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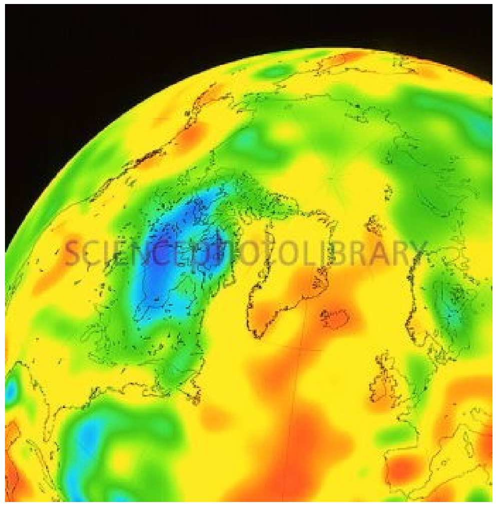
Canada's Gravity Deficit



by Miles Mathis

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I don't know if you have heard that Canada has a gravity deficit, but it does. It is centered over Hudson Bay, as you see in the figure above, and it is huge, both in size and strength. It was finally reported widely in the mainstream this January. This is odd in itself, considering that the data and theory to "explain" it have been around for many years. The main theory to explain gravity anomalies is convection in the mantle, which may cause mass differentials. These differentials then cause gravity differentials. Unfortunately, the anomaly in Canada turned out to be far too large to explain with convection (despite the fact that convection theory is a push to start with). So geophysicists went to work to create a second push in theory specifically to try to explain it. Mark Simons at Caltech came up with that theory in 1997, using "incomplete glacial rebound." So let us look at that theory, to see if it has any potential merit.

Simons and his friend at MIT Bradford Hager noticed that the blue spot was centered over Hudson Bay, which seemed to suggest a solution:

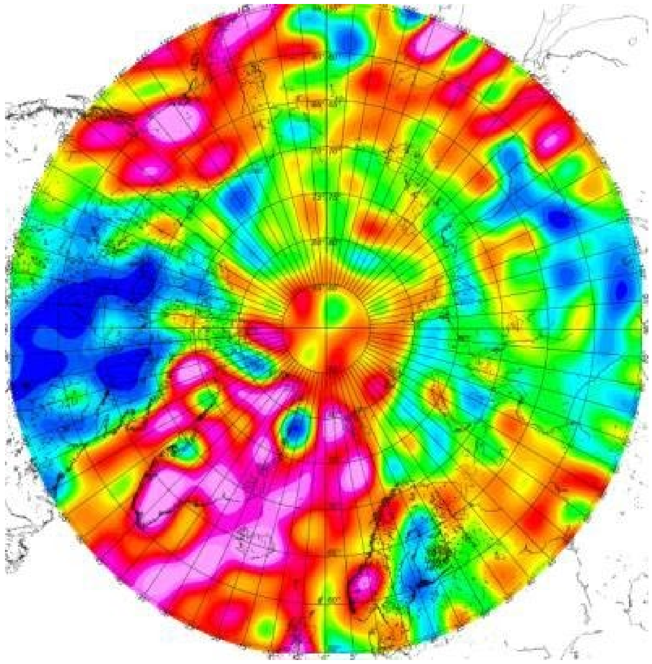
> About 18,000 years ago, Hudson Bay was at the center of a continental–sized glacier. Known as the Laurentide ice sheet, this glacier had a thickness of several kilometers. The weight of the ice bowed the surface of Earth down. The vast majority of the ice eventually melted at the end the Ice Age, leaving a depression in its wake. While this depression has endured for thousands of years, it has been gradually recovering or "flattening itself out." The term "glacial rebound" refers to this exact behavior, whereby the land in formerly glaciated areas rises after the ice load has disappeared. Evidence of this is seen in coastlines located near the center of the former ice sheet. These coastlines have already risen several hundred meters and will continue to rebound. The rate at which the area rebounds is a function of the viscosity of Earth," says Simons. "By looking at the rate of rebound going on, it's possible to learn about the planet's viscosity.

The favored model suggests that underneath the oldest parts of continents (some of which are over 4 billion years old) the viscosity of the outer 400 kilometers of Earth is much stiffer than under the oceans. Therefore, these continental keels can resist the erosion by the convective flow that drives plate tectonics.

