hildenbrand, and Melanie J. Hopkins

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U.S. Department of the Interior
U.S. Geological Survey

[1] U.S. Geological Survey, 345 Middlefield Road, MS 989 Menlo Park, CA 94025

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INTRODUCTION

This study of geophysical terranes within and surrounding the Great Basin of the western United States (fig. 1A) integrates geophysical and geologic data to provide new insights on basement composition and structure at local, intermediate, and regional scales. Potential field (gravity and magnetic) studies are particularly useful to define the location, depth, and extent of buried basement sources and fundamental structural or compositional boundaries. They especially serve in imaging the subsurface in areas of extensive Cenozoic cover or where surface outcrops may be detached from the deeper crust. Identifying buried compositional or structural boundaries has applications, for example, in tectonic and earthquake hazard studies as they may reflect unmapped or buried faults. In many places, such features act as guides or barriers to fluid or magma flow or form favorable environments for mineralization and are therefore important to mineral, groundwater, and geothermal studies. This work serves in assessing the potential for undiscovered mineral deposits and provides important long-term land-use planning information. The primary component of this report is a set of geophysical maps with anomalies that are labeled and keyed to tables containing information on the anomaly and its source. Maps and data tables are provided in a variety of formats (tab delimited text, Microsoft Excel, PDF, and ArcGIS) for readers to review and download. The PDF formatted product allows the user to easily move between features on the maps and their entries in the tables, and vice-versa. Our goal in highlighting these anomalies is to stimulate thought and research about crustal features of the Great Basin. While we do not offer comprehensive interpretation of every gravity and magnetic feature in the Great Basin, we hope this product will serve as a useful spatial catalog of those features.

Physiography

The Great Basin is a broad hydrologically closed region spanning much of the western United States (fig. 1A). It forms part of the Basin and Range Province (Figure 1B), which is characterized by late Cenozoic regional extension ranging from Mexico nearly to Canada and California to Texas. This extension has been accompanied by normal and detatchment faulting, crustal block uplift, downdrop, rotations and tilting, crustal thinning and ductile flow, and

widespread magmatism. Crustal blocks expose a range of variably deformed pre-Cenozoic rocks as well as early and middle Cenozoic volcanic rocks.

The study area (fig. 1A) includes the Great Basin and parts of ten adjacent physiographic provinces (Cascade Mtns, Columbia Plateaus, Snake River Plain, Northern Rocky Mtns, Sierra Nevada, Great Valley, Coast Ranges, Mojave Desert, Colorado Plateaus, and Middle Rocky Mtns). The Great Basin is sharply defined on its northern, western and eastern margins where it is bound by the Snake River Plain, Sierra Nevada, and Colorado Plateaus, respectively. Northwestern, northeastern and southern boundaries, however, are less well defined. Definitions of the Great Basin and its surrounding provinces used in this report largely follow those of Fenneman and Johnson (1946).

Potential Field Geophysics

Several excellent reviews of magnetic methods have been published by Grant (1985a,b), Reford (1980), Hinze and Zietz (1985), Blakely (1995), and Gunn and Dentith (1997). Similarly, Simpson and others (1986), Simpson and Jachens (1989), Jachens and others (1989), and Blakely (1995) provide informative reviews of gravity methods. These geophysical techniques, which allow imaging of subsurface structure, are particularly important in the Great Basin where more than 75% of the surface is covered by Cenozoic deposits. Gravity and magnetic anomalies occur due to lateral contrasts in rock density and magnetic properties (induced and remanent magnetizations), respectively. Rock-property contrasts may occur within a rock unit, such as resulting from gradual lateral facies changes or heterogeneous alteration, or at geologic structures such as faults, folds, or contacts. The geometry and depth to sources, the character of the geomagnetic field, and the rock properties of sources all determine the character of the associated potential field anomalies. Despite the complexity of potential fields and their sources, gravity and magnetic data can be used to resolve the geometry and origin of sources, particularly when combined with other geologic constraints such as the regional tectonic models, surface geology, and seismic data.

GRAVITY DATA

Gravity data were compiled from a variety of sources reduced and gridded (Hildenbrand and others, 2000) to produce the various gravity and derivative maps shown in this report. Gravity maps, derived from these data, reflect anomalies that may arise from contrasts in density due to contacts between different rock units, partial melting, or phase transitions. Generally, long-wavelength anomalies with smooth gradients originate from sources at depths greater than sources of short-wavelength anomalies that display steep gradients. While short-wavelength anomalies must arise from sources at shallow depths, long-wavelength anomalies, could arise from shallow, thin sources that have gently sloping sides.

In order to produce a gravity map reflecting lateral variations in density in the crust, raw gravity measurements were reduced using standard gravity reduction methods (Dobrin and Savit, 1988; Blakely, 1995). These reductions remove the effects of elevation, topography, total mass, rotation, and ellipsoidal shape of the Earth and yield the complete Bouguer gravity anomaly (CBA). Although the CBA reveals lateral density variations at short wavelength scales, it does an inferior job isolating longer wavelength features since these are often masked by broad anomalies due to deep crustal roots that isostatically compensate topographic loads. The isostatic correction attempts to remove effects of compensating masses.

Despite its name, an isostatic anomaly does not necessarily reflect the state of isostatic equilibrium. In this study, we are most interested in those cases where anomalies arise from density inhomogeneities in the crust. Nonetheless, it should be noted that an isosatic anomaly may reflect areas out of isostatic balance, either dynamically or by means of elastic support. For example, because the isostatic correction ignores effects of lithospheric strength it may not acurately account for regional fields associated with topographic loads. Thus, in areas where the lithoshere is exceptionally strong, topographic loads can be supported regionally, and compensation distributed over the area of elastic flexure rather than being locally compensated.

A general correlation between topography and the regional bouguer gravity field indicates that across the Great Basin the crust is in isostatic equilibrium. A common misconception is that the depth of compensation corresponds to the Moho. Because Bouguer gravity does not correlate to crustal thickness (Eaton and others, 1978) and gravity effects due to variations in the crustal

thickness versus lithospheric thickness differ by an order of magnitude (i.e., asthenoshere/lithosphere density contrast is ~0.08 g/cc and between crust and lithosphere it is ~0.4 g/cc), compensation likely occurs at mid-crustal depths. In the Great Basin, where heat flow is high and extension is large, isostatic compensation is probably achieved over relatively short lateral distances (e.g. 150 km), and within relatively shallow crustal depths perhaps within the upper 20 km (Eaton and others, 1978).

Although the close correspondence of topography and Bouguer gravity suggests compensation is achieved largely by an Airy-Heiskanen mechanism, some regions, such as the Rocky Mountains (Eaton and others, 1978, Woollard, 1972), are best fit with a Pratt model that achieves compensation through lateral density variations. This is indicated by crustal density variations inferred from seismic compressional wave velocity data. It has been suggested that isostatic equilibrium and extension in the Great Basin are likely accommodated by shallow crustal intrusion or ductile flow, especially in areas such as core complexes where the crust has undergone significant stretching and thinning (Thompson and McCarthy, 1990).

MAGNETIC DATA

Magnetic data were derived from a compilation of statewide compilations (Hildenbrand and others, 2000). Surveys have all been continued to a common reference level of 0.305 km above ground surface, gridded, and filtered to produce the magnetic maps shown in this report. Variations in the magnetic field arise from contrasts in the magnetic properties of rocks. These contrasts can be due to a number of different sources including crustal structures, metamorphism and alteration, variations in remanent magnetization, and variations in the concentration and type of magnetic minerals.

Generally, the most significant contributions to crustal anomalies arise from magnetite, one of the most common, strongly magnetic minerals in the crust. Furthermore, because the magnetic susceptibility of magnetite dramatically drops at temperatures above the Curie point (580° for pure magnetite), the portion of crust most responsible for variations in the magnetic field is that

which lies above the Curie isotherm. This probably coincides roughly with the Moho, though in areas of high heat flow, like the Great Basin, it may occur at significantly shallower depths.

Although the magnetic field strength depends on both induced and remanent crustal magnetization, it is often assumed that the remanent component is negligible. This is because remanence is often low enough to ignore or because remanent components are often aligned close to the induced field component. In general, this is supported by the character of many magnetic anomalies. For example, in the northern hemisphere, anomalies often have relatively weak minima that lie to the north of their maxima counterparts (note that magnetic sources generally display bipolar anomalies). An important effect on the character of geophysical anomalies is the depth to the source. The shallower the depth to a body, the higher the amplitude, the shorter the wavelength, and the sharper the gradients of its anomaly. Generally, magnetic highs arise from mafic igneous and crystalline basement rocks, whereas lows arise from felsic igneous, sedimentary, or altered basement rocks. Igneous outcrops not associated with high-amplitude magnetic anomalies might be thin or contain low concentrations of primary magnetic minerals, or have lost them due to alteration.

Aeromagnetic anomalies in most of the Great Basin have been found to arise from Precambrian metamorphic, Mesozoic granitic and gabbroic, Tertiary calc-alkaline volcanic and intrusive, and Tertiary basaltic rocks (Blakely, 1988). Much of the Precambrian basement in the Great Basin is weakly magnetic, in contrast to the magnetic basement of the Colorado Plateaus (Mabey and others, 1978).

FILTERING AND DERIVATIVE METHODS

Basement Gravity

An iterative gravity inversion method (Jachens and Moring, 1990), used to determine the depth to pre-Cenozoic basement and the thickness of Cenozoic basin deposits, was applied to the Great Basin to obtain a basement gravity map (Figure 2), a by-product of the depth-to-basement process. Basement gravity, which is the isostatic gravity with the effects of Cenozoic basins

removed, reflects lateral density variations in pre-Cenozoic basement rocks and is particularly useful for defining pre-Cenozoic structures and crustal geophysical terranes.

Isostatic gravity anomalies were used during this inversion process because they enhance or reflect shallow- to mid-crustal sources within the Earth by removing long-wavelength variations in the gravity field inversely related to regional topography (Simpson and others, 1986). The Basement gravity inversion process depends on their being a significant contrast in density between the usually dense basement rocks and any overlying Cenozoic deposits. While this is true for much of the Great Basin, Cenozoic mafic volcanic rocks can have densities similar to those of their underlying basement rocks. This is a problem, particularly in the northwestern-most part of the Great Basin that is blanketed by middle Miocene mafic lava flows. As a result, the inversion process was not applied in areas where the thickness of overlying volcanic rocks could not be determined. The boundary within which the depth-to-basement calculation was applied is shown in Figure 2. Outside this boundary, we show isostatic gravity values.

The depth-to-basement method separates the gravity field into two components: the gravity field caused by pre-Cenozoic basement and the gravity field caused by overlying younger basin deposits. An initial basement gravity field is determined by using only stations located on pre-Cenozoic basement outcrops. The initial basement gravity field is approximate because stations located on basement are influenced by the gravity effect of low-density deposits in nearby basins, especially for those stations near the edge of the basins. The difference between the isostatic gravity and basement gravity fields provides the first estimate of the basin gravity field, which is inverted to provide the first estimate of the basin shape. The gravitational effect of the basins is subtracted from each station located on basement and a new and improved basement gravity field is determined. This process is repeated until successive iterations converge. Inversion of the final basin gravity field yields the final estimate of the depth to pre-Cenozoic basement. The density of basement rocks is allowed to vary horizontally, whereas the density of basin-filling deposits increases with depth according to a density-depth relationship defined by Jachens and Moring (1990).

A number of limitations are inherent in this method, including uncertainties that relate to: the gravity data coverage, especially for stations on basement outcrops; the density-depth function; accuracy and scale of the geologic mapping; simplifying assumptions regarding concealed

geology; and the distribution of basement outcrops. A more detailed discussion of the limitations and accuracy of the method were provided by Jachens and Moring (1990).

Magnetic Potential (pseudogravity)

Crustal magnetism differs from and is more complex than gravity, which varies due simply to the crustal density distribution. Magnetism varies because of differences in both the concentration and type of magnetic minerals within the crust (analogous to the relation between density and gravity), and crustal remanent magnetization. Furthermore, because crustal magnetization is seldom vertical, except at the magnetic poles, anomalies are asymmetric and not centered over their sources. In addition, unlike gravity, crustal remanent magnetism has a depth limit set by the Curie temperature isotherm, the temperature above which remanent magnetization does not exist. Magnetic data also tend to highlight shallower features than gravity, because magnetic field strength attenuates more significantly with distance to the source than does gravity.

Because of this complexity of magnetic anomalies they are typically more difficult to interpret. The pseudogravity or magnetic potential transformation (Baranov, 1957; Blakely, 1995) removes asymmetry of anomalies, by centering them over their sources, and allows for a more accurate estimate of the extent of source bodies. In addition, it helps highlight regional magnetic features masked by high-frequency anomalies.

Because the magnetic and gravity potentials are related by a directional derivative, thus the total magnetic field can be transformed into an equivalent gravity field. Magnetic potential, or pseudogravity, maps are produced by the transformation of the magnetic field into the equivalent gravity field assuming a density distribution equal to the magnetization distribution (Baranov, 1957). The ratio between magnetization and density is held constant and remanent magnetization is assumed to be either negligible or in the same direction as the Earth's magnetic field. This process amplifies long wavelengths (deeper sources) at the expense of short wavelengths (shallow sources). In addition, because gravity anomalies have their steepest gradients approximately over the edges of their causative sources, especially for shallow sources, the magnetic potential map can be used to approximate the edges of magnetic sources (Blakely, 1995).

Maximum Horizontal Gradients

To better define the edges of geophysical sources and to help derive geophysical lineaments and terranes, the amplitudes of the maximum horizontal gradients (AMHG) of both gravity and magnetic data were computer generated. A technique described by Blakely and Simpson (1986) was used to calculate the AMHG. Because the AMHG tend to lie over the edges of bodies with near vertical boundaries (Cordell and McCafferty, 1989; Grauch and Cordell, 1987), they are useful at estimating the extent of buried sources. AMHG were derived for both previously described basement gravity and magnetic potential maps. Because these maxima reflect abrupt lateral changes in the density or magnetization of the underlying rocks, they were used to aid in defining the boundaries of geophysical terranes shown in Figures 2 and 3.

POTENTIAL FIELD MAPS

Gravity and magnetic lineations (shown in figs. 2 and 3, respectively) were derived with the aid of the AMHG method described above. Geophysical terranes are based in part on the AMHG-derived boundaries and on geophysical fabric. Areas, for example, that display a consistent trend or wavelength of anomalies, in contrast to their surroundings, were defined as distinct geophysical terranes that may represented discrete crustal blocks having similar physical properties or sources. Gravity and magnetic terrane maps (figs. 2 and 3) were created by visual inspection of gravity, magnetic, and derivative geophysical maps, and by drawing polygons around similar geophysical areas using derived lineaments as a guide to locating terrane boundaries. In addition to geophysical terranes, we have also included a number of lineations. A few of these are defined as geophysical features listed in table 1, while others occur on figures 2 and 3 simply as unlabeled features that are intended to highlight the geophysical fabric.

GEOPHYSICAL TERRANE TABLE

The geophysical terrane table (table 1) lists geophysical terranes that occur on the gravity and magnetic terrane maps (figs. 2 and 3). The table is organized to allow the user to identify features in the table that occur on the maps, and to move between maps and table. Terrane names contain (from left to right): a two letter (uppercase) code identifying the state in which they mostly occur, a single letter (lowercase) code identifying whether the feature is a gravity (g) or magnetic (m) terrane, and a two digit number indicating the feature number. Geologic and geophysical references provided in the table point the user to an example of work pertaining to some part of the anomaly or to its presumed source rock, and should not be considered a complete list of pertinent or historical citations. We refer the reader to references contained within the cited publications for further background. Several of the table columns are specifically defined such that they may be used as search terms or as tools for sorting the table based on the terrane characteristics (These include: Generalized Source Rock, Province, Tectonic Setting, and Scale). A brief discussion of these terms is provided below. These search fields are inherently simplified and may not adequately explain the character, especially of diverse terranes.

Generalized Source Rock

Five primary rock categories (sedimentary, volcanic, intrusive, metamorphic, and basement) are used in conjunction with five secondary rock categories (silicic, mafic, ultramafic, carbonate, and siliceous) to provide thirteen categories (table 3) to describe the generalized source rock. Note that in some cases, the choice between terms is arbitrary. For example, basement and metamorphic rock categories overlap, and in many cases are interchangable. Here, ‘Metamorphic’ is generally used in the Coast Ranges and Klamath Mountains, and ‘Basement’ in the Great Basin and Colorado Plateaus. In areas where several different source rocks may be present, multiple rock type terms have been used. ‘Basement’ is generally used throughout this report to refer loosely to dense, crystalline, and usually Precambrian rocks. This is in contrast to its use in the term ‘basement gravity’ (e.g., fig. 2), which considers basement as pre-Cenozoic rocks assumed to be dense, crystalline rocks of many types. Note that in places where source

rocks are entirely covered, the inferred source rock type is generally inferred from the gravity and magnetic character of the terrane, and may not be unique. For example, a gravity and magnetic low that could be inferred as due to silicic basement might instead be due to depressed basement that has no lateral variation in basement composition.

Table 3. Generalized source rock categories

Primary	Secondary	Usage
sedimentary	carbonate	Generally used to refer to dense sedimentary rocks (e.g. limestone, dolomite).
	siliceous	Generally used to refer to non-carbonate sedimentary rocks (e.g. sandstone, siltstone, argillites, cherts).
volcanic	silicic	Generally used for non-magnetic volcanic rocks. An exception to this is in areas of silicic tuff. Generally includes intermediate composition rocks (e.g. andesites).
	mafic	Generally used for magnetic volcanic rocks.
intrusive	silicic	Generally used for low density or non-magnetic intrusive rocks. Generally includes intermediate composition rocks (e.g. dacites).
	mafic	Generally used for dense or magnetic intrusive rocks. Note that some granitic rocks can be dense.
	ultramafic	Generally used for dense or magnetic intrusive rocks.
metamorphic	silicic	Generally used for low density or non-magnetic (e.g. quartzose) metamorphic rocks.
	mafic	Generally used for dense and magnetic metamorphic rocks.
	ultramafic	Generally used for dense and magnetic metamorphic rocks.
basement	silicic	Generally used for relatively low density or non-magnetic basement rocks.

	mafic	Generally used for very dense and magnetic basement rocks.
	carbonate	Generally used for dense and non-magnetic basement rocks.

Tectonic Setting

The 'Tectonic Setting' category describes the tectonic setting associated with the development of the geophysical feature. In cases where a terrane formed from several geologic events or during multiple stages, or straddled different tectonic settings, multiple categories of 'Tectonic Setting' were used. As a result, both ancient and recent settings may be listed. Nonetheless, the most representative setting controlling the character of the feature is given (e.g., the 'Tectonic Setting' of Salinian granites in the Coast Ranges is given as both 'Batholith' and 'Transcurrent' because the shape of the block subsequent to the rocks having formed as a batholith was modified by transcurent strike-slip motion). In cases where multiple terms are given, the setting considered primarily responsible for the feature is listed first. When there is doubt as to the origin of the source, the present tectonic setting is given (e.g. 'Extension" applies to sources within the Great Basin with no known tectonic origin). Table 4 lists 'Tectonic Setting' categories that include eleven terms (extension, transcurrent, compression, stable crust, subduction, accretion, uplift, depression, hotspot, batholith, continental margin). The use of 'Subduction' to describe the tectonic setting of terranes within the Great Basin applies to Mesozoic intrusive rocks mainly in the western Great Basin (Walker Lane Belt) and Oligocene to middle Miocene volcanism that occurred throughout the Great Basin due to shallowing and subsequent steepening of the subducting Farallon slab.

Table 4: Tectonic setting categories

Tectonic setting	Usage
extension	Generally applies to entire Great Basin with Basin and Range type extension and to even greater extended terranes. Also used to describe back-arc spreading as seen in the Oregon highlands.

transcurrent	Refers to areas subjected to significant strike-slip deformation. Generally applied to right-lateral displacements in Coast Ranges and the Walker Lane.
compression	Used in the region east of the Idaho Batholith and north of the Snake River Plain -- an area in the Rocky Mountains Foreland Thrust Belt.
stable crust	Largely applies to the Colorado Plateaus region and refers to areas of weakly deformed flay-lying Mesozoic and Paleozoic rocks.
subduction	Applies to major batholiths and to extensive magmatism in the Great Basin thought to relate to shallowing of the subducting Farallon Plate in the later part of the Cenozoic.
accretion	Used extensively in California in the Coast Ranges, Klamath Mountains, and extending to the western Sierra Nevada. These areas are often also associated with transcurrent tectonic setting.
uplift	Used for blocks of basement uplifted on high-angle faults or on flextures. Areas include core complexes and the Colorado Plateaus.
depression	Used largely for isolated basins in the California Coast Ranges. Also associated with areas of pull-apart tectonics. Can also apply to depressed basement.
hotspot	Used to refer to magmatism and fracturing associated with the ancestral Yellowstone hotspot.
batholith	Used to refer to large granitoid intrusions associated with the Sierra Nevada, Salinian Block, and Idaho Batholiths and to fragments of these such as may occur eastern California and west-central Nevada.
continental margin	Refers to Paleozoic and Mesozoic continental margin in the Great Basin. Defined esentially by the edge of the continental shelf.

Provinces

Geophysical terranes within twelve physiographic provinces, that include the Great Basin and parts of its surrounding provinces (Cascade Mtns., Coast Ranges, Colorado Plateaus, Columbia Plateaus, Great Valley, Klamath Mtns., Middle Rocky Mtns., Mojave Desert, Northern Rocky Mtns., Sierra Nevada, Snake River Plain) are described in this report (figs. 2 and 3, table 1). Figure 1 shows the extent of these provinces (note that the province boundaries used here largely follow those of Fenneman and Johnson (1946), and table 2 gives their physiographic, geologic and geophysical descriptions.

In places, province boundaries are poorly defined, for example, at the boundary between the Great Basin and Columbia Plateaus Provinces. This boundary, which is not well expressed physiographically, represents one of the few differences between the province map used here and that of others (e.g. Fenneman and Johnson, 1946). Terms used under the ‘Generalized Tectonic Setting’ column refer to the same terms used in Table 4 and described above.

Scale of Geophysical Features

At the broadest scales, geophysical terranes can reflect major deep-seated crustal discontinuities such as transform, accommodation, or shear zones, ancient continental margins, failed rifts, accretionary belts, or magmatic arcs. At local scales, they can reflect, for example, individual faults or intrusive bodies. Below is a description and definition of terrane scales that appear in table 1.

Regional-scale Geophysical Provinces

Regional scale terranes are considered to constitute very large regions, extending from hundreds to thousands of kilometers, that may consist of an assemblage of smaller-scale features that share a common character in contrast to surrounding regions (e.g. the terrane may define a zone of consistent geophysical fabric). A regional-scale feature may reflect a region of common tectonic or magmatic history and it may be bound by deep crustal to subcrustal faults. Some examples include volcanic plateaus, broad shear zones, and broad and coherent crustal blocks bound by deep crustal faults. Identification of regional-scale features is aided by standard and long-wavelength geophysical maps, fabric analysis, contrasts of dominant frequencies, and contrasts in mean gravity and magnetic values.

A description of the regional geophysical expression of the Great Basin and each of its surrounding provinces is given in table 2. The broadest expression in regional gravity and magnetic maps of the study area are reflected in figure 4, which show outlines that roughly mimic the shape and extent of the entire Great Basin. These largest of terranes appear in table 1 as the first two entries.

The Great Basin boundary has relatively sharply defined geophysical boundaries, though these, in places, crosscut the physiographically and geologically defined boundaries of the region. To the north it contrasts with the high basement gravity and magnetic character of the Snake River Plain, although the gravity high over the northern Great Basin merges with that of the Snake River Plain. To the west, the high frequency magnetic and moderate gravity highs of the western

Great Basin abut the prominent northwest-trending magnetic high and gravity low of the eastern Sierra Nevada Province. At its east edge, the Great Basin is rimmed by the Colorado Plateaus. Though its contact is not particularly clear in the basement gravity, the generally low magnetic fields over the Great Basin contrast sharply with the high magnetic terrain of the Colorado Plateaus. More ambiguous occur to the northeast, northwest, and south where the Great Basin meets with Middle Rocky Mountains, Columbia Plateaus, and Mojave Desert Provinces, respectively.

Intermediate-Scale Geophysical Features

Intermediate-scale terranes constitute large coherent anomalies (e.g., crustal rifts or sutures, structural basins or ranges, or batholiths) that extend on the order of tens to hundreds of kilometers. Identification of these regional-scale features is aided by standard geophysical maps, long- and short-wavelength maps, and AMHG maps.

Local-Scale Geophysical Features

Local-scale features (reflecting, for example, individual plutons, faults, or calderas) reflect anomalies arising from discrete source bodies that reside in the shallow to mid-crust, and extend over several tens of kilometers. Identification of local-scale features is aided by standard geophysical, long- and short-wavelength, and AMHG maps. Although a few local-scale anomalies are described in this report, a detailed assessment of local-scale anomalies is beyond the scope of this study.

DISCUSSION

This work provides an introduction to geophysical terranes of the Great Basin and surrounding regions, with interpretations of their underlying causes. The aim of this work is to relate geophysical terranes to their geologic domain counterparts, to resolve the nature of transitions

between terranes, and to understand their origin, and their relation to basement structures and composition.

The study spans local-scale (e.g., individual plutons, faults, or calderas), anomalies arising from discrete source bodies that reside in the shallow to mid-crust, and extend over an order of several tens of kilometers to regional-scale features (very large regions, extending from hundreds to thousands of kilometers). Assessment of geophysical terranes was aided by a variety of filtering and derivative methods, and took into account frequency, amplitude, fabric, and gradients of terranes anomalies.

Geophysical maps and data tables of this report are provided in a variety of formats (tab delimited text, Microsoft Excel, Microsoft Word, PDF, and ArcGIS) for readers to review and download. The PDF formatted product contains useful links that allow the user to easily move between features on the maps and their entries in the tables.

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TABLES

Table 1. Geophysical features of the Great Basin and parts of surrounding provinces. Terranes appear in the table sorted in the order of: state, gravity number, and magnetic number. Refer to gravity and magnetic terrane maps (figs. 2 and 3, respectively). The table gives (from left to right): Scale of anomaly (R=Regional, I=Intermediate, L=Local); Terrane ID (containing from left to right: 2 digits for the state, 1 'm' or 'g' for magnetic or gravity anomaly, respectively; two digits for terrane number); Terrane definition (describes the geophysical characteristics that define the feature), Anomaly type (H=high, L=low, or B=both high and low); Geologic Province (describes the geology associated with the geophysical terrane); Inferred source of anomaly; Generalized source rock (see Table 3 for description of terms); Tectonic setting (see table 4 for description of terms); Province (gives the associated physiographic province, see table 2); References. Abbreviations include: BR, Basin and Range; CP, Colorado Plateau; CRP, Columbia River Plateaus; Cz, Cenozoic; GB, Great Basin; Mz, Mesozoic; NNR, Northern Nevada Rift; pC, Precambrian; Pz, Paleozoic; SRP, Snake River Plain. For further details, see text.

Table 2. Physiographic provinces and their geologic and geophysical character. Physiographic province boundaries and descriptions are modified from Fenneman and Johnson (1946).

FIGURES

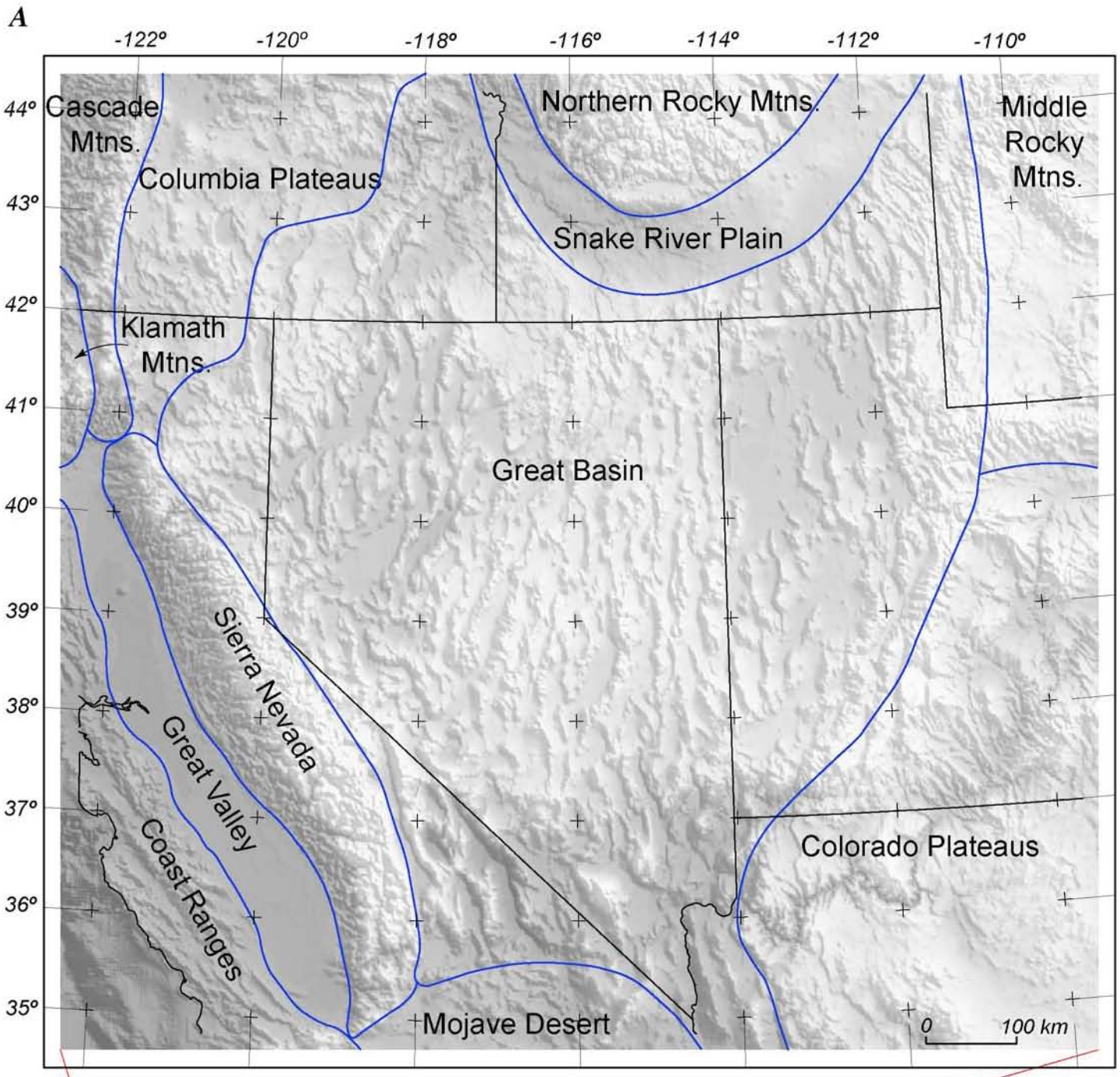
Figure 1. A) Index map of the Great Basin showing digital shaded relief and outlines of the Great Basin and surrounding physiographic provinces. Physiographic province boundaries are modified from Fenneman and Johnson (1946); B) The Basin and Range extensional province that includes the Great Basin.

Figure 2. Basement gravity terrane map of the study area. Blue lines are edges of gravity sources determined by the maximum horizontal gravity method; each feature is uniquely labeled and described in Table 1. Yellow lines are linear gravity features, labeled uniquely and described in Table 1; red lines are unlabeled, undescribed, linear gravity features. White line

shows boundary within which basement calculation was performed. Isostatic gravity is shown outside this boundary.

Figure 3. Magnetic potential terrane map of the study area. Blue lines are edges of magnetic sources determined by the maximum horizontal gravity method; each feature is uniquely labeled and described in Table 1. Yellow lines are linear magnetic features, labeled uniquely and described in Table 1; red lines are unlabeled, undescribed, linear magnetic features.

Figure 4. Regional isostatic gravity and pseudogravity field maps of the Great Basin and surrounding area. The white outline represents the Great Basin boundary in each map. The black outlines represent the regional gravity terrane and regional pseudogravity terrane described in Table 1 as G1 and M1, respectively.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Northern Rocky Mtns.
Middle Rocky Mtns.
Snake River Plain
Klamath Mtns.
Great Basin
Sierra Nevada
Great Valley
Coast Ranges
Colorado Plateaus
Mojave Desert
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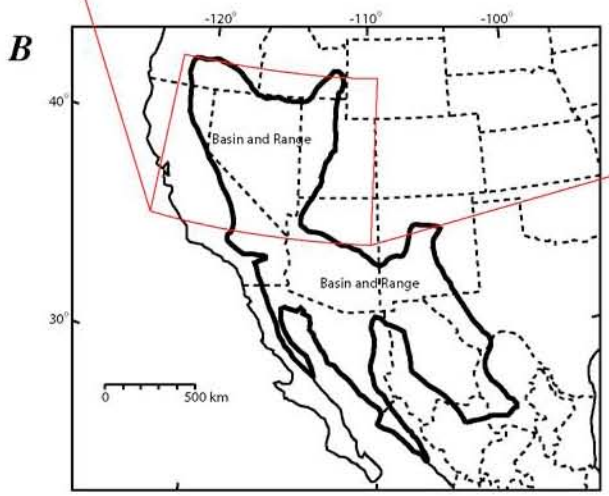
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500 km

Figure 1

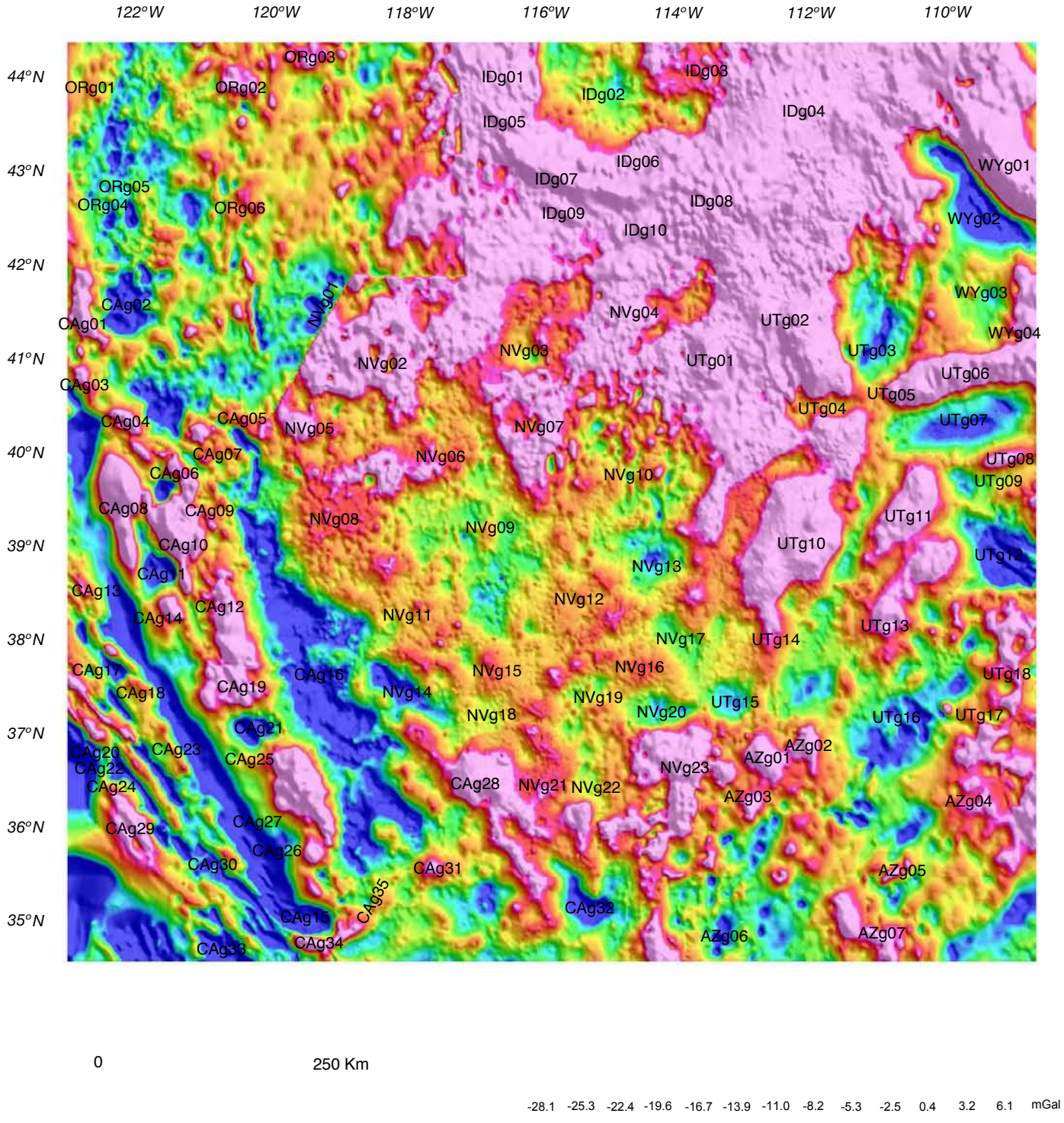


Figure 2. Basement gravity terrane map of the Great Basin. Blue lines circumscribe labeled polygonal features described in Table 1; yellow lines show labeled linear features described in Table 1; red lines show undescribed linear trends.

