

Oceans and Climate Change

Adam Smith talks with Eric Lindstrom, Liesl Hotaling, Andy Pritchard, Scott McLean, and Zdenka Willis in this podcast from PodAcadmy. A portion of NASA Program Manager Eric Lindstrom's transcript is provided below.

Eric Lindstrom: We launched the Aquarius satellite last June to measure salinity from space.

Adam Smith: That's Eric Lindstrom, physical oceanography program manager at NASA headquarters in Washington, DC. I sat down with Eric at a recent oceanography conference in London to hear more about Aquarius. *How does it measure salinity from space?*

Eric Lindstrom: Salinity is normally measured from a ship. We measure the conductivity of seawater. Well, we can get a estimate of the conductivity of the seawater from space. As the conductivity changes, the microwave emissions change and we put a very sensitive radiometer in space that measures the microwave emissions from the sea surface and we can back that out into a salinity estimate. It's a very daunting remote sensing measurement. We have to have a very sensitive radiometer and we have all sorts of conflicting issues: the roughness of the surface, the temperature of the surface, the galactic background radiation.

Adam Smith: Aquarius is up there producing all this data. *Who is using that data and for what purpose?*

Eric Lindstrom: At the moment, it's just being used by salinity scientists trying to understand the measurement itself. It's not quite ready for prime time yet but the reason it's flying is to understand the water cycle on the planet, among other things. In this warming world that we have, the oceans are warming, the atmosphere's warming, there's the idea that the water cycle on the planet will accelerate, there'll be more moisture in the atmosphere, more precipitation, more cycling of water through the system. And the ocean can be kind of integrated gauge for that – changes in salinity can indicate changes in evaporation and precipitation over the ocean. In fact, if you look back over all the measurements that have been made from ships over the last 50 years and you map the changes in salinity you actually find that most of the saltier places in the ocean surface have gotten saltier and the fresher places have gotten fresher, which is exactly the fingerprint that you would think to see in an acceleration of the water cycle. So Aquarius is coming along ocean scientists are trying to diagnose if this is really true, that there is an acceleration. We have to like a doctor doing diagnostics on a human, we have to rule out other diseases so what we're trying to do with salinity here is rule out that it's not ocean processes fooling us to make it look like an acceleration of the water cycle.

Adam Smith: As Eric said, because Aquarius is not even one year into its new job testing salt from orbit, the little satellite isn't ready for prime time yet. Scientists around the world who are working with NASA to calibrate the data before they can start to use it properly for research purposes are due to meet in Buenos Aires in April, when they'll decide how to start releasing the data. The wait is only heightening oceanographers' enthusiasm...