In other words, gravity is now lower where the ice was thicker 18,000 years ago. The ice pushed the land down, so there is less land there now. “The area around Hudson Bay has less mass because some of the Earth has been pushed to the sides by the ice sheet. Less mass means less gravity.”

One of the worst theories ever, as we see already. The first problem is that the current anomaly doesn't match the Laurentide ice sheet, or ice sheets in general. We see that from their own maps:

To start with, the southern part of Greenland is at about the same latitude as Hudson Bay and the center of the gravity anomaly, and yet southern Greenland is red on the gravity map, while Canada is blue. They don't show us Russia on the current gravity map, but although Russia had an equivalent ice sheet in the Tarantian period—which, like Canada's ice sheet, has since melted—it doesn't have an equivalent gravity deficit. Although American and Canadian stories hide this, we can find data from The Geologic Survey of Norway:



Canada is to the left, Russia to the right. Although we do get some blue spots in central Russia, they aren't nearly as prominent as in Canada. And curiously, we get red spots above them, indicating gravity excesses. Even more curious—and counter to the theory—are the large red areas we see in Finland and Western Russia, centered around St. Petersburg. Go to about 4:30 on the map. The deep blue circle in northern Greenland also contradicts the theory, since there is still an ice sheet there that *hasn't* melted. The blue spot north of Alaska is a problem. The blue spot in the middle of the Pacific Ocean at 12 o'clock is also a problem, as is the blue spot in Sweden. Why would Sweden have a big blue minimum, while Norway right next to it has a hot pink maximum? This ice-sheet/viscosity theory is a non-starter.

And if only that were the only problem with the theory. We see the second problem in the HowStuffWorks link, where it is now admitted that the ice sheet theory can only account for 25-45% of the anomaly in Canada. As the years pass, they seem to realize how weak the theory is, so they keep scaling it back. In their *Nature* article of 1997, Simons and Hager even admit, "Indeed, there is a poor global correlation between the observed gravity field and that predicted by models of glacial isostasy." To get around this, they ignore the local amplitude of the gravity field and global correlations as a function of spherical harmonic degrees, diverting you instead into a "spatio-spectral localization method for spherical harmonic representations of global data sets. This method is similar to wavelet techniques in the cartesian domain and is well suited to global geophysical data." Is it?

The method can be expressed as spatial windowing followed by spectral decomposition. We use a smooth axisymmetric window with a characteristic spatial width equal to twice the wavelength being considered. The window is translated over the globe providing sets of localized coefficients at all positions and wavelengths.

Sounds like data pushing to me. Does gravity have a spectrum or a wavelength? No, so how are they applying this data reading? We don't know, because they won't tell us the specifics. They simply point to a footnoted paper at *GJI*, where they use a similar method to analyze the mantle of Venus. Since their entire theory depends on this method, it is diversionary to put it in a footnote. Reading data shouldn't be this difficult, and we are already suspicious. Our suspicion is heightened when we read this in the paper at *GJI*:

Many analyses and interpretations of the gravity and topography of Venus depend strongly on the assumptions made during field manipulation.... In particular, we seek techniques to estimate the frequency content of a signal as a function of position, generically termed localization methods.

Well, ALL interpretations and theories depend strongly on "the assumptions made during field manipulation." But it is curious that they call their interpretation a "field manipulation." That is almost to admit they are *manipulating* data. Very odd wording, to say the least. I begin to see that I will need to write an entire paper on pushing data with "localization methods," but I will have to compress it for you here. The best way to do that may be through this quote from the authors:

Because this approach is new, the development of the method is given in detail along with a synthetic example. The multiresolution approach distinguishes features which have large amplitudes but are limited in spatial extent from those which are truly long-wavelength and cyclic in character, that is we make the crucial distinction between a characteristic length-scale and a characteristic wavelength. This distinction is epitomized by the delta function, which has a characteristic length-scale of zero but incorporates the entire spectral domain.

