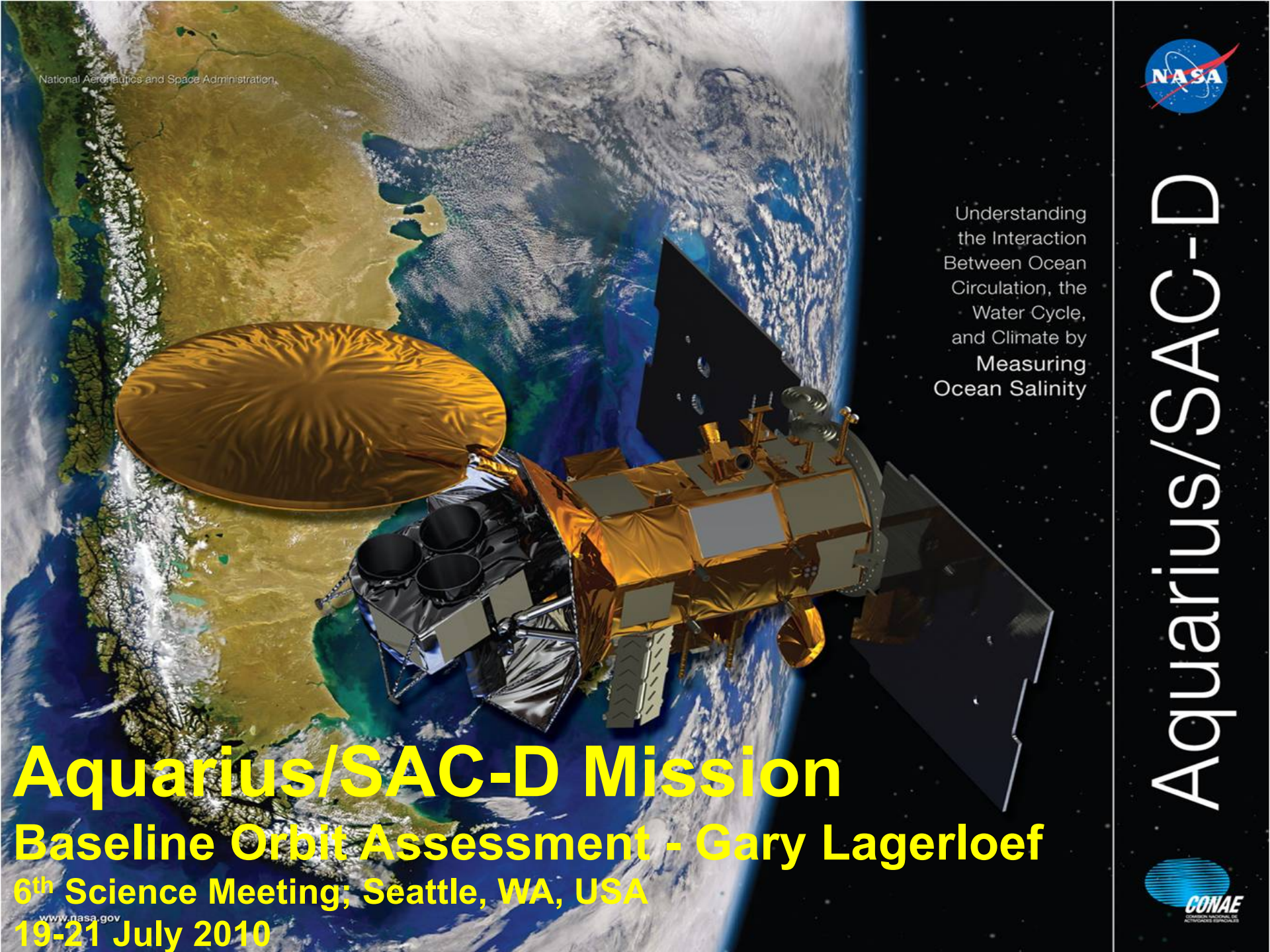


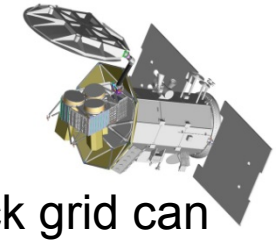
Aquarius/SAC-D Mission

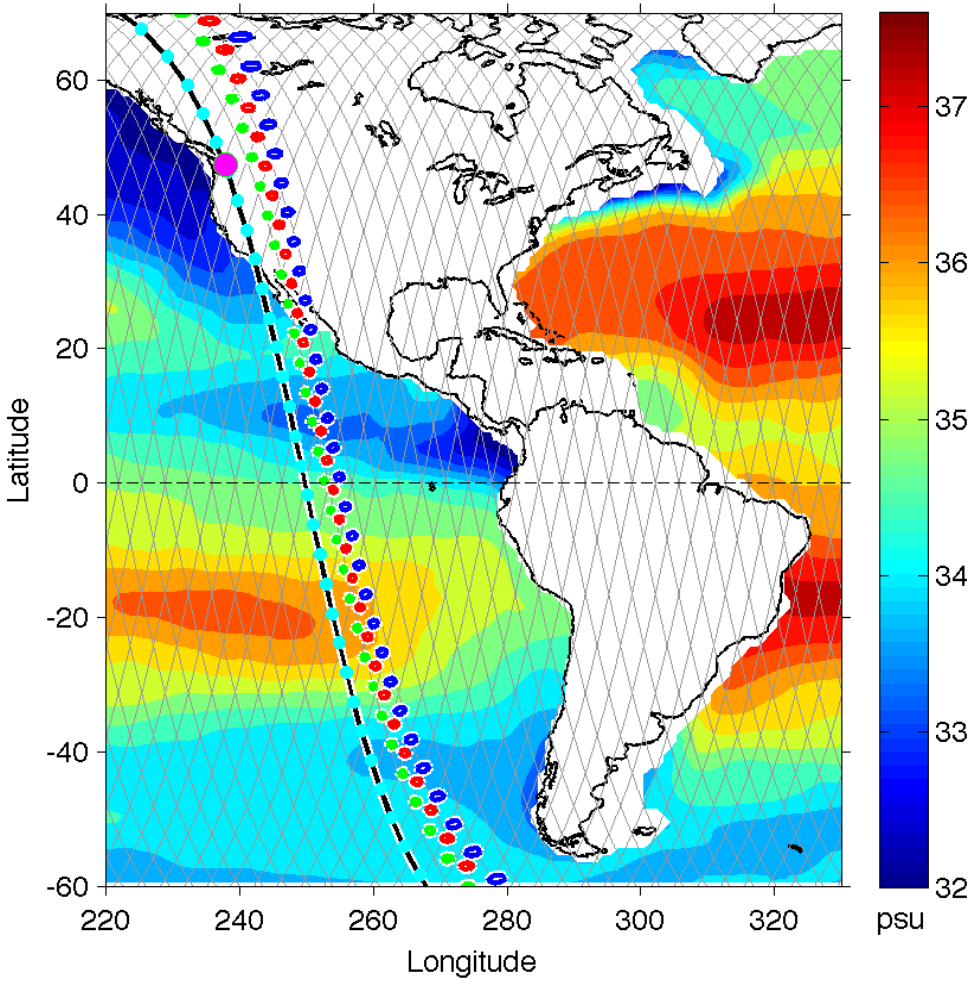
Baseline Orbit Assessment - Gary Lagerloef

6th Science Meeting; Seattle, WA, USA

19-21 July 2010

Orbit Longitude





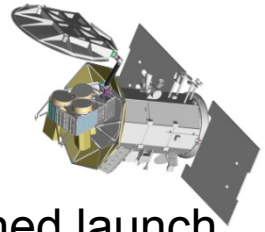
Longitude of the ground-track grid can be adjusted east-west – at some cost in propulsion fuel.

At the last meeting (Oct. 2009) we discussed whether it would be advantageous to optimize the footprint locations for scientific reasons.

I have looked at several examples (to follow) using the baseline orbit and see no compelling reason to change.