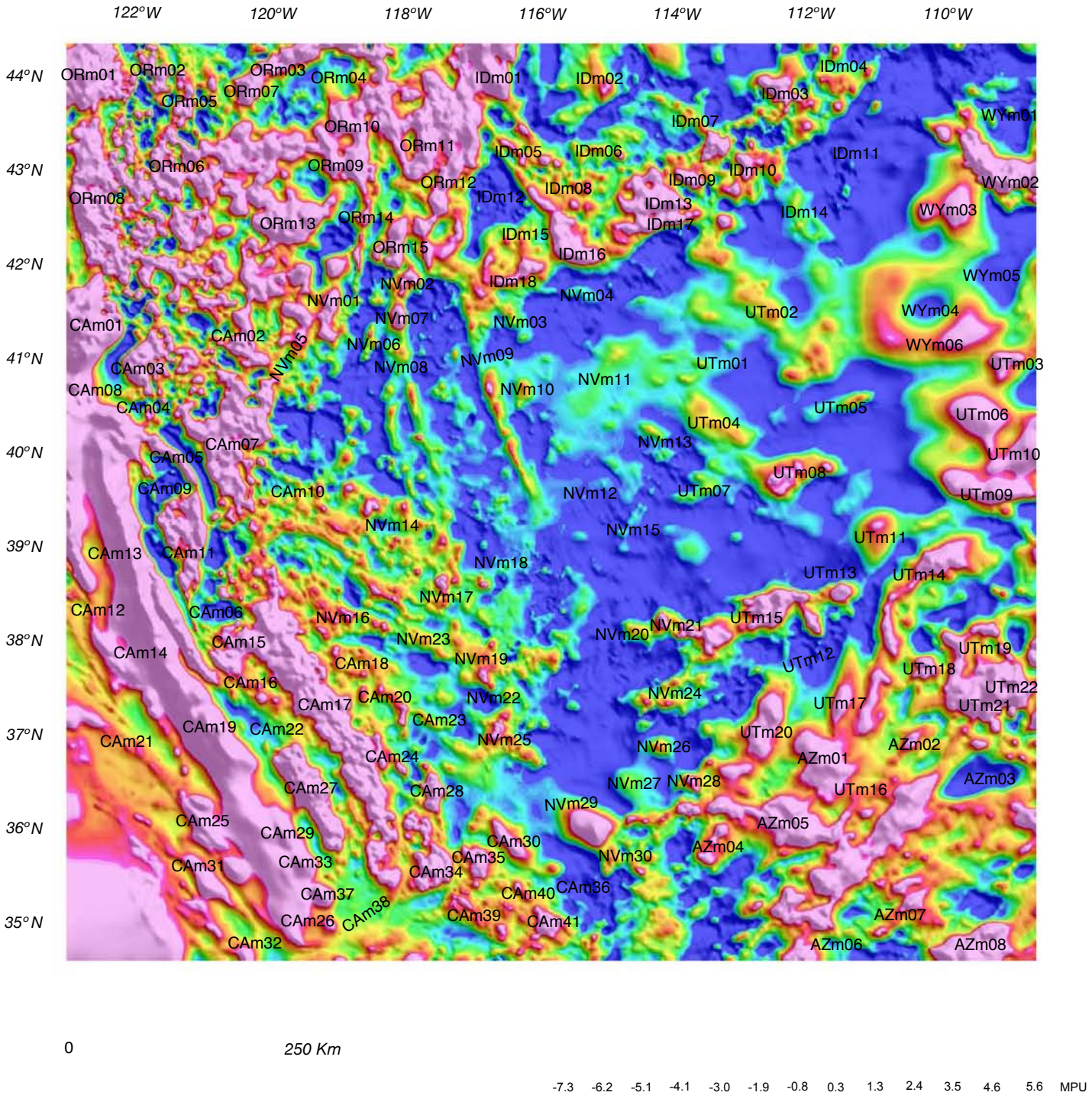
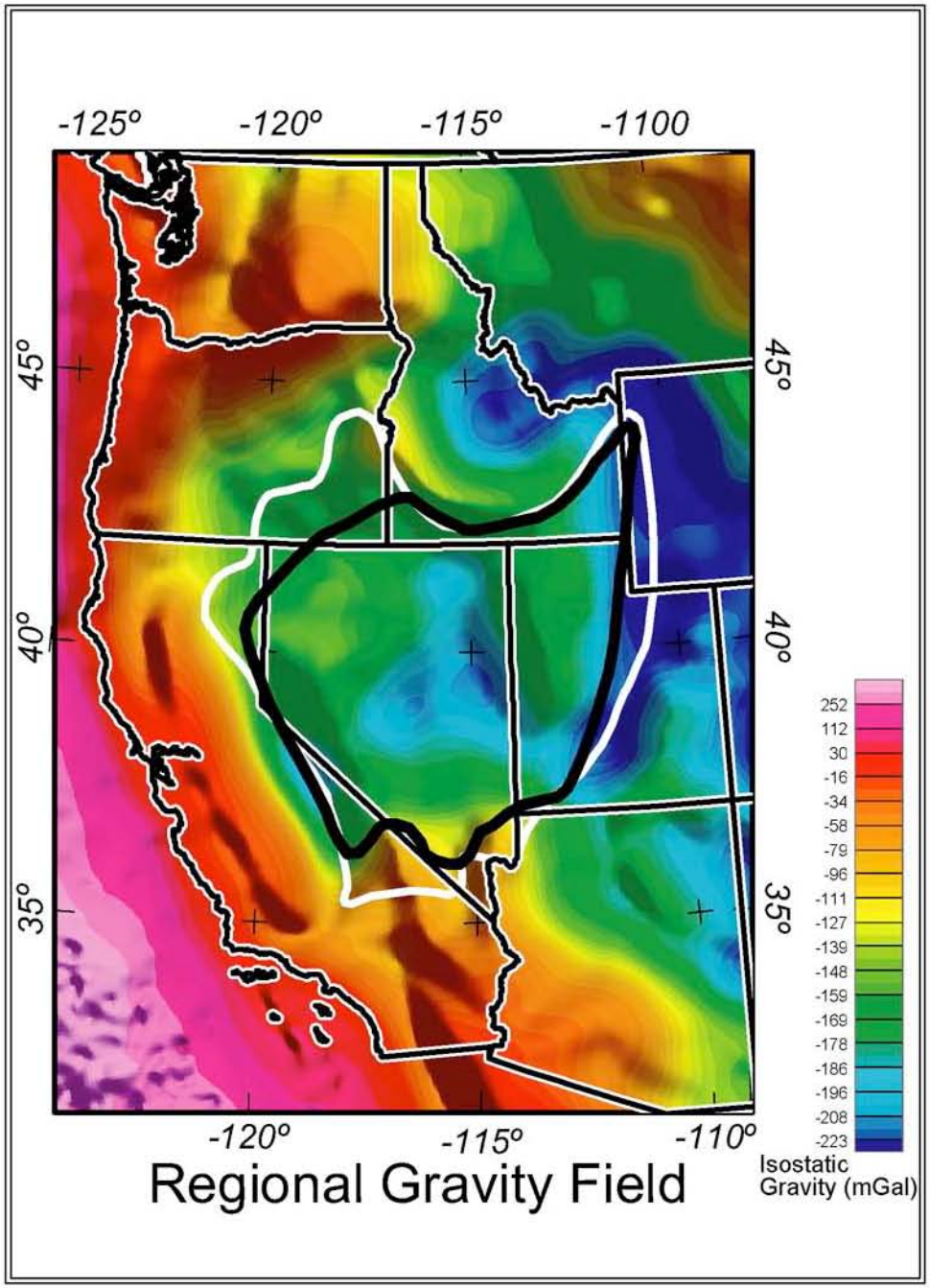


Figure 3. Magnetic potential (pseudogravity) terrane map of the Great Basin. Blue lines circumscribe labeled polygonal features described in Table 1; yellow lines show labeled linear features described in Table 1; red lines show undescribed linear trends.



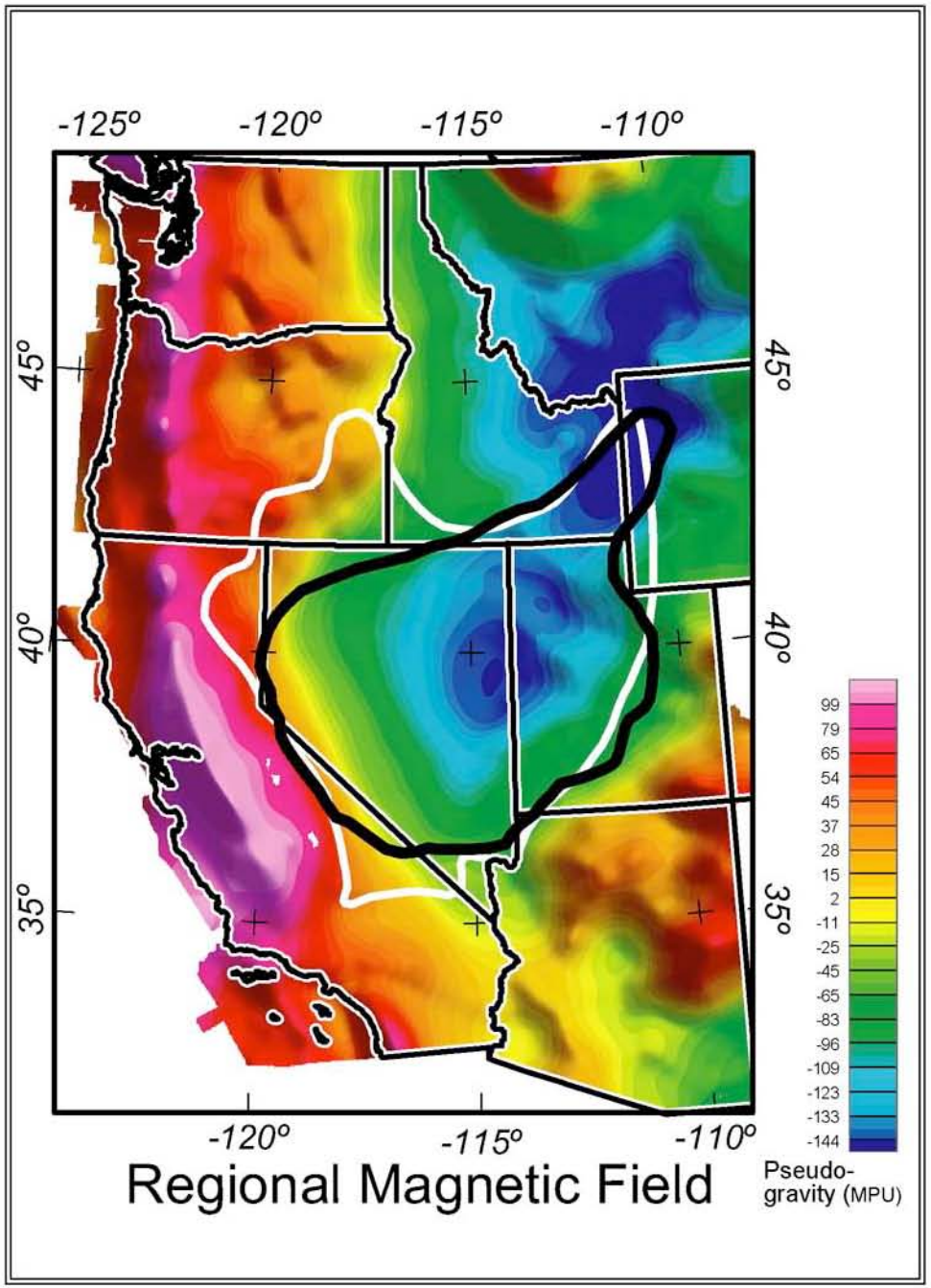


Figure 4. Regional isostatic gravity and pseudogravity field maps of the Great Basin.

Table 1: Geophysical Features of the Great Basin and parts of the surrounding provinces

Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
R	G1		Regional long-wavelength gravity anomaly spans entire GB and has bi-lateral symmetry (resembling the form of a butterfly). Anomaly appears best in isostatic gravity and topography, but expressed also in pseudogravity (see regional isostatic field map, figure 4). Corresponds with regional magnetic low.	Anomaly corresponds roughly to a topographically high region of extended crust associated with the GB Province.	Anomaly reflects regionally extended, hot and elevated crust.	varied	extension	Great Basin	Fenneman, 1931; Eaton and others, 1978; Mabey and others, 1978; Glen and others, 2000
R	M2		Broadest regional pseudogravity feature corresponding roughly with the extent of the GB defined by topography (see regional pseudogravity map, figure 4). Corresponds with regional isostatic gravity low.	Anomaly corresponds roughly to a topographically high region of extended crust associated with the GB Province.	Anomaly reflects regionally extended, hot and elevated crust.	varied	extension	Great Basin	Fenneman, 1931; Eaton and others, 1978; Mabey and others, 1978; Glen and others, 2000
I	AZg01	H	Oval gravity high (35km) that correlates with magnetic anomaly UTm20.	Located on CP close to Hurricane Fault zone. Corresponds in part with Q and T volcanic centers.	Source is buried by Pz and Mz strata. May be dense and magnetic buried pC basement or Q and T volcanic rocks.	basement , volcanic mafic	uplift, stable crust, extension	Colorado Plateaus	
I	AZg02	H	Oval gravity high (35km) over north end of magnetic anomaly AZm01.	Located over a broader high on Kanab Plateau.	Source is buried by Pz and Mz strata. Source may be dense and magnetic buried pC basement.	basement	uplift, stable crust	Colorado Plateaus	
I	AZg03	H	EW-elongate regional gravity high (250x125km) containing some prominent large (~100km diameter) highs.	Northern part of feature corresponds to CP/GB transition. Western part is entirely within the GB. Northern and western portions correspond closely with outcrops of Pz strata.	Shallow pC-basement rocks.	basement	uplift	Colorado Plateaus	
I	AZg04	H	Broad gravity high (350x150km).	Located over Pz, and thickest Mz strata in AZ. coincides in part with the Black Mesa Basin.	Regionally elevated dense pC basement rocks beneath CP.	basement	uplift, stable crust	Colorado Plateaus	Sumner, 1985
	AZg05	H	NE-trending gravity high (50x25km). Edges correspond to steep magnetic gradients.	Located over T and Q volcanic rocks of the San Francisco Peaks volcanic field. Trend is similar to axes of monoclines in Mz strata that may indicate step faults in basement.	Uplifted dense pC basement or dense intrusive rocks associated with Cz volcanic field.	basement, intrusive mafic	uplift, stable crust	Colorado Plateaus	
I	AZg06	L	NE-trending gravity low (100x25km) within a much broader gravity low. Corresponds with magnetic low.	Lies within the transition zone between GB CP within a broader gravity low, over pC basement and Mz granitic rocks.	Low density, non-magnetic pC basement (silicic gneisses) and/or Mz granitic rocks.	basement, intrusive silicic	uplift	Colorado Plateaus	Sumner, 1985
I	AZg07	H	Prominant NW-trending gravity high (175x50km). Corresponds closely with a magnetic low (not numbered).	Located near the south edge of CP (Mogollon Rim).	Dense, nonmagnetic crystalline pC-basement.	basement	uplift	Colorado Plateaus	
I	AZm01	H	NW-trending magnetic high (75x40km) within a broader high of CP. North end corresponds to gravity high AZg02.	Kaibab (Unikaret) Plateau (CP).	Buried by Pz and Mz strata. Uplifted magnetic pC basement.	basement	uplift, stable crust	Colorado Plateaus	
I	AZm02	H	NE-trending elongate magnetic high(75x25km) located within a much larger gravity low.	Over Pz and Mz strata over the Paria Plateau (CP). Parallels plunging anticline, and is in line with the northeastern extension of the Bright Angle Fault.	Magnetic intrusive or faulted and uplifted basement rocks.	intrusive mafic, basement	stable crust, uplift	Colorado Plateaus	
I	AZm03	L	Prominent east-trending magnetic low (75x40km) that is within a much larger region of gravity high.	Over flat-lying Pz and Mz strata of CP. Corresponds to the NW part of the Black Mesa Basin.	Source is covered by Pz and Mz strata. Possible uplift of non-magnetic pC basement.	basement	uplift, stable crust	Colorado Plateaus	Sumner, 1985
I	AZm04	H	Equidimensional (40km) magnetic high. Over a complex gravity anomaly. Mostly within but near the edge of a generally high magnetic region.	At west edge of CP. Includes Iron Mtn volcanic rocks.	Probable uplifted magnetic pC basement or Cz volcanic and associated intrusive rocks.	basement, volcanic mafic, intrusive mafic	uplift, stable crust	Colorado Plateaus	

Table 1: Geophysical Features of the Great Basin and parts of the surrounding provinces

Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
I	AZm05	H	EW-trending elongate magnetic anomaly high (250km) that narrows at its west end (10km wide extending for ~150km). East end widens to ~75 km.	East end includes a large part of Coconino plateau. West end roughly corresponds with trace of the Colorado River and Lake Mead. Includes Mt Floyd volcanic field.	Probable uplifted magnetic pC basement uplifted on east-trending fault, or Cz volcanic or intrusive rocks.	basement, intrusive silicic, volcanic silicic	uplift	Colorado Plateaus	Sumner, 1985
I	AZm06	H	NE-trending elongate magnetic high (250kmx25km). SE-edge corresponds with gravity lineations. Includes three small anomalies at SW end.	Southern part correlates with San Francisco Peaks volcanic field. Straddles edge of CP. Anomaly resembles that associated with the Springerville volcanic field to SE. Trend is parallel to the Colorado Lineament which may be related to the Colorado Mineral Belt located to the NE. Aligned along Mesa Butte Fault.	Magnetic pC basement or Cz igneous rocks that exploited a fracture system in the basement.	basement, intrusive mafic, volcanic mafic	stable crust	Colorado Plateaus	Stewart and Crowell, 1992
I	AZm07	H	NE-trending elongate magnetic high (100x25km). Corresponds with NE-trending linear gravity features.	Located in transition zone of CP and BR, over Hackberry Miocene lava flows.	Magnetic volcanic rocks and feeder dikes.	volcanic mafic	extension	Colorado Plateaus	
I	AZm08	H	NE-trending elongate magnetic high (100x25km) located on a gravity low.	Located in transition zone of CP and BR, on pC (Apache group) rocks.	Magnetic pC basement.	basement	uplift	Colorado Plateaus	
I	CAg01	H	Narrow roughly NS-trending gravity high (100x10km). Located entirely within a magnetic high.	Anomaly located over complex of Mz intrusive rocks, Pz and Mz metasedimentary rocks, and ultramafic rocks that are part of the Klamath Mtns. Gravity anomaly is centered over a magnetic high (CAm01).	Gravity anomaly mimics crescent-shaped structural slivers, and is probably due to a dense portion of the eastern Klamath Mtns, probably mafic ultramafic rocks of the Trinity Ophiolite.	intrusive mafic, volcanic mafic, ultramafic	accretion	Klamath Mtns	LaFehr, 1966; Griscom,1980b; Jachens and Griscom, 1985; Jachens and others, 1989
I	CAg02	L	Oval gravity low (75km) within regionally complex magnetic region (CAm02).	Over Q and T volcanic arc terrain. Includes Mount Shasta at its SW end. It is ringed on its southwest half by Klamath Mtns Mz intrusive rocks.	Probably thick sequence of low density volcanic rocks.	volcanic silicic	accretion	Cascade Mtns	Griscom,1980a
I	CAg03	H	NW-elongate gravity high (50x20km). Corresponds to a magnetic high region.	Primarily on Pz limestones of the Klamath Mtns.	Probably due to dense, magnetic mafic and ultramafic rocks of the Trinity Ophiolite, though some of gravity anomaly may be due to dense carbonate rocks.	ultramafic, sedimentary carbonate	accretion	Klamath Mtns	
I	CAg04	H	NW-trending moderate gravity high (30x20km).	Over Q and T volcanic rocks.	Probably dense, magnetic metamorphic or intrusive rocks of the Sierra Nevada foothills and Klamath Mtns.	intrusive mafic, metamorphic mafic	accretion	Sierra Nevada	
	CAg05	H	NW-trending gravity high (75x50km). Located over a prominant magnetic high. Feature looks similar (in gravity and magnetics) to feature (CAg07).	Over T volcanic rocks.	Due to relatively dense and magnetic Mz granitic T volcanic rocks similar to feature CAg07.	volcanic mafic, intrusive silicic	batholith, extension	Great Basin	
I	CAg06	H	NW-trending moderate gravity high (100x20km). Located mostly over a magnetic low (unlabeled).	Over Mz and Pz rocks of the western foothills of the Sierra Nevada.	Sources are various NW-trending Mz and Pz intrusive and metamorphic rocks in western Sierra Nevada foothills. Anomaly likely due to intrusive and metamorphic rocks.	intrusive mafic, metamorphic	accretion	Sierra Nevada	Burnett and Jennings, 1982
I	CAg07	H	NW-trending (100x50km) variable gravity high. Located over a magnetic high region. Gravity anomaly is similar to the main Sierra Nevada batholith CAg12, though more magnetic.	Over T volcanic rocks, Mz granitic and metavolcanic rocks, and some Mz and Pz strata in the NW part of anomaly.	Due to relatively dense and magnetic Mz granitic or metavolcanic rocks, or T volcanic rocks.	volcanic mafic, intrusive silicic	batholith, extension	Great Basin	
I	CAg08	H	NW-trending prominent gravity high (150x50km). Forms northern end of prominent magnetic high (CAm19).	Entirely over north end of Great Valley. Sutter Buttes lies at its center.	May be dense, magnetic mafic volcanic roots, obducted magnetic oceanic crust or ultramafic rocks (ophiolite).	intrusive mafic, volcanic mafic, ultramafic	accretion	Great Valley	Griscom 1973; Cady, 1975; Jachens and others, 1989; Jachens and others, 1995

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Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
	CAg09	H	NS-trending prominent gravity high (40x25km). Located within gravity anomaly CAg10, and magnetic anomaly high CAm11.	Largely over Mz granitic pluton, and some Pz carbonates.	May be due to dense, magnetic intrusive rocks or perhaps dense, magnetic, mafic and ultramafic oceanic crust (Smartville Ophiolite).	intrusive mafic, ultramafic	accretion, batholith	Sierra Nevada	Oliver, 1980
I	CAg10	H	Prominent NW-trending gravity high (100x40km).	Over Mz granitic plutons, Pz carbonate and ultramafic rocks.	May be due to dense, magnetic intrusive rocks or dense, magnetic, mafic and ultramafic thrust slices in Klamath Mtns and Sierra Nevada.	intrusive mafic, ultramafic	accretion, batholith	Sierra Nevada	LaFehr, 1966; Jachens and Griscom, 1985; Jachens and others, 1989
I	CAg11	L	Oval gravity low (50km).	Over a Mz pluton.	Low density intrusive rocks.	intrusive silicic	batholith	Great Valley, Sierra Nevada	Oliver, 1980
I	CAg12	H	NNW-trending gravity high (275x75km).	Occurs over Pz and Mz meta-sedimentary, metavolcanic, oceanic crustal rocks (ophiolites), and granitic rocks.	Dense mafic and ultramafic ophiolite rocks.	intrusive mafic, volcanic mafic, ultramafic	accretion, batholith	Sierra Nevada, Great Valley	Oliver, 1980
I	CAg13	L	Narrow NW-trending gravity low (150x<10km) in line with gravity low CAg24.	Follows along trace of the Hayward and Rodgers Creek Faults.	Low density valley fill in East Bay Trough, and eastern Santa Clara and Livermore Valleys.	sedimentary siliceous	transcurrent, depression	Coast Ranges	Roberts and Jachens, 1993
I	CAg14	H	NW-trending gravity high (50x20km).	Mostly over alluvium and Tertiary sediments.	May be due to dense mafic to ultramafic intrusive bodies or to dense metasedimentary rocks.	intrusive mafic, ultramafic, metamorphic mafic	accretion	Great Valley, Sierra Nevada	
I	CAg15	L	Prominent, elongate NW-trending gravity low (700x50km). Strong gradients on eastern edge and in parts on its western edge. Located over magnetic low anomaly CAm14.	Located at westernmost edge of Great Valley.	Likely source is low density valley fill.	sedimentary siliceous	depression	Great Valley	Byerly, 1966; Suppe, 1979; Oliver and Griscom, 1980; Jachens and others, 1989
R	CAg16	L	Prominent NW-trending gravity low (550x75km). Corresponds with magnetic high anomaly CAm17.	Gravity anomaly is broader than the corresponding magnetic anomaly (CAm17), but also located mostly over eastern Sierra Nevada batholith.	Magnetic, low density granitic rocks.	intrusive silicic	batholith	Sierra Nevada	Oliver and Mabey, 1963; Griscom and Oliver, 1980; Jachens and others, 1989
I	CAg17	H	Prominent narrow NW-trending gravity high (>100x5km). Southern half is located over magnetic high CAm21.	Over Franciscan Complex rocks.	May be due to mafic and ultramafic rocks of the Franciscan Complex, such as greenstones of Permanente and Headlands terranes.	extrusive mafic, intrusive mafic, ultramafic	transcurrent, accretion	Coast Ranges	Jachens and Griscom, in press
R	CAg18	B	Irregular, NW-trending, long, linear, moderate gravity high (400x25km) defined by gravity lows to the east (CAg15) and to the west (CAm23,24,30)	Eastern Coast Ranges. Varied moderately high-density rocks within the San Andreas Fault zone.	Various sources whose alignment is associated with accretion along continental margin and with subsequent strike-slip faulting within the San Andreas Fault zone. Anomaly is due to exposed Mz bedrock surounded by low-density Cz rocks and basin fill.	sedimentary siliceous, ultramafic, volcanic mafic	transcurrent, accretion, depression, uplift	Coast Ranges	
L	CAg19	H	Narrow linear NNW-trending gravity high (50x2km).	Occurs over Pz and Mz metasedimentary, metavolcanic, ophiolite, and granitic rocks.	Dense mafic and ultramafic ophiolite rocks	intrusive mafic, volcanic mafic, ultramafic	accretion	Sierra Nevada	Oliver, 1980
	CAg20	H	NW-trending gravity high (50x10km).	Located over Mz Ben Lomond pluton in the Santa Cruz Mtns.	Magnetic Logan Gabbro beneath Ben Lomond pluton.	intrusive mafic	accretion, transcurrent	Coast Ranges	Jachens and others, 1998
L	CAg21	L	Oval gravity low (50x40km) associated with a magnetic low. Similar to other western Sierra gravity belt lows (e.g. CAg11, and unamed low south of anomaly CAg06).	Occurs mainly over Mz granitic rocks and some Mz metasedimentary, and T,Q sedimentary rocks.	Low density silicic plutons	intrusive felsic	batholith	Sierra Nevada, Great Valley	Oliver and others, 1992
I	CAg22	H	Narrow NW-trending gravity high (125x<10km).	Over Salinian Mz intrusive body. Eastern edge is along San Andreas Fault.	Relatively dense intrusive body surrounded by low-density basin fill.	intrusive silicic	transcurrent, accretion	Coast Ranges	
	CAg23	H	NW-trending gravity high (60x10km). Corresponds with a NW-trending elongate magnetic high.	Located over eastern edge of Coast Range Franciscan complex - includes ultramafic rocks (serpentines and eclogites).	Due to Franciscan metasedimentary rocks.	ultramafic	accretion, transcurrent	Coast Ranges	

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I	CAg24	L	Narrow NW-trending gravity low (125x<10km).	Located over Coyote valley Q and T valley fill, along eastern side of San Andreas Fault.	Low density valley fill.	sedimentary siliceous	transcurrent, depression	Coast Ranges	
I	CAg25	H	Large, NNW-trending moderate gravity high (600x150km) containing several prominant highs (e.g. CAg12, CAg26) and lows (e.g. CAg21)	Western part occurs over Great Valley sediments. Eastern part includes granitic rocks of the Sierra Nevada Batholith and Mz and Pz metasedimentary rocks of the western Sierra Nevada.	Dense mafic and ultramafic ophiolite rocks	intrusive mafic, volcanic mafic, ultramafic	accretion, batholith	Sierra Nevada, Great Valley	Oliver and Griscom, 1980
L	CAg26	H	NNW-trending gravity high (150x70km). Anomaly occurs largely over a magnetic low.	Western part of anomaly occurs over sediments of the Great Valley. Eastern edge occurs over Sierra Nevada Batholith and Mz and Pz metasedimentary rocks.	Dense mafic and ultramafic ophiolite rocks.	intrusive mafic, volcanic mafic, ultramafic	accretion	Sierra Nevada, Great Valley	Oliver and Griscom, 1980
L	CAg27	H	NNW-trending narrow gravity high (125x20km) refered to as the Dinuba gravity lineament. Anomally occurs over a magnetic high.	Occurs at contact between Great Valley and Sierra Nevada, mostly over mafic and ultramafic Pz and Mz oceanic crustal rocks.	Dense mafic and ultramafic ophiolite rocks.	intrusive mafic, volcanic mafic, ultramafic	accretion	Sierra Nevada, Great Valley	Oliver, 1980
I	CAg28	H	Prominent oval gravity high (50km) located over a magnetic low region.	Located over the north end of Death Valley over pC crystalline basement.	Dense crystalline basement.	basement mafic	uplift	Great Basin	Chapman and others, 1973
I	CAg29	H	NW-trending gravity high (100x50km).	Located over Franciscan assemblage metamorphic (Sur Series) rocks to the west of the Hosgri Fault and K Salinian granites to the east.	Salinian K granites, Franciscan (Sur series) metasedimentary and metavolcanic rocks.	sedimentary siliceous, extrusive mafic, metamorphic mafic, intrusive silicic	transcurrent, accretion	Coast Ranges	
I	CAg30	L	Prominent NW-trending gravity low (>300x25km). Along it western edge is a magnetic high (CAm31).	Follows the Salinas Valley Q fill and some Miocene sedimentary rocks. Anomaly is bound on its western edge by Salinian granitic basement.	Low density basin fill.	sedimentary siliceous	transcurrent, depression	Coast Ranges	Chapman and Griscom, 1980; Jachens and others, 1989
I	CAg31	H	Oval gravity high (40km) located over a magnetic high at the southern end of Eastern Sierra magnetic anomaly (CAm34).	Located just north of the Garlock fault at the spillway between China and Searles Lakes. Located over Mz granitic rocks.	Possibly dense, magnetic pluton.	intrusive mafic	extension	Great Basin	
I	CAg32	L	Prominent NW-trending gravity low (100x40km) located over a magnetic low region. A small oval magnetic high occurs at its north end.	Located mostly over Mz Tectonia batholith, Mz Kingston Peak intrusive rocks.	Low density intrusive body.	intrusive silicic	extension	Great Basin, Mojave	Healey, 1970
	CAg33	L	NW-trending gravity low (>50x50km). Located immediately west of a similarly shaped moderate to low magnetic ridge.	Located over T and K sediments of the Santa Maria Basin.	Low density sedimentary rocks.	sedimentary siliceous	depression, transcurrent	Coast Ranges	
	CAg34	H	Narrow ENE-trending gravity high (75x20km).	Located just north of the Garlock Fault over Mz granitic rocks.	Dense granitic rocks.	intrusive silicic	batholith	Coast Ranges, Sierra Nevada, Great Valley	
I	CAg35	B	ENE-trending linear feature (~100km) dividing a gravity high to the north and a low to the south. Approximately corresponds with trace of the Garlock Fault. Corresponds with magnetic anomaly CAm38.	Left-lateral fault bounding southern edges of Coast Ranges, Great Valley, and Sierra Nevada with the Mojave desert.	Edges of anomalies associated with Coast Ranges, Great Valley, Sierra Nevada, and Mojave Desert.		transcurrent	Great Basin, Mojave	Davis and Burchfiel, 1973
I	CAm01	H	Irregular shaped prominent magnetic high (75 EW x 100km NS) that entirely encompasses the associated gravity anomaly (CAg01).	Eastern lobe of magnetic anomaly corresponds with Mt Shasta. Bulk of magnetic anomaly located over complex of Mz intrusive rocks, Pz and Mz metasedimentary rocks, and ultramafic rocks that are part of the Klamath Mtns. Anomaly corresponds mostly with a gravity high (CAg01).	Magnetic anomaly sources are varied. Mostly due to magnetic intrusive rocks of the Klamath Mtns. SE lobe of magnetic anomaly may be due to magnetic volcanic rocks of Mt Shasta.	intrusive mafic, volcanic mafic, ultramafic	accretion	Klamath Mtns	LaFehr, 1966; Griscom,1980b; Blakely and others, 1985; Jachens and others, 1989