What this means is that they are not treating gravity as spectral, they are treating the data as spectral. Notice the previous quote, where they say that they are estimating the frequency content *of the signal*. So the frequency is manufactured in the data, not in the field. Basically, in order to better push data, many new methods of compiling data have been invented. Data itself is treated as a mathematical field, and the math is then manipulated by applying various computer models and number models to it. Of course—as we have seen many times before—anything can be indicated this way. With enough math and modelling, you can prove anything. Notice the authors admit this method is new, above. But:

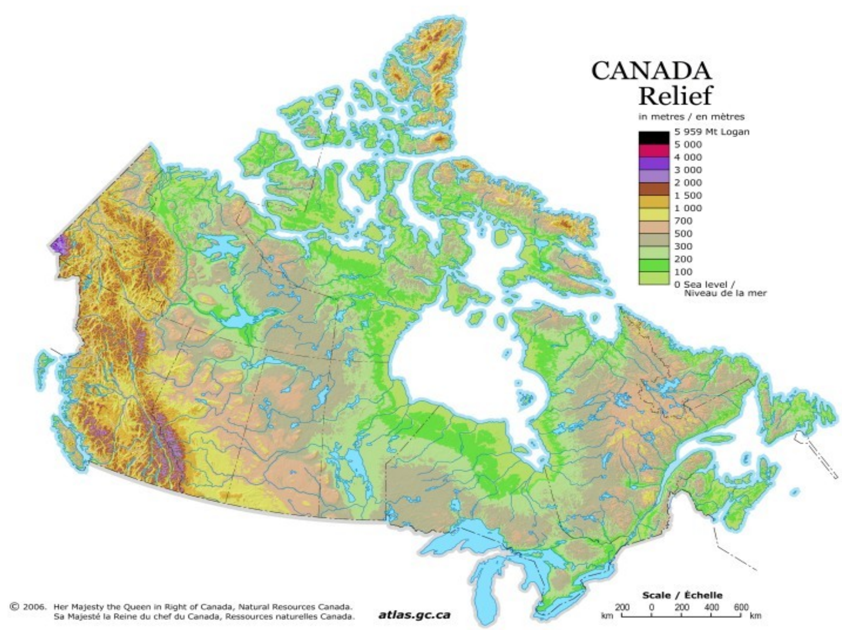
Non-stationary spectrum-estimation techniques are not new. Wavelets and other multiresolution methods are now common for time-series analysis and image processing (e.g. Daubechies 1992). Localization techniques exist for analysing both 1- and 2-D data, but available techniques are designed for a Cartesian domain (however, see Schroder & Sweldens 1995). We introduce here a technique for spatio-spectral localization of data on a sphere.

This means they are forcing data variously into either length-scale or wavelength patterns, then extrapolating techniques developed for pushing linear data into data from a sphere. This gives them a sort of double push right out of the gates. To really understand the cheats here would require a much more thorough analysis than I want to give here, but you should already see that these guys have dived off into a deep pit of data pushing, one that they have not hidden very well. If the theory of ice-sheets really explained the data from gravity maps, they wouldn't have to divert you into all this new method analysis. It is only when your theory *doesn't* match your data that you have to hide behind a lot of new math and methodology.

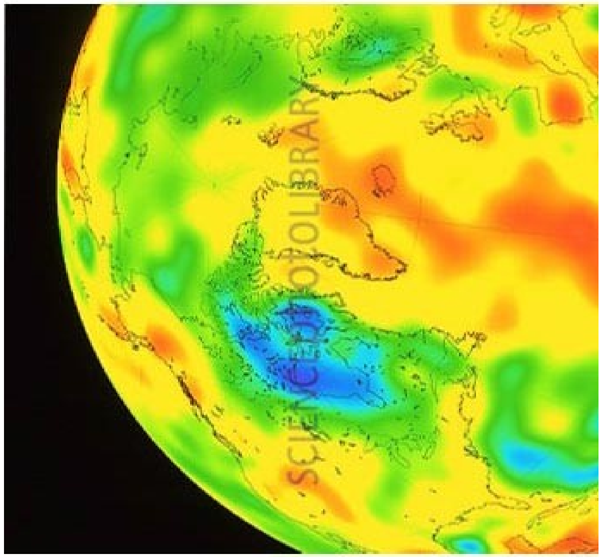
Fortunately, we can see the contradictions in theory without having to study their pushed models. We can simply return to the first quotes above, seeing how little sense they make. I point out that they admit the ice sheets were several kilometers thick and continent wide. They covered the *entire* North American continent, above about Kansas. If that is so, then how could earth be "pushed to the sides"? There were no sides. Look at the ice sheet map. The ice sheet actually went beyond the edge of the land, so there are no "sides." Wouldn't the weight of the ice sheet just compress the entire continent, making it more dense as a whole? Given their own theory of viscosity and compressibility, the weight on top could only add to overall density. Well, since more density leads to more gravity, we should see more gravity, not less. They ignore that logic, of course. By pushing these models, they can follow radius and ignore density.

