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July 23, 2003

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Studying Gravity From Space

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Ever since Issac Newton first observed a falling apple, scientists have worked to understand the force of gravity on our planet.

News 36 Video

Here is the story:

- [Gravity Study](#)

Now new technology is allowing researchers here in Austin to study to earth in a way never possible before.

The past decade has produced advances in technology like microwave radar and global positioning systems that are pushing space-based earth research to new levels of discovery.

Scientists at the University of Texas say they have opened the doors to a new and deeper understanding of how our planet works.

In a small lab at the University of Texas Center for Space Research, our knowledge of the Earth's gravitational field is becoming more detailed than ever.

Dr. Byron Tapley leads the joint UT/ German Aerospace/NASA Mission called GRACE -- the Gravity Recovery And Climate Experiment. Twin satellites orbit Earth 137 miles apart. With sophisticated microwave radars, the distance between the two is measured to thousandths of an

inch. That allows scientists to map the planet's mass some 50 times more accurately than previously possible.

"We really don't know for the Earth at large what the mass make-up of the Earth would be," Dr. Byron Tapley with the U.T. Center for Space Research said, "Knowing where all the mass points that make up the earth are, knowing what their distribution are, and knowing what the size of them are, is an extremely difficult point to come up

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with."

By using the gravity data like a filter, researchers can pinpoint ocean currents or the movement of moisture in weather systems.

"One of the things that we have the capability of doing is be able to look below the surface to the water contained in the aquifers, and look at the variations in the aquifers on a seasonal basis," Tapley said.

It's bringing new clarity to climate change research.

"Understanding the mass transport, or the mass exchange between the atmosphere, the ocean, and the solid earth is an important point in being able to look at effects of a lot of industrial processes," Tapley said.

The GRACE project will produce a new map of the Earth's gravity every 30 days over the next four years to help the study of long term changes in the Earth's mass and gravity.

There's much more detail about the GRACE mission on the Internet at [the GRACE Project -- Mapping Earth's Gravity Web site.](#)

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