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Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
R	CAm02	H	Regional magnetic high consisting of several high frequency, high amplitude magnetic anomalies. Anomaly is continuous with feature ORm06.	Over T and Q andesite volcanic terrane, much of which is in Oregon.	Magnetic volcanic rocks.	volcanic mafic	extension	Columbia Plateaus	Griscom,1980b
I	CAm03	H	Prominent kidney shaped NS-trending magnetic high (60x25km). Straddles moderate gravity high and low anomalies.	Located over Q volcanic rocks. Eastern edge butts up against Klamath series metavolcanic rocks.	Magnetic volcanic rocks.	volcanic mafic	extension	Columbia Plateaus, Cascade Mtns, Sierra Nevada	
I	CAm04	H	Prominent NW-trending magnetic high (50x20km).	Over Q and T volcanic rocks.	Probably dense, magnetic metamorphic or intrusive rocks of the Sierra Nevada foothills and Klamath Mtns.	intrusive mafic, metamorphic mafic	accretion	Sierra Nevada	
I	CAm05	H	Prominent NW-trending magnetic high (70x10km).	Over Mz and Pz rocks of the western foothills of the Sierra Nevada.	Sources are various NW-trending Mz and Pz intrusive and metamorphic rocks in western Sierra Nevada foothills. Anomaly likely due to magnetic intrusive and metamorphic rocks.	intrusive mafic, metamorphic	accretion	Sierra Nevada	Burnett and Jennings, 1982
	CAm06	L	Arcuate NNW-trending elongate magnetic low (250x25km, that broadens at southern edge to 100km).	Shape of anomaly correlates well with outcrops of Pz marine sedimentary rocks consisting of limestones, sandstones, metavolcanics.	Weakly magnetic sedimentary rocks and possibly serpentinites.	sedimentary siliceous, ultramafic	accretion	Sierra Nevada	
	CAm07	H	Prominent magnetic high (175x100km). Located over NW-trending gravity highs and lows (e.g. CAg05,07).	Located over K granitic and T volcanic rocks. Eastern edge is aligned with magnetic feautre NVm05 and gravity feature NVg01.	Due to magnetic granitic or volcanic rocks.	intrusive silicic, volcanic mafic	batholith, extension	Great Basin	
	CAm08	B	NNW-trending narrow magnetic zone (225x15km) with prominent eastern and western boundaries that separate it from a prominent high to the west (CAm19) and prominent low to the east (CAm09).	Located over eastern Great Valley over Q sediments.	Anomaly likely associated with anomaly CAm19 and represents magnetic obducted oceanic crust.	ultramafic	accretion	Sierra Nevada	
	CAm09	L	NNW-trending elongate magnetic low (300x25km. Northern end broadens to ~75km).	Located over western edge of Mz and Pz metamorphic and granitic rocks of the western Sierra Nevada foothills.	Weakly magnetic metamorphic rocks.	intrusive silicic, metamorphic silicic, sedimentary siliceous	accretion	Sierra Nevada	
	CAm10	H	Prominent narrow NS-trending magnetic high (75x5km). May be a continuation of anomaly CAm05.	Correlates with narrow body of ultramafic rocks.	Strongly magnetic ultramafic rocks.	ultramafic	accretion	Sierra Nevada	
	CAm11	H	Large magnetic high (110x50km) surrounded by prominent lows.	Located mostly over metavolcanic and metasedimentary rocks of Sierra Nevada foothill gold belt, and over remnants of Sierra Nevada intrusive rocks and some ultramafic bodies. Eastern edge correlates well with string of ultramafic rocks (Smartsville ophiolite).	Magnetic metavolcanic and ultramafic rocks.	volcanic mafic, intrusive mafic, ultramafic	accretion, batholith	Sierra Nevada	
	CAm12	H	NW-trending magnetic high (>75x25km)	Located over Franciscan assemblage and ultramafic rocks.	Strongly magnetic ultramafic rocks of the Coast Range ophiolite that lie along the Coast Range Fault.	ultramafic	accretion, transcurrent	Coast Ranges	Jachens and others, 1995
	CAm13	H	Prominent NW-trending elongate magnetic high (175x20km). Anomaly splays off of feature CAm19.	Located at eastern edge of Great Valley over T and K sedimentary rocks.	Likely source is strongly magnetic obducted oceanic crust.	volcanic mafic, ultramafic	accretion	Great Valley	Griscom, 1966

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I	CAm14	L	Elongate NW-trending magnetic low region directly west of prominent magnetic high (CAm19). Its western edge (less well defined) consists of a series of NW-trending discontinuous gradients. Located over gravity low anomaly CAg15.	Located at westernmost edge of Great Valley.	Likely source is weakly magnetic valley fill.	sedimentary siliceous	depression	Great Valley	Byerly, 1966; Suppe, 1979; Oliver and Griscom, 1980; Jachens and others, 1989
	CAm15	H	Oval magnetic high (25x20km).	Located over Pz metamorphic, Q volcanic and ultramafic rocks along the Bear Mt Fault Zone.	Likely due to strongly magnetic ultramafic rocks.	ultramafic	accretion	Sierra Nevada	
	CAm16	H	Long NW-trending magnetic high (100x20km). Anomally is mostly associated with a much broader gravity high (CAg12).	Occurs over Mz and Pz metasedimentary rocks, granitic rocks, ophiolites and serpentinites along the Bear Mt fault zone and related faults.	Dense mafic and ultramafic ophiolite rocks.	intrusive mafic, ultramafic	accretion	Sierra Nevada	
R	CAm17	H	Prominent NW-trending magnetic high (50x400km).Corresponds with gravity low anomaly CAg16.	Magnetic anomaly located over eastern Sierra Nevada batholith. Gravity anomaly (CAg16) is broader, but also located mostly over eastern Sierra Nevada batholith.	Magnetic, low density granitic rocks.	intrusive silicic	batholith	Sierra Nevada	Oliver and Mabey, 1963; Griscom and Oliver, 1980; Jachens and others, 1989
I	CAm18	H	Oblate EW trending moderate magnetic high (100x40km).	Northeast of Long Valley Caldera, over Benton Range and north end of White Mtns, over Q volcanic and Mz intrusive rocks.	Magnetic volcanic and intrusive rocks.	volcanic mafic, intrusive mafic	extension, batholith	Great Basin	Stewart and Carlson, 1978
R	CAm19	H	Prominent NW-trending magnetic high (450x40km). Strong gradients on its eastern edge and in parts on its western edge. Corresponds with subdued gravity high CAg25. Continuous with magnetic anomaly CAm26.	Located over basin fill of Great Valley. Anomaly trends parallel to Great Valley.	Slab of strongly magnetic obducted oceanic crust and mantle.	volcanic mafic, ultramafic	accretion	Great Valley	Griscom, 1966; Cady, 1975; Griscom and Jachens, 1990; Jachens and others, 1995
I	CAm20	H	Arcuate shaped magnetic high (75x10km).	Located over Jurassic Cottonwood pluton. May be related to the Sylvania pluton which has same age and composition. A fault separates and may have offset these plutons.	Magnetic intrusive rocks.	intrusive mafic, intrusive silicic	extension, batholith	Great Basin	McKee and Nelson, 1967
	CAm21	H	NW-trending moderate magnetic high (150x25km). NW end corresponds with NW-trending elongate gravity high (CAg17). SE end corresponds with NW-trending gravity low (CAg24).	Southern end follows the Santa Clara Valley, and is bound on the west by the San Andreas Fault. In the north, the anomaly crosses the San Andreas Fault and runs offshore.	Anomaly is caused by 3 different sources in 3 different fault blocks. Western end is offshore, west of the San Gregorio Fault and is likely caused by Coast Range ophiolite rocks ocurring in Franciscan terrane. Central part is caused by deeply buried, concealed Logan gabbro of likely ophiolite origin. Southeastern part is due to slivers of Coast range ophiolite rocks in Franciscan terrane.	intrusive mafic, ultramafic	transcurrent, accretion	Coast Ranges	Jachens and others, 1998
	CAm22	L	Long NNW-trending magnetic low (500x75km) with internal magnetic highs (e.g. CAm27). Southern portion of anomaly crosses the Garlock Fault (CAm38) and is offset to the east by ~75km.	Western part of anomaly occurs over Great Valley sediments and Mz and Pz metasedimentary rocks. Eastern, central and southern parts occur over Sierra Nevada batholith. Southern most part of anomaly, south of the Garlock Fault, occurs over granitic rocks and valley fill of the Mojave Desert.	Weakly magnetic sedimentary and granitic rocks.	intrusive silicic, sedimentary siliceous	batholith, depression	Sierra Nevada, Great Valley	
I	CAm23	H	Small WNW-trending moderate elongate magnetic high (40x10km) on the CA-NV border.	Located over Jurassic Sylvania pluton.	Magnetic intrusive rocks.	intrusive mafic, intrusive silicic	extension, batholith	Great Basin	McKee, 1968
	CAm24	H	Elongate NW-trending magnetic high (60x10km).	Located over Mz pluton in the Inyo Mtns.	Magnetic intrusive rocks.	intrusive mafic, intrusive silicic	extension, batholith	Great Basin	

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R	CAm25	H	NNW-trending magnetic high (60x20km).	Located near the San Andreas Fault zone largely over T sedimentary and Franciscan assemblage rocks. NE of the San Andreas Fault, the main part of anomaly is over a serpentinite diapir (New Idria Dome) and a largely concealed serpentinite, flat-lying body that extends SE to Table Mt. Southwest of the San Andreas Fault, at the south end of the anomaly, the anomaly is located over Cretaceous intrusive rocks.	Serpentinites and magnetic intrusive rocks.	ultramafic, intrusive mafic, intrusive silicic	transcurrent, accretion, batholith	Coast Ranges	
	CAm26	H	Prominent NW-trending magnetic high (200x50km). Corresponds with subdued gravity high CAg25. Continuous with magnetic anomaly CAm19.	Located over basin fill of Great Valley. Anomaly trends parallel to Great Valley	Slab of strongly magnetic obducted oceanic crust and mantle.	volcanic mafic, ultramafic	accretion	Great Valley	Cady, 1975; Griscom and Jachens, 1990; Jachens and others, 1995
	CAm27	H	Long linear NW-trending magnetic high (125x25km) corresponding to the Dinuba gravity high (CAg27).	Occurs at contact between Great Valley and Sierra Nevada, mostly over mafic and ultramafic Pz and Mz oceanic crustal rocks.	Magnetic mafic and ultramafic ophiolite rocks.	intrusive mafic, volcanic mafic, ultramafic	accretion	Sierra Nevada, Great Valley	
	CAm28	H	Prominent magnetic high (40x25km).	Located over Mz pluton (Hunter Mt batholith) in the central Panamint Range.	Magnetic intrusive rocks.	intrusive mafic, intrusive silicic	extension, batholith	Great Basin	Mabey, 1961; Chen and Moore, 1982
	CAm29	H	Small NW-trending magnetic high (10x20km).	Located over eastern Great Valley and within anomaly CAm26.	May be a shallow sliver of obducted magnetic oceanic crust.	volcanic mafic, intrusive mafic	accretion	Great Valley	
	CAm30	H	Prominent elongate NW-trending magnetic high (70x25km).	Located over T intrusive, volcanic, and possibly pC crystalline basement rocks in the Black Mtns.	Likely due to magnetic intrusive, volcanic and/or basement rocks.	intrusive mafic, volcanic mafic, basement mafic	extension	Great Basin	Griscom, 1966
I	CAm31	H	Narrow NW-trending magnetic high (100x10km).	Located along fault traces of the San Andreas Fault zone, over K granitic rocks of the La Panza Range.	Magnetic intrusive rocks.	intrusive silicic	transcurrent, accretion	Coast Ranges	
	CAm32	H	Small oval magnetic high (20km).	Located over the eastern Coast Ranges on the San Andreas Fault SE of Parkfield over T sedimentary rocks, and near an outcrop of Cretaceous granite.	Inferred to be due to buried body of magnetic serpentinite.	ultramafic	transcurrent, accretion	Coast Ranges	Hanna and others, 1972
	CAm33	H	Small oval magnetic high (20km).	Located over eastern part of Great Valley and within anomaly CAm26.	May be a shallow sliver of obducted magnetic oceanic crust.	ultramafic, intrusive mafic	accretion	Great Valley	
	CAm34	H	NS-oriented magnetic high (100x50km).	Located over Mz pluton associated with the southern Sierra Nevada batholith over the Argus Range.	Magnetic intrusive rocks.	intrusive mafic	extension, batholith	Great Basin	
	CAm35	H	Small magnetic high (40x40km).	Located mostly over T and Q volcanic and some Mz granitic rocks. Includes some outcrop of pC rocks.	Magnetic volcanic or intrusive rocks	volcanic mafic, intrusive mafic	extension, batholith	Mojave Desert	
	CAm36	H	Small oval magnetic high (10km).	Located over a T intrusive body.	Magnetic intrusive rocks.	intrusive mafic	extension	Great Basin	
	CAm37	H	Small oval magnetic high (20km).	Located over eastern part of Great Valley and within anomaly CAm26.	May be a shallow sliver of obducted magnetic oceanic crust.	ultramafic, intrusive mafic	accretion	Great Valley	
I	CAm38	B	ENE-trending linear feature (~300km) defined by the alignment of truncated prominent magnetic highs and lows of the Great Valley and Sierra Nevada (e.g. CAm26, CAm22, CAm17, CAm34). Also defined by left-lateral offset of prominant magnetic low (CAm22) and magnetic highs associated with Mz plutons (CAm17 and CAm39). Left-lateral offset of anomalies appears to be ~75km. Approximately corresponds with trace of the Garlock Fault. Corresponds with gravity anomaly CAg35.	Corresponds to left-lateral fault bounding southern edges of Coast Ranges, Great Valley, and Sierra Nevada with the Mojave Desert.	Edges of anomalies associated with Coast Ranges, Great Valley, Sierra Nevada, and Mojave Desert.		transcurrent	Great Basin, Mojave	

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	CAm39	H	Elongate WNW-trending magnetic high (75x25km).	Located mostly over Mz pluton in the Mojave Desert. SE end sits over volcanic rocks.	Magnetic intrusive rocks.	intrusive mafic	extension, batholith	Mojave Desert	
	CAm40	H	Small NW-trending magnetic high (30x10km).	Located over Mz pluton in Mojave Desert.	Magnetic intrusive rocks.	intrusive mafic	extension, batholith	Mojave Desert	
	CAm41	H	Small NW-trending magnetic high (30x20km).	Located over Mz intrusive, Pz sedimentary and pC basement rocks in the Mojave Desert.	Magnetic intrusive or basement rocks.	intrusive mafic, basement mafic	batholith	Mojave Desert	
I	IDg01	H	Broad NW-trending high containing several smaller elongate anomalies (up to 200km). Gravity terrane is north of, and broader than, the magnetic terrane (IDm08). Contiguous with IDg06 and IDg04.	Veneer of alluvium overlying basaltic lava flows.	Dense and magnetic basaltic rocks.	volcanic mafic	hotspot	Snake River Plain	Mabey, 1976; Mabey, 1982; Sparlin and others, 1982; Jachens and others, 1989
R	IDg02	L	Gravity low bounded on west and south by western SRP high and on east by a gravity high (IDg03). Located over a regional magnetic low interspersed by isolated magnetic highs (e.g. IDm02).	Granitic batholith.	Low density, weakly magnetic granitic rocks.	intrusive silicic	batholith	Northern Rocky Mtns	Bott and Smithson, 1967; Jachens and others, 1989; Mabey, 1986
I	IDg03	H	Uniform gravity high bounded on south and east by intense gravity high of SRP and bounded on west by ID batholith. Regional magnetic low with local discrete highs.	Northernmost extension of basin and range. Mainly pC through upper Pz marine strata. Thick cover of Eocene volcanic rocks.	Dense sedimentary and basement rocks.	basement silicic, basement carbonate, sedimentary carbonate, sedimentary siliceous	compression	Northern Rocky Mtns	
I	IDg04	H	Broad well defined high with several elongate large positive anomalies. Contiguous with IDg01 and IDg06. Very good correlation with magnetic anomaly IDm04.	Basaltic lava flows. Located entirely within topographically defined SRP.	Magnetic basaltic rocks.	volcanic mafic	hotspot	Snake River Plain	Mabey, 1976; Sparlin and others, 1982; Jachens and others, 1989
	IDg05	H	NW-trending elongate gravity high (50x5km). Located mostly over a NW-trending elongate magnetic low.	Located entirely within SRP over Q alluvium.	Possibly dense, but weakly or reversely magnetized intrusive rocks.	intrusive mafic, intrusive silicic	hotspot	Snake River Plain	
R	IDg06	H	Arcuate regional gravity high, highest to the east. Contains several distinct smaller anomalies (e.g. IDg05,07,08). Contiguous with IDg01 and IDg04. Corresponds with magnetic high IDm10.	Arcuate and well defined topographic depression. Mostly basaltic lava flows and cinder cones.	Gravity highs due to dense mafic intrusive rocks and underplating.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	Mabey, 1976; Mabey and others, 1978; Mabey, 1982; Sparlin and others, 1982; Jachens and others, 1989
I	IDg07	H	WNW-trending extremely high gravity terrane (150x25km). Contiguous with feature IDg08. Located entirely within larger western and eastern SRP gravity and magnetic terranes (IDg06,IDm08).	Located entirely over Q and T volcanic rocks of the SRP.	Likely source is dense basaltic lava flows and associated intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	
I	IDg08	H	Irregular shaped, high gravity anomaly with many small frequency superimposed highs (125km EWx75km NS). Contiguous with gravity feature IDg07. Located entirely within larger western and eastern SRP gravity and magnetic terranes (IDg06,IDm08).	Located entirely over Q and T volcanic rocks of the SRP.	Likely source is dense basaltic lava flows and associated intrusive rocks. High frequency superimposed anomalies may be due to volcanic vents.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	
I	IDg09	H	NW-trending narrow gravity high (50x10km). Located at eastern edge of NW-trending magnetic feature IDm16.	At edge of downwarp of SRP. Located over Q and T volcanic rocks at the southern edge of the SRP.	May be volcanic infilling of dense, magnetic lava flows and possibly vents forming along tectonic edge of SRP.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	

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I	IDg10	H	EW-trending gravity high (75x25km). Corresponds with magnetic high IDm17.	At edge of downwarp of SRP. Located over Q and T volcanic rocks at the southern edge of the SRP.	May be volcanic infilling of dense, magnetic lava flows and possibly vents forming along tectonic edge of SRP.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	Mabey and others, 1978
I	IDm01	H	NW-trending magnetic high within SRP (60x25km). Located over broad gravity high.	Located over SRP on T and Cretaceous sediments. Northeast edge borders on T volcanic rocks.	Likely due to strongly magnetized intrusive or volcanic rocks.	intrusive mafic, volcanic mafic	hotspot	Snake River Plain	
	IDm02	H	Irregular magnetic high (60x30km).	Located over T intrusive on western edge of Idaho Batholith.	Magnetic intrusive rocks.	intrusive mafic	uplift	Northern Rocky Mtns	Mabey, 1986
	IDm03	H	NW-trending prominent magnetic high within the SRP (75x25km).	Located within SRP over Q sediments and some Q and T volcanic rocks. Anomaly is parallel to several NW-trending features crossing the eastern SRP.	Magnetic intrusive or volcanic rocks.	intrusive mafic, volcanic mafic	hotspot	Snake River Plain	
I	IDm04	H	Well defined region of small to intermediate sized (50-75km) anomalies. Regionally a high magnetic area. Very good correlation with gravity anomaly IDg04. Contiguous with IDm08 and IDm10.	Basaltic lava flows. Located entirely within topographically defined SRP.	Dense basaltic rocks.	volcanic mafic	hotspot	Snake River Plain	Sparlin and others, 1982; Mabey, 1986; Jachens and others, 1989
	IDm05	H	NW-trending elongate magnetic high within the western SRP (30x15km).	Located within western SRP over Q volcanic rocks.	Magnetic volcanic or buried intrusive rocks.	intrusive mafic, volcanic mafic	hotspot	Snake River Plain	
	IDm06	H	EW-trending string of local magnetic highs (75x25km).	Located at south end of Idaho Batholith over Mz intrusive and T volcanic rocks.	Magnetic volcanic or shallow intrusive rocks.	intrusive mafic, volcanic mafic	compression	Northern Rocky Mtns	
	IDm07	H	NW-trending elongate string of magnetic highs (125x25km).	Crosses at right angle to the northern edge of SRP and spans Cz volcanic, Cz and Mz intrusive, and Pz clastic rocks. Parallels trend of basins and ranges north of the SRP. Follows the NW-trending Craters of the Moon rift.	Magnetic intrusive and volcanic rocks.	intrusive mafic, volcanic mafic	hotspot, compression	Northern Rocky Mtns, Snake River Plain	Mabey and others, 1978
I	IDm08	H	NW-trending region consisting of several high frequency and some prominent long linear anomalies (up to 200km). Magnetic terrane is south of, and narrower than the gravity terrane (IDg01). Contiguous with IDm04 and IDm10.	Veneer of alluvium overlying basaltic lava flows.	Dense and magnetic basaltic rocks.	volcanic mafic	hotspot	Snake River Plain	Sparlin and others, 1982; Mabey, 1982; Jachens and others, 1989
	IDm09	H	NW-trending prominent magnetic high within the eastern SRP (30x15km).	Located within eastern SRP over Q volcanic rocks.	Magnetic volcanic rocks or buried intrusive.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	
R	IDm10	H	Arcuate regional magnetic high consisting of small to intermediate sized anomalies (<100km) in most places displaying a NW-fabric (e.g. IDm03,07,09). Corresponds with gravity high IDg06. Contiguous with IDm04 and IDm08.	Arcuate and well defined topographic depression. Mostly basaltic lava flows and cinder cones.	Magnetic mafic volcanic and intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	Mabey, 1976; Mabey and others, 1978; Mabey, 1982; Sparlin and others, 1982; Jachens and others, 1989
	IDm11	L	Large, pronounced magnetic low (250x125km) that corresponds with gravity high extending off of the eastern SRP.	Located over thrusted strata of the Rocky Mtns thrust belt.	Weakly magnetic, high density carbonate rocks.	sedimentary carbonate	compression	Great Basin, Middle Rocky Mtns	
	IDm12	L	Prominent magnetic low (100x50km) located over a moderate gravity low of the same general size.	Located over Mz intrusive rocks. May be related to Idaho Batholith.	Weakly magnetic and relatively low density intrusive rocks.	intrusive silicic	batholith	Great Basin	
	IDm13	H	EW-trending prominent magnetic high within the eastern SRP (30x15km).	Located within eastern SRP over Q volcanic rocks.	Magnetic volcanic or buried intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	

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I	IDm14	H	NW-trending subdued magnetic high (100x30km) branching off of eastern SRP. Bounds Magnetic low domain to northeast.	Located over early Pz stratified rocks, pC metamorphic, and T sedimentary rocks. Parallels trend of thrust slices of Pz strata. Cuts across and is normal to the southern edge of SRP. Has similar trend to hotspot-related rift features such as the Great Rift and to narrow NW-trending features in Utah (UTg02, UTm02).	May be similar in origin to feature UTm02 - rift related mafic magnetic intrusive or volcanic rocks or Precambrian basement.	intrusive mafic,volcanic mafic, basement mafic	hotspot	Great Basin, Snake River Plain	Mabey and others, 1978
I	IDm15	H	Irregular magnetic terrain similar in character with SRP. Forms a tongue extending off western SRP in line and parallel to eastern SRP. Includes a prominent U-shaped magnetic high at its SW end (IDm18). Possibly a fossil trace of Yellowstone hotspot. Forms part of the Humboldt magnetic zone of Mabey and others (1978).	Located over T and Q volcanic rocks.	Magnetic volcanic and intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	Mabey and others, 1978; Hinze and Zietz, 1985
I	IDm16	H	NW-trending narrow magnetic high (190x40km). Includes gravity IDg09, though largely located outside the gravity defined western SRP over regional gravity high of northern GB (NVg04). Northern end converges on the southern edge of the topographic and gravity defined SRP. Feature narrows to the NW.	Northern 2/3 of anomaly parallels western SRP. Southern end extends over northern GB.	Probably due to extensive magnetic volcanic and intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain, Great Basin	Mabey and others, 1978
I	IDm17	H	EW-trending magnetic high (75x10km). Corresponds with gravity high IDg10.	At edge of downwarp of SRP. Located over Q and T volcanic rocks at the southern edge of the SRP.	May be volcanic infilling of dense, magnetic lava flows and possibly vents forming along tectonic edge of SRP.	volcanic mafic, intrusive mafic	hotspot	Snake River Plain	Mabey and others, 1978
	IDm18	H	U-shaped magnetic high (75x20km) that is located over a gravity high.	Located over T lava flows.	Magnetic volcanic and intrusive rocks.	intrusive mafic, volcanic mafic	hotspot, extension	Great Basin	
I	NVg01	B	NE-trending boundary between high gravity to SE and low gravity to NW. Very well correlated with magnetic boundary. Corresponds with magnetic feature NVm05.	West of this line there are no pre-Cz rocks exposed. The boundary also corresponds with the eastern edge of topographic and basaltic plateau. Note that this boundary corresponds with the edge of basement gravity calculation. See Isostatic gravity map.	The prominent gravity anomaly likely reflects a major deep crustal discontinuity.	volcanic mafic, sedimentary siliceous	transcurrent, accretion	Great Basin	McKee and others, 1983; Blakely, 1988; McKee and others, 1990; Wyld and Wright, 2001
I	NVg02	H	ENE-trending gravity high mainly defined in NW Nevada (225x100km).	Located mostly over Mz metaclastic rocks (including mudstones and sandstones). Crosses several pre-Cz lithologic terranes and the continental margin inferred from Sr-isotopic ratios. Anomaly lies in line with eastern SRP and is coincident with a region of high heatflow extending SW from the eastern SRP. Anomaly is not easily distinguished from general gravity high south of the SRP. Northern edge of anomaly is poorly defined.	May reflect a region of uplifted dense lower crustal rocks.	basement mafic	uplift	Great Basin	
I	NVg03	L	Oval gravity low (50km) within broad regional gravity high of northern GB (NVg04).	Located over western assemblage (upper plate of Roberts Mt thrust) cherts and shales at north end of Carlin trend. Small plutons crop out at center of anomaly.	May be due to a large buried pluton.	intrusive silicic	extension	Great Basin	

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R	NVg04	H	Regional gravity high across northern GB. Extends from the SRP southward. Southern boundary (at 40° latitude) is marked by an abrupt gradient to low regional gravity of the southern GB regional gravity low (NVg10). Anomaly largely coincides with a regional magnetic low (UTm01).	The central and eastern part of the anomaly is underlain largely by Pz carbonate rocks. The western and northern parts are coincident with Pz silicic sedimentary rocks overlain by Miocene volcanic rocks that extend north into OR, ID, and SRP.	Underlain by low magnetic, high density (likely carbonate rocks). Anomaly may indicate that carbonate rocks extend to the SRP and that volcanic rocks form only a thin veneer (since magnetic anomaly is low). Alternatively, gravity high may reflect dense mafic underplating associated with the Yellowstone hotspot.	sedimentary carbonate, intrusive mafic	continental margin, hotspot	Great Basin	Glen and others, 2000; Pierce and others, 2000
	NVg05	H	ENE-trending gravity high (80x25km). Corresponds with a magnetic low.	Located over T volcanic, Pz and Mz sedimentary, and Mz intrusive rocks near the boundary of the Black Rock and Jungo lithologic terranes.	May be due to dense intrusive or Mz metasedimentary rocks.	basement mafic	subduction, continental margin	Great Basin	
I	NVg06	H	Regional gravity high. Generally associated with magnetic low, but also spans magnetic highs of western and central NNR.	Located over T volcanic, Mz sedimentary and intrusive, and Pz sedimentary rocks. Centered on Jurassic Humboldt lopolith gabbro and basalts.	May be due to dense mafic intrusive rocks including the Jurassic Humboldt lopolith.	intrusive mafic	continental margin	Great Basin	Page, 1965; Speed, 1976; Oldow, 1984; Dilek and Moores, 1995; Hildenbrand and others, 2000
I	NVg07	H	Prominent gravity high over north central Nevada. Southern boundary of the high has a distinct 'V' shape. Anomaly is part of the Northern GB gravity high terrane (NVg04). West edge of gravity 'V' corresponds closely with the Northern Nevada Rift (NVm12).	East edge of gravity 'V' corresponds with middle Pz Roberts Mt thrust front. West edge may reflect an older crustal discontinuity.	Gravity high (inside 'V' relates to regional high of northern GB - NVg04). East edge may reflect crustal discontinuity at thrust juxtaposing dense Pz sedimentary rocks to the NW with less dense sedimentary rocks to the SE. West edge may reflect an older crustal discontinuity associated with the pC continental margin.	sedimentary siliceous, basement mafic	continental margin, accretion	Great Basin	Grauch and others, 1995; Hildenbrand and others, 2000; Ponce and Glen, 2002
	NVg08	H	Gravity high (125x60km). Corresponds with west end of feature NVm14 associated with diverse magnetic signature of the Walker Lane belt.	Located largely over the Carson Sink and over T volcanic rocks on the west edge of anomaly. Also located over some Mz intrusive rocks.	May be due to dense mafic to intermediate composition volcanic and associated intrusive rocks.	volcanic mafic, intrusive mafic	subduction	Great Basin	Hildenbrand and others, 2000
I	NVg09	L	NW-trending gravity low bounded to SW by the generally high gravity over the Walker Lane belt (NVg11). Located over a regional magnetic low punctuated by highs of NNR anomalies. Bounded on the northeast by the gravity high of the Northern Nevada basement gravity V (NVg07). At its eastern edge it merges with feature NVg10.	Located over intermediate composition tuffs that lie on Mz strata in the west, and on Pz strata in the east.	Low density tuffs, and quartzose sedimentary rocks.	sedimentary silicic	subduction	Great Basin	
R	NVg10	L	Regional gravity low that extends from ~37° latitude in the south to ~40° latitude in the north. Anomaly located mostly over regional magnetic low (UTm01). On its western edge, anomaly merges with feature NVm09.	Western part is located mostly over T volcanic and Pz sedimentary rocks. To the east, anomaly located mostly over Pz rocks. Pz rocks on the west are more silicic than those to the east. Region lacks significant basalt outcrops such as occur to the north.	Anomaly due to low density and low magnetic source rocks, which may indicate that Pz rocks are thinner here than to the north beneath feature NVg04.	sedimentary silicic	extension	Great Basin	Blakely and Jachens, 1991; Glen and others, 2000
I	NVg11	H	NW-trending elongate zone (~100kmx350km) in western NV, regional positive anomaly with several prominent local (~25km) positive anomalies. Located within diverse magnetic feature NVm23.	Structurally defined province characterized by NW-trending topographic features. located over Mz granites, Pz strata, and late T volcanic rocks. Corresponds mostly with the physiographically defined Walker Lane belt.	Gravity feature is possibly due to T mafic underplating. Magnetic anomalies may express shallow to deeply buried magnetic plutons . Possibly represents the eastern edge of Sierra Nevada Batholith.	intrusive mafic	transcurrent, extension, continental margin	Great Basin	Blakely, 1988; Craig, 1992; Hildenbrand and others, 2000

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I	NVg12	H	Roughly oval (125km EWx100km NS) diffuse gravity high. Located over a regional magnetic low. Probably relates to feature NVg16.	Located over diverse range of rock types including T volcanic and Pz sedimentary rocks.	Likely source is thick accumulation of limestones and dolomites.	sedimentary carbonate	continental margin	Great Basin	
I	NVg13	L	Oval gravity low (50km).	Located over alluvial basin west of Wheeler Peak. NE end of anomaly located over granitic plutons.	May be due to thick pile of low density alluvial fill, and/or low density granitic plutons.	sedimentary siliceous, intrusive silicic	extension	Great Basin	
I	NVg14	L	Prominent NW-trending gravity low (120x30km) located over a magnetic low.	Corresponds with the Jurassic Sylvania pluton in the Sylvania Mtns.	Low density non-magnetic pluton.	intrusive silicic	batholith	Great Basin	McKee, 1968
	NVg15	H	NS-trending gravity high (60x40km). Coresponds with intense parts of magnetic feature NVm19.	Located largely over T volcanic rocks. Some outcrops of Mz sedimentary and T intrusive rocks at the south end of anomaly.	May be due to dense volcanic and associated intrusive rocks.	volcanic mafic, intrusive mafic	batholith	Great Basin	
I	NVg16	H	EW-trending variable gravity high (200x50km). Located over a regional magnetic low Probably relates to feature NVg12.	Located over T volcanic and Pz carbonate rocks, though largely follows the along northern and western edge of an extensive outcrop of Pz carbonates.	Dense, weakly magnetic carbonate rocks.	sedimentary carbonate	continental margin	Great Basin	
I	NVg17	L	NW-trending gravity low (30x20km). Corresponds with magnetic anomaly NVm21.	Wilson Creek Mtns - late Oligocene caldera.	Thick accumulation of low density, magnetic caldera fill tuffs and underlying silicic intrusive rocks.	volcanic silicic	subduction	Great Basin	Best and others, 1989a; Best and others, 1989b
I	NVg18	B	Boundary between low basement gravity to the north and higher basement gravity to the south. Also an alignment of several prominent anomalies across Sierra Nevada, southern GB, and CP. No or little magnetic expression.	Southern end of GB. Corresponds with topographic drop from north to south, and to a band of seismicity rimming the Basin and Range.	Speculated (Saltus and Thompson, 1995) to relate to a combination of thermal buoyancy (related to Yellowstone plume head), thickened crust and mid-lower crustal felsic and mafic dikes and sill injection beneath the gravity high region.	intrusive mafic, intrusive felsic	subduction, hotspot	Great Basin	Stewart and others, 1977; Eaton and others, 1978; Saltus and Thompson 1995; Pierce and others, 2000
	NVg19	L	Irregular-shaped gravity low with local highs (175x100km). Corresponds to regional magnetic low.	Located mostly over Pz carbonate rocks and Q and T sediments.	May be due to thick low density, poorly consolodated sedimentary rocks in deep intra-range basins.	sedimentary siliceous	extension	Great Basin	
I	NVg20	L	Oval east-trending gravity low (75x40km). Partly coincident with anomaly NVm24.	West end of Clover Mtns and part of Caliente depression and Caliente and Kane Springs Wash calderas. Also over Pz sedimentary rocks.	Thick accumulation of low density rhyolitic and tuffaceous sedimentary rocks.	volcanic silicic	subduction	Great Basin	Noble and McKee, 1972; Best and others, 1989b
I	NVg21	H	Irregular shaped gravity high. Generally NW-trending (max 300km NWx125km SE).	Located over pC crystalline, Pz carbonate and quartzite, and T volcanic rocks. Includes most of Death Valley and Pahrump Valley.	Likely source is pC crystalline basement and thick accumulation of limestones and dolomites.	basement silicic	extension, uplift	Great Basin	
L	NVg22	H	Small oval gravity high (10km). Corresponds partly with magnetic high NVm30.	Fault block of pC to Mz sedimentary rocks.	Speculated (Blank, 1988; Blakely, 1988) to be due to upwarp in dense and magnetic crystalline basement and to an associated T intrusion.	basement mafic	uplift	Great Basin	Stewart and Carlson, 1978; Blank, 1988; Blakely, 1988
I	NVg23	H	Irregular shaped gravity high (140x125km). Bulk of anomaly located over magnetic low. Entire anomaly crosses numerous local magnetic anomalies.	Located largely over pC rocks of the Virgin Valley.	Dense pC crystalline rocks.	basement silicic	extension, uplift	Great Basin	Langenheim and others, 2000
	NVm01	H	Elongate north-trending magnetic high (100x25km).	Located over T volcanic and sedimentary rocks. Has similar trend as the western NNR.	Strongly magnetic volcanic rocks or mafic intrusive rocks.	intrusive mafic, volcanic mafic	extension, hotspot	Great Basin	Glen and Ponce, 2002; Ponce and Glen, 2002
L	NVm02	H	Oval cluster of high frequency positive magnetic anomalies (25 km).	McDermitt group of caldera.	Magnetic intrusive and extrusive rocks.	intrusive mafic, volcanic silicic	extension, hotspot	Great Basin	U.S. Geological Survey 1972; U.S. Geological Survey 1982a,b; Rytuba and McKee, 1984; Best and others, 1989b;
	NVm03	H	Elongate NW-trending moderate magnetic high (50x20km).	Located over T volcanic rocks.	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	extension, hotspot	Great Basin	Glen and Ponce, 2002; Ponce and Glen, 2002