But even following radius (altitude from center of the Earth) won't help them, since the maps don't follow radius either. Not all areas in Canada that show gravity loss are currently low-lying. Some, like Hudson Bay itself, are still low-lying, but we have no evidence the Bay is strictly an outcome of the ice sheet. If it were, then all of Canada would be a low-lying bay. But however that may be, we know that the Rocky Mountains rose more than 75 million years ago, long before the Laurentide ice sheet. So the Rocky Mountains are not "earth that was pushed to the side" by the ice sheet. The ice sheet went right over the lot. The ice sheet should have compressed the Rockies just like everything else, adding density everywhere. Why didn't it?

I will be told that the Rockies were already too dense to compress, but nothing on Earth is that dense. Everything can be compressed, and everything will be equally compressed. It may *react* to compression differently, but the force is the same with the same cause. I will be told the cause wasn't the same, since more ice was over lower elevations. True, but only partially true. What is the rise of the Rockies in Canada? About 5km. But that is only a narrow line in the west. Most of Canada is below 1km, so it would have been beneath most of the ice.



For this reason, Canada shouldn't show the gravity variation it does. To see this very simply, just compare this elevation map to the gravity map under title. See how the elevation map varies mainly east to west? The elevation lines run mainly north to south, which indicates that you see the most variation if you travel east to west. Well, the gravity map is just the opposite. As you see, its lines run east to west, indicating you would see the most variation if you traveled north to south.



I have turned the map 90 degrees so you can see what I mean. The blue and green lines run across Canada here, whereas on the elevation maps the lines run up and down. So gravity isn't following elevation. There are mountains north and east of Hudson Bay, but the gravity maps give us no sign of them. Look at the mountains in Quebec, east of Hudson Bay. They weren't squashed down by the ice, so why are they green in the map above? We would expect them to be yellow or red, like the Rockies. As Simons and Hager admitted, the maps don't match.

That blue low out in the Atlantic also looks peculiar, especially next to surrounding reds and yellows. Which leads us into convection theory. As it turns out, convection theory is just as poor as ice sheet theory. Out in the oceans, convection theory has to explain *all* the variations, especially nearer the equator. Ice sheet theory won't help them there. But convection theory doesn't even come close to explaining the gravity maps. As I have shown in previous papers, convection theory is a series of pushes and *ad hoc* manipulations, and no matter how much they cobble together and combine these theories, they can't get them to match data. They can explain some limited data over short periods, yes. But data in general, no. Convection theory can't explain anything because it isn't based on a strong underlying field theory. They don't know what is causing the initial forces and differentials, so they are lost when they try to explain the effects nearer the surface.

The best way to prove they don't understand the underlying field is to show you the underlying field. When you compare their theories to my theory, you will see precisely how theirs fail. The real cause of these gravity variations is charge variations. When we see a blue spot, we are seeing more charge; red, less charge. Since the field of the Earth is a unified field of gravity and charge, and since charge and gravity are arrayed against one another as vectors in the field, more charge equals less unified field. Since we are measuring the unified field with our machines—*not* the solo gravity field—these are the maps we will get.

Let me clarify that, for those who may not have read my previous unified field papers. I have shown that Newton's gravity field is actually a dual field, with two components. Newton compressed the dual field into a single field, which he expressed with the simplified equation

