

# Engineering Advanced Argo Floats Transcription

OK. In an effort to do something in the ocean that we can use with Aquarius, we've changed our Argo floats—some of them—a little bit. We've added something here that you can see in this diagram called an STS unit. What the STS unit will do is allow us to measure salinity at very small scales—centimeter scales—very near the sea surface. Most of the Argo floats stop measuring at a depth of a couple of meters, two or three meters., because over time if they go up the sea surface they are going to get dirt, and junk, and biology entrained in the sensor, and that's not good for it. So we shut them off.

This is an effort to get right up to the sea surface and measure at a very high resolution so we can compare it with a satellite. You can take the satellite which measures well right at the sea surface, and instruments like this can measure in the upper few meters at very high resolution, and you can use all these data together. We have about 50 of these in the ocean right now generously funded through NASA. They are specially equipped Argo floats that can be used in conjunction with Aquarius. We're using these to learn a lot about the very near surface of the salinity field in the world ocean.

One of the things that we're doing is NASA has funded a very large and intense study in this area of the Western Atlantic between Africa and the U.S. in the white box there. This is called the SPURS experiment. SPURS is an acronym for Salinity Processes in the Upper Ocean Study. What we're trying to do is use a number of different kinds of modern instrumentation to really take apart the budget of salinity in a place like this. That is, what is it that actually determines what the salinity really is? And how does it get to this near equilibrium that I mention later because there's so many things going on here, different processes?

And yet over time they must all almost add up to zero. It's very curious about how that happens, and that's why we're trying to study here—all of those processes—to see how they interact with one another and to see how equilibrium is maintained. This has been ongoing for about a year and a half now. There's a cruise out there in the middle of the box right now to recover the instruments that are still there. Then the analysis now is just beginning of all the data, so if a year from now if somebody gives a talk like this they can tell you all about the interesting results that have come out of this, and what that dynamical balance really is.

The next slide is kind of a cartoon of all the stuff that is going out there. You can see the ships there. You can see the yellow floats which I have been talking about here. We have about 18 of those out in the box there. In addition to that you see gliders. Gliders are something that floats except they can be steered. They don't just drift with the currents; they can be steered. There were at one time something as many as 6 or 7 gliders out there that were moving around the box in a star pattern in order to measure temperature and salinity on a regular grid.

Then you can see there's a mooring there that's at the center of the box, a heavily instrumented mooring between the surface and the bottom which is about 5000 m. It has all kinds of things on that line to measure things. Next week's speaker Tom Farrar is going to talk to you about that. Then there are surface drifters which are floats that are just drifting on the sea surface. They don't go up or down, but they can tell you a lot about what's going on right at the sea surface. Of course then in the dark part

there we have the Aquarius satellite, and we have other satellites that we can use as well. So there's a large armada of stuff out there right now measuring salinity and temperature, all kinds of atmospheric variables as well in that region.