Table 1: Geophysical Features of the Great Basin and parts of the surrounding provinces

Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
	NVm04	H	Subdued east-trending magnetic high (40x15km).	At its west end it overlies a K pluton; middle and eastern portions located over T volcanic rocks.	Moderately magnetic intrusive and/or volcanic rocks.	volcanic mafic, intrusive silicic	extension, hotspot	Great Basin	
I	NVm05	B	NE-trending boundary between strongly magnetic region of high frequency anomalies to the NW and low magnetic relief to the SE. Very good correlation with gravity boundary (NVg01).	West of this line there are no pre-Cz rocks exposed. The boundary also corresponds with the eastern edge of topographic and basaltic plateau.	Magnetic anomaly reflects contrast of magnetic volcanic rocks to NW and weakly magnetic sedimentary rocks to the SE.	volcanic mafic, sedimentary siliceous	transcurrent, accretion	Great Basin	McKee and others, 1983; Blakely, 1988; McKee and others, 1990; Wyld and Wright; 2001
	NVm06	H	Subdued north-trending magnetic high (50x15km).	Located over T volcanic rocks and Mz sedimentary rocks. Has similar trend as the western NNR.	May be due to magnetic mafic intrusive rocks.	intrusive mafic, volcanic mafic	extension, hotspot	Great Basin	Glen and Ponce, 2002; Ponce and Glen, 2002
	NVm07	H	Oval (20km) magnetic high located over the northern part of the western NNR (NVm08).	Located just south of McDermitt Calderas, over T volcanic rocks.	Perhaps due to magnetic intrusive rocks associated with the western NNR (NVm08).	intrusive mafic, volcanic mafic	extension, hotspot	Great Basin	Glen and Ponce, 2002; Ponce and Glen, 2002
I	NVm08	H	Two long, narrow NNW-trending magnetic highs that merge to the north (western and central Northern Nevada Rifts of Glen and Ponce, 2002).	Anomaly corresponds in places with narrow NNW-trending zones of mafic dikes (of presumed Miocene age). Due to their great length, the anomalies likely correspond in places with other sources, such as the small magnetic high along central anomaly just south of NVm07. Inferred to have the same origin as anomaly NVm12.	Sources are largely concealed. Largely due to magnetic mafic intrusive rocks.	intrusive mafic	hotspot, extension	Great Basin	Blakely, 1988; Glen and Ponce 2002; Ponce and Glen, 2002
I	NVm09	L	Magnetic low crossing eastern NNR (NVm12) magnetic high. Gap in eastern NNR corresponds with gravity low and topographic trough.	NE-trending fault-bound basin (Midas Trough) cutting late Cz rocks.	Downdropped basaltic rocks of eastern NNR (NVm12). Magnetic sources are farther from surface within trough than outside it.	sedimentary siliceous	extension, depression	Great Basin	Rowan and Wetlaufer, 1973; Zoback and Zoback, 1980; Blakely, 1988
	NVm10	H	Oval magnetic high (20km).	Located mostly over Pz sedimentary rocks and some Tertiary volcanic and intrusive rocks. Lies over central Carlin trend.	May be due to magnetic intrusive rocks.	intrusive mafic	extension	Great Basin	Henry and Ressel, 2000; Grauch, 1996
I	NVm11	H	NE-trending elongate subdued magnetic high (100x25km).	Located over pC and Pz rocks of the Ruby Mtns metamorphic core complex (gneiss).	Deep magnetic source of metamorphic rocks.	metamorphic silicic, basement silicic	extension, uplift	Great Basin	Dallmeyer and others, 1986; Blakely, 1988; Blakely and others, 1996
I	NVm12	H	Long narrow NNW-trending magnetic high located over the eastern edge of a prominent gravity gradient. Constitutes the eastern NNR of Glen and Ponce, 2002.	Anomaly corresponds with narrow NNW-trending zone of Miocene mafic dikes.	Magnetic mafic intrusive rocks.	intrusive mafic	hotspot, extension	Great Basin	Zoback and Thompson, 1978; Blakely 1988; Zoback and others, 1994; John and others, 2000; Glen and Ponce 2002
	NVm13	H	Elongate NW-trending moderate magnetic high (50x20km).	Located over Pz carbonate rocks and several small T intrusive bodies.	Magnetic intrusive rocks.	intrusive mafic	extension	Great Basin	Grauch, 1996
I	NVm14	H	Large varied NW-trending magnetic high (250x100km) consisting of many smaller isolated magnetic highs.	Western half of anomaly lies over physiographically defined Walker Lane belt. Primarily large Mz plutons on the west and scattered plutons and Q and T volcanic rocks to east.	Magnetic volcanic and intrusive rocks. Local highs may be volcanic centers or individual plutons.	volcanic mafic, intrusive mafic	extension, transcurrent, batholith	Great Basin	Blakely, 1988; Stewart, 1988; Hildenbrand and others, 2000
	NVm15	H	Subdued NE-trending magnetic high (70x25km).	Located mostly over Pz carbonate rocks.	May be due to K intrusive rocks or mineralized carbonate strata.	intrusive silicic	stable crust	Great Basin	Mabey and others, 1978
I	NVm16	H	Irregular shaped magnetic high (125x50km). Contains a more prominent oval magnetic high at its southern edge.	Located over Q and T volcanic rocks and Mz plutons. Centered over Aurora and Bodie igneous centers.	Magnetic volcanic and intrusive rocks.	intrusive mafic, volcanic mafic	extension, transcurrent, batholith	Great Basin	Kleinhampl and others, 1975; Grauch, 1996
	NVm17	H	"S"-shaped irregular magnetic high (40x10km).	Located over T volcanic rocks at south end of Toiyabe Range. North end corresponds to the Toiyabe caldera.	May be due to magnetic volcanic and buried intrusive rocks.	intrusive mafic, volcanic mafic	extension, transcurrent	Great Basin	
I	NVm18	H	Small oval magnetic high (20km).	Located over Mt. Jefferson and Trail Canyon calderas in the Toquima Range.	Magnetic tuff and associated intrusive rocks.	intrusive mafic, intrusive silicic	extension, transcurrent, batholith	Great Basin	Kleinhampl and Ziony, 1984

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Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
I	NVm19	H	Mostly east-trending, irregular shaped region of variable magnetic high (125x50km). Contains a more prominent oval magnetic high at its southern edge.	Located mostly over T volcanic rocks of several identified volcanic centers. Few scattered Mz plutons and Pz sedimentary rocks.	Magnetic volcanic and possibly intrusive rocks.	volcanic mafic, volcanic silicic, intrusive silicic	extension, subduction	Great Basin	
	NVm20	H	Oval moderate magnetic high (30km).	Located at east end of anomaly UTm15 and over T volcanic rocks.	Magnetic volcanic rocks.	volcanic mafic, volcanic silicic	extension, subduction	Great Basin	Mabey and others, 1978
I	NVm21	H	Magnetic high (25x15km) located within broader gravity low (NVg17).	Wilson Creek Mtns - late Oligocene Indian Peak and White Rock calderas.	Thick accumulation of low density, magnetic caldera fill tuffs and associated intrusive rocks.	volcanic silicic	subduction	Great Basin	Best and others, 1989a; Best and others, 1989b
I	NVm22	H	Subdued oval magnetic high mostly identified by a ring of maximum horizontal gradients (20km).	Located over pC and Cambrian sedimentary rocks and small exposure of T volcanic rocks.	Oval form suggests it may be a buried pluton.	intrusive silicic	batholith, transurrent	Great Basin	
I	NVm23	H	NW-trending elongate region with high frequency NW elongate positive anomalies. Region is ~250x550km in western and central NV. Includes several large anomalies (e.g. NVm14,16,17,19,22,25). Southwest part of anomaly located over gravity anomaly NVg11.	Physiographically defined province characterized by NW-trending topographic features. located over Mz granites, Pz strata, and late T volcanic rocks. Western part of anomaly corresponds with the tectonically defined Walker Lane.	Gravity terrane is possibly due to mafic underplating. Magnetic anomalies may express shallow to deeply buried magnetic plutons. Possible represents the eastern edge of Sierra Nevada Batholith.	intrusive mafic	transcurrent, extension, continental margin	Great Basin	Blakely, 1988; Craig, 1992; Hildenbrand and others, 2000; Blakely and others, 1996
I	NVm24	H	A region of variable magnetic highs. EW-oriented oval feature (75kmx50km) slightly displaced to north of a similarly shaped gravity low (NVg20).	Clover Mtns region - Miocene Caliente caldera.	Magnetic volcanic tuffs and associated intrusive rocks.	volcanic silicic, intrusive silicic	subduction	Great Basin	Best and others, 1989a; Best and others, 1989b
I	NVm25	H	NW-trending magnetic high (90x25km) located over a basement gravity low. Corresponds partly with the single largest isostatic gravity low in Nevada (Silent Canyon Caldera).	Located over the southern Nevada volcanic field - Miocene silicic volcanic rocks. Several identified calderas (e.g. Silent Canyon, Timber Mtn, Black Mtn).	Magnetic, low density volcanic rocks.	volcanic silicic	subduction, transcurrent	Great Basin	Eckel, 1968; Byers and others, 1976; Oliver and others, 1995; Grauch and others, 1999; Mankinen and others, 1999; McKee and others, 1999; Hildenbrand and others, 2000; McKee and others, 2001
I	NVm26	H	Small pronounced oval magnetic high (20km). Located over a much broader pronounced gravity high (NVg23).	Mormon Mtns--Fault block of pC crystalline basement.	Dense and magnetic crystalline basement.	basement mafic	uplift	Great Basin	Blank, 1988; Blakely, 1988; Blakely and others, 1996
I	NVm27	H	Small subdued oval magnetic high (40km). Located over a regional gravity high.	Fault block of pC crystalline basement.	Dense and magnetic crystalline basement.	basement mafic	uplift	Great Basin	Blank, 1988; Blakely, 1988; Blakely and others, 1996
I	NVm28	H	Small pronounced oval magnetic high (20km). Located over a much broader pronounced gravity high (NVg23).	Fault block of pC crystalline basement.	Dense and magnetic crystalline basement.	basement mafic	uplift	Great Basin	
I	NVm29	H	EW alignment of magnetic highs that separates a regional magnetic low to north from a region dominated by several local magnetic highs to south.	South of this boundary are Q volcanic, T intrusive, and Mz granititic rocks. To the north are mainly Pz carbonate rocks.	Weakly magnetic carbonate rocks to north and magnetic igneous rocks to south.	sedimentary carbonate, volcanic mafic, basement mafic	extension, uplift	Great Basin	Blakely and others, 1996
L	NVm30	H	Small oval magnetic high (30km) enclosing a smaller NS elongate high. Located over NW flank of a broad NW-trending magnetic high(60x30km). Corresponds partly with gravity high NVg22.	Fault block of pC to Mz sedimentary rocks.	Possibly due to upwarp in dense and magnetic crystalline basement and to an associated T intrusion.	basement mafic	uplift	Great Basin	Stewart and Carlson, 1978; Blank, 1988; Blakely, 1988; Blakely and others, 1996
I	ORg01	H	Subdued NS-elongate gravity high (>125 x >75km). Corresponds with magnetic anomaly ORm01.	Located over western Cascades, late Cz volcanic rocks. Eastern edge is at the transition between the basaltic western Cascades and the younger, more andesitic eastern Cascades.	Interpreted to be due to concealed accreted Eocene Siletz River volcanic rocks. Forms part of the eastern edge of the Oregon forearc block.	volcanic mafic	accretion, subduction	Cascade Mtns	Wells and others, 1998

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Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
I	ORg02	H	Prominent oval gravity high (50km) located at SW end of feature ORg03. Corresponds partly with magnetic anomaly ORm07.	Located over T volcanic rocks.	Perhaps due to dense magnetic intrusive rocks.	intrusive mafic, volcanic mafic	hotspot	Columbia Plateaus	
I	ORg03	H	NE-trending elongate gravity high (>125x40km). Corresponds with magnetic anomaly ORm03.	Skirts north edge of Blue Mtns and located mostly within the southern part of the John Day basin.	Perhaps due to dense magnetic rift intrusive rocks or accreted Triassic ultramafic rocks.	intrusive mafic, volcanic mafic, ultramafic	hotspot, accretion	Columbia Plateaus	
R	ORg04	L	NNW-elongate gravity low (50x175km). Closely correlated with magnetic high ORm08.	Western Cascade Range consisting of T andesite volcanic rocks in the Cascade graben.	Magnetic, low density intermediate volcanic rocks.	volcanic silicic, intrusive silicic	subduction	Cascade Mtns	Jachens and others, 1989; LaFehr, 1965; Blakely and others, 1985
	ORg05	L	NNW-trending gravity low (100x25km). Contains discrete lows within it.	Located over Q and T volcanic rocks of the high Cascade Range. Includes Crater Lake.	Magnetic, low density intermediate volcanic rocks.	volcanic silicic intrusive silicic	subduction	Cascade Mtns, Columbia Plateaus	
R	ORg06	B	Moderate gravity low with a few small (<100km diameter) intermediate amplitude highs. Regional low is mainly defined by highs to east associated with northern GB and western SRP. Corresponds in part with magnetic anomaly	Southernmost edge of CRP basalts and related lava flows, and younger lava flows across Oregon highlands. lava flows are underlain by Tertiary sediments.	Low density sedimentary rocks.	sedimentary siliceous	extension	Columbia Plateaus	
I	ORm01	H	Pronounced magnetic high (>75km NS x >60km EW). Occupies northern 2/3 of the corresponding gravity anomaly. Corresponds with gravity anomaly ORg01.	Located over western Cascades, late Cz volcanic rocks. Eastern edge is at the transition between the basaltic western Cascades and the younger, more andesitic eastern Cascades.	Interpreted to be due to concealed accreted Eocene Siletz River Volcanic rocks. Forms part of the eastern edge of the Oregon forearc block.	volcanic mafic	accretion, subduction	Cascade Mtns	Wells and others, 1998
	ORm02	H	Elongate NS-oriented magnetic high (50x20km).	Located over T and Q volcanic rocks of the Cascade Range that includes the Three Sisters and Mt. Washington.	Strongly magnetic volcanic rocks.	volcanic silicic intrusive silicic	subduction	Cascade Mtns, Columbia Plateaus	
I	ORm03	H	NE-trending elongate magnetic high (>125x25km). Corresponds with gravity anomaly ORg03.	Skirts north edge of Blue Mtns and located mostly within the southern part of the John Day basin.	Perhaps due to dense magnetic rift intrusive rocks or accreted Triassic ultramafic rocks.	intrusive mafic, volcanic mafic, ultramafic	hotspot, accretion	Columbia Plateaus	
	ORm04	L	Large NE-trending magnetic low (225x60km).	Corresponds closely with Mz sedimentary rocks of the Blue Mtns.	Weakly magnetic sedimentary rocks. Mainly contrasted with the surrounding strongly magnetic volcanic rocks.	sedimentary siliceous	accretion	Columbia Plateaus, Great Basin	Vallier and Brooks, 1986; Vallier and Brooks, 1994
	ORm05	H	Elongate arcuate NS-trending magnetic high (100x25km).	Located over Q and T volcanic rocks on the east side of the Cascade Range (includes Newberry Craters).	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	subduction	Columbia Plateaus	
R	ORm06	B	High amplitude, high frequency magnetic anomalies that extend across Oregon highlands. Corresponds with gravity anomaly ORg06.	Southernmost edge of CRP basalts and related rocks, and younger volcanic rocks across Oregon highlands. Volcanic rocks are underlain by Tertiary sediments.	Magnetic basaltic rocks.	volcanic mafic	extension, hotspot	Columbia Plateaus	
I	ORm07	H	Oval magnetic high (40km) that is located at the SW end of feature ORm03. Corresponds partly with gravity anomaly ORg02.	Located over T volcanic rocks.	Perhaps due to dense magnetic intrusive rocks.	intrusive mafic, volcanic mafic	hotspot	Columbia Plateaus	
R	ORm08	H	NNW-elongate magnetic high (50x200km). Closely correlated with gravity high ORg04. Consists of high amplitude and high frequency magnetic anomalies.	Western Cascade Range consisting of T andesite in the Cascade graben.	Magnetic, low density intermediate volcanic rocks.	volcanic silicic, intrusive silicic	subduction	Cascade Mtns	LaFehr, 1965; Blakely and others, 1985; Jachens and others, 1989
	ORm09	H	Elongate NW-trending magnetic high (60x10km).	Located over Q and T volcanic and sedimentary rocks. Anomaly has the same trend as Q faulting.	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	extension, hotspot	Columbia Plateaus	
	ORm10	H	Elongate NW-trending magnetic high (50x20km).	Located over T volcanic and sedimentary rocks. Anomaly has the same trend as Q faulting.	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	extension, hotspot	Columbia Plateaus	
	ORm11	H	Elongate north-trending magnetic high (80x20km).	Located over Q and T volcanic rocks.	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	extension, hotspot	Great Basin	

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	ORm12	H	Elongate NE-trending magnetic high (125x25km).	Located over Q and T volcanic and sedimentary rocks.	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	hotspot	Great Basin	
	ORm13	H	Elongate east-trending prominent magnetic high (75x40km).	Located over T volcanic rocks of the Cascade Range.	Strongly magnetic volcanic rocks.	volcanic mafic, intrusive mafic	extension, hotspot	Great Basin	
	ORm14	H	Elongate NS-trending magnetic high (150x20km).	Located over T volcanic rocks of Steens Mt. Anomaly has similar trend as the western NNR anomaly (feature NVm08).	Strongly magnetic volcanic or mafic intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Great Basin	
	ORm15	H	Elongate NS-trending magnetic high (60x20km).	Located over Q and T volcanic rocks. Has similar trend and is in-line with the the western NNR anomaly (NVm08).	Strongly mafic magnetic volcanic or intrusive rocks.	volcanic mafic, intrusive mafic	hotspot	Great Basin	
I	UTg01	H	Prominent NS-oriented oblate gravity high (75x30km). Located over regional magnetic low.	Located over Great Salt Lake desert. Few outcrops nearby are T silicic volcanic rocks and Pz quartzites and limestones.	Likely source is pC crystalline basement below Pz stratified rocks.	basement mafic	uplift, extension	Great Basin	
I	UTg02	H	Prominent NW-trending gravity highs (UTg02; 225x50km) branching off of the Eastern SRP. Anomaly has two segments. Corresponds with magnetic anomaly UTm02.	Located over the Great Salt Lake. Anomaly merges with the Great Rift that cuts across the eastern SRP. Has same trend as: Pz and pC basement outcrops, the Great Salt Lake, and the Great Rift. Located over pC basement in the Raft River and Albion Mtns at its NW end.	Possibly due to dense, magnetic mafic rocks associated with rifting. Has similar trend to basement on either side of eastern SRP. May be due to magnetic basement or to rift related intrusive rocks that were injected along pre-existing basement structure.	intrusive mafic	hotspot	Great Basin	Mabey and others, 1978; Kuntz and others, 1988; Kuntz and others, 1992
I	UTg03	L	Prominent gravity low (130x100km).	Anomaly located mostly over T and Q alluvium. Eastern edge corresponds to the Rocky Mtns frontal thrust belt.	Low density sedimentary basin fill. Likely due to thrust-related thickening of low density sedimentary rocks.	sedimentary siliceous	depression	Great Basin	
I	UTg04	L	EW-trending gravity low west of boundary between Uinta Basin and Mtns (75x30km). Marks the southern edge of the Great Salt Lake Desert. Corresponds with magnetic anomaly UTm05.	Corresponds with T intrusive rocks and stratified Pz sandstones. May be due to subduction-related volcanism along pC crustal discontinuity.	Low density intrusive rocks.	intrusive silicic, sedimentary siliceous	subduction	Great Basin	Mabey and others, 1978
I	UTg05	B	EW-trending alignment of anomalies, comprising Uinta Mtns/Basin boundary to the east and a gravity trough (UTg04) to the west.	Correlates with inferred boundary between Proterozoic crust to the south and Archean crust to the north.	Defined by juxtaposing terranes on Proterozoic crust to the south (e.g. Uinta Mtns) and Archean crust to the north.	basement mafic, basement silicic	accretion	Great Basin, Middle Rocky Mtns	Zietz and others, 1969; Stewart and others, 1977; Hutchinson and Albers, 1992; Karlstrom and others, 2002
I	UTg06	B	Prominent east-trending gravity high (200x50km) over the Uinta Mtns. Located over a regional magnetic low. An oval (25km diameter) magnetic high (feature UTm03) is located at the east end of the Uinta Mtns.	Closely corresponds to pC outcrops of the Uinta Mtns.	Dense, generally weakly magnetic structurally uplifted pC basement.	basement mafic	uplift	Middle Rocky Mtns, Great Basin	Simpson and others, 1986
I	UTg07	L	Prominent EW-elongate gravity low (200x75km). Corresponds partly with magnetic anomaly UTm06.	Corresponds with the Uinta Basin.	Due to low density sedimentary fill.	sedimentary siliceous, volcanic mafic, intrusive mafic	depression	Middle Rocky Mtns, Great Basin, Colorado Plateaus	
I	UTg08	H	Narrow EW-elongate gravity high (100x25km). Located over regional magnetic high.	Located at southern edge of the Uinta Basin.	Source may be pC basement similar to Uinta Mtns.	basement mafic	uplift	Colorado Plateaus	
I	UTg09	L	EW-elongate gravity low (125x25km). Corresponds with magnetic anomaly UTm09.	Located at southern edge of Uinta Basin. Anomaly parallels trend of Uinta Mtns.	Likely reflects low density basin fill.	sedimentary siliceous	depression	Colorado Plateaus	Mabey and others, 1978
I	UTg10	H	Prominent gravity high (150x100km). Corresponds with a regional magnetic low.	Located largely over Q deposits. Pz carbonate rocks correspond closely with anomaly's southern and eastern edges. Located also over scattered outcrops of T volcanic, Pz carbonate, and pC basement rocks.	Perhaps due to thick accumulation of Pz carbonate rocks and/or to dense pC crystalline basement.	sedimentary carbonate, basement mafic	continental margin, uplift	Great Basin	

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I	UTg11	H	NE-trending gravity high (150x50km) that encompasses the Wasatch Plateau. Northern end located over a magnetic low and southern end over a magnetic high (UTm11).	Located at north end of basin along the Sevier River over western Colorado Plateau. Corresponds with the western part of the San Rafel Swell.	Likely reflects upwarp of dense pC basement.	basement mafic	uplift	Colorado Plateaus, Great Basin	
I	UTg12	L	NW-trending gravity low (125x50km) with distinct NW-trending ridges. Located over a generally low magnetic area.	Located over La Sal Mtns. Straddles Northern edge of CRP.	Low may be partly due to La Sal T intrusive bodies. Ridges may be related to faults in pC basement.	intrusive silicic	stable crust	Colorado Plateaus	
I	UTg13	H	NE-trending gravity high (170x50km). Corresponds with magnetic anomaly UTm14.	Roughly corresponds to the edge of the Wasatch plateau. Cuts across drainages of the CP. Located over part of the Circle Cliffs and San Rafael Swell structural uplifts.	Likely reflects upwarp of dense, magnetic pC basement.	basement mafic	uplift	Colorado Plateaus	
I	UTg14	H	NS-oriented gravity high (100x40km) that is contiguous with feature UTg10. North end crosses large magnetic high (UTm15). South end located over magnetic low region.	Located at edge of GB over the eastern edge of the Sevier Thrust belt. Located mostly over T volcanic rocks.	Unknown source, but possibly dense basement brought near to surface by frontal thrust.	basement mafic	uplift	Great Basin	
I	UTg15	L	Oval gravity low (50km). Located over a magnetic low.	Located over welded silicic tuff volcanic field (Bull Valley silicic complex).	Thick accumulation of low density rhyolitic and tufaceous sedimentary rocks.	volcanic silicic, intrusive silicic	subduction	Great Basin	
I	UTg16	L	Large oval gravity low (100km). Located over moderately high magnetic terrain that includes magnetic anomalies AZm02 and southern end of UTm14.	Located over Mz and Pz strata of CRP over Glen Canyon along the Colorado River.	Area is covered by CRP strata. Possibly due to downwarp of basement.	basement silicic	depression	Colorado Plateaus	
I	UTg17	H	Gravity high (100x125km). Encompasses feature UTg18. Is contiguous with broader gravity high (AZg04). Corresponds with magnetic anomaly UTm21.	Located over flat lying Pz and Mz strata of CRP. Outlines the Monument upwarp.	May be dense and magnetic intrusive or uplifted buried basement rocks.	intrusive mafic, basement mafic	uplift	Colorado Plateaus	
I	UTg18	B	Doughnut-shaped gravity high with internal low (50km). Very good correlation with magnetic anomaly UTm22.	Located over Pz and Mz flat lying strata of CRP, but corresponds with a small T intrusive outcrop (much smaller) that represents a deep seated intrusive or diatreme.	May be dense magnetic mantle derived intrusive rocks.	intrusive mafic, ultramafic	stable crust	Colorado Plateaus	Mabey and others, 1978
R	UTm01	L	Regional magnetic low lacking short-wavelength magnetic anomalies. Extends from the Walker Lane (NVm23) and Modoc Plateau (CAm02) anomalies on the west eastward across virtually the entire study area. Terrane extends from the SRP (IDm10) to the southern Quiet zone boundary (NVm29) and edge of the Colorado Plateaus (UTm12).	Anomaly spans a wide range of rock types and ages.	Speculation on source includes initial low magnetic susceptibilities of volcanic rocks (Stewart and others, 1977; Blakely, 1988), diminished magnetic susceptibility by intense hydrothermal alteration (Eaton, 1978). Demonstrated (Blakely, 1988) not to be the result of a shallow Curie isotherm.	volcanic silicic, metamorphic	subduction, extension	Great Basin	Stewart and others, 1977; Eaton and others, 1978; Mabey and others, 1978; Blakely, 1988
I	UTm02	H	NW-trending magnetic high (225x50km). Extends SE from the eastern SRP. Corresponds with gravity anomaly UTg02.	Located over the Great Salt Lake. Anomaly merges with the Great Rift that cuts across the eastern SRP. Has same trend as: Pz and pC basement outcrops, the Great Salt Lake, and the Great Rift. Located over pC bsement in the Raft River and Albion Mtns at its NW end.	Possibly due to dense, magnetic mafic rocks associated with rifting. Has similar trend to basement on either side of eastern SRP. May be due to magnetic basement or to rift related intrusive rocks that were injected along pre-existing basement structure.	intrusive mafic	hotspot	Great Basin	Mabey and others, 1978; Kuntz and others, 1988; Kuntz and others, 1992
I	UTm03	B	An oval (25km diameter) magnetic high located at the east end of the Uinta Mtns.	Closely corresponds to pC outcrops of the Uinta Mtns.	Magnetic structurally uplifted pC basement.	basement mafic	uplift	Middle Rocky Mtns, Great Basin	Simpson and others, 1986

Table 1: Geophysical Features of the Great Basin and parts of the surrounding provinces

Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
I	UTm04	H	Moderate NW-trending magnetic high (75x30km).	Located over Q fill of Great Salt Lake Desert. Nearest outcrops are volcanic rocks and pC basement. Mz Gold Hill pluton lies to the south.	Possibly due to magnetic pluton, magnetic basement, or volcanic rocks.	intrusive mafic, basement mafic, volcanic mafic	subduction, extension	Great Basin	Mabey and others, 1978
I	UTm05	H	ENE-trending narrow linear magnetic high (30x5km) west of boundary between Uinta Basin and Mtns (feature UTm05). Marks the southern edge of the Great Salt Lake Desert. Corresponds with gravity anomaly UTg04.	Corresponds with several T intrusive rocks (Wasatch igneous belt) and stratified Pz sandstones. May be due to subduction-related volcanism along pC crustal discontinuity.	Magnetic, low density intrusive rocks.	intrusive silicic, sedimentary siliceous	subduction	Great Basin	Mabey and others, 1978; Vogel and others, 2001
I	UTm06	H	WNW-elongate oval-shaped magnetic high (75x40km) that lies within a gravity low. Corresponds with gravity anomaly UTg07.	Corresponds with part of the Uinta Basin.	Source is likely buried magnetic volcanic or intrusive rocks.	sedimentary siliceous, volcanic mafic, intrusive mafic	depression	Middle Rocky Mtns, Great Basin, Colorado Plateaus	
	UTm07	H	Elongate moderate magnetic high (50x25km).	Located over outcrops of pC and Pz sedimentary, and T volcanic and intrusive rocks.	Magnetic Mz and T intrusive rocks and/or T volcanic rocks.	intrusive mafic, volcanic mafic	subduction, extension	Great Basin	Mabey and others, 1978
I	UTm08	H	EW-elongate magnetic high (100x40km). Located over a relative gravity low that is within a regional gravity high.	Located over pC and Pz sedimentary and T volcanic rocks.	May be due to magnetic basement and/or volcanic and associated intrusive rocks.	basement mafic, volcanic mafic, intrusive mafic	subduction, extension	Great Basin	Mabey and others, 1978
I	UTm09	H	EW-elongate magnetic high (125x25km). Magnetic terrane overlaps with, but generally located south of gravity anomaly UTg09.	Located at southern edge of Uinta Basin. Anomaly parallels trend of Uinta Mtns.	Magnetic high may reflect magnetic igneous rocks.	intrusive mafic	depression	Colorado Plateaus	Mabey and others, 1978
I	UTm10	H	Irregular magnetic high (75x75km) that includes magnetic highs UTm06,09, and an unlabeled high to the east. Anomaly spans several distinct EW-trending gravity highs and lows (UTg07,08,09).	Located mostly over the Uinta Basin over T sedimentary rocks.	Mostl likely due to magnetic basement rocks.	basement mafic	stable crust	Colorado Plateaus	
I	UTm11	H	Oval magnetic high (75x50km).	Located at north end of Sevier volcanic plateau.	Magnetic volcanic rocks.	volcanic mafic	subduction	Great Basin, Colorado Plateaus	
I	UTm12	B	Boundary between regional low of GB and regional high of CP.	Boundary, in most places, skirts the CP.	Marks the boundary between generally low magnetic terrain of the GB and the varied, but strongly magnetic terrain of the CP. CP magnetic highs are largely due to zones of magnetic basement.	basement mafic	stable crust, extension	Great Basin, Colorado Plateaus	
	UTm13	L	Elongate east-trending magnetic low (50x25km) with well defined northern and southern boundaries. Located over a gravity low.	Southern edge of the anomaly corresponds with northern extent of a volcanic field bordering the CP. Located over Q basin with some outcrops of Pz and Mz sedimentary rocks.	Northern edge may reflect basement topography at bordering a Q basin. Southern edge defined by contrast of weakly magnetic basin fill with magnetic T volcanic rocks.	basement mafic, sedimentary siliceous, volcanic mafic	subduction, extension	Great Basin	
I	UTm14	H	Arcuate NE-trending elongate magnetic high (300x40km). Corresponds with gravity anomaly UTm13.	Roughly corresponds to the edge of the Wasatch plateau. Cuts across drainages of the CP. Located over part of the Circle Cliffs and San Rafel Swell structural uplifts.	Likely reflects upwarp of dense, magnetic pC basement.	basement mafic	uplift	Colorado Plateaus	
I	UTm15	H	Elongate ENE-trending magnetic high (250x30km).	Corresponds to Enterprise tholeitic basalts. Eastern part of anomaly corresponds with a T intrusive body.	Strongly magnetic volcanic and intrusive rocks.	volcanic mafic, intrusive mafic	subduction, extension	Great Basin	Mabey and others, 1978; Best and others, 1980

Table 1: Geophysical Features of the Great Basin and parts of the surrounding provinces

Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
R	UTm16	H	Regional magnetic high of CP containing numerous large to intermediate magnetic highs (features UTm14, UTm17, UTm18, UTm19, UTm20, UTm21, UTm22, AZm01, AZm02, AZm05, AZm06, AZm07, AZm08), several of which are NE-trending.	Largely located over flat lying Pz and Mz sedimentary rocks. Includes the La Sal Mtns Cz volcanic rocks. NE-trending anomalies corresponds to Colorado mineral belt.	Regional high is most likely due to magnetic pC basement or Cz volcanic rocks.	basement mafic, volcanic mafic	stable crust, uplift	Colorado Plateaus	Case and Joesting, 1972; Mabey and others, 1978; Blank and others, 1998
I	UTm17	H	NNE-trending elongate magnetic high (100x25km).	Located over the northwestern CP over T and Mz sedientary rocks.	May be similar to magnetic feature UTm14, possibly due to flexure and upwarp of magnetic pC basement rocks.	basement mafic	uplift	Colorado Plateaus	
	UTm18	H	Oval magnetic high (25km).	Located over the CP. Partly located over the Henry Mtns.	Shape suggests it may be buried intrusive. Outcrops of Pz rocks suggest anomaly may also relate to an upwarp of pC basement rocks.	intrusive mafic, basement mafic	stable crust, uplift	Colorado Plateaus	
I	UTm19	H	Oval magnetic high (75x125km). Encompasses magnetic highs (magnetic features UTm21 and UTm22). Corresponds partly with gravity anomaly UTg17.	Located over flat lying Pz and Mz strata of CP along the Monument upwarp.	May be dense and magnetic intrusive or uplifted buried basement rocks.	intrusive mafic, basement mafic	uplift	Colorado Plateaus	
I	UTm20	H	Elongate NNE-trending magnetic high that straddles the edge of a gravity high (~100x25km).	Located over the CP but close to Hurricane Fault that uplifts rocks to the east.	May be due to magnetic pC basement rocks brought close to surface by Hurricane Fault.	basement mafic	uplift	Colorado Plateaus, Great Basin	
	UTm21	H	Prominent magnetic high (50x50km). Adjoined with magnetic anomaly UTm22.	Located over upper Pz carbonate and Mz clastic sedimentary rocks.	May be due to magnetic intrusive or shallow pC basement rocks.	intrusive mafic, basement mafic	stable crust, uplift	Colorado Plateaus	
I	UTm22	H	Doughnut-shaped magnetic high with internal low (40km). Corresponds with gravity anomaly UTg18.	Located over Pz and Mz flat lying strata of CP, but corresponds with a small T intrusive outcrop (much smaller) that represents a deep seated intrusive or diatreme.	May be dense magnetic mantle derived intrusive rocks.	intrusive mafic, ultramafic	stable crust	Colorado Plateaus	Mabey and others, 1978
I	WYg01	H	Prominent NW-trending gravity high (200x30km). Corresponds with magnetic	Corresponds to Wind River Range.	Dense, magnetic pC basement in the Wind River Range.	basement mafic	uplift	Middle Rocky Mtns	Sims and others, 2001
I	WYg02	L	Very prominent NW-trending elongate gravity low (175x70km).	Located over northern extension of Green River Basin. Bound on the south by a smaller amplitude gravity low. Bound on the NE by a prominent gravity high over the Wind River Mtns (WYg01).	Low density basin fill.	sedimentary siliceous	depression	Middle Rocky Mtns	
I	WYg03	L	Moderate north-trending gravity low (125x75km).	Located over Cretacous sedimentary rocks over northern extension of Green River Basin. Bound on the south by prominent east-trending high of Uinta Mtns (UTg06). Bound on the east by prominent gravity high of the Rock Springs uplift (WYg04).	Low density basin fill.	sedimentary siliceous	depression	Middle Rocky Mtns	
I	WYg04	H	North-trending gravity high (125x50km). Corresponds with magnetic anomaly WYm05.	Rock Springs uplift -- a structural high that exposes Cretaceous sedimentary rocks.	Dense and magnetic pC basement rocks at core of uplift.	basement mafic	uplift	Middle Rocky Mtns	Sims and others, 2001
	WYm01	L	Variable magnetic region that is generally low (>100km). Located over a gravity high. Southern portion overlaps with prominant gravity high (WYg01) associated with the Wind River Range.	Located over large alluvial basin and over pC and Pz rocks.	May be due to dense, and moderately to weakly magnetic pC basement and Pz sedimentary rocks.	basement mafic, basement silicic, sedimentary siliceous	depression	Middle Rocky Mtns	Sims and others, 2001
I	WYm02	H	Prominent NW-trending magnetic high (200x30km). Corresponds with magnetic anomaly WYg01.	Corresponds to Wind River Range.	Dense, magnetic pC basement in the Wind River Range.	basement mafic	uplift	Middle Rocky Mtns	Sims and others, 2001
I	WYm03	H	Oval-shaped magnetic high (75x50km). Located over the western part of a gravity low, and over a basin filled with T sedimentary rocks and Q sediments.	Located mostly over T sedimentary rocks and Q sediments.	Buried magnetic pC basement.	basement mafic	uplift	Middle Rocky Mtns, Great Basin	Sims and others, 2001

Table 1: Geophysical Features of the Great Basin and parts of the surrounding provinces

Scale	ID	Hi/lo/ both	Terrane definition	Geologic province	Inferred source of anomaly	Generalized source rock	Tectonic setting	Province	References
I	WYm04	L	Oval magnetic low (60km). Surrounded partly by magnetic high feature WYm06.	Located over Cretaceous sedimentary strata in Green River basin.	Weakly magnetic pC metasedimentary rocks.	basement silicic	depression	Great Basin, Middle Rocky Mtns	Sims and others, 2001
I	WYm05	H	North-trending low to moderate magnetic high (125x25km). Corresponds with magnetic anomaly WYg04.	Rock Springs uplift -- a structural high that exposes Cretaceous sedimentary rocks.	Dense and magnetic pC basement rocks at core of uplift.	basement mafic	uplift	Middle Rocky Mtns	Sims and others, 2001
I	WYm06	H	EW-elongate, U-shaped magnetic high (175x50km). Located north of Uinta Mtns, over alluvium and T sedimentary rocks in the Flaming Gorge area.	Located over Cretacous sedimentary strata.	Magnetic pC granitic rocks.	intrusive silicic, intrusive mafic, basement mafic	batholith, uplift	Middle Rocky Mtns, Great Basin	Sims and others, 2001

(1) Generalized source rock: sedimentary - carbonate, siliceous; volcanic - silicic, mafic; intrusive - silicic, mafic; basement - silicic, mafic, carbonate; metamorphic -
(2) Tectonic setting: extension, transcurrent, compression, stable crust, accretion, uplift, depression,
Abbreviations: CRP - Columbia River Plateau; CP - Colorado Plateau; SRP - Snake River Plain; NNR - Northern Nevada Rift; Mz - Mesozoic, Cz - Cenozoic; Pz, Paleozoic, pC - Precambrian, GB - Great Basin, BR - Basin and Range; compass directions (e.g. NE - northeast)

Table 2. Physiograpic provinces and their geologic and geophysical character.