$F=GMm/r^2$

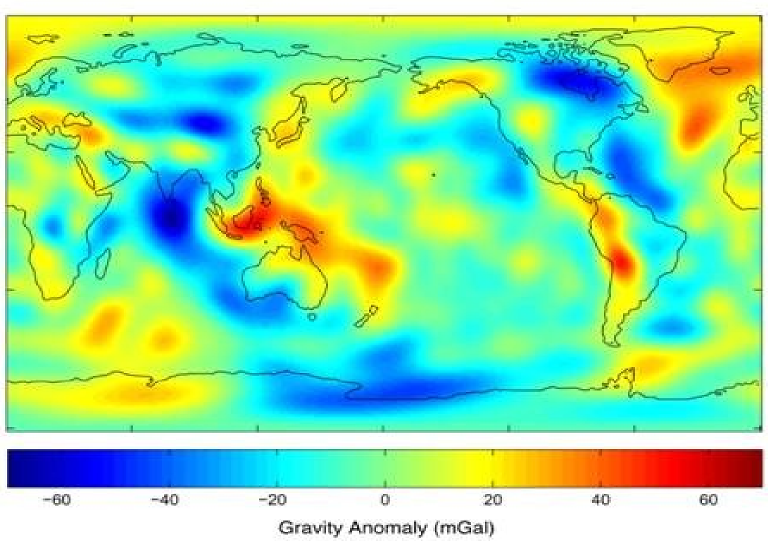
In that equation, G is a constant, which Newton never assigned to anything. We now know a number for it, but it is still not assigned. It is used only because it works. I have shown that it is a field transform between the two fields that underlie the equation. Basically it is a size transform between the charge field and the solo gravity field. Yes, Newton's equation contains charge and is already unified. This is why we haven't been able to unify it (or Einstein's field equations) with quantum mechanics. QM is a field of charge, and since what we call gravity already included charge, we couldn't unify QM with gravity. We couldn't add in what was already there.

So charge is already in the field. But as vectors, the two fields are in opposition. The charge field points out at the surface of the Earth and the gravity field points in. This is simply due to motion. If we track a test particle near the surface of the Earth, the solo gravity field causes it to move down. The charge field causes it to move up. Since gravity is stronger, the particle moves down.

Why does the charge field cause it to move up? Because charge is real photons. The Earth is recycling these real photons, taking them in at the poles and emitting them most strongly near the equator (or at 30N and S).   So real photons are moving up everywhere. They are hitting you from below right now, offsetting solo gravity to a small extent. What we call gravity, and measure, is a combination of the two fields.

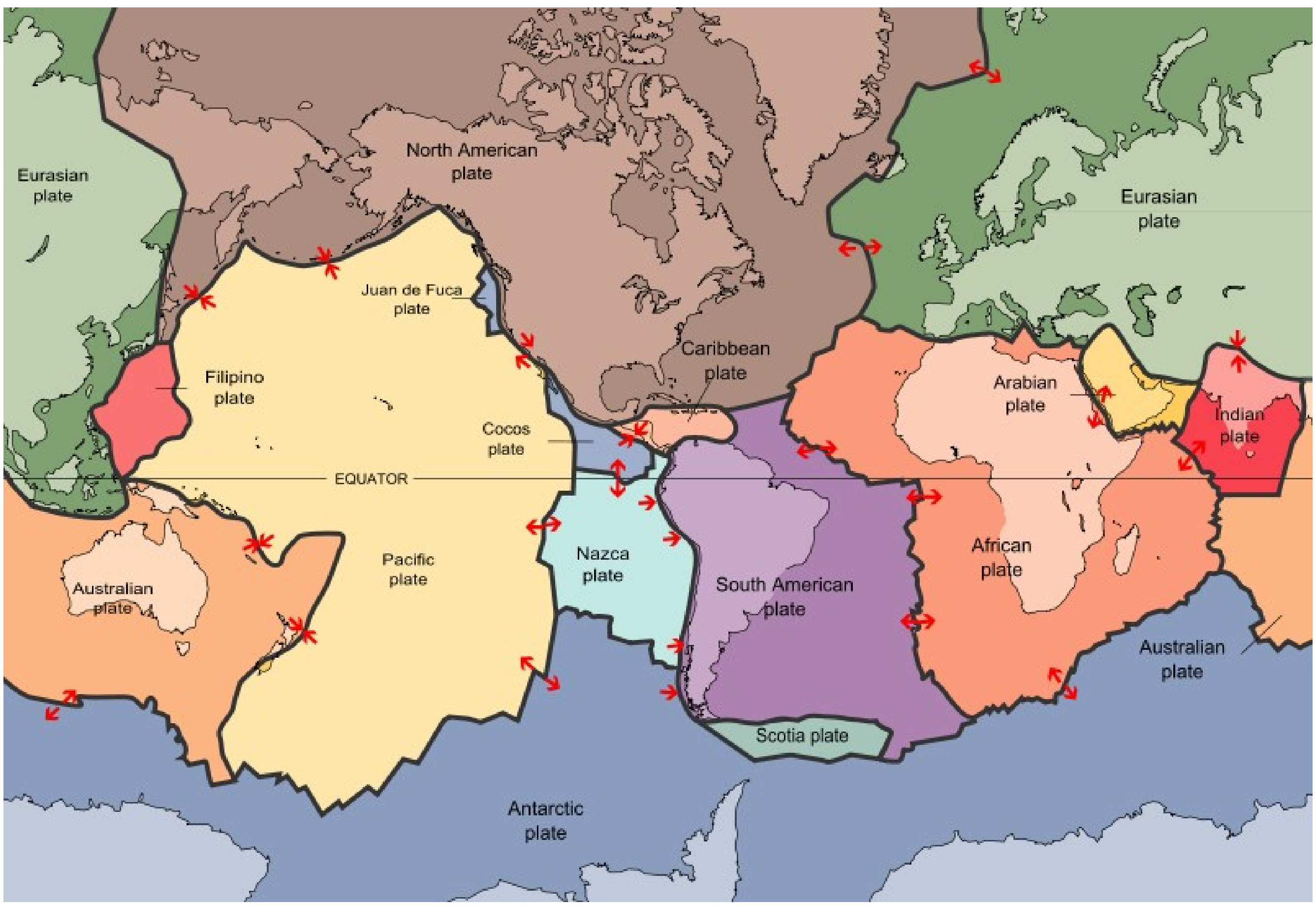
This explains the gravity map variations, because the variations we are mapping are mainly charge variations. Once we separate the two fields, gravity only varies by the radius, and the radius of the Earth doesn't vary enough or in the right places to explain these maps. Only charge variations can explain them.

