



# EARTH NEWS

## Satellites Reveal Changes In Earth's Gravity

(NAPSA)—A government agency that usually keeps its eyes trained on the heavens, has, for many years, focused on Earth science and climate change as well—and has uncovered a number of interesting facts.

For instance, while the Earth isn't flat, it's not exactly round, either. Neither is its gravitational field.

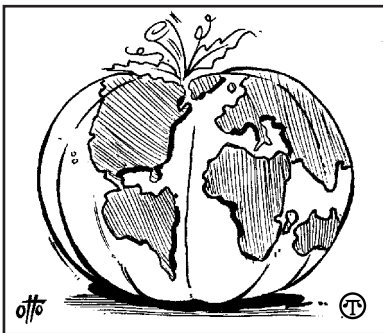
Since 1975, NASA and the international community have launched a number of satellites designed to be precisely tracked by the Satellite Laser Ranging (SLR) network. Modern tracking systems can measure the range of these satellites to better than a centimeter. Study of the orbital motion of these satellites has allowed scientists to understand changes in the Earth's gravity field, rotation and crustal dynamics.

A recent study of the SLR data indicated that since 1998 the bulge in the Earth's gravity field at the equator is growing, and scientists think that the ocean may hold the answer to the mystery of how the changes in the trend of Earth's gravity are occurring.

According to scientists, the Earth is shaped more like a pumpkin—slightly flat at both poles—than a perfectly round sphere, such as a basketball. But that shape has been shifting.

Scientists believe movements of mass have caused this recent change from the high latitudes to the equator. Such large changes may be caused by climate change, but could also be part of normal long-period climactic variation.

"The three areas that can trigger large changes in the Earth's gravitational field are oceans, polar and glacial ice, and atmosphere," said Christopher Cox, research scientist at NASA's Goddard Space Flight Center, Greenbelt, Md.



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Cox and colleague Dr. Benjamin Chao have ruled out the atmosphere as the cause. Instead, they suggest a significant amount of ice or water must be moving from high latitude regions to the equator, and oceans could be the vehicles of this movement.

These changes started about the time of the last big El Niño—a warm ocean current that flows along the coast of Peru—in 1998, although there is no evidence that the gravity field changes are caused by this current.

Data recorded by the TOPEX/POSEIDEN mission—which studies sea level height—does show an increase in the equatorial bulge of the oceans corresponding to the observed gravity changes, but the data are not yet conclusive. One critical factor is the temperature of the world's oceans, and its salt content, for which detailed data are not yet available.

To learn more about NASA and International Laser Ranging efforts, visit the Web site at <http://ilrs.gsfc.nasa.gov>. To learn more about the TOPEX/POSEIDEN project and other NASA efforts to explore the oceans from space, visit the Web site at <http://earthobservatory.nasa.gov>.