Physiographic Province	Physiographic Description	Geologic Description	Gravity expression	Magnetic expression	Generalized geophysical sources	General tectonic setting	Notes	References
Cascade Mtns	Part of the Cascade-Sierra Mountain chain Province of Fenneman (1931). Includes Southern and Middle Cascade Mountains. In south, consists of volcanic mountains, variously eroded, and no distinct range. In the north, consists of continuous range capped by high volcanic plateau.	Cenozoic to present subduction-related volcanic arc.	Characterized by low gravity values.	Dominated by high amplitude and high frequency anomalies.	Magnetic volcanic rocks.	Subduction	Contains no continental basement. Characterized by high heat flow. Crustal thickness is on the order of 35-40km.	Mabey and others, 1978; Eaton and others 1978; Smith, 1978; Blackwell, 1978
Coast Ranges	Part of the Pacific Border Province of Fenneman (1931). Parallel ranges and valleys. Folded, faulted and metamorphosed strata. Rounded crests of unequal height.	Northwest trending ranges influenced by San Andreas fault system. Consists of various fault bounded tectonic slivers. Largely consists of dissected Cenozoic sedimentary basins, Mesozoic granites, melange.	Characterized by numerous long and narrow NNW-trending gravity highs and lows.	Characterized by numerous long and narrow NNW-trending magnetic highs and lows.	Sedimentary basins, ophiolite rocks, intrusive rocks.	Accretion, Transcurrent	Characterized by variable high heat flow. Especially high north of San Francisco associated with Sonoma volcanic field. Crustal thickness is on the order of 25-30km. Active seismically associated with right-lateral transform motion along the San Andreas Fault system.	Smith, 1978; Blackwell, 1978
Colorado Plateaus	Characteristics include: high block and dissected plateaus, strong relief, and mature canyon plateaus. In south, trenched by Grand Canyon.	Large stable crustal block overlain by largely flat-lying Paleozoic and Mesozoic strata with gentle flexures forming broad north-south-trending monoclinal folds. In places, pierced by deep-seated diatremes and volcanic necks. Earthquakes are rare.	Variable gravity signature containing several gravity highs and lows some reflecting a NE-trending fabric.	Characterized by several prominent NE-trending magnetic highs.	Magnetic intrusive and basement rocks.	Stable crust	Generally weakly magnetic flat lying strata over magnetic basement. Northeast magnetic lineaments correlate with major Precambrian fault systems. West-trending anomalies occur over northeast UT are due to Precambrian basement and perhaps magnetic intrusive rocks. Crustal thickness is on the order of 35-45km. Characterized by moderate to low heat flow. Ringed by high heat flow. In general, characterized by low seismicity except at its margins.	Smith, 1978; Blackwell, 1978
Columbia Plateaus	Characteristics include: rolling plateau with young incised valleys; complex mountains and dissected volcanic plateaus; young lava plateau with immature drainage.	Mostly extensive flat-lying volcanics associated with the Columbia River basalts and related rocks. Flood basaltic volcanic setting.	Generally low gravity relief reflecting some NE-trending fabric	Dominated by high amplitude and high frequency anomalies.	Magnetic volcanic rocks.	Extension, Hotspot	Crustal thickness is on the order of 30-35km, thinning to the north. Characterized by very low seismicity and high to moderate heat flow.	Smith, 1978; Blackwell, 1978
Great Basin	Part of the Basin and Range Province of Fenneman (1931). Consists of isolated NNE-trending ranges (dissected block mountains) separated by aggraded desert plains of about equal width.	Eastern part is mostly Paleozoic stratified rocks overlain by Cenozoic volcanogenic rocks. Western part include Paleozoic and Mesozoic stratified rocks overlain by Cenozoic volcanogenic rocks. Central part is characterized by many Cenozoic calderas.	Highly variable geophysical character. Several large gravity domains. Broadest scale character reflects physiographic basin. Northern Great Basin corresponds to high gravity and the southern to generally moderate to low gravity.	Highly variable geophysical character. The western Great Basin, over the Walker Lane, consists of numerous high frequency and high amplitude anomalies displaying a dominant NW-trending fabric. The central Great Basin is punctuated by several NNW-trending narrow magnetic highs. Most of the Great Basin is generally characterized by low magnetic relief (termed "quiet basement zone" by Mabey et al., 1978.	Magnetic extrusive, intrusive and basement rocks.	Extension	Subdued magnetic expression in the GB occurs over basement (Mabey et al., 1978). Many anomalies may be associated with Phanerozoic rocks (in strong contrast to abundant basement anomalies over the Colorado Plateaus). Crustal thickness is moderately low (25km) and surrounded by significantly thicker crust in the Sierra Nevada, Colorado Plateaus, and Snake River Plain. Characterized by moderately low seismicity except at its borders. An exception is the Central Nevada Seismic Belt that runs north-south trending narrow seismic zone aligned with Dixie Valley. Characterized by moderate heat flow. High heat flow observed in the northern Great Basin (Battle Mountain High) and low heat flow observed in the south (Eureka Low).	Smith, 1978; Blackwell, 1978; Mabey and others, 1978
Great Valley	Part of the Pacific Border Province of Fenneman (1931). Low fluviatile plain.	North-south-trending, deep alluvial basin filled with Cenozoic to recent sediments.	Characterized mostly by long linear NNW-trending gravity low.	Characterized mostly by long linear NNW-trending magnetic high.	Magnetic obducted oceanic crust. Low density basin fill.	Subduction, Accretion	Characterized by low heat flow, and bound by high heat flow in the Sierra Nevada and Coast Ranges. Crustal thickness is on the order of 20-30km. Characterized by low seismicity and is bound by high seismicity in the Coast Ranges and Sierra Nevada.	Hinze and Zietz, 1985

Table 2. Physiograpic provinces and their geologic and geophysical character.

Physiographic Province	Physiographic Description	Geologic Description	Gravity expression	Magnetic expression	Generalized geophysical sources	General tectonic setting	Notes	References
Klamath Mtns	Part of the Pacific Border Province of Fenneman (1931). Uplifted and dissected peneplain on resistant rocks.	Highly thrusted and folded metamorphic Mesozoic sedimentary and intrusive rocks.	Largely characterized by a large prominent gravity high.	Moderate magnetic high region containing a few prominent NNW-trending prominent highs.	Complex of Mesozoic intrusive rocks, Paleozoic and Mesozoic metasedimentary rocks, and ultramafic rocks that are part of the Klamath Mountains.	Accretion, Batholith	Characterized by low heat flow and low seismicity. Crustal thickness is on the order of 30-35km.	
Middle Rocky Mtns	Complex mountains, mainly anticlinal ranges, intermontane basins.	Includes folded and faulted Paleozoic and Mesozoic stratified rocks on Precambrian basement. Contains Wyoming basin filled with Cenozoic and Recent sedimentary rocks.	Characterized by several intermediate-sized gravity highs and lows. Most prominent are the NW-trending Wind River and the Uinta Mountains anomalies.	Characterized by moderate magnetic fields and a few magnetic highs and lows. Prominent highs include the NW-trending Wind River anomaly.	Precambrian basement and basin fill.	Compression	Crustal thickness is on the order of 40km. Area displays moderate to high heat flow and low seismicity.	Mabey and others, 1978; Smith, 1978
Mojave Desert	Part of the Basin and Range Province of Fenneman (1931). Consists of short ranges in desert plains.	Isolated faulted ranges formed in an extensional transcurrent setting associated with Great Basin, San Andreas and Garlock Faults. Includes Mesozoic plutonic rocks and varying amounts of Precambrian through Mesozoic stratified rocks. Deep alluvial basins.	Characterized by generally high gravity values.	Characterized by generally high magnetic values.	Plutonic rocks.	Batholith, Extension	Characterized by moderate to low seismicity and is bound by high seismicity associated with the San Andreas and Garlock Fault systems. Heat flow is moderate to high. Crustal thickness is on the order of 20-30km.	Smith, 1978; Blackwell, 1978
Northern Rocky Mtns	Deeply dissected mountain uplands.	Central and western parts consist of Idaho Batholith and Challis volcanics. Central and eastern parts consist of crystalline Precambrian rocks and Paleozoic strata. Batholithic and high level silicic volcanic activity. Abundant listric thrust faults.	Western half is characterized by low gravity values. Eastern half is characterized by high gravity.	Relatively low magnetic relief, though punctuated by some moderate magnetic highs.	Low density and magnetic intrusive rocks of Idaho batholith and Precambrian and Paleozoic strata.	Batholith, Extension	Crustal thickness is on the order of 35-40km. Characterized by low seismicity and moderate to low heat flow.	Smith, 1978; Blackwell, 1978
Sierra Nevada	Part of the Cascade-Sierra Mountain chain of Fenneman (1931). Block mountain range tilted west. Accordant crests. Alpine peaks near east side.	Mesozoic batholithic complex locally capped by Cenozoic volcanic rocks and bounded by high angle normal fault on the east. Intruded into belts of accreted terranes that crop out extensively in the western part of the range.	Characterized by several large prominent NW-trending gravity highs and lows.	Characterized by several large prominent NW-trending magnetic highs and lows.	Plutonic, volcanic, ophiolite rocks.	Batholith, Accretion	Crustal thickness is up to 50km. Displays high heat flow. Characterized by high seismicity at its eastern margin.	Hinze and Zietz, 1985; Oliver, 1977; Smith, 1978; Blackwell, 1978; Lachenbruch and Sass, 1978
Snake River Plain	Part of the Columbia Plateaus of Fenneman (1931). Young lava plateau that features recent volcanism and ineffective drainage.	Mostly flat-lying flows and cinder cones and associated poorly lithified Miocene and younger sedimentary rocks that cover a series of Miocene and younger silicic calderas. Considered to mark the trace of the Yellowstone hotspot.	Characterized by prominent gravity high over entire Province.	Characterized by moderately high magnetic fields punctuated by several small, prominent magnetic highs.	Volcanic rocks.	Hotspot	Crustal thickness is on the order of 30-40km. Displays moderate heat flow and low seismicity to the west , increasing to high heat flow and active seismicity to the east.	Smith, 1978; Blackwell, 1978; Mabey and others, 1978; Eaton and others, 1978.

G1

Scale R

Province Great Basin

Tectonic Setting extension

Terrane Definition

Regional long-wavelength gravity anomaly spans entire GB and has bi-lateral symmetry (resembling the form of a butterfly). Anomaly appears best in isostatic gravity and topography, but expressed also in pseudogravity (see regional isostatic field map, figure 4). Corresponds with regional magnetic low.

Hi/lo/both

Geologic Province

Anomaly corresponds roughly to a topographically high region of extended crust associated with the GB Province.

Inferred Source of Anomaly

Anomaly reflects regionally extended, hot and elevated crust.

Generalized source rock varied

References

Fenneman, 1931;
Eaton and others, 1978;
Mabey and others, 1978;
Glen and others, 2000

To Map To Table

M2

Scale R

Province Great Basin

Tectonic Setting extension

Terrane Definition

Broadest regional pseudogravity feature corresponding roughly with the extent of the GB defined by topography (see regional pseudogravity map, figure 4). Corresponds with regional isostatic gravity low.

Hi/lo/both

Geologic Province

Anomaly corresponds roughly to a topographically high region of extended crust associated with the GB Province.

Inferred Source of Anomaly

Anomaly reflects regionally extended, hot and elevated crust.

Generalized source rock varied

References

Fenneman, 1931;
Eaton and others, 1978;
Mabey and others, 1978;
Glen and others, 2000

To Map To Table

AZg01

Scale I

Province Colorado Plateaus

Tectonic Setting uplift, stable crust, extension

Terrane Definition

Oval gravity high (35km) that correlates with magnetic anomaly UTm20.

Hi/lo/both H

Geologic Province

Located on CP close to Hurricane Fault zone. Corresponds in part with Q and T volcanic centers.

Inferred Source of Anomaly

Source is buried by Pz and Mz strata. May be dense and magnetic buried pC basement or Q and T volcanic rocks.

Generalized source rock basement , volcanic mafic

References

To Map **To Table**

AZg02

Scale I

Province Colorado Plateaus

Tectonic Setting uplift, stable crust

Terrane Definition

Oval gravity high (35km) over north end of magnetic anomaly AZm01.

Hi/lo/both H

Geologic Province

Located over a broader high on Kanab Plateau.

Inferred Source of Anomaly

Source is buried by Pz and Mz strata. Source may be dense and magnetic buried pC basement.

Generalized source rock basement

References

To Map **To Table**

AZg03

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

EW-elongate regional gravity high (250x125km) containing some prominent large (~100km diameter) highs.

Hi/lo/both H

Geologic Province

Northern part of feature corresponds to CP/GB transition. Western part is entirely within the GB. Northern and western portions correspond closely with outcrops of Pz strata.

Inferred Source of Anomaly

Shallow pC-basement rocks.

Generalized source rock basement

References

To Map **To Table**

AZg04

Scale I

Province Colorado Plateaus

Tectonic Setting uplift, stable crust

Terrane Definition

Broad gravity high (350x150km).

Hi/lo/both H

Geologic Province

Located over Pz, and thickest Mz strata in AZ. coincides in part with the Black Mesa Basin.

Inferred Source of Anomaly

Regionally elevated dense pC basement rocks beneath CP.

Generalized source rock basement

References

Sumner, 1985

To Map To Table

AZg05

Scale

Province Colorado Plateaus

Tectonic Setting uplift, stable crust

Terrane Definition

NE-trending gravity high (50x25km). Edges correspond to steep magnetic gradients.

Hi/lo/both H

Geologic Province

Located over T and Q volcanic rocks of the San Francisco Peaks volcanic field. Trend is similar to axes of monoclines in Mz strata that may indicate step faults in basement.

Inferred Source of Anomaly

Uplifted dense pC basement or dense intrusive rocks associated with Cz volcanic field.

Generalized source rock basement, intrusive mafic

References

To Map To Table

AZg06

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

NE-trending gravity low (100x25km) within a much broader gravity low. Corresponds with magnetic low.

Hi/lo/both L

Geologic Province

Lies within the transition zone between GB CP within a broader gravity low, over pC basement and Mz granitic rocks.

Inferred Source of Anomaly

Low density, non-magnetic pC basement (silicic gneisses) and/or Mz granitic rocks.

Generalized source rock basement, intrusive silicic

References

Sumner, 1985

To Map To Table

AZg07

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

Prominant NW-trending gravity high (175x50km). Corresponds closely with a magnetic low (not numbered).

Hi/lo/both H

Geologic Province

Located near the south edge of CP (Mogollon Rim).

Inferred Source of Anomaly

Dense, nonmagnetic crystalline pC-basement.

Generalized source rock basement

References

To Map **To Table**

AZm01

Scale I

Province Colorado Plateaus

Tectonic Setting uplift, stable crust

Terrane Definition

NW-trending magnetic high (75x40km) within a broader high of CP. North end corresponds to gravity high AZg02.

Hi/lo/both H

Geologic Province

Kaibab (Unikaret) Plateau (CP).

Inferred Source of Anomaly

Buried by Pz and Mz strata. Uplifted magnetic pC basement.

Generalized source rock basement

References

To Map **To Table**

AZm02

Scale I

Province Colorado Plateaus

Tectonic Setting stable crust, uplift

Terrane Definition

NE-trending elongate magnetic high(75x25km) located within a much larger gravity low.

Hi/lo/both H

Geologic Province

Over Pz and Mz strata over the Paria Plateau (CP). Parallels plunging anticline, and is in line with the northeastern extension of the Bright Angle Fault.

Inferred Source of Anomaly

Magnetic intrusive or faulted and uplifted basement rocks.

Generalized source rock intrusive mafic, basement

References

To Map **To Table**

AZm03

Scale I

Province Colorado Plateaus

Tectonic Setting uplift, stable crust

Terrane Definition

Prominent east-trending magnetic low (75x40km) that is within a much larger region of gravity high.

Hi/lo/both L

Geologic Province

Over flat-lying Pz and Mz strata of CP. Corresponds to the NW part of the Black Mesa Basin.

Inferred Source of Anomaly

Source is covered by Pz and Mz strata. Possible uplift of non-magnetic pC basement.

Generalized source rock basement

References

Sumner, 1985

To Map **To Table**

AZm04

Scale I

Province Colorado Plateaus

Tectonic Setting uplift, stable crust

Terrane Definition

Equidimensional (40km) magnetic high. Over a complex gravity anomaly. Mostly within but near the edge of a generally high magnetic region.

Hi/lo/both H

Geologic Province

At west edge of CP. Includes Iron Mtn volcanic rocks.

Inferred Source of Anomaly

Probable uplifted magnetic pC basement or Cz volcanic and associated intrusive rocks.

Generalized source rock basement, volcanic mafic, intrusive mafic

References

To Map **To Table**

AZm05

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

EW-trending elongate magnetic anomaly high (250km) that narrows at its west end (10km wide extending for ~150km). East end widens to ~75 km.

Hi/lo/both H

Geologic Province

East end includes a large part of Coconino plateau. West end roughly corresponds with trace of the Colorado River and Lake Mead. Includes Mt Floyd volcanic field.

Inferred Source of Anomaly

Probable uplifted magnetic pC basement uplifted on east-trending fault, or Cz volcanic or intrusive rocks.

Generalized source rock basement, intrusive silicic, volcanic silicic

References

Sumner, 1985

To Map To Table

AZm06

Scale I

Province Colorado Plateaus

Tectonic Setting stable crust

Terrane Definition

NE-trending elongate magnetic high (250kmx25km). SE-edge corresponds with gravity lineations. Includes three small anomalies at SW end.

Hi/lo/both H

Geologic Province

Southern part correlates with San Francisco Peaks volcanic field. Straddles edge of CP. Anomaly resembles that associated with the Springerville volcanic field to SE. Trend is parallel to the Colorado Lineament which may be related to the Colorado Mineral Belt located to the NE. Aligned along Mesa Butte Fault.

Inferred Source of Anomaly

Magnetic pC basement or Cz igneous rocks that exploited a fracture system in the basement.

Generalized source rock basement, intrusive mafic, volcanic mafic

References

Stewart and Crowell, 1992

To Map To Table

AZm07

Scale I

Province Colorado Plateaus

Tectonic Setting extension

Terrane Definition

NE-trending elongate magnetic high (100x25km). Corresponds with NE-trending linear gravity features.

Hi/lo/both H

Geologic Province

Located in transition zone of CP and BR, over Hackberry Miocene lava flows.

Inferred Source of Anomaly

Magnetic volcanic rocks and feeder dikes.

Generalized source rock volcanic mafic

References

To Map **To Table**

AZm08

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

NE-trending elongate magnetic high (100x25km) located on a gravity low.

Hi/lo/both H

Geologic Province

Located in transition zone of CP and BR, on pC (Apache group) rocks.

Inferred Source of Anomaly

Magnetic pC basement.

Generalized source rock basement

References

CAg01

Scale I

Province Klamath Mtns

Tectonic Setting accretion

Terrane Definition

Narrow roughly NS-trending gravity high (100x10km). Located entirely within a magnetic high.

Hi/lo/both H

Geologic Province

Anomaly located over complex of Mz intrusive rocks, Pz and Mz metasedimentary rocks, and ultramafic rocks that are part of the Klamath Mtns. Gravity anomaly is centered over a magnetic high (CAm01).

Inferred Source of Anomaly

Gravity anomaly mimics crescent-shaped structural slivers, and is probably due to a dense portion of the eastern Klamath Mtns, probably mafic ultramafic rocks of the Trinity Ophiolite.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

LaFehr, 1966;
Griscom,1980b;
Jachens and Griscom, 1985;
Jachens and others, 1989

To Map To Table

CAg02

Scale I

Province Cascade Mtns

Tectonic Setting accretion

Terrane Definition

Oval gravity low (75km) within regionally complex magnetic region (CAm02).

Hi/lo/both L

Geologic Province

Over Q and T volcanic arc terrain. Includes Mount Shasta at its SW end. It is ringed on its southwest half by Klamath Mtns Mz intrusive rocks.

Inferred Source of Anomaly

Probably thick sequence of low density volcanic rocks.

Generalized source rock volcanic silicic

References

Griscom,1980a

To Map To Table

CAg03

Scale I

Province Klamath Mtns

Tectonic Setting accretion

Terrane Definition

NW-elongate gravity high (50x20km). Corresponds to a magnetic high region.

Hi/lo/both H

Geologic Province

Primarily on Pz limestones of the Klamath Mtns.

Inferred Source of Anomaly

Probably due to dense, magnetic mafic and ultramafic rocks of the Trinity Ophiolite, though some of gravity anomaly may be due to dense carbonate rocks.

Generalized source rock ultramafic, sedimentary carbonate

References

To Map **To Table**

CAg04

Scale I

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

NW-trending moderate gravity high (30x20km).

Hi/lo/both H

Geologic Province

Over Q and T volcanic rocks.

Inferred Source of Anomaly

Probably dense, magnetic metamorphic or intrusive rocks of the Sierra Nevada foothills and Klamath Mtns.

Generalized source rock intrusive mafic, metamorphic mafic

References

To Map **To Table**

CAg05

Scale

Province Great Basin

Tectonic Setting batholith, extension

Terrane Definition

NW-trending gravity high (75x50km). Located over a prominant magnetic high. Feature looks similar (in gravity and magnetics) to feature (CAg07).

Hi/lo/both H

Geologic Province

Over T volcanic rocks.

Inferred Source of Anomaly

Due to relatively dense and magnetic Mz granitic T volcanic rocks similar to feature CAg7.

Generalized source rock volcanic mafic, intrusive silicic

References

CAg06

Scale I

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

NW-trending moderate gravity high (100x20km). Located mostly over a magnetic low (unlabeled).

Hi/lo/both H

Geologic Province

Over Mz and Pz rocks of the western foothills of the Sierra Nevada.

Inferred Source of Anomaly

Sources are various NW-trending Mz and Pz intrusive and metamorphic rocks in western Sierra Nevada foothills. Anomaly likely due to intrusive and metamorphic rocks.

Generalized source rock intrusive mafic, metamorphic

References

Burnett and Jennings, 1982

To Map To Table

CAg07

Scale I

Province Great Basin

Tectonic Setting batholith, extension

Terrane Definition

NW-trending (100x50km) variable gravity high. Located over a magnetic high region. Gravity anomaly is similar to the main Sierra Nevada batholith CAg12, though more magnetic.

Hi/lo/both H

Geologic Province

Over T volcanic rocks, Mz granitic and metavolcanic rocks, and some Mz and Pz strata in the NW part of anomaly.

Inferred Source of Anomaly

Due to relatively dense and magnetic Mz granitic or metavolcanic rocks, or T volcanic rocks.

Generalized source rock volcanic mafic, intrusive silicic

References

To Map **To Table**

CAg08

Scale I

Province Great Valley

Tectonic Setting accretion

Terrane Definition

NW-trending prominent gravity high (150x50km). Forms northern end of prominent magnetic high (CAm19).

Hi/lo/both H

Geologic Province

Entirely over north end of Great Valley. Sutter Buttes lies at its center.

Inferred Source of Anomaly

May be dense, magnetic mafic volcanic roots, obducted magnetic oceanic crust or ultramafic rocks (ophiolite).

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

Griscom 1973;
Cady, 1975;
Jachens and others, 1989;
Jachens and others, 1995

To Map **To Table**

CAg09

Scale

Province Sierra Nevada

Tectonic Setting accretion, batholith

Terrane Definition

NS-trending prominent gravity high (40x25km). Located within gravity anomaly CAg10, and magnetic anomaly high CAm11.

Hi/lo/both H

Geologic Province

Largely over Mz granitic pluton, and some Pz carbonates.

Inferred Source of Anomaly

May be due to dense, magnetic intrusive rocks or perhaps dense, magnetic, mafic and ultramafic oceanic crust (Smartville Ophiolite).

Generalized source rock intrusive mafic, ultramafic

References

Oliver, 1980

To Map To Table

CAg10

Scale I

Province Sierra Nevada

Tectonic Setting accretion, batholith

Terrane Definition

Prominent NW-trending gravity high (100x40km).

Hi/lo/both H

Geologic Province

Over Mz granitic plutons, Pz carbonate and ultramafic rocks.

Inferred Source of Anomaly

May be due to dense, magnetic intrusive rocks or dense, magnetic, mafic and ultramafic thrust slices in Klamath Mtns and Sierra Nevada.

Generalized source rock intrusive mafic, ultramafic

References

LaFehr, 1966;
Jachens and Griscom, 1986;
Jachens and others, 1989

To Map **To Table**

CAg11

Scale I

Province Great Valley, Sierra Nevada

Tectonic Setting batholith

Terrane Definition

Oval gravity low (50km).

Hi/lo/both L

Geologic Province

Over a Mz pluton.

Inferred Source of Anomaly

Low density intrusive rocks.

Generalized source rock intrusive silicic

References

Oliver, 1980

To Map **To Table**

CAg12

Scale I

Province Sierra Nevada, Great Valley

Tectonic Setting accretion, batholith

Terrane Definition

NNW-trending gravity high (275x75km).

Hi/lo/both H

Geologic Province

Occurs over Pz and Mz meta-sedimentary, metavolcanic, oceanic crustal rocks (ophiolites), and granitic rocks.

Inferred Source of Anomaly

Dense mafic and ultramafic ophiolite rocks.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

Oliver, 1980

To Map **To Table**

CAg13

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, depression

Terrane Definition

Narrow NW-trending gravity low (150x<10km) in line with gravity low CAg24.

Hi/lo/both L

Geologic Province

Follows along trace of the Hayward and Rodgers Creek Faults.

Inferred Source of Anomaly

Low density valley fill in East Bay Trough, and eastern Santa Clara and Livermore Valleys.

Generalized source rock sedimentary siliceous

References

Roberts and Jachens, 1993

To Map To Table

CAg14

Scale I

Province Great Valley, Sierra Nevada

Tectonic Setting accretion

Terrane Definition

NW-trending gravity high (50x20km).

Hi/lo/both H

Geologic Province

Mostly over alluvium and Tertiary sediments.

Inferred Source of Anomaly

May be due to dense mafic to ultramafic intrusive bodies or to dense metasedimentary rocks.

Generalized source rock intrusive mafic, ultramafic, metamorphic mafic

References

To Map **To Table**

CAg15

Scale I

Province Great Valley

Tectonic Setting depression

Terrane Definition

Prominent, elongate NW-trending gravity low (700x50km). Strong gradients on eastern edge and in parts on its western edge. Located over magnetic low anomaly CAm14.

Hi/lo/both L

Geologic Province

Located at westernmost edge of Great Valley.

Inferred Source of Anomaly

Likely source is low density valley fill.

Generalized source rock sedimentary siliceous

References

Byerly, 1966;
Suppe, 1979;
Oliver and Griscom, 1980;
Jachens and others, 1989

To Map To Table

CAg16

Scale R

Province Sierra Nevada

Tectonic Setting batholith

Terrane Definition

Prominent NW-trending gravity low (550x75km). Corresponds with magnetic high anomaly CAm17.

Hi/lo/both L

Geologic Province

Gravity anomaly is broader than the corresponding magnetic anomaly (CAm17), but also located mostly over eastern Sierra Nevada batholith.

Inferred Source of Anomaly

Magnetic, low density granitic rocks.

Generalized source rock intrusive silicic

References

Oliver and Mabey, 1963;
Griscom and Oliver, 1980;
Jachens and others, 1989

To Map To Table

CAg17

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, accretion

Terrane Definition

Prominent narrow NW-trending gravity high (>100x5km). Southern half is located over magnetic high CAm21.

Hi/lo/both H

Geologic Province

Over Franciscan Complex rocks.

Inferred Source of Anomaly

May be due to mafic and ultramafic rocks of the Franciscan Complex, such as greenstones of Permanente and Headlands terranes.

Generalized source rock extrusive mafic, intrusive mafic, ultramafic

References

Jachens and Griscom, in press

To Map To Table

CAg18

Scale R

Province Coast Ranges

Tectonic Setting transcurrent, accretion, depression, uplift

Terrane Definition

Irregular, NW-trending, long, linear, moderate gravity high (400x25km) defined by gravity lows to the east (CAg15) and to the west (CAm23,24,30)

Hi/lo/both B

Geologic Province

Eastern Coast Ranges. Varied moderately high-density rocks within the San Andreas Fault zone.

Inferred Source of Anomaly

Various sources whose alignment is associated with accretion along continental margin and with subsequent strike-slip faulting within the San Andreas Fault zone. Anomaly is due to exposed Mz bedrock surounded by low-density Cz rocks and basin fill.

Generalized source rock sedimentary siliceous, ultramafic, volcanic mafic

References

To Map **To Table**

CAg19

Scale L

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Narrow linear NNW-trending gravity high (50x2km).

Hi/lo/both H

Geologic Province

Occurs over Pz and Mz metasedimentary, metavolcanic, ophiolite, and granitic rocks.

Inferred Source of Anomaly

Dense mafic and ultramafic ophiolite rocks

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

Oliver, 1980

To Map To Table

CAg20

Scale

Province Coast Ranges

Tectonic Setting accretion, transcurrent

Terrane Definition

NW-trending gravity high (50x10km).

Hi/lo/both H

Geologic Province

Located over Mz Ben Lomond pluton in the Santa Cruz Mtns.

Inferred Source of Anomaly

Magnetic Logan Gabbro beneath Ben Lomond pluton.

Generalized source rock intrusive mafic

References

Jachens and others, 1998

To Map To Table

CAg21

Scale L

Province Sierra Nevada, Great Valley

Tectonic Setting batholith

Terrane Definition

Oval gravity low (50x40km) associated with a magnetic low. Similar to other western Sierra gravity belt lows (e.g. CAg11, and unamed low south of anomaly CAg06).

Hi/lo/both L

Geologic Province

Occurs mainly over Mz granitic rocks and some Mz metasedimentary, and T,Q sedimentary rocks.

Inferred Source of Anomaly

Low density silicic plutons

Generalized source rock intrusive felsic

References

Oliver and others, 1992

To Map **To Table**

CAg22

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, accretion

Terrane Definition

Narrow NW-trending gravity high (125x<10km).