Once you understand this, you see that mainstream geophysics is very roughly on the right track. In convection theory, they are trying to follow density variations in the crust and mantle. But since they don't understand what is being channeled through the mantle and crust, they don't understand the mechanisms of convection. It is charge that is being convected, not heat or pressure variations or compressions. Yes, charge happens to peak in the infrared, which we call heat. This masks charge as heat, and the mainstream sometimes models convection as heat transfer from the core. In this they aren't terribly far off. Except that they have the wrong model for heat in the core. It is not a dynamo, it is charge recycling.

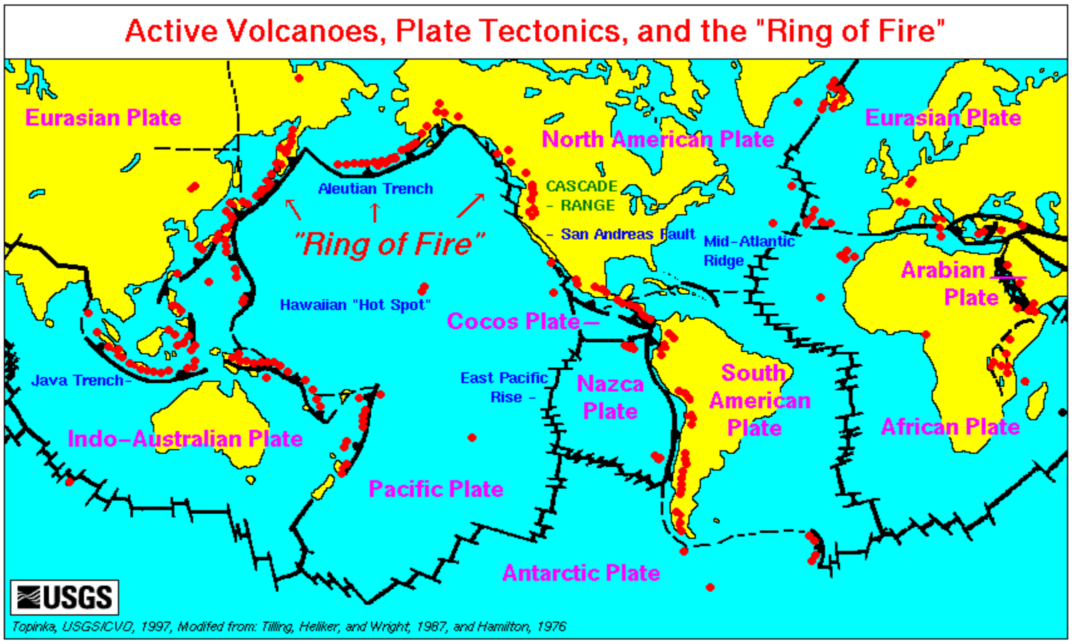


To see how this works, let us look at this map from the GRACE satellite. As I said, they still explain this map mainly by convection, but they don't know what is being convected. Now that we know it is charge, we can explain the variations quite easily. Blue is where charge is moving up through the Earth most easily, and red is where is moving with the most difficulty. For this reason, highs (reds) must be where we have higher densities somewhere along the way. These densities can either be in the upper or lower crust, or in the mantle. They can even be lower, but we have fewer variations lower, so most of these variations will be seen higher up, nearer the surface. We can see mountains blocking charge, and this no surprise. We have both more density and more mass at more radius, so mountains will naturally block charge coming up from below. We see reds or yellows at the Rockies, the Himalayas, the Andes, the Urals, the Alps and Balkans, Japan, New Guinea, the Philippines, Borneo, the Dividing Range, the Mountains of South Africa, and the Pontic Mountains of Turkey.

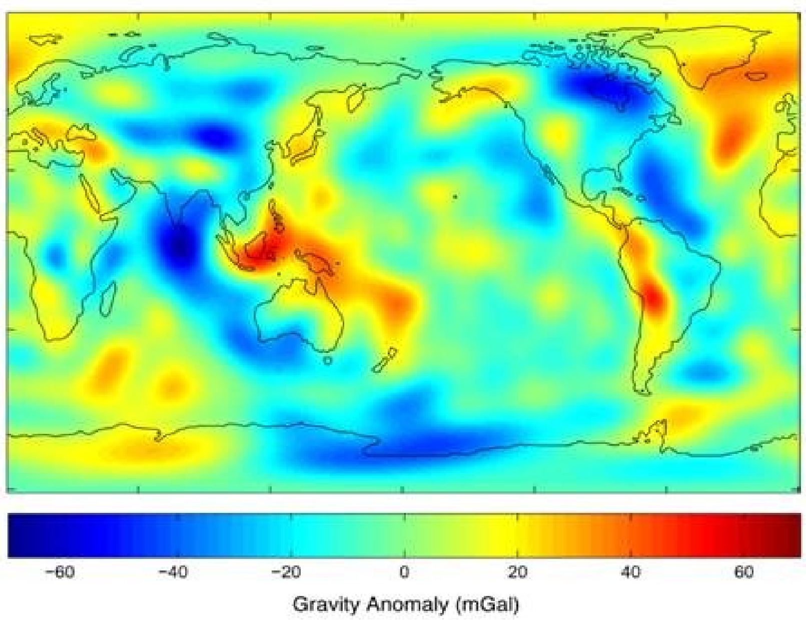