Hi/lo/both H

Geologic Province

Over Salinian Mz intrusive body. Eastern edge is along San Andreas Fault.

Inferred Source of Anomaly

Relatively dense intrusive body surrounded by low-density basin fill.

Generalized source rock intrusive silicic

References

To Map **To Table**

CAg23

Scale

Province Coast Ranges

Tectonic Setting accretion, transcurrent

Terrane Definition

NW-trending gravity high (60x10km). Corresponds with a NW-trending elongate magnetic high.

Hi/lo/both H

Geologic Province

Located over eastern edge of Coast Range Franciscan complex - includes ultramafic rocks (serpentines and eclogites).

Inferred Source of Anomaly

Due to Franciscan metasedimentary rocks.

Generalized source rock ultramafic

References

To Map To Table

CAg24

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, depression

Terrane Definition

Narrow NW-trending gravity low (125x<10km).

Hi/lo/both L

Geologic Province

Located over Coyote valley Q and T valley fill, along eastern side of San Andreas Fault.

Inferred Source of Anomaly

Low density valley fill.

Generalized source rock sedimentary siliceous

References

To Map **To Table**

CAg25

Scale I

Province Sierra Nevada, Great Valley

Tectonic Setting accretion, batholith

Terrane Definition

Large, NNW-trending moderate gravity high (600x150km) containing several prominant highs (e.g. CAg12, CAg26) and lows (e.g. CAg21)

Hi/lo/both H

Geologic Province

Western part occurs over Great Valley sediments. Eastern part includes granitic rocks of the Sierra Nevada Batholith and Mz and Pz metasedimentary rocks of the western Sierra Nevada.

Inferred Source of Anomaly

Dense mafic and ultramafic ophiolite rocks

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

Oliver and Griscom, 1980

To Map To Table

CAg26

Scale L

Province Sierra Nevada, Great Valley

Tectonic Setting accretion

Terrane Definition

NNW-trending gravity high (150x70km). Anomaly occurs largely over a magnetic low.

Hi/lo/both H

Geologic Province

Western part of anomaly occurs over sediments of the Great Valley. Eastern edge occurs over Sierra Nevada Batholith and Mz and Pz metasedimentary rocks.

Inferred Source of Anomaly

Dense mafic and ultramafic ophiolite rocks.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

Oliver and Griscom, 1980

To Map To Table

CAg27

Scale L

Province Sierra Nevada, Great Valley

Tectonic Setting accretion

Terrane Definition

NNW-trending narrow gravity high (125x20km) refered to as the Dinuba gravity lineament. Anomally occurs over a magnetic high.

Hi/lo/both H

Geologic Province

Occurs at contact between Great Valley and Sierra Nevada, mostly over mafic and ultramafic Pz and Mz oceanic crustal rocks.

Inferred Source of Anomaly

Dense mafic and ultramafic ophiolite rocks.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

Oliver, 1980

To Map To Table

CAg28

Scale I

Province Great Basin

Tectonic Setting uplift

Terrane Definition

Prominent oval gravity high (50km) located over a magnetic low region.

Hi/lo/both H

Geologic Province

Located over the north end of Death Valley over pC crystalline basement.

Inferred Source of Anomaly

Dense crystalline basement.

Generalized source rock basement mafic

References

Chapman and others, 1973

To Map To Table

CAg29

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, accretion

Terrane Definition

NW-trending gravity high (100x50km).

Hi/lo/both H

Geologic Province

Located over Franciscan assemblage metamorphic (Sur Series) rocks to the west of the Hosgri Fault and K Salinian granites to the east.

Inferred Source of Anomaly

Salinian K granites, Franciscan (Sur series) metasedimentary and metavolcanic rocks.

Generalized source rock sedimentary siliceous, extrusive mafic, metamorphic mafic, intrusive silicic

References

To Map **To Table**

CAg30

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, depression

Terrane Definition

Prominent NW-trending gravity low (>300x25km). Along it western edge is a magnetic high (CAm31).

Hi/lo/both L

Geologic Province

Follows the Salinas Valley Q fill and some Miocene sedimentary rocks. Anomaly is bound on its western edge by Salinian granitic basement.

Inferred Source of Anomaly

Low density basin fill.

Generalized source rock sedimentary siliceous

References

Chapman and Griscom, 1980;
Jachens and others, 1989

To Map To Table

CAg31

Scale I

Province Great Basin

Tectonic Setting extension

Terrane Definition

Oval gravity high (40km) located over a magnetic high at the southern end of Eastern Sierra magnetic anomaly (CAm34).

Hi/lo/both H

Geologic Province

Located just north of the Garlock fault at the spillway between China and Searles Lakes. Located over Mz granitic rocks.

Inferred Source of Anomaly

Possibly dense, magnetic pluton.

Generalized source rock intrusive mafic

References

To Map **To Table**

CAg32

Scale I

Province Great Basin, Mojave

Tectonic Setting extension

Terrane Definition

Prominent NW-trending gravity low (100x40km) located over a magnetic low region. A small oval magnetic high occurs at its north end.

Hi/lo/both L

Geologic Province

Located mostly over Mz Tectonia batholith, Mz Kingston Peak intrusive rocks.

Inferred Source of Anomaly

Low density intrusive body.

Generalized source rock intrusive silicic

References

Healey, 1970

To Map To Table

CAg33

Scale

Province Coast Ranges

Tectonic Setting depression, transcurrent

Terrane Definition

NW-trending gravity low (>50x50km). Located immediately west of a similarly shaped moderate to low magnetic ridge.

Hi/lo/both L

Geologic Province

Located over T and K sediments of the Santa Maria Basin.

Inferred Source of Anomaly

Low density sedimentary rocks.

Generalized source rock sedimentary siliceous

References

To Map **To Table**

CAg34

Scale

Province Coast Ranges, Sierra Nevada, Great

Tectonic Setting batholith

Terrane Definition

Narrow ENE-trending gravity high (75x20km).

Hi/lo/both H

Geologic Province

Located just north of the Garlock Fault over Mz granitic rocks.

Inferred Source of Anomaly

Dense granitic rocks.

Generalized source rock intrusive silicic

References

To Map To Table

CAg35

Scale I

Province Great Basin, Mojave

Tectonic Setting transcurrent

Terrane Definition

ENE-trending linear feature (~100km) dividing a gravity high to the north and a low to the south. Approximately corresponds with trace of the Garlock Fault. Corresponds with magnetic anomaly CAm38.

Hi/lo/both B

Geologic Province

Left-lateral fault bounding southern edges of Coast Ranges, Great Valley, and Sierra Nevada with the Mojave desert.

Inferred Source of Anomaly

Edges of anomalies associated with Coast Ranges, Great Valley, Sierra Nevada, and Mojave Desert.

Generalized source rock

References

Davis and Burchfiel, 1973

To Map To Table

CAm01

Scale I

Province Klamath Mtns

Tectonic Setting accretion

Terrane Definition

Irregular shaped prominent magnetic high (75 EW x 100km NS) that entirely encompasses the associated gravity anomaly (CAg01).

Hi/lo/both H

Geologic Province

Eastern lobe of magnetic anomaly corresponds with Mt Shasta. Bulk of magnetic anomaly located over complex of Mz intrusive rocks, Pz and Mz metasedimentary rocks, and ultramafic rocks that are part of the Klamath Mtns. Anomaly corresponds mostly with a gravity high (CAg01).

Inferred Source of Anomaly

Magnetic anomaly sources are varied. Mostly due to magnetic intrusive rocks of the Klamath Mtns. SE lobe of magnetic anomaly may be due to magnetic volcanic rocks of Mt Shasta.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

LaFehr, 1966;
Griscom,1980b;
Blakely and others, 1985;
Jachens and others, 1989

To Map To Table

CAm02

Scale R

Province Columbia Plateaus

Tectonic Setting extension

Terrane Definition

Regional magnetic high consisting of several high frequency, high amplitude magnetic anomalies. Anomaly is continuous with feature ORm06.

Hi/lo/both H

Geologic Province

Over T and Q andesite volcanic terrane, much of which is in Oregon.

Inferred Source of Anomaly

Magnetic volcanic rocks.

Generalized source rock volcanic mafic

References

Griscom,1980b

To Map **To Table**

CAm03

Scale I

Province Columbia Plateaus, Cascade Mtns,

Tectonic Setting extension

Terrane Definition

Prominent kidney shaped NS-trending magnetic high (60x25km). Straddles moderate gravity high and low anomalies.

Hi/lo/both H

Geologic Province

Located over Q volcanic rocks. Eastern edge butts up against Klamath series metavolcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic rocks.

Generalized source rock volcanic mafic

References

To Map **To Table**

CAm04

Scale I

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Prominent NW-trending magnetic high (50x20km).

Hi/lo/both H

Geologic Province

Over Q and T volcanic rocks.

Inferred Source of Anomaly

Probably dense, magnetic metamorphic or intrusive rocks of the Sierra Nevada foothills and Klamath Mtns.

Generalized source rock intrusive mafic, metamorphic mafic

References

To Map **To Table**

CAm05

Scale I

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Prominent NW-trending magnetic high (70x10km).

Hi/lo/both H

Geologic Province

Over Mz and Pz rocks of the western foothills of the Sierra Nevada.

Inferred Source of Anomaly

Sources are various NW-trending Mz and Pz intrusive and metamorphic rocks in western Sierra Nevada foothills. Anomaly likely due to magnetic intrusive and metamorphic rocks.

Generalized source rock intrusive mafic, metamorphic

References

Burnett and Jennings, 1982

To Map To Table

CAm06

Scale

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Arcuate NNW-trending elongate magnetic low (250x25km, that broadens at southern edge to 100km).

Hi/lo/both L

Geologic Province

Shape of anomaly correlates well with outcrops of Pz marine sedimentary rocks consisting of limestones, sandstones, metavolcanics.

Inferred Source of Anomaly

Weakly magnetic sedimentary rocks and possibly serpentinites.

Generalized source rock sedimentary siliceous, ultramafic

References

To Map To Table

CAm07

Scale

Province Great Basin

Tectonic Setting batholith, extension

Terrane Definition

Prominent magnetic high (175x100km). Located over NW-trending gravity highs and lows (e.g. CAg05,07).

Hi/lo/both H

Geologic Province

Located over K granitic and T volcanic rocks. Eastern edge is aligned with magnetic feautre NVm05 and gravity feature NVg01.

Inferred Source of Anomaly

Due to magnetic granitic or volcanic rocks.

Generalized source rock intrusive silicic, volcanic mafic

References

To Map To Table

CAm08

Scale

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

NNW-trending narrow magnetic zone (225x15km) with prominent eastern and western boundaries that separate it from a prominent high to the west (CAm19) and prominent low to the east (CAm09).

Hi/lo/both B

Geologic Province

Located over eastern Great Valley over Q sediments.

Inferred Source of Anomaly

Anomaly likely associated with anomaly CAm19 and represents magnetic obducted oceanic crust.

Generalized source rock ultramafic

References

To Map To Table

CAm09

Scale

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

NNW-trending elongate magnetic low (300x25km. Northern end broadens to ~75km).

Hi/lo/both L

Geologic Province

Located over western edge of Mz and Pz metamorphic and granitic rocks of the western Sierra Nevada foothills.

Inferred Source of Anomaly

Weakly magnetic metamorphic rocks.

Generalized source rock intrusive silicic, metamorphic silicic, sedimentary siliceous

References

To Map To Table

CAm10

Scale

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Prominent narrow NS-trending magnetic high (75x5km). May be a continuation of anomaly CAm05.

Hi/lo/both H

Geologic Province

Correlates with narrow body of ultramafic rocks.

Inferred Source of Anomaly

Strongly magnetic ultramafic rocks.

Generalized source rock ultramafic

References

To Map To Table

CAm11

Scale

Province Sierra Nevada

Tectonic Setting accretion, batholith

Terrane Definition

Large magnetic high (110x50km) surrounded by prominent lows.

Hi/lo/both H

Geologic Province

Located mostly over metavolcanic and metasedimentary rocks of Sierra Nevada foothill gold belt, and over remnants of Sierra Nevada intrusive rocks and some ultramafic bodies. Eastern edge correlates well with string of ultramafic rocks (Smartsville ophiolite).

Inferred Source of Anomaly

Magnetic metavolcanic and ultramafic rocks.

Generalized source rock volcanic mafic, intrusive mafic, ultramafic

References

To Map To Table

CAm12

Scale

Province Coast Ranges

Tectonic Setting accretion, transcurrent

Terrane Definition

NW-trending magnetic high (>75x25km)

Hi/lo/both H

Geologic Province

Located over Franciscan assemblage and ultramafic rocks.

Inferred Source of Anomaly

Strongly magnetic ultramafic rocks of the Coast Range ophiolite that lie along the Coast Range Fault.

Generalized source rock ultramafic

References

Jachens and others, 1995

To Map To Table

CAm13

Scale

Province Great Valley

Tectonic Setting accretion

Terrane Definition

Prominent NW-trending elongate magnetic high (175x20km). Anomaly splays off of feature CAm19.

Hi/lo/both H

Geologic Province

Located at eastern edge of Great Valley over T and K sedimentary rocks.

Inferred Source of Anomaly

Likely source is strongly magnetic obducted oceanic crust.

Generalized source rock volcanic mafic, ultramafic

References

Griscom, 1966

To Map To Table

CAm14

Scale I

Province Great Valley

Tectonic Setting depression

Terrane Definition

Elongate NW-trending magnetic low region directly west of prominent magnetic high (CAm19). Its western edge (less well defined) consists of a series of NW-trending discontinuous gradients. Located over gravity low anomaly CAg15.

Hi/lo/both L

Geologic Province

Located at westernmost edge of Great Valley.

Inferred Source of Anomaly

Likely source is weakly magnetic valley fill.

Generalized source rock sedimentary siliceous

References

Byerly, 1966;
Suppe, 1979;
Oliver and Griscom, 1980;
Jachens and others, 1989

To Map To Table

CAm15

Scale

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Oval magnetic high (25x20km).

Hi/lo/both H

Geologic Province

Located over Pz metamorphic, Q volcanic and ultramafic rocks along the Bear Mt Fault Zone.

Inferred Source of Anomaly

Likely due to strongly magnetic ultramafic rocks.

Generalized source rock ultramafic

References

To Map To Table

CAm16

Scale

Province Sierra Nevada

Tectonic Setting accretion

Terrane Definition

Long NW-trending magnetic high (100x20km). Anomally is mostly associated with a much broader gravity high (CAg12).

Hi/lo/both H

Geologic Province

Occurs over Mz and Pz metasedimentary rocks, granitic rocks, ophiolites and serpentinites along the Bear Mt fault zone and related faults.

Inferred Source of Anomaly

Dense mafic and ultramafic ophiolite rocks.

Generalized source rock intrusive mafic, ultramafic

References

To Map

To Table

CAm17

Scale R

Province Sierra Nevada

Tectonic Setting batholith

Terrane Definition

Prominent NW-trending magnetic high (50x400km).Corresponds with gravity low anomaly CAg16.

Hi/lo/both H

Geologic Province

Magnetic anomaly located over eastern Sierra Nevada batholith. Gravity anomaly (CAg16) is broader, but also located mostly over eastern Sierra Nevada batholith.

Inferred Source of Anomaly

Magnetic, low density granitic rocks.

Generalized source rock intrusive silicic

References

Oliver and Mabey, 1963;
Griscom and Oliver, 1980;
Jachens and others, 1989

To Map To Table

CAm18

Scale I

Province Great Basin

Tectonic Setting extension, batholith

Terrane Definition

Oblate EW trending moderate magnetic high (100x40km).

Hi/lo/both H

Geologic Province

Northeast of Long Valley Caldera, over Benton Range and north end of White Mtns, over Q volcanic and Mz intrusive rocks.

Inferred Source of Anomaly

Magnetic volcanic and intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Stewart and Carlson, 1978

To Map To Table

CAm19

Scale R

Province Great Valley

Tectonic Setting accretion

Terrane Definition

Prominent NW-trending magnetic high (450x40km). Strong gradients on its eastern edge and in parts on its western edge. Corresponds with subdued gravity high CAg25. Continuous with magnetic anomaly CAm26.

Hi/lo/both H

Geologic Province

Located over basin fill of Great Valley. Anomaly trends parallel to Great Valley

Inferred Source of Anomaly

Slab of strongly magnetic obducted oceanic crust and mantle.

Generalized source rock volcanic mafic, ultramafic

References

Griscom, 1966;
Cady, 1975;
Griscom and Jachens, 1990;
Jachens and others, 1995

To Map To Table

CAm20

Scale I

Province Great Basin

Tectonic Setting extension, batholith

Terrane Definition

Arcuate shaped magnetic high (75x10km).

Hi/lo/both H

Geologic Province

Located over Jurassic Cottonwood pluton. May be related to the Sylvania pluton which has same age and composition. A fault separates and may have offset these plutons.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic, intrusive silicic

References

McKee and Nelson, 1967

To Map To Table

CAm21

Scale

Province Coast Ranges

Tectonic Setting transcurrent, accretion

Terrane Definition

NW-trending moderate magnetic high (150x25km). NW end corresponds with NW-trending elongate gravity high (CAg17). SE end corresponds with NW-trending gravity low (CAg24).

Hi/lo/both H

Geologic Province

Southern end follows the Santa Clara Valley, and is bound on the west by the San Andreas Fault. In the north, the anomaly crosses the San Andreas Fault and runs offshore.

Inferred Source of Anomaly

Anomaly is caused by 3 different sources in 3 different fault blocks. Western end is offshore, west of the San Gregorio Fault and is likely caused by Coast Range ophiolite rocks ocurring in Franciscan terrane. Central part is caused by deeply buried, concealed Logan gabbro of likely ophiolite origin. Southeastern part is due to slivers of Coast range ophiolite rocks in Franciscan terrane.

Generalized source rock intrusive mafic, ultramafic

References

Jachens and others, 1998

To Map To Table

CAm22

Scale

Province Sierra Nevada, Great Valley

Tectonic Setting batholith, depression

Terrane Definition

Long NNW-trending magnetic low (500x75km) with internal magnetic highs (e.g. CAm27). Southern portion of anomaly crosses the Garlock Fault (CAm38) and is offset to the east by ~75km.

Hi/lo/both L

Geologic Province

Western part of anomaly occurs over Great Valley sediments and Mz and Pz metasedimentary rocks. Eastern, central and southern parts occur over Sierra Nevada batholith. Southern most part of anomaly, south of the Garlock Fault, occurs over granitic rocks and valley fill of the Mojave Desert.

Inferred Source of Anomaly

Weakly magnetic sedimentary and granitic rocks.

Generalized source rock intrusive silicic, sedimentary siliceous

References

To Map To Table

CAm23

Scale I

Province Great Basin

Tectonic Setting extension, batholith

Terrane Definition

Small WNW-trending moderate elongate magnetic high (40x10km) on the CA-NV border.

Hi/lo/both H

Geologic Province

Located over Jurassic Sylvania pluton.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic, intrusive silicic

References

McKee, 1968

To Map **To Table**

CAm24

Scale

Province Great Basin

Tectonic Setting extension, batholith

Terrane Definition

Elongate NW-trending magnetic high (60x10km).

Hi/lo/both H

Geologic Province

Located over Mz pluton in the Inyo Mtns.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic, intrusive silicic

References

To Map

To Table

CAm25

Scale

Province Coast Ranges

Tectonic Setting transcurrent, accretion, batholith

Terrane Definition

NNW-trending magnetic high (60x20km).

Hi/lo/both H

Geologic Province

Located near the San Andreas Fault zone largely over T sedimentary and Franciscan assemblage rocks. NE of the San Andreas Fault, the main part of anomaly is over a serpentinite diapir (New Idria Dome) and a largely concealed serpentinite, flat-lying body that extends SE to Table Mt. Southwest of the San Andreas Fault, at the south end of the anomaly, the anomaly is located over Cretaceous intrusive rocks.

Inferred Source of Anomaly

Serpentinites and magnetic intrusive rocks.

Generalized source rock ultramafic, intrusive mafic, intrusive silicic

References

To Map

To Table

CAm26

Scale R

Province Great Valley

Tectonic Setting accretion

Terrane Definition

Prominent NW-trending magnetic high (200x50km). Corresponds with subdued gravity high CAg25. Continuous with magnetic anomaly CAm19.

Hi/lo/both H

Geologic Province

Located over basin fill of Great Valley. Anomaly trends parallel to Great Valley

Inferred Source of Anomaly

Slab of strongly magnetic obducted oceanic crust and mantle.

Generalized source rock volcanic mafic, ultramafic

References

Cady, 1975;
Griscom and Jachens, 1990;
Jachens and others, 1995

To Map To Table

CAm27

Scale

Province Sierra Nevada, Great Valley

Tectonic Setting accretion

Terrane Definition

Long linear NW-trending magnetic high (125x25km) corresponding to the Dinuba gravity high (CAg27).

Hi/lo/both H

Geologic Province

Occurs at contact between Great Valley and Sierra Nevada, mostly over mafic and ultramafic Pz and Mz oceanic crustal rocks.

Inferred Source of Anomaly

Magnetic mafic and ultramafic ophiolite rocks.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

To Map To Table

CAm28

Scale

Province Great Basin

Tectonic Setting extension, batholith

Terrane Definition

Prominent magnetic high (40x25km).

Hi/lo/both H

Geologic Province

Located over Mz pluton (Hunter Mt batholith) in the central Panamint Range.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic, intrusive silicic

References

Mabey, 1961;
Chen and Moore, 1982

To Map To Table

CAm29

Scale

Province Great Valley

Tectonic Setting accretion

Terrane Definition

Small NW-trending magnetic high (10x20km).

Hi/lo/both H

Geologic Province

Located over eastern Great Valley and within anomaly CAm26.

Inferred Source of Anomaly

May be a shallow sliver of obducted magnetic oceanic crust.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map

To Table

CAm30

Scale

Province Great Basin

Tectonic Setting extension

Terrane Definition

Prominent elongate NW-trending magnetic high (70x25km).

Hi/lo/both H

Geologic Province

Located over T intrusive, volcanic, and possibly pC crystalline basement rocks in the Black Mtns.

Inferred Source of Anomaly

Likely due to magnetic intrusive, volcanic and/or basement rocks.

Generalized source rock intrusive mafic, volcanic mafic, basement mafic

References

Griscom, 1966

To Map To Table

CAm31

Scale I

Province Coast Ranges

Tectonic Setting transcurrent, accretion

Terrane Definition

Narrow NW-trending magnetic high (100x10km).

Hi/lo/both H

Geologic Province

Located along fault traces of the San Andreas Fault zone, over K granitic rocks of the La Panza Range.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive silicic

References

To Map **To Table**

CAm32

Scale

Province Coast Ranges

Tectonic Setting transcurrent, accretion

Terrane Definition

Small oval magnetic high (20km).

Hi/lo/both H

Geologic Province

Located over the eastern Coast Ranges on the San Andreas Fault SE of Parkfield over T sedimentary rocks, and near an outcrop of Cretaceous granite.

Inferred Source of Anomaly

Inferred to be due to buried body of magnetic serpentinite.

Generalized source rock ultramafic

References

Hanna and others, 1972

To Map To Table

CAm33

Scale

Province Great Valley

Tectonic Setting accretion

Terrane Definition

Small oval magnetic high (20km).

Hi/lo/both H

Geologic Province

Located over eastern part of Great Valley and within anomaly CAm26.

Inferred Source of Anomaly

May be a shallow sliver of obducted magnetic oceanic crust.

Generalized source rock ultramafic, intrusive mafic

References

To Map To Table

CAm34

Scale

Province Great Basin

Tectonic Setting extension, batholith

Terrane Definition

NS-oriented magnetic high (100x50km).

Hi/lo/both H

Geologic Province

Located over Mz pluton associated with the southern Sierra Nevada batholith over the Argus Range.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

To Map

To Table

CAm35

Scale

Province Mojave Desert

Tectonic Setting extension, batholith

Terrane Definition

Small magnetic high (40x40km).

Hi/lo/both H

Geologic Province

Located mostly over T and Q volcanic and some Mz granitic rocks. Includes some outcrop of pC rocks.

Inferred Source of Anomaly

Magnetic volcanic or intrusive rocks

Generalized source rock volcanic mafic, intrusive mafic

References

CAm36

Scale

Province Great Basin

Tectonic Setting extension

Terrane Definition

Small oval magnetic high (10km).

Hi/lo/both H

Geologic Province

Located over a T intrusive body.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

CAm37

Scale

Province Great Valley

Tectonic Setting accretion

Terrane Definition

Small oval magnetic high (20km).

Hi/lo/both H

Geologic Province

Located over eastern part of Great Valley and within anomaly CAm26.

Inferred Source of Anomaly

May be a shallow sliver of obducted magnetic oceanic crust.

Generalized source rock ultramafic, intrusive mafic

References

CAm38

Scale I

Province Great Basin, Mojave

Tectonic Setting transcurrent

Terrane Definition

ENE-trending linear feature (~300km) defined by the alignment of truncated prominent magnetic highs and lows of the Great Valley and Sierra Nevada (e.g. CAm26, CAm22, CAm17, CAm34). Also defined by left-lateral offset of prominant magnetic low (CAm22) and magnetic highs associated with Mz plutons (CAm17 and CAm39). Left-lateral offset of anomalies appears to be ~75km. Approximately corresponds with trace of the Garlock Fault. Corresponds with gravity anomaly CAg35.

Hi/lo/both B

Geologic Province

Corresponds to left-lateral fault bounding southern edges of Coast Ranges, Great Valley, and Sierra Nevada with the Mojave desert.

Inferred Source of Anomaly

Edges of anomalies associated with Coast Ranges, Great Valley, Sierra Nevada, and Mojave Desert.

Generalized source rock

References

To Map **To Table**

CAm39

Scale

Province Mojave Desert

Tectonic Setting extension, batholith

Terrane Definition

Elongate WNW-trending magnetic high (75x25km).

Hi/lo/both H

Geologic Province

Located mostly over Mz pluton in the Mojave Desert. SE end sits over volcanic rocks.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

To Map To Table

CAm40

Scale

Province Mojave Desert

Tectonic Setting extension, batholith

Terrane Definition

Small NW-trending magnetic high (30x10km).

Hi/lo/both H

Geologic Province

Located over Mz pluton in Mojave Desert.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

To Map

To Table

CAm41

Scale

Province Mojave Desert

Tectonic Setting batholith

Terrane Definition

Small NW-trending magnetic high (30x20km).

Hi/lo/both H

Geologic Province

Located over Mz intrusive, Pz sedimentary and pC basement rocks in the Mojave Desert.

Inferred Source of Anomaly

Magnetic intrusive or basement rocks.

Generalized source rock intrusive mafic, basement mafic

References

To Map To Table

IDg01

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Broad NW-trending high containing several smaller elongate anomalies (up to 200km). Gravity terrane is north of, and broader than, the magnetic terrane (IDm08). Contiguous with IDg06 and IDg04.

Hi/lo/both H

Geologic Province

Veneer of alluvium overlying basaltic lava flows.

Inferred Source of Anomaly

Dense and magnetic basaltic rocks.

Generalized source rock volcanic mafic

References

Mabey, 1976;
Mabey, 1982;
Sparlin and others, 1982;
Jachens and others, 1989

To Map **To Table**

IDg02

Scale R

Province Northern Rocky Mtns

Tectonic Setting batholith

Terrane Definition

Gravity low bounded on west and south by western SRP high and on east by a gravity high (IDg03). Located over a regional magnetic low interspersed by isolated magnetic highs (e.g. IDm02).

Hi/lo/both L

Geologic Province

Granitic batholith.

Inferred Source of Anomaly

Low density, weakly magnetic granitic rocks.

Generalized source rock intrusive silicic

References

Bott and Smithson, 1967;
Jachens and others, 1989;
Mabey, 1986

To Map To Table

IDg03

Scale I

Province Northern Rocky Mtns

Tectonic Setting compression

Terrane Definition

Uniform gravity high bounded on south and east by intense gravity high of SRP and bounded on west by ID batholith. Regional magnetic low with local discrete highs.

Hi/lo/both H

Geologic Province

Northernmost extension of basin and range. Mainly pC through upper Pz marine strata. Thick cover of Eocene volcanic rocks.

Inferred Source of Anomaly

Dense sedimentary and basement rocks.

Generalized source rock basement silicic, basement carbonate, sedimentary carbonate, sedimentary siliceous

References

To Map **To Table**

IDg04

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Broad well defined high with several elongate large positive anomalies. Contiguous with IDg01 and IDg06. Very good correlation with magnetic anomaly IDm04.

Hi/lo/both H

Geologic Province

Basaltic lava flows. Located entirely within topographically defined SRP.

Inferred Source of Anomaly

Magnetic basaltic rocks.

Generalized source rock volcanic mafic

References

Mabey, 1976;
Sparlin and others, 1982;
Jachens and others, 1989

To Map To Table

IDg05

Scale

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending elongate gravity high (50x5km). Located mostly over a NW-trending elongate magnetic low.

Hi/lo/both H

Geologic Province

Located entirely within SRP over Q alluvium.

Inferred Source of Anomaly

Possibly dense, but weakly or reversely magnetized intrusive rocks.

Generalized source rock intrusive mafic, intrusive silicic

References

To Map **To Table**

IDg06

Scale R

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Arcuate regional gravity high, highest to the east. Contains several distinct smaller anomalies (e.g. IDg05,07,08). Contiguous with IDg01 and IDg04. Corresponds with magnetic high IDm10.

Hi/lo/both H

Geologic Province

Arcuate and well defined topographic depression. Mostly basaltic lava flows and cinder cones.

Inferred Source of Anomaly

Gravity highs due to dense mafic intrusive rocks and underplating.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey, 1976;
Mabey and others, 1978;
Mabey, 1982;
Sparlin and others, 1982;
Jachens and others, 1989

To Map

To Table

IDg07

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

WNW-trending extremely high gravity terrane (150x25km). Contiguous with feature IDg08. Located entirely within larger western and eastern SRP gravity and magnetic terranes (IDg06,IDm08).

Hi/lo/both H

Geologic Province

Located entirely over Q and T volcanic rocks of the SRP.

Inferred Source of Anomaly

Likely source is dense basaltic lava flows and associated intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map To Table

IDg08

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Irregular shaped, high gravity anomaly with many small frequency superimposed highs (125km EWx75km NS). Contiguous with gravity feature IDg07. Located entirely within larger western and eastern SRP gravity and magnetic terranes (IDg06,IDm08).

Hi/lo/both H

Geologic Province

Located entirely over Q and T volcanic rocks of the SRP.

Inferred Source of Anomaly

Likely source is dense basaltic lava flows and associated intrusive rocks. High frequency superimposed anomalies may be due to volcanic vents.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map **To Table**

IDg09

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending narrow gravity high (50x10km). Located at eastern edge of NW-trending magnetic feature IDm16.

Hi/lo/both H

Geologic Province

At edge of downwarp of SRP. Located over Q and T volcanic rocks at the southern edge of the SRP.

Inferred Source of Anomaly

May be volcanic infilling of dense, magnetic lava flows and possibly vents forming along tectonic edge of SRP.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map **To Table**

IDg10

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

EW-trending gravity high (75x25km). Corresponds with magnetic high IDm17.

Hi/lo/both H

Geologic Province

At edge of downwarp of SRP. Located over Q and T volcanic rocks at the southern edge of the SRP.

Inferred Source of Anomaly

May be volcanic infilling of dense, magnetic lava flows and possibly vents forming along tectonic edge of SRP.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey and others, 1978

To Map To Table

IDm01

Scale

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending magnetic high within SRP (60x25km). Located over broad gravity high.

Hi/lo/both H

Geologic Province

Located over SRP on T and Cretaceous sediments. Northeast edge borders on T volcanic rocks.

Inferred Source of Anomaly

Likely due to strongly magnetized intrusive or volcanic rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

To Map To Table

IDm02

Scale I

Province Northern Rocky Mtns

Tectonic Setting uplift

Terrane Definition

Irregular magnetic high (60x30km).

Hi/lo/both H

Geologic Province

Located over T intrusive on western edge of Idaho Batholith.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

Mabey, 1986

To Map **To Table**

IDm03

Scale

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending prominent magnetic high within the SRP (75x25km).

Hi/lo/both H

Geologic Province

Located within SRP over Q sediments and some Q and T volcanic rocks. Anomaly is parallel to several NW-trending features crossing the eastern SRP.

Inferred Source of Anomaly

Magnetic intrusive or volcanic rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

To Map To Table

IDm04

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Well defined region of small to intermediate sized (50-75km) anomalies. Regionally a high magnetic area. Very good correlation with gravity anomaly IDg04. Contiguous with IDm08 and IDm10.

Hi/lo/both H

Geologic Province

Basaltic lava flows. Located entirely within topographically defined SRP.

Inferred Source of Anomaly

Dense basaltic rocks.

Generalized source rock volcanic mafic

References

Sparlin and others, 1982;
Mabey, 1986;
Jachens and others, 1989

To Map To Table

IDm05

Scale

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending elongate magnetic high within the western SRP (30x15km).

Hi/lo/both H

Geologic Province

Located within western SRP over Q volcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic or buried intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

IDm06

Scale

Province Northern Rocky Mtns

Tectonic Setting compression

Terrane Definition

EW-trending string of local magnetic highs (75x25km).

Hi/lo/both H

Geologic Province

Located at south end of Idaho Batholith over Mz intrusive and T volcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic or shallow intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

IDm07

Scale

Province Northern Rocky Mtns, Snake River

Tectonic Setting hotspot, compression

Terrane Definition

NW-trending elongate string of magnetic highs (125x25km).

Hi/lo/both H

Geologic Province

Crosses at right angle to the northern edge of SRP and spans Cz volcanic, Cz and Mz intrusive, and Pz clastic rocks. Parallels trend of basins and ranges north of the SRP. Follows the NW-trending Craters of the Moon rift.

Inferred Source of Anomaly

Magnetic intrusive and volcanic rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

Mabey and others, 1978

To Map To Table

IDm08

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending region consisting of several high frequency and some prominent long linear anomalies (up to 200km). Magnetic terrane is south of, and narrower than the gravity terrane (IDg1). Contiguous with IDm04 and IDm10.

Hi/lo/both H

Geologic Province

Veneer of alluvium overlying basaltic lava flows.

Inferred Source of Anomaly

Dense and magnetic basaltic rocks.

Generalized source rock volcanic mafic

References

Sparlin and others, 1982;
Mabey, 1982;
Jachens and others, 1989

To Map To Table

IDm09

Scale

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending prominent magnetic high within the eastern SRP (30x15km).

Hi/lo/both H

Geologic Province

Located within eastern SRP over Q volcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic rocks or buried intrusive.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map

To Table

IDm10

Scale R

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Arcuate regional magnetic high consisting of small to intermediate sized anomalies (<100km) in most places displaying a NW-fabric (e.g. IDm03,07,09). Corresponds with gravity high IDg06. Contiguous with IDm04 and IDm08.

Hi/lo/both H

Geologic Province

Arcuate and well defined topographic depression. Mostly basaltic lava flows and cinder cones.

Inferred Source of Anomaly

Magnetic mafic volcanic and intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey, 1976;
Mabey and others, 1978;
Mabey, 1982;
Sparlin and others, 1982;
Jachens and others, 1989

To Map

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IDm11

Scale

Province Great Basin, Middle Rocky Mtns

Tectonic Setting compression

Terrane Definition

Large, pronounced magnetic low (250x125km) that corresponds with gravity high extending off of the eastern SRP.

Hi/lo/both L

Geologic Province

Located over thrusted strata of the Rocky Mtns thrust belt.

Inferred Source of Anomaly

Weakly magnetic, high density carbonate rocks.

Generalized source rock sedimentary carbonate

References

To Map

To Table

IDm12

Scale

Province Great Basin

Tectonic Setting batholith

Terrane Definition

Prominent magnetic low (100x50km) located over a moderate gravity low of the same general size.

Hi/lo/both L

Geologic Province

Located over Mz intrusive rocks. May be related to Idaho Batholith.

Inferred Source of Anomaly

Weakly magnetic and relatively low density intrusive rocks.

Generalized source rock intrusive silicic

References

To Map To Table

IDm13

Scale

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

EW-trending prominent magnetic high within the eastern SRP (30x15km).

Hi/lo/both H

Geologic Province

Located within eastern SRP over Q volcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic or buried intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map

To Table

IDm14

Scale I

Province Great Basin, Snake River Plain

Tectonic Setting hotspot

Terrane Definition

NW-trending subdued magnetic high (100x30km) branching off of eastern SRP. Bounds Magnetic low domain to northeast.

Hi/lo/both H

Geologic Province

Located over early Pz stratified rocks, pC metamorphic, and T sedimentary rocks. Parallels trend of thrust slices of Pz strata. Cuts across and is normal to the southern edge of SRP. Has similar trend to hotspot-related rift features such as the Great Rift and to narrow NW-trending features in Utah (UTg02, UTm02).

Inferred Source of Anomaly

May be similar in origin to feature UTm02 - rift related mafic magnetic intrusive or volcanic rocks or Precambrian basement.

Generalized source rock intrusive mafic,volcanic mafic, basement mafic

References

Mabey and others, 1978

To Map To Table

IDm15

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

Irregular magnetic terrain similar in character with SRP. Forms a tongue extending off western SRP in line and parallel to eastern SRP. Includes a prominent U-shaped magnetic high at its SW end (IDm18). Possibly a fossil trace of Yellowstone hotspot. Forms part of the Humboldt magnetic zone of Mabey and others (1978).

Hi/lo/both H

Geologic Province

Located over T and Q volcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic and intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey and others, 1978;
Hinze and Zietz, 1985

To Map To Table

IDm16

Scale I

Province Snake River Plain, Great Basin

Tectonic Setting hotspot

Terrane Definition

NW-trending narrow magnetic high (190x40km). Includes gravity IDg09, though largely located outside the gravity defined western SRP over regional gravity high of northern GB (NVg04). Northern end converges on the southern edge of the topographic and gravity defined SRP. Feature narrows to the NW.

Hi/lo/both H

Geologic Province

Northern 2/3 of anomaly parallels western SRP. Southern end extends over northern GB.

Inferred Source of Anomaly

Probably due to extensive magnetic volcanic and intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey and others, 1978

To Map To Table

IDm17

Scale I

Province Snake River Plain

Tectonic Setting hotspot

Terrane Definition

EW-trending magnetic high (75x10km). Corresponds with gravity high IDg10.

Hi/lo/both H

Geologic Province

At edge of downwarp of SRP. Located over Q and T volcanic rocks at the southern edge of the SRP.

Inferred Source of Anomaly

May be volcanic infilling of dense, magnetic lava flows and possibly vents forming along tectonic edge of SRP.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey and others, 1978

To Map **To Table**

IDm18

Scale

Province Great Basin

Tectonic Setting hotspot, extension

Terrane Definition

U-shaped magnetic high (75x20km) that is located over a gravity high.

Hi/lo/both H

Geologic Province

Located over T lava flows.

Inferred Source of Anomaly

Magnetic volcanic and intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

To Map

To Table

NVg01

Scale I

Province Great Basin

Tectonic Setting transcurrent, accretion

Terrane Definition

NE-trending boundary between high gravity to SE and low gravity to NW. Very well correlated with magnetic boundary. Corresponds with magnetic feature NVm05.

Hi/lo/both B

Geologic Province

West of this line there are no pre-Cz rocks exposed. The boundary also corresponds with the eastern edge of topographic and basaltic plateau. Note that this boundary corresponds with the edge of basement gravity calculation. See Isostatic gravity map.

Inferred Source of Anomaly

The prominent gravity anomaly likely reflects a major deep crustal discontinuity.

Generalized source rock volcanic mafic, sedimentary siliceous

References

McKee and others, 1983;
Blakely, 1988;
McKee and others, 1990;
Wyld and Wright, 2001

To Map **To Table**

NVg02

Scale I

Province Great Basin

Tectonic Setting uplift

Terrane Definition

ENE-trending gravity high mainly defined in NW Nevada (225x100km).

Hi/lo/both H

Geologic Province

Located mostly over Mz metaclastic rocks (including mudstones and sandstones). Crosses several pre-Cz lithologic terranes and the continental margin inferred from Sr-isotopic ratios. Anomaly lies in line with eastern SRP and is coincident with a region of high heatflow extending SW from the eastern SRP. Anomaly is not easily distinguished from general gravity high south of the SRP. Northern edge of anomaly is poorly defined.

Inferred Source of Anomaly

May reflect a region of uplifted dense lower crustal rocks.

Generalized source rock basement mafic

References

To Map **To Table**

NVg03

Scale I

Province Great Basin

Tectonic Setting extension

Terrane Definition

Oval gravity low (50km) within broad regional gravity high of northern GB (NVg04).

Hi/lo/both L

Geologic Province

Located over western assemblage (upper plate of Roberts Mt thrust) cherts and shales at north end of Carlin trend. Small plutons crop out at center of anomaly

Inferred Source of Anomaly

May be due to a large buried pluton.

Generalized source rock intrusive silicic

References

To Map **To Table**

NVg04

Scale R

Province Great Basin

Tectonic Setting continental margin, hotspot

Terrane Definition

Regional gravity high across northern GB. Extends from the SRP southward. Southern boundary (at 40° latitude) is marked by an abrupt gradient to low regional gravity of the southern GB regional gravity low (NVg10). Anomaly largely coincides with a regional magnetic low (UTm01).

Hi/lo/both H

Geologic Province

The central and eastern part of the anomaly is underlain largely by Pz carbonate rocks. The western and northern parts are coincident with Pz silicic sedimentary rocks overlain by Miocene volcanic rocks that extend north into OR, ID, and SRP.

Inferred Source of Anomaly

Underlain by low magnetic, high density (likely carbonate rocks). Anomaly may indicate that carbonate rocks extend to the SRP and that volcanic rocks form only a thin veneer (since magnetic anomaly is low). Alternatively, gravity high may reflect dense mafic underplating associated with the Yellowstone hotspot.

Generalized source rock sedimentary carbonate, intrusive mafic

References

Glen and others, 2000;
Pierce and others, 2000

To Map To Table

NVg05

Scale

Province Great Basin

Tectonic Setting subduction, continental margin

Terrane Definition

ENE-trending gravity high (80x25km). Corresponds with a magnetic low.

Hi/lo/both H

Geologic Province

Located over T volcanic, Pz and Mz sedimentary, and Mz intrusive rocks near the boundary of the Black Rock and Jungo lithologic terranes.

Inferred Source of Anomaly

May be due to dense intrusive or Mz metasedimentary rocks.

Generalized source rock basement mafic

References

To Map

To Table

NVg06

Scale I

Province Great Basin

Tectonic Setting continental margin

Terrane Definition

Regional gravity high. Generally associated with magnetic low, but also spans magnetic highs of western and central NNR.

Hi/lo/both H

Geologic Province

Located over T volcanic, Mz sedimentary and intrusive, and Pz sedimentary rocks. Centered on Jurassic Humboldt lopolith gabbro and basalts.

Inferred Source of Anomaly

May be due to dense mafic intrusive rocks including the Jurassic Humboldt lopolith.

Generalized source rock intrusive mafic

References

Page, 1965;
Speed, 1976;
Oldow, 1984;
Dilek and Moores, 1995;
Hildenbrand and others, 2000

To Map **To Table**

NVg07

Scale I

Province Great Basin

Tectonic Setting continental margin, accretion

Terrane Definition

Prominent gravity high over north central Nevada. Southern boundary of the high has a distinct 'V' shape. Anomaly is part of the Northern GB gravity high terrane (NVg04). West edge of gravity 'V' corresponds closely with the Northern Nevada Rift (NVm12).

Hi/lo/both H

Geologic Province

East edge of gravity 'V' corresponds with middle Pz Roberts Mt thrust front. West edge may reflect an older crustal discontinuity.

Inferred Source of Anomaly

Gravity high (inside 'V' relates to regional high of northern GB - NVg04). East edge may reflect crustal discontinuity at thrust juxtaposing dense Pz sedimentary rocks to the NW with less dense sedimentary rocks to the SE. West edge may reflect an older crustal discontinuity associated with the pC continental margin.

Generalized source rock sedimentary siliceous, basement mafic

References

Grauch and others, 1995;
Hildenbrand and others, 2000;
Ponce and Glen, 2002

To Map To Table

NVg08

Scale

Province Great Basin

Tectonic Setting subduction

Terrane Definition

Gravity high (125x60km). Corresponds with west end of feature NVm14 associated with diverse magnetic signature of the Walker Lane belt.

Hi/lo/both H

Geologic Province

Located largely over the Carson Sink and over T volcanic rocks on the west edge of anomaly. Also located over some Mz intrusive rocks.

Inferred Source of Anomaly

May be due to dense mafic to intermediate composition volcanic and associated intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Hildenbrand and others, 2000

To Map To Table

NVg09

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

NW-trending gravity low bounded to SW by the generally high gravity over the Walker Lane belt (NVg11). Located over a regional magnetic low punctuated by highs of NNR anomalies. Bounded on the northeast by the gravity high of the Northern Nevada basement gravity V (NVg07). At its eastern edge it merges with feature NVg10.

Hi/lo/both L

Geologic Province

Located over intermediate composition tuffs that lie on Mz strata in the west, and on Pz strata in the east.

Inferred Source of Anomaly

Low density tuffs, and quartzose sedimentary rocks.

Generalized source rock sedimentary silicic

References

To Map **To Table**

NVg10

Scale R

Province Great Basin

Tectonic Setting extension

Terrane Definition

Regional gravity low that extends from ~37° latitude in the south to ~40° latitude in the north. Anomaly located mostly over regional magnetic low (UTm01). On its western edge, anomaly merges with feature NVm09.

Hi/lo/both L

Geologic Province

Western part is located mostly over T volcanic and Pz sedimentary rocks. To the east, anomaly located mostly over Pz rocks. Pz rocks on the west are more silicic than those to the east. Region lacks significant basalt outcrops such as occur to the north.

Inferred Source of Anomaly

Anomaly due to low density and low magnetic source rocks, which may indicate that Pz rocks are thinner here than to the north beneath feature NVg04.

Generalized source rock sedimentary silicic

References

Blakely and Jachens, 1991;
Glen and others, 2000

To Map To Table

NVg11

Scale I

Province Great Basin

Tectonic Setting transcurrent, extension, continental margin

Terrane Definition

NW-trending elongate zone (~100kmx350km) in western NV, regional positive anomaly with several prominent local (~25km) positive anomalies. Located within diverse magnetic feature NVm23.

Hi/lo/both H

Geologic Province

Structurally defined province characterized by NW-trending topographic features. located over Mz granites, Pz strata, and late T volcanic rocks. Corresponds mostly with the physiographically defined Walker Lane belt.

Inferred Source of Anomaly

Gravity feature is possibly due to T mafic underplating. Magnetic anomalies may express shallow to deeply buried magnetic plutons . Possibly represents the eastern edge of Sierra Nevada Batholith.

Generalized source rock intrusive mafic

References

Blakely, 1988;
Craig, 1992;
Hildenbrand and others, 2000

To Map **To Table**

NVg12

Scale I

Province Great Basin

Tectonic Setting continental margin

Terrane Definition

Roughly oval (125km EWx100km NS) diffuse gravity high. Located over a regional magnetic low. Probably relates to feature NVg16.

Hi/lo/both H

Geologic Province

Located over diverse range of rock types including T volcanic and Pz sedimentary rocks.

Inferred Source of Anomaly

Likely source is thick accumulation of limestones and dolomites.

Generalized source rock sedimentary carbonate

References

To Map **To Table**

NVg13

Scale I

Province Great Basin

Tectonic Setting extension

Terrane Definition

Oval gravity low (50km).

Hi/lo/both L

Geologic Province

Located over alluvial basin west of Wheeler Peak. NE end of anomaly located over granitic plutons.

Inferred Source of Anomaly

May be due to thick pile of low density alluvial fill, and/or low density granitic plutons.

Generalized source rock sedimentary siliceous, intrusive silicic

References

To Map **To Table**

NVg14

Scale I

Province Great Basin

Tectonic Setting batholith

Terrane Definition

Prominent NW-trending gravity low (120x30km) located over a magnetic low.

Hi/lo/both L

Geologic Province

Corresponds with the Jurassic Sylvania pluton in the Sylvania Mtns.

Inferred Source of Anomaly

Low density non-magnetic pluton.

Generalized source rock intrusive silicic

References

McKee, 1968

To Map To Table

NVg15

Scale

Province Great Basin

Tectonic Setting batholith

Terrane Definition

NS-trending gravity high (60x40km). Coresponds with intense parts of magnetic feature NV19.

Hi/lo/both H

Geologic Province

Located largely over T volcanic rocks. Some outcrops of Mz sedimentary and T intrusive rocks at the south end of anomaly.

Inferred Source of Anomaly

May be due to dense volcanic and associated intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map To Table

NVg16

Scale I

Province Great Basin

Tectonic Setting continental margin

Terrane Definition

EW-trending variable gravity high (200x50km). Located over a regional magnetic low Probably relates to feature NVg12.

Hi/lo/both H

Geologic Province

Located over T volcanic and Pz carbonate rocks, though largely follows the along northern and western edge of an extensive outcrop of Pz carbonates.

Inferred Source of Anomaly

Dense, weakly magnetic carbonate rocks.

Generalized source rock sedimentary carbonate

References

To Map **To Table**

NVg17

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

NW-trending gravity low (30x20km). Corresponds with magnetic anomaly NVm21.

Hi/lo/both L

Geologic Province

Wilson Creek Mtns - late Oligocene caldera.

Inferred Source of Anomaly

Thick accumulation of low density, magnetic caldera fill tuffs and underlying silicic intrusive rocks.

Generalized source rock volcanic silicic

References

Best and others, 1989a;
Best and others, 1989b

To Map **To Table**

NVg18

Scale I

Province Great Basin

Tectonic Setting subduction, hotspot

Terrane Definition

Boundary between low basement gravity to the north and higher basement gravity to the south. Also an alignment of several prominent anomalies across Sierra Nevada, southern GB, and CP. No or little magnetic expression.

Hi/lo/both B

Geologic Province

Southern end of GB. Corresponds with topographic drop from north to south, and to a band of seismicity rimming the Basin and Range.

Inferred Source of Anomaly

Speculated (Saltus and Thompson, 1995) to relate to a combination of thermal buoyancy (related to Yellowstone plume head), thickened crust and mid-lower crustal felsic and mafic dikes and sill injection beneath the gravity high region.

Generalized source rock intrusive mafic, intrusive felsic

References

Stewart and others, 1977;
Eaton and others, 1978;
Saltus and Thompson 1995;
Pierce and others, 2000

To Map To Table

NVg19

Scale

Province Great Basin

Tectonic Setting extension

Terrane Definition

Irregular-shaped gravity low with local highs (175x100km). Corresponds to regional magnetic low.

Hi/lo/both L

Geologic Province

Located mostly over Pz carbonate rocks and Q and T sediments.

Inferred Source of Anomaly

May be due to thick low density, poorly consolodated sedimentary rocks in deep intra-range basins.

Generalized source rock sedimentary siliceous

References

To Map To Table

NVg20

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

Oval east-trending gravity low (75x40km). Partly coincident with anomaly NVm24.

Hi/lo/both L

Geologic Province

West end of Clover Mtns and part of Caliente depression and Caliente and Kane Springs Wash calderas. Also over Pz sedimentary rocks.

Inferred Source of Anomaly

Thick accumulation of low density rhyolitic and tuffaceous sedimentary rocks.

Generalized source rock volcanic silicic

References

Noble and McKee, 1972;
Best and others, 1989b

To Map **To Table**

NVg21

Scale I

Province Great Basin

Tectonic Setting extension, uplift

Terrane Definition

Irregular shaped gravity high. Generally NW-trending (max 300km NWx125km SE).

Hi/lo/both H

Geologic Province

Located over pC crystalline, Pz carbonate and quartzite, and T volcanic rocks. Includes most of Death Valley and Pahrump Valley.

Inferred Source of Anomaly

Likely source is pC crystalline basement and thick accumulation of limestones and dolomites.

Generalized source rock basement silicic

References

To Map **To Table**

NVg22

Scale L

Province Great Basin

Tectonic Setting uplift

Terrane Definition

Small oval gravity high (10km). Corresponds partly with magnetic high NVm30.

Hi/lo/both H

Geologic Province

Fault block of pC to Mz sedimentary rocks.

Inferred Source of Anomaly

Speculated (Blank, 1988; Blakely, 1988) to be due to upwarp in dense and magnetic crystalline basement and to an associated T intrusion.

Generalized source rock basement mafic

References

Stewart and Carlson, 1978;
Blank, 1988;
Blakely, 1988

To Map **To Table**

NVg23

Scale I

Province Great Basin

Tectonic Setting extension, uplift

Terrane Definition

Irregular shaped gravity high (140x125km). Bulk of anomaly located over magnetic low. Entire anomaly crosses numerous local magnetic anomalies.

Hi/lo/both H

Geologic Province

Located largely over pC rocks of the Virgin Valley.

Inferred Source of Anomaly

Dense pC crystalline rocks.

Generalized source rock basement silicic

References

Langenheim and others, 2000

To Map **To Table**

NVm01

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Elongate north-trending magnetic high (100x25km).

Hi/lo/both H

Geologic Province

Located over T volcanic and sedimentary rocks. Has similar trend as the western NNR.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks or mafic intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

Glen and Ponce, 2002;
Ponce and Glen, 2002

To Map To Table

NVm02

Scale L

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Oval cluster of high frequency positive magnetic anomalies (25 km).

Hi/lo/both H

Geologic Province

McDermitt group of caldera.

Inferred Source of Anomaly

Magnetic intrusive and extrusive rocks.

Generalized source rock intrusive mafic, volcanic silicic

References

U.S. Geological Survey 1972;
U.S. Geological Survey 1982a,b;
Rytuba and McKee, 1984;
Best and others, 1989b;

To Map To Table

NVm03

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Elongate NW-trending moderate magnetic high (50x20km).

Hi/lo/both H

Geologic Province

Located over T volcanic rocks.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Glen and Ponce, 2002;
Ponce and Glen, 2002

To Map To Table

NVm04

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Subdued east-trending magnetic high (40x15km).

Hi/lo/both H

Geologic Province

At its west end it overlies a K pluton; middle and eastern portions located over T volcanic rocks.

Inferred Source of Anomaly

Moderately magnetic intrusive and/or volcanic rocks.

Generalized source rock volcanic mafic, intrusive silicic

References

To Map **To Table**

NVm05

Scale I

Province Great Basin

Tectonic Setting transcurrent, accretion

Terrane Definition

NE-trending boundary between strongly magnetic region of high frequency anomalies to the NW and low magnetic relief to the SE. Very good correlation with gravity boundary (NVg01).

Hi/lo/both B

Geologic Province

West of this line there are no pre-Cz rocks exposed. The boundary also corresponds with the eastern edge of topographic and basaltic plateau.

Inferred Source of Anomaly

Magnetic anomaly reflects contrast of magnetic volcanic rocks to NW and weakly magnetic sedimentary rocks to the SE.

Generalized source rock volcanic mafic, sedimentary siliceous

References

McKee and others, 1983;
Blakely, 1988;
McKee and others, 1990;
Wyld and Wright; 2001

To Map To Table

NVm06

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Subdued north-trending magnetic high (50x15km).

Hi/lo/both H

Geologic Province

Located over T volcanic rocks and Mz sedimentary rocks. Has similar trend as the western NNR.

Inferred Source of Anomaly

May be due to magnetic mafic intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

Glen and Ponce, 2002;
Ponce and Glen, 2002

To Map To Table

NVm07

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Oval (20km) magnetic high located over the northern part of the western NNR (NVm08).

Hi/lo/both H

Geologic Province

Located just south of McDermitt Calderas, over T volcanic rocks.

Inferred Source of Anomaly

Perhaps due to magnetic intrusive rocks associated with the western NNR (NVm08).

Generalized source rock intrusive mafic, volcanic mafic

References

Glen and Ponce, 2002;
Ponce and Glen, 2002

To Map To Table

NVm08

Scale I

Province Great Basin

Tectonic Setting hotspot, extension

Terrane Definition

Two long, narrow NNW-trending magnetic highs that merge to the north (western and central Northern Nevada Rifts of Glen and Ponce, 2002).

Hi/lo/both H

Geologic Province

Anomaly corresponds in places with narrow NNW-trending zones of mafic dikes (of presumed Miocene age). Due to their great length, the anomalies likely correspond in places with other sources, such as the small magnetic high along central anomaly just south of NVm07. Inferred to have the same origin as anomaly NVm12.

Inferred Source of Anomaly

Sources are largely concealed. Largely due to magnetic mafic intrusive rocks.

Generalized source rock intrusive mafic

References

Blakely, 1988;
Glen and Ponce 2002;
Ponce and Glen, 2002

To Map To Table

NVm09

Scale I

Province Great Basin

Tectonic Setting extension, depression

Terrane Definition

Magnetic low crossing eastern NNR (NVm12) magnetic high. Gap in eastern NNR corresponds with gravity low and topographic trough.

Hi/lo/both L

Geologic Province

NE-trending fault-bound basin (Midas Trough) cutting late Cz rocks.

Inferred Source of Anomaly

Downdropped basaltic rocks of eastern NNR (NVm12). Magnetic sources are farther from surface within trough than outside it.

Generalized source rock sedimentary siliceous

References

Rowan and Wetlaufer, 1973;
Zoback and Zoback, 1980;
Blakely, 1988

To Map To Table

NVm10

Scale

Province Great Basin

Tectonic Setting extension

Terrane Definition

Oval magnetic high (20km).

Hi/lo/both H

Geologic Province

Located mostly over Pz sedimentary rocks and some Tertiary volcanic and intrusive rocks. Lies over central Carlin trend.

Inferred Source of Anomaly

May be due to magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

Henry and Ressel, 2000;
Grauch, 1996

To Map To Table

NVm11

Scale I

Province Great Basin

Tectonic Setting extension, uplift

Terrane Definition

NE-trending elongate subdued magnetic high (100x25km).

Hi/lo/both H

Geologic Province

Located over pC and Pz rocks of the Ruby Mtns metamorphic core complex (gneiss).

Inferred Source of Anomaly

Deep magnetic source of metamorphic rocks.

Generalized source rock metamorphic silicic, basement silicic

References

Dallmeyer and others, 1986;
Blakely, 1988;
Blakely and others, 1996

To Map To Table

NVm12

Scale I

Province Great Basin

Tectonic Setting hotspot, extension

Terrane Definition

Long narrow NNW-trending magnetic high located over the eastern edge of a prominent gravity gradient. Constitutes the eastern NNR of Glen and Ponce, 2002.

Hi/lo/both H

Geologic Province

Anomaly corresponds with narrow NNW-trending zone of Miocene mafic dikes.

Inferred Source of Anomaly

Magnetic mafic intrusive rocks.

Generalized source rock intrusive mafic

References

Zoback and Thompson, 1978;
Blakely 1988;
Zoback and others, 1994;
John and others, 2000;
Glen and Ponce 2002

To Map To Table

NVm13

Scale

Province Great Basin

Tectonic Setting extension

Terrane Definition

Elongate NW-trending moderate magnetic high (50x20km).

Hi/lo/both H

Geologic Province

Located over Pz carbonate rocks and several small T intrusive bodies.

Inferred Source of Anomaly

Magnetic intrusive rocks.

Generalized source rock intrusive mafic

References

Grauch, 1996

To Map **To Table**

NVm14

Scale I

Province Great Basin

Tectonic Setting extension, transcurrent, batholith

Terrane Definition

Large varied NW-trending magnetic high (250x100km) consisting of many smaller isolated magnetic highs.

Hi/lo/both H

Geologic Province

Western half of anomaly lies over physiographically defined Walker Lane belt. Primarily large Mz plutons on the west and scattered plutons and Q and T volcanic rocks to east.

Inferred Source of Anomaly

Magnetic volcanic and intrusive rocks. Local highs may be volcanic centers or individual plutons.

Generalized source rock volcanic mafic, intrusive mafic

References

Blakely, 1988;
Stewart, 1988;
Hildenbrand and others, 2000

To Map **To Table**

NVm15

Scale

Province Great Basin

Tectonic Setting stable crust

Terrane Definition

Subdued NE-trending magnetic high (70x25km).

Hi/lo/both H

Geologic Province

Located mostly over Pz carbonate rocks.

Inferred Source of Anomaly

May be due to K intrusive rocks or mineralized carbonate strata.

Generalized source rock intrusive silicic

References

Mabey and others, 1978

To Map To Table

NVm16

Scale I

Province Great Basin

Tectonic Setting extension, transcurrent, batholith

Terrane Definition

Irregular shaped magnetic high (125x50km). Contains a more prominent oval magnetic high at its southern edge.

Hi/lo/both H

Geologic Province

Located over Q and T volcanic rocks and Mz plutons. Centered over Aurora and Bodie igneous centers.

Inferred Source of Anomaly

Magnetic volcanic and intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

Kleinhampl and others, 1975;
Grauch, 1996

To Map **To Table**

NVm17

Scale

Province Great Basin

Tectonic Setting extension, transcurrent

Terrane Definition

"S"-shaped irregular magnetic high (40x10km).

Hi/lo/both H

Geologic Province

Located over T volcanic rocks at south end of Toiyabe Range. North end corresponds to the Toiyabe caldera.

Inferred Source of Anomaly

May be due to magnetic volcanic and buried intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

To Map **To Table**

NVm18

Scale I

Province Great Basin

Tectonic Setting extension, transcurrent,batholith

Terrane Definition

Small oval magnetic high (20km).

Hi/lo/both H

Geologic Province

Located over Mt. Jefferson and Trail Canyon calderas in the Toquima Range

Inferred Source of Anomaly

Magnetic tuff and associated intrusive rocks.

Generalized source rock intrusive mafic, intrusive silicic

References

Kleinhampl and Ziony, 1984

To Map To Table

NVm19

Scale I

Province Great Basin

Tectonic Setting extension, subduction

Terrane Definition

Mostly east-trending, irregular shaped region of variable magnetic high (125x50km). Contains a more prominent oval magnetic high at its southern edge.

Hi/lo/both H

Geologic Province

Located mostly over T volcanic rocks of several identified volcanic centers. Few scattered Mz plutons and Pz sedimentary rocks.

Inferred Source of Anomaly

Magnetic volcanic and possibly intrusive rocks.

Generalized source rock volcanic mafic, volcanic silicic, intrusive silicic

References

To Map **To Table**

NVm20

Scale

Province Great Basin

Tectonic Setting extension, subduction

Terrane Definition

Oval moderate magnetic high (30km).

Hi/lo/both H

Geologic Province

Located at east end of anomaly UTm15 and over T volcanic rocks.

Inferred Source of Anomaly

Magnetic volcanic rocks.

Generalized source rock volcanic mafic, volcanic silicic

References

Mabey and others, 1978

To Map To Table

NVm21

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

Magnetic high (25x15km) located within broader gravity low (NVg17).

Hi/lo/both H

Geologic Province

Wilson Creek Mtns - late Oligocene Indian Peak and White Rock calderas.

Inferred Source of Anomaly

Thick accumulation of low density, magnetic caldera fill tuffs and associated intrusive rocks.

Generalized source rock volcanic silicic

References

Best and others, 1989a;
Best and others, 1989b

To Map To Table

NVm22

Scale I

Province Great Basin

Tectonic Setting batholith, transurrent

Terrane Definition

Subdued oval magnetic high mostly identified by a ring of maximum horizontal gradients (20km).

Hi/lo/both H

Geologic Province

Located over pC and Cambrian sedimentary rocks and small exposure of T volcanic rocks.

Inferred Source of Anomaly

Oval form suggests it may be a buried pluton.

Generalized source rock intrusive silicic

References

To Map **To Table**

NVm23

Scale I

Province Great Basin

Tectonic Setting transcurrent, extension, continental margin

Terrane Definition

NW-trending elongate region with high frequency NW elongate positive anomalies. Region is ~250x550km in western and central NV. Includes several large anomalies (e.g. NVm14,16,17,19,22,25). Southwest part of anomaly located over gravity anomaly NVg11.

Hi/lo/both H

Geologic Province

Physiographically defined province characterized by NW-trending topographic features. located over Mz granites, Pz strata, and late T volcanic rocks. Western part of anomaly corresponds with the tectonically defined Walker Lane.

Inferred Source of Anomaly

Gravity terrane is possibly due to mafic underplating. Magnetic anomalies may express shallow to deeply buried magnetic plutons. Possible represents the eastern edge of Sierra Nevada Batholith.

Generalized source rock intrusive mafic

References

Blakely, 1988;
Craig, 1992;
Hildenbrand and others, 2000;
Blakely and others, 1996

To Map **To Table**

NVm24

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

A region of variable magnetic highs. EW-oriented oval feature (75kmx50km) slightly displaced to north of a similarly shaped gravity low (NVg20).

Hi/lo/both H

Geologic Province

Clover Mtns region - Miocene Caliente caldera.

Inferred Source of Anomaly

Magnetic volcanic tuffs and associated intrusive rocks.

Generalized source rock volcanic silicic, intrusive silicic

References

Best and others, 1989a;
Best and others, 1989b

To Map **To Table**

NVm25

Scale I

Province Great Basin

Tectonic Setting subduction, transcurrent

Terrane Definition

NW-trending magnetic high (90x25km) located over a basement gravity low. Corresponds partly with the single largest isostatic gravity low in Nevada (Silent Canyon Caldera).

Hi/lo/both H

Geologic Province

Located over the southern Nevada volcanic field - Miocene silicic volcanic rocks. Several identified calderas (e.g. Silent Canyon, Timber Mtn, Black Mtn).

Inferred Source of Anomaly

Magnetic, low density volcanic rocks.

Generalized source rock volcanic silicic

References

Eckel, 1968;
Byers and others, 1976;
Oliver and others, 1995;
Grauch and others, 1999;
Mankinen and others, 1999;
McKee and others, 1999;
Hildenbrand and others, 2000;

To Map To Table

NVm26

Scale I

Province Great Basin

Tectonic Setting uplift

Terrane Definition

Small pronounced oval magnetic high (20km). Located over a much broader pronounced gravity high (NVg23).

Hi/lo/both H

Geologic Province

Mormon Mtns--Fault block of pC crystalline basement.

Inferred Source of Anomaly

Dense and magnetic crystalline basement.

Generalized source rock basement mafic

References

Blank, 1988;
Blakely, 1988;
Blakely and others, 1996

To Map To Table

NVm27

Scale I

Province Great Basin

Tectonic Setting uplift

Terrane Definition

Small subdued oval magnetic high (40km). Located over a regional gravity high.

Hi/lo/both H

Geologic Province

Fault block of pC crystalline basement.

Inferred Source of Anomaly

Dense and magnetic crystalline basement.

Generalized source rock basement mafic

References

Blank, 1988;
Blakely, 1988;
Blakely and others, 1996

To Map **To Table**

NVm28

Scale I

Province Great Basin

Tectonic Setting uplift

Terrane Definition

Small pronounced oval magnetic high (20km). Located over a much broader pronounced gravity high (NVg23).

Hi/lo/both H

Geologic Province

Fault block of pC crystalline basement.

Inferred Source of Anomaly

Dense and magnetic crystalline basement.

Generalized source rock basement mafic

References

To Map **To Table**

NVm29

Scale I

Province Great Basin

Tectonic Setting extension, uplift

Terrane Definition

EW alignment of magnetic highs that separates a regional magnetic low to north from a region dominated by several local magnetic highs to south.

Hi/lo/both H

Geologic Province

South of this boundary are Q volcanic, T intrusive, and Mz granititic rocks. To the north are mainly Pz carbonate rocks.

Inferred Source of Anomaly

Weakly magnetic carbonate rocks to north and magnetic igneous rocks to south.

Generalized source rock sedimentary carbonate, volcanic mafic, basement mafic

References

Blakely and others, 1996

To Map To Table

NVm30

Scale L

Province Great Basin

Tectonic Setting uplift

Terrane Definition

Small oval magnetic high (30km) enclosing a smaller NS elongate high. Located over NW flank of a broad NW-trending magnetic high(60x30km). Corresponds partly with gravity high NVg22.

Hi/lo/both H

Geologic Province

Fault block of pC to Mz sedimentary rocks.

Inferred Source of Anomaly

Possibly due to upwarp in dense and magnetic crystalline basement and to an associated T intrusion.

Generalized source rock basement mafic

References

Stewart and Carlson, 1978;
Blank, 1988;
Blakely, 1988;
Blakely and others, 1996

To Map **To Table**

ORg01

Scale I

Province Cascade Mtns

Tectonic Setting accretion, subduction

Terrane Definition

Subdued NS-elongate gravity high (>125 x >75km). Corresponds with magnetic anomaly ORm01.

Hi/lo/both H

Geologic Province

Located over western Cascades, late Cz volcanic rocks. Eastern edge is at the transition between the basaltic western Cascades and the younger, more andesitic eastern Cascades.

Inferred Source of Anomaly

Interpreted to be due to concealed accreted Eocene Siletz River volcanic rocks. Forms part of the eastern edge of the Oregon forearc block.

Generalized source rock volcanic mafic

References

Wells and others, 1998

To Map **To Table**

ORg02

Scale I

Province Columbia Plateaus

Tectonic Setting hotspot

Terrane Definition

Prominent oval gravity high (50km) located at SW end of feature ORg03. Corresponds partly with magnetic anomaly ORm07.

Hi/lo/both H

Geologic Province

Located over T volcanic rocks.

Inferred Source of Anomaly

Perhaps due to dense magnetic intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

To Map **To Table**

ORg03

Scale I

Province Columbia Plateaus

Tectonic Setting hotspot, accretion

Terrane Definition

NE-trending elongate gravity high (>125x40km). Corresponds with magnetic anomaly ORm03.

Hi/lo/both H

Geologic Province

Skirts north edge of Blue Mtns and located mostly within the southern part of the John Day basin.