We also see blues across all of 30N, except where we have mountains blocking charge. Except for the mid-Atlantic, which brings us to our second major density input: the plate thickness. Thick plates can also block charge, and thinner plates let it pass. We see this most clearly below India, where we have a gravity low even steeper than Canada. That also happens to be the location of the very thin Indian plate.



From this you will notice that gravitational highs also follow plate seams and volcanic activity. This is because plates tend to be thicker where they meet. They get mashed against one another, increasing both density and thickness, just as you would expect.



Again, compare that to the GRACE gravity map:



The reds are on plate seams, where we see high vulcanism. **The blues are in the middle of plates**. So the gravity low in Canada has nothing to do with ice sheets. It has something to do with convection, but we need charge to explain what is being convected. It is charge. Charge is passing more easily up through the area of Canada, and it is doing so because it is moving through the center of the North American plate. **The plate is thinner in the middle**, so charge passes more easily. We are seeing charge channeling *up* through the plates.

Now that you see how easy it is to overlay these maps, explaining one with the other, you will wonder why it wasn't done before me. Well, it isn't that hard once you have charge, but no one before me had charge moving like I do. They hadn't unlocked Newton's gravity equation, so they didn't realize the field was unified. They didn't realize gravity already included charge. Likewise, they didn't understand the mechanism of charge recycling. Without that, you don't think to look for the explanation I just gave. If you don't look for it, you don't find it.

Notice that once you have the right theory, you don't need complex math or models to explain data. You don't need the spatio-spectral localization methods of Simons and Hager, and you don't need axisymmetric windows or a multi-resolution approach or wavelet techniques. You just need to go back and unlock some old simple equations. Once you do that, you have the key to every door.