Inferred Source of Anomaly

Perhaps due to dense magnetic rift intrusive rocks or accreted Triassic ultramafic rocks.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

To Map **To Table**

ORg04

Scale R

Province Cascade Mtns

Tectonic Setting subduction

Terrane Definition

NNW-elongate gravity low (50x175km). Closely correlated with magnetic high ORm08.

Hi/lo/both L

Geologic Province

Western Cascade Range consisting of T andesite volcanic rocks in the Cascade graben.

Inferred Source of Anomaly

Magnetic, low density intermediate volcanic rocks.

Generalized source rock volcanic silicic, intrusive silicic

References

Jachens and others, 1989;
LaFehr, 1965;
Blakely and others, 1985

To Map To Table

ORg05

Scale

Province Cascade Mtns, Columbia Plateaus

Tectonic Setting subduction

Terrane Definition

NNW-trending gravity low (100x25km). Contains discrete lows within it.

Hi/lo/both L

Geologic Province

Located over Q and T volcanic rocks of the high Cascade Range. Includes Crater Lake.

Inferred Source of Anomaly

Magnetic, low density intermediate volcanic rocks.

Generalized source rock volcanic silicic intrusive silicic

References

ORg06

Scale R

Province Columbia Plateaus

Tectonic Setting extension

Terrane Definition

Moderate gravity low with a few small (<100km diameter) intermediate amplitude highs. Regional low is mainly defined by highs to east associated with northern GB and western SRP. Corresponds in part with magnetic anomaly ORm06.

Hi/lo/both B

Geologic Province

Southernmost edge of CRP basalts and related lava flows, and younger lava flows across Oregon highlands. lava flows are underlain by Tertiary sediments.

Inferred Source of Anomaly

Low density sedimentary rocks.

Generalized source rock sedimentary siliceous

References

To Map **To Table**

ORm01

Scale I

Province Cascade Mtns

Tectonic Setting accretion, subduction

Terrane Definition

Pronounced magnetic high (>75km NS x >60km EW). Occupies northern 2/3 of the corresponding gravity anomaly. Corresponds with gravity anomaly ORg01.

Hi/lo/both H

Geologic Province

Located over western Cascades, late Cz volcanic rocks. Eastern edge is at the transition between the basaltic western Cascades and the younger, more andesitic eastern Cascades.

Inferred Source of Anomaly

Interpreted to be due to concealed accreted Eocene Siletz River Volcanic rocks. Forms part of the eastern edge of the Oregon forearc block.

Generalized source rock volcanic mafic

References

Wells and others, 1998

To Map To Table

ORm02

Scale

Province Cascade Mtns, Columbia Plateaus

Tectonic Setting subduction

Terrane Definition

Elongate NS-oriented magnetic high (50x20km).

Hi/lo/both H

Geologic Province

Located over T and Q volcanic rocks of the Cascade Range that includes the Three Sisters and Mt. Washington.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic silicic intrusive silicic

References

To Map **To Table**

ORm03

Scale I

Province Columbia Plateaus

Tectonic Setting hotspot, accretion

Terrane Definition

NE-trending elongate magnetic high (>125x25km). Corresponds with gravity anomaly ORg03.

Hi/lo/both H

Geologic Province

Skirts north edge of Blue Mtns and located mostly within the southern part of the John Day basin.

Inferred Source of Anomaly

Perhaps due to dense magnetic rift intrusive rocks or accreted Triassic ultramafic rocks.

Generalized source rock intrusive mafic, volcanic mafic, ultramafic

References

To Map **To Table**

ORm04

Scale

Province Columbia Plateaus, Great Basin

Tectonic Setting accretion

Terrane Definition

Large NE-trending magnetic low (225x60km).

Hi/lo/both L

Geologic Province

Corresponds closely with Mz sedimentary rocks of the Blue Mtns.

Inferred Source of Anomaly

Weakly magnetic sedimentary rocks. Mainly contrasted with the surrounding strongly magnetic volcanic rocks.

Generalized source rock sedimentary siliceous

References

Vallier and Brooks, 1986;
Vallier and Brooks, 1994

To Map To Table

ORm05

Scale

Province Columbia Plateaus

Tectonic Setting subduction

Terrane Definition

Elongate arcuate NS-trending magnetic high (100x25km).

Hi/lo/both H

Geologic Province

Located over Q and T volcanic rocks on the east side of the Cascade Range (includes Newberry Craters).

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

ORm06

Scale R

Province Columbia Plateaus

Tectonic Setting extension, hotspot

Terrane Definition

High amplitude, high frequency magnetic anomalies that extend across Oregon highlands. Corresponds with gravity anomaly ORg06.

Hi/lo/both B

Geologic Province

Southernmost edge of CRP basalts and related rocks, and younger volcanic rocks across Oregon highlands. Volcanic rocks are underlain by Tertiary sediments.

Inferred Source of Anomaly

Magnetic basaltic rocks.

Generalized source rock volcanic mafic

References

To Map **To Table**

ORm07

Scale I

Province Columbia Plateaus

Tectonic Setting hotspot

Terrane Definition

Oval magnetic high (40km) that is located at the SW end of feature ORm03.
Corresponds partly with gravity anomaly ORg02.

Hi/lo/both H

Geologic Province

Located over T volcanic rocks.

Inferred Source of Anomaly

Perhaps due to dense magnetic intrusive rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

To Map **To Table**

ORm08

Scale R

Province Cascade Mtns

Tectonic Setting subduction

Terrane Definition

NNW-elongate magnetic high (50x200km). Closely correlated with gravity high ORg04. Consists of high amplitude and high frequency magnetic anomalies.

Hi/lo/both H

Geologic Province

Western Cascade Range consisting of T andesite in the Cascade graben.

Inferred Source of Anomaly

Magnetic, low density intermediate volcanic rocks.

Generalized source rock volcanic silicic, intrusive silicic

References

LaFehr, 1965;
Blakely and others, 1985;
Jachens and others, 1989

To Map **To Table**

ORm09

Scale

Province Columbia Plateaus

Tectonic Setting extension, hotspot

Terrane Definition

Elongate NW-trending magnetic high (60x10km).

Hi/lo/both H

Geologic Province

Located over Q and T volcanic and sedimentary rocks. Anomaly has the same trend as Q faulting.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map **To Table**

ORm10

Scale

Province Columbia Plateaus

Tectonic Setting extension, hotspot

Terrane Definition

Elongate NW-trending magnetic high (50x20km).

Hi/lo/both H

Geologic Province

Located over T volcanic and sedimentary rocks. Anomaly has the same trend as Q faulting.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

ORm11

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Elongate north-trending magnetic high (80x20km).

Hi/lo/both H

Geologic Province

Located over Q and T volcanic rocks.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map

To Table

ORm12

Scale

Province Great Basin

Tectonic Setting hotspot

Terrane Definition

Elongate NE-trending magnetic high (125x25km).

Hi/lo/both H

Geologic Province

Located over Q and T volcanic and sedimentary rocks.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map

To Table

ORm13

Scale

Province Great Basin

Tectonic Setting extension, hotspot

Terrane Definition

Elongate east-trending prominent magnetic high (75x40km).

Hi/lo/both H

Geologic Province

Located over T volcanic rocks of the Cascade Range.

Inferred Source of Anomaly

Strongly magnetic volcanic rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map

To Table

ORm14

Scale

Province Great Basin

Tectonic Setting hotspot

Terrane Definition

Elongate NS-trending magnetic high (150x20km).

Hi/lo/both H

Geologic Province

Located over T volcanic rocks of Steens Mt. Anomaly has similar trend as the western NNR anomaly (feature NVm08).

Inferred Source of Anomaly

Strongly magnetic volcanic or mafic intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

To Map **To Table**

ORm15

Scale

Province Great Basin

Tectonic Setting hotspot

Terrane Definition

Elongate NS-trending magnetic high (60x20km).

Hi/lo/both H

Geologic Province

Located over Q and T volcanic rocks. Has similar trend and is in-line with the the western NNR anomaly (NVm08).

Inferred Source of Anomaly

Strongly mafic magnetic volcanic or intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

UTg01

Scale I

Province Great Basin

Tectonic Setting uplift, extension

Terrane Definition

Prominent NS-oriented oblate gravity high (75x30km). Located over regional magnetic low.

Hi/lo/both H

Geologic Province

Located over Great Salt Lake desert. Few outcrops nearby are T silicic volcanic rocks and Pz quartzites and limestones.

Inferred Source of Anomaly

Likely source is pC crystalline basement below Pz stratified rocks.

Generalized source rock basement mafic

References

UTg02

Scale I

Province Great Basin

Tectonic Setting hotspot

Terrane Definition

Prominent NW-trending gravity highs (UTg02a,b; 225x50km) branching off of the Eastern SRP. Anomaly has two segments. Corresponds with magnetic anomaly UTm02.

Hi/lo/both H

Geologic Province

Located over the Great Salt Lake. Anomaly merges with the Great Rift that cuts across the eastern SRP. Has same trend as: Pz and pC basement outcrops, the Great Salt Lake, and the Great Rift. Located over pC basement in the Raft River and Albion Mtns at its NW end.

Inferred Source of Anomaly

Possibly due to dense, magnetic mafic rocks associated with rifting. Has similar trend to basement on either side of eastern SRP. May be due to magnetic basement or to rift related intrusive rocks that were injected along pre-existing basement structure.

Generalized source rock intrusive mafic

References

Mabey and others, 1978;
Kuntz and others, 1988;
Kuntz and others, 1992

To Map To Table

UTg03

Scale I

Province Great Basin

Tectonic Setting depression

Terrane Definition

Prominent gravity low (130x100km).

Hi/lo/both L

Geologic Province

Anomaly located mostly over T and Q alluvium. Eastern edge corresponds to the Rocky Mtns frontal thrust belt.

Inferred Source of Anomaly

Low density sedimentary basin fill. Likely due to thrust-related thickening of low density sedimentary rocks.

Generalized source rock sedimentary siliceous

References

To Map **To Table**

UTg04

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

EW-trending gravity low west of boundary between Uinta Basin and Mtns (75x30km). Marks the southern edge of the Great Salt Lake Desert. Corresponds with magnetic anomaly UTm05.

Hi/lo/both L

Geologic Province

Corresponds with T intrusive rocks and stratified Pz sandstones. May be due to subduction-related volcanism along pC crustal discontinuity.

Inferred Source of Anomaly

Low density intrusive rocks.

Generalized source rock intrusive silicic, sedimentary siliceous

References

Mabey and others, 1978

To Map To Table

UTg05

Scale I

Province Great Basin, Middle Rocky Mtns

Tectonic Setting accretion

Terrane Definition

EW-trending alignment of anomalies, comprising Uinta Mtns/Basin boundary to the east and a gravity trough (UTg04) to the west.

Hi/lo/both B

Geologic Province

Correlates with inferred boundary between Proterozoic crust to the south and Archean crust to the north.

Inferred Source of Anomaly

Defined by juxtaposing terranes on Proterozoic crust to the south (e.g. Uinta Mtns) and Archean crust to the north.

Generalized source rock basement mafic, basement silicic

References

Zietz and others, 1969;
Stewart and others, 1977;
Hutchinson and Albers, 1992;
Karlstrom and others, 2002

To Map To Table

UTg06

Scale I

Province Middle Rocky Mtns, Great Basin

Tectonic Setting uplift

Terrane Definition

Prominent east-trending gravity high (200x50km) over the Uinta Mtns. Located over a regional magnetic low. An oval (25km diameter) magnetic high (feature UTm03) is located at the east end of the Uinta Mtns.

Hi/lo/both B

Geologic Province

Closely corresponds to pC outcrops of the Uinta Mtns.

Inferred Source of Anomaly

Dense, generally weakly magnetic structurally uplifted pC basement.

Generalized source rock basement mafic

References

Simpson and others, 1986

To Map To Table

UTg07

Scale I

Province Middle Rocky Mtns, Great Basin,

Tectonic Setting depression

Terrane Definition

Prominent EW-elongate gravity low (200x75km). Corresponds partly with magnetic anomaly UTm06.

Hi/lo/both L

Geologic Province

Corresponds with the Uinta Basin.

Inferred Source of Anomaly

Due to low density sedimentary fill.

Generalized source rock sedimentary siliceous, volcanic mafic, intrusive mafic

References

To Map **To Table**

UTg08

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

Narrow EW-elongate gravity high (100x25km). Located over regional magnetic high.

Hi/lo/both H

Geologic Province

Located at southern edge of the Uinta Basin.

Inferred Source of Anomaly

Source may be pC basement similar to Uinta Mtns.

Generalized source rock basement mafic

References

To Map **To Table**

UTg09

Scale I

Province Colorado Plateaus

Tectonic Setting depression

Terrane Definition

EW-elongate gravity low (125x25km). Corresponds with magnetic anomaly UTm09.

Hi/lo/both L

Geologic Province

Located at southern edge of Uinta Basin. Anomaly parallels trend of Uinta Mtns.

Inferred Source of Anomaly

Likely reflects low density basin fill.

Generalized source rock sedimentary siliceous

References

Mabey and others, 1978

To Map **To Table**

UTg10

Scale I

Province Great Basin

Tectonic Setting continental margin, uplift

Terrane Definition

Prominent gravity high (150x100km). Corresponds with a regional magnetic low.

Hi/lo/both H

Geologic Province

Located largely over Q deposits. Pz carbonate rocks correspond closely with anomaly's southern and eastern edges. Located also over scattered outcrops of T volcanic, Pz carbonate, and pC basement rocks.

Inferred Source of Anomaly

Perhaps due to thick accumulation of Pz carbonate rocks and/or to dense pC crystalline basement.

Generalized source rock sedimentary carbonate, basement mafic

References

To Map **To Table**

UTg11

Scale I

Province Colorado Plateaus, Great Basin

Tectonic Setting uplift

Terrane Definition

NE-trending gravity high (150x50km) that encompasses the Wasatch Plateau. Northern end located over a magnetic low and southern end over a magnetic high (UTm11).

Hi/lo/both H

Geologic Province

Located at north end of basin along the Sevier River over western Colorado Plateau. Corresponds with the western part of the San Rafel Swell.

Inferred Source of Anomaly

Likely reflects upwarp of dense pC basement.

Generalized source rock basement mafic

References

To Map **To Table**

UTg12

Scale I

Province Colorado Plateaus

Tectonic Setting stable crust

Terrane Definition

NW-trending gravity low (125x50km) with distinct NW-trending ridges. Located over a generally low magnetic area.

Hi/lo/both L

Geologic Province

Located over La Sal Mtns. Straddles Northern edge of CRP.

Inferred Source of Anomaly

Low may be partly due to La Sal T intrusive bodies. Ridges may be related to faults in pC basement.

Generalized source rock intrusive silicic

References

To Map **To Table**

UTg13

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

NE-trending gravity high (170x50km). Corresponds with magnetic anomaly UTm14.

Hi/lo/both H

Geologic Province

Roughly corresponds to the edge of the Wasatch plateau. Cuts across drainages of the CP. Located over part of the Circle Cliffs and San Rafael Swell structural uplifts.

Inferred Source of Anomaly

Likely reflects upwarp of dense, magnetic pC basement.

Generalized source rock basement mafic

References

To Map **To Table**

UTg14

Scale I

Province Great Basin

Tectonic Setting uplift

Terrane Definition

NS-oriented gravity high (100x40km) that is contiguous with feature UTg10. North end crosses large magnetic high (UTm15). South end located over magnetic low region.

Hi/lo/both H

Geologic Province

Located at edge of GB over the eastern edge of the Sevier Thrust belt. Located mostly over T volcanic rocks.

Inferred Source of Anomaly

Unknown source, but possibly dense basement brought near to surface by frontal thrust.

Generalized source rock basement mafic

References

To Map **To Table**

UTg15

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

Oval gravity low (50km). Located over a magnetic low.

Hi/lo/both L

Geologic Province

Located over welded silicic tuff volcanic field (Bull Valley silicic complex).

Inferred Source of Anomaly

Thick accumulation of low density rhyolitic and tufaceous sedimentary rocks.

Generalized source rock volcanic silicic, intrusive silicic

References

To Map **To Table**

UTg16

Scale I

Province Colorado Plateaus

Tectonic Setting depression

Terrane Definition

Large oval gravity low (100km). Located over moderately high magnetic terrain that includes magnetic anomalies AZm02 and southern end of UTm14.

Hi/lo/both L

Geologic Province

Located over Mz and Pz strata of CRP over Glen Canyon along the Colorado River.

Inferred Source of Anomaly

Area is covered by CRP strata. Possibly due to downwarp of basement.

Generalized source rock basement silicic

References

To Map **To Table**

UTg17

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

Gravity high (100x125km). Encompasses feature UTg18. Is contiguous with broader gravity high (AZg04). Corresponds with magnetic anomaly UTm21.

Hi/lo/both H

Geologic Province

Located over flat lying Pz and Mz strata of CRP. Outlines the Monument upwarp.

Inferred Source of Anomaly

May be dense and magnetic intrusive or uplifted buried basement rocks.

Generalized source rock intrusive mafic, basement mafic

References

UTg18

Scale I

Province Colorado Plateaus

Tectonic Setting stable crust

Terrane Definition

Doughnut-shaped gravity high with internal low (50km). Very good correlation with magnetic anomaly UTm22.

Hi/lo/both B

Geologic Province

Located over Pz and Mz flat lying strata of CRP, but corresponds with a small T intrusive outcrop (much smaller) that represents a deep seated intrusive or diatreme.

Inferred Source of Anomaly

May be dense magnetic mantle derived intrusive rocks.

Generalized source rock intrusive mafic, ultramafic

References

Mabey and others, 1978

To Map To Table

UTm01

Scale R

Province Great Basin

Tectonic Setting subduction, extension

Terrane Definition

Regional magnetic low lacking short-wavelength magnetic anomalies. Extends from the Walker Lane (NVm23) and Modoc Plateau (CAm02) anomalies on the west eastward across virtually the entire study area. Terrane extends from the SRP (IDm10) to the southern Quiet zone boundary (NVm29) and edge of the Colorado Plateaus (UTm12).

Hi/lo/both L

Geologic Province

Anomaly spans a wide range of rock types and ages.

Inferred Source of Anomaly

Speculation on source includes initial low magnetic susceptibilities of volcanic rocks (Stewart and others, 1977; Blakely, 1988), diminished magnetic susceptibility by intense hydrothermal alteration (Eaton, 1978). Demonstrated (Blakely, 1988) not to be the result of a shallow Curie isotherm.

Generalized source rock volcanic silicic, metamorphic

References

Stewart and others, 1977;
Eaton and others, 1978;
Mabey and others, 1978;
Blakely, 1988

To Map To Table

UTm02

Scale I

Province Great Basin

Tectonic Setting hotspot

Terrane Definition

NW-trending magnetic high (225x50km). Extends SE from the eastern SRP. Corresponds with gravity anomaly UTg02.

Hi/lo/both H

Geologic Province

Located over the Great Salt Lake. Anomaly merges with the Great Rift that cuts across the eastern SRP. Has same trend as: Pz and pC basement outcrops, the Great Salt Lake, and the Great Rift. Located over pC bsement in the Raft River and Albion Mtns at its NW end.

Inferred Source of Anomaly

Possibly due to dense, magnetic mafic rocks associated with rifting. Has similar trend to basement on either side of eastern SRP. May be due to magnetic basement or to rift related intrusive rocks that were injected along pre-existing basement structure.

Generalized source rock intrusive mafic

References

Mabey and others, 1978;
Kuntz and others, 1988;
Kuntz and others, 1992

To Map To Table

UTm03

Scale I

Province Middle Rocky Mtns, Great Basin

Tectonic Setting uplift

Terrane Definition

An oval (25km diameter) magnetic high located at the east end of the Uinta Mtns.

Hi/lo/both B

Geologic Province

Closely corresponds to pC outcrops of the Uinta Mtns.

Inferred Source of Anomaly

Magnetic structurally uplifted pC basement.

Generalized source rock basement mafic

References

Simpson and others, 1986

To Map To Table

UTm04

Scale I

Province Great Basin

Tectonic Setting subduction, extension

Terrane Definition

Moderate NW-trending magnetic high (75x30km).

Hi/lo/both H

Geologic Province

Located over Q fill of Great Salt Lake Desert. Nearest outcrops are volcanic rocks and pC basement. Mz Gold Hill pluton lies to the south.

Inferred Source of Anomaly

Possibly due to magnetic pluton, magnetic basement, or volcanic rocks.

Generalized source rock intrusive mafic, basement mafic, volcanic mafic

References

Mabey and others, 1978

To Map To Table

UTm05

Scale I

Province Great Basin

Tectonic Setting subduction

Terrane Definition

ENE-trending narrow linear magnetic high (30x5km) west of boundary between Uinta Basin and Mtns (feature UTm05). Marks the southern edge of the Great Salt Lake Desert. Corresponds with gravity anomaly UTg04.

Hi/lo/both H

Geologic Province

Corresponds with several T intrusive rocks (Wasatch igneous belt) and stratified Pz sandstones. May be due to subduction-related volcanism along pC crustal discontinuity.

Inferred Source of Anomaly

Magnetic, low density intrusive rocks.

Generalized source rock intrusive silicic, sedimentary siliceous

References

Mabey and others, 1978;
Vogel and others, 2001

To Map To Table

UTm06

Scale I

Province Middle Rocky Mtns, Great Basin,

Tectonic Setting depression

Terrane Definition

WNW-elongate oval-shaped magnetic high (75x40km) that lies within a gravity low. Corresponds with gravity anomaly UTg07.

Hi/lo/both H

Geologic Province

Corresponds with part of the Uinta Basin.

Inferred Source of Anomaly

Source is likely buried magnetic volcanic or intrusive rocks.

Generalized source rock sedimentary siliceous, volcanic mafic, intrusive mafic

References

To Map **To Table**

UTm07

Scale

Province Great Basin

Tectonic Setting subduction, extension

Terrane Definition

Elongate moderate magnetic high (50x25km).

Hi/lo/both H

Geologic Province

Located over outcrops of pC and Pz sedimentary, and T volcanic and intrusive rocks.

Inferred Source of Anomaly

Magnetic Mz and T intrusive rocks and/or T volcanic rocks.

Generalized source rock intrusive mafic, volcanic mafic

References

Mabey and others, 1978

To Map To Table

UTm08

Scale I

Province Great Basin

Tectonic Setting subduction, extension

Terrane Definition

EW-elongate magnetic high (100x40km). Located over a relative gravity low that is within a regional gravity high.

Hi/lo/both H

Geologic Province

Located over pC and Pz sedimentary and T volcanic rocks.

Inferred Source of Anomaly

May be due to magnetic basement and/or volcanic and associated intrusive rocks.

Generalized source rock basement mafic, volcanic mafic, intrusive mafic

References

Mabey and others, 1978

To Map To Table

UTm09

Scale I

Province Colorado Plateaus

Tectonic Setting depression

Terrane Definition

EW-elongate magnetic high (125x25km). Magnetic terrane overlaps with, but generally located south of gravity anomaly UTg09.

Hi/lo/both H

Geologic Province

Located at southern edge of Uinta Basin. Anomaly parallels trend of Uinta Mtns.

Inferred Source of Anomaly

Magnetic high may reflect magnetic igneous rocks.

Generalized source rock intrusive mafic

References

Mabey and others, 1978

To Map To Table

UTm10

Scale I

Province Colorado Plateaus

Tectonic Setting stable crust

Terrane Definition

Irregular magnetic high (75x75km) that includes magnetic highs UTm06,09, and an unlabeled high to the east. Anomaly spans several distinct EW-trending gravity highs and lows (UTg07,08,09).

Hi/lo/both H

Geologic Province

Located mostly over the Uinta Basin over T sedimentary rocks.

Inferred Source of Anomaly

Mostl likely due to magnetic basement rocks.

Generalized source rock basement mafic

References

To Map **To Table**

UTm11

Scale I

Province Great Basin, Colorado Plateaus

Tectonic Setting subduction

Terrane Definition

Oval magnetic high (75x50km).

Hi/lo/both H

Geologic Province

Located at north end of Sevier volcanic plateau.

Inferred Source of Anomaly

Magnetic volcanic rocks.

Generalized source rock volcanic mafic

References

To Map **To Table**

UTm12

Scale I

Province Great Basin, Colorado Plateaus

Tectonic Setting stable crust, extension

Terrane Definition

Boundary between regional low of GB and regional high of CP.

Hi/lo/both B

Geologic Province

Boundary, in most places, skirts the CP.

Inferred Source of Anomaly

Marks the boundary between generally low magnetic terrain of the GB and the varied, but strongly magnetic terrain of the CP. CP magnetic highs are largely due to zones of magnetic basement.

Generalized source rock basement mafic

References

To Map **To Table**

UTm13

Scale

Province Great Basin

Tectonic Setting subduction, extension

Terrane Definition

Elongate east-trending magnetic low (50x25km) with well defined northern and southern boundaries. Located over a gravity low.

Hi/lo/both L

Geologic Province

Southern edge of the anomaly corresponds with northern extent of a volcanic field bordering the CP. Located over Q basin with some outcrops of Pz and Mz sedimentary rocks.

Inferred Source of Anomaly

Northern edge may reflect basement topography at bordering a Q basin. Southern edge defined by contrast of weakly magnetic basin fill with magnetic T volcanic rocks.

Generalized source rock basement mafic, sedimentary siliceous, volcanic mafic

References

To Map To Table

UTm14

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

Arcuate NE-trending elongate magnetic high (300x40km). Corresponds with gravity anomaly UTm13.

Hi/lo/both H

Geologic Province

Roughly corresponds to the edge of the Wasatch plateau. Cuts across drainages of the CP. Located over part of the Circle Cliffs and San Rafel Swell structural uplifts.

Inferred Source of Anomaly

Likely reflects upwarp of dense, magnetic pC basement.

Generalized source rock basement mafic

References

To Map **To Table**

UTm15

Scale I

Province Great Basin

Tectonic Setting subduction, extension

Terrane Definition

Elongate ENE-trending magnetic high (250x30km).

Hi/lo/both H

Geologic Province

Corresponds to Enterprise tholeitic basalts. Eastern part of anomaly corresponds with a T intrusive body.

Inferred Source of Anomaly

Strongly magnetic volcanic and intrusive rocks.

Generalized source rock volcanic mafic, intrusive mafic

References

Mabey and others, 1978;
Best and others, 1980

To Map **To Table**

UTm16

Scale R

Province Colorado Plateaus

Tectonic Setting stable crust, uplift

Terrane Definition

Regional magnetic high of CP containing numerous large to intermediate magnetic highs (features UTm14, UTm17, UTm18, UTm19, UTm20, UTm21, UTm22, AZm01, AZm02, AZm05, AZm06, AZm07, AZm08), several of which are NE-trending.

Hi/lo/both H

Geologic Province

Largely located over flat lying Pz and Mz sedimentary rocks. Includes the La Sal Mtns Cz volcanic rocks. NE-trending anomalies corresponds to Colorado mineral belt.

Inferred Source of Anomaly

Regional high is most likely due to magnetic pC basement or Cz volcanic rocks.

Generalized source rock basement mafic, volcanic mafic

References

Case and Joesting, 1972;
Mabey and others, 1978;
Blank and others, 1998

To Map To Table

UTm17

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

NNE-trending elongate magnetic high (100x25km).

Hi/lo/both H

Geologic Province

Located over the northwestern CP over T and Mz sedientary rocks.

Inferred Source of Anomaly

May be similar to magnetic feature UTm14, possibly due to flexure and upwarp of magnetic pC basement rocks.

Generalized source rock basement mafic

References

To Map **To Table**

UTm18

Scale

Province Colorado Plateaus

Tectonic Setting stable crust, uplift

Terrane Definition

Oval magnetic high (25km).

Hi/lo/both H

Geologic Province

Located over the CP. Partly located over the Henry Mtns.

Inferred Source of Anomaly

Shape suggests it may be buried intrusive. Outcrops of Pz rocks suggest anomaly may also relate to an upwarp of pC basement rocks.

Generalized source rock intrusive mafic, basement mafic

References

UTm19

Scale I

Province Colorado Plateaus

Tectonic Setting uplift

Terrane Definition

Oval magnetic high (75x125km). Encompasses magnetic highs (magnetic features UT21 and UT22). Corresponds partly with gravity anomaly UTg17.

Hi/lo/both H

Geologic Province

Located over flat lying Pz and Mz strata of CP along the Monument upwarp.

Inferred Source of Anomaly

May be dense and magnetic intrusive or uplifted buried basement rocks.

Generalized source rock intrusive mafic, basement mafic

References

To Map **To Table**

UTm20

Scale I

Province Colorado Plateaus, Great Basin

Tectonic Setting uplift

Terrane Definition

Elongate NNE-trending magnetic high that straddles the edge of a gravity high (~100x25km).

Hi/lo/both H

Geologic Province

Located over the CP but close to Hurricane Fault that uplifts rocks to the east.

Inferred Source of Anomaly

May be due to magnetic pC basement rocks brought close to surface by Hurricane Fault.

Generalized source rock basement mafic

References

To Map **To Table**

UTm21

Scale

Province Colorado Plateaus

Tectonic Setting stable crust, uplift

Terrane Definition

Prominent magnetic high (50x50km). Adjoined with magnetic anomaly UTm22.

Hi/lo/both H

Geologic Province

Located over upper Pz carbonate and Mz clastic sedimentary rocks.

Inferred Source of Anomaly

May be due to magnetic intrusive or shallow pC basement rocks.

Generalized source rock intrusive mafic, basement mafic

References

To Map To Table

UTm22

Scale I

Province Colorado Plateaus

Tectonic Setting stable crust

Terrane Definition

Doughnut-shaped magnetic high with internal low (40km). Corresponds with gravity anomaly UTg18.

Hi/lo/both H

Geologic Province

Located over Pz and Mz flat lying strata of CP, but corresponds with a small T intrusive outcrop (much smaller) that represents a deep seated intrusive or diatreme.

Inferred Source of Anomaly

May be dense magnetic mantle derived intrusive rocks.

Generalized source rock intrusive mafic, ultramafic

References

Mabey and others, 1978

To Map To Table

WYg01

Scale I

Province Middle Rocky Mtns

Tectonic Setting uplift

Terrane Definition

Prominent NW-trending gravity high (200x30km). Corresponds with magnetic anomaly WYm02.

Hi/lo/both H

Geologic Province

Corresponds to Wind River Range.

Inferred Source of Anomaly

Dense, magnetic pC basement in the Wind River Range.

Generalized source rock basement mafic

References

Sims and others, 2001

To Map To Table

WYg02

Scale I

Province Middle Rocky Mtns

Tectonic Setting depression

Terrane Definition

Very prominent NW-trending elongate gravity low (175x70km).

Hi/lo/both L

Geologic Province

Located over northern extension of Green River Basin. Bound on the south by a smaller amplitude gravity low. Bound on the NE by a prominent gravity high over the Wind River Mtns (WYg01).

Inferred Source of Anomaly

Low density basin fill.

Generalized source rock sedimentary siliceous

References

To Map **To Table**

WYg03

Scale I

Province Middle Rocky Mtns

Tectonic Setting depression

Terrane Definition

Moderate north-trending gravity low (125x75km).

Hi/lo/both L

Geologic Province

Located over Cretacous sedimentary rocks over northern extension of Green River Basin. Bound on the south by prominent east-trending high of Uinta Mtns (UTg06). Bound on the east by prominent gravity high of the Rock Springs uplift (WYg04).

Inferred Source of Anomaly

Low density basin fill.

Generalized source rock sedimentary siliceous

References

To Map **To Table**

WYg04

Scale I

Province Middle Rocky Mtns

Tectonic Setting uplift

Terrane Definition

North-trending gravity high (125x50km). Corresponds with magnetic anomaly WYm05.

Hi/lo/both H

Geologic Province

Rock Springs uplift -- a structural high that exposes Cretaceous sedimentary rocks.

Inferred Source of Anomaly

Dense and magnetic pC basement rocks at core of uplift.

Generalized source rock basement mafic

References

Sims and others, 2001

To Map To Table

WYm01

Scale

Province Middle Rocky Mtns

Tectonic Setting depression

Terrane Definition

Variable magnetic region that is generally low (>100km). Located over a gravity high. Southern portion overlaps with prominant gravity high (WYg01) associated with the Wind River Range.

Hi/lo/both L

Geologic Province

Located over large alluvial basin and over pC and Pz rocks.

Inferred Source of Anomaly

May be due to dense, and moderately to weakly magnetic pC basement and Pz sedimentary rocks.

Generalized source rock basement mafic, basement silicic, sedimentary siliceous

References

Sims and others, 2001

To Map To Table

WYm02

Scale I

Province Middle Rocky Mtns

Tectonic Setting uplift

Terrane Definition

Prominent NW-trending magnetic high (200x30km). Corresponds with magnetic anomaly WYg01.

Hi/lo/both H

Geologic Province

Corresponds to Wind River Range.

Inferred Source of Anomaly

Dense, magnetic pC basement in the Wind River Range.

Generalized source rock basement mafic

References

Sims and others, 2001

To Map **To Table**

WYm03

Scale I

Province Middle Rocky Mtns, Great Basin

Tectonic Setting uplift

Terrane Definition

Oval-shaped magnetic high (75x50km). Located over the western part of a gravity low, and over a basin filled with T sedimentary rocks and Q sediments.

Hi/lo/both H

Geologic Province

Located mostly over T sedimentary rocks and Q sediments.

Inferred Source of Anomaly

Buried magnetic pC basement.

Generalized source rock basement mafic

References

Sims and others, 2001

To Map To Table

WYm04

Scale I

Province Great Basin, Middle Rocky Mtns

Tectonic Setting depression

Terrane Definition

Oval magnetic low (60km). Surrounded partly by magnetic high feature WYm06.

Hi/lo/both L

Geologic Province

Located over Cretaceous sedimentary strata in Green River basin.

Inferred Source of Anomaly

Weakly magnetic pC metasedimentary rocks.

Generalized source rock basement silicic

References

Sims and others, 2001

To Map To Table

WYm05

Scale I

Province Middle Rocky Mtns

Tectonic Setting uplift

Terrane Definition

North-trending low to moderate magnetic high (125x25km). Corresponds with magnetic anomaly WYg04.

Hi/lo/both H

Geologic Province

Rock Springs uplift -- a structural high that exposes Cretaceous sedimentary rocks.

Inferred Source of Anomaly

Dense and magnetic pC basement rocks at core of uplift.

Generalized source rock basement mafic

References

Sims and others, 2001

To Map To Table

WYm06

Scale I

Province Middle Rocky Mtns, Great Basin

Tectonic Setting batholith, uplift

Terrane Definition

EW-elongate, U-shaped magnetic high (175x50km). Located north of Uinta Mtns, over alluvium and T sedimentary rocks in the Flaming Gorge area.

Hi/lo/both H

Geologic Province

Located over Cretacous sedimentary strata.

Inferred Source of Anomaly

Magnetic pC granitic rocks.

Generalized source rock intrusive silicic, intrusive mafic, basement mafic

References

Sims and others, 2001

To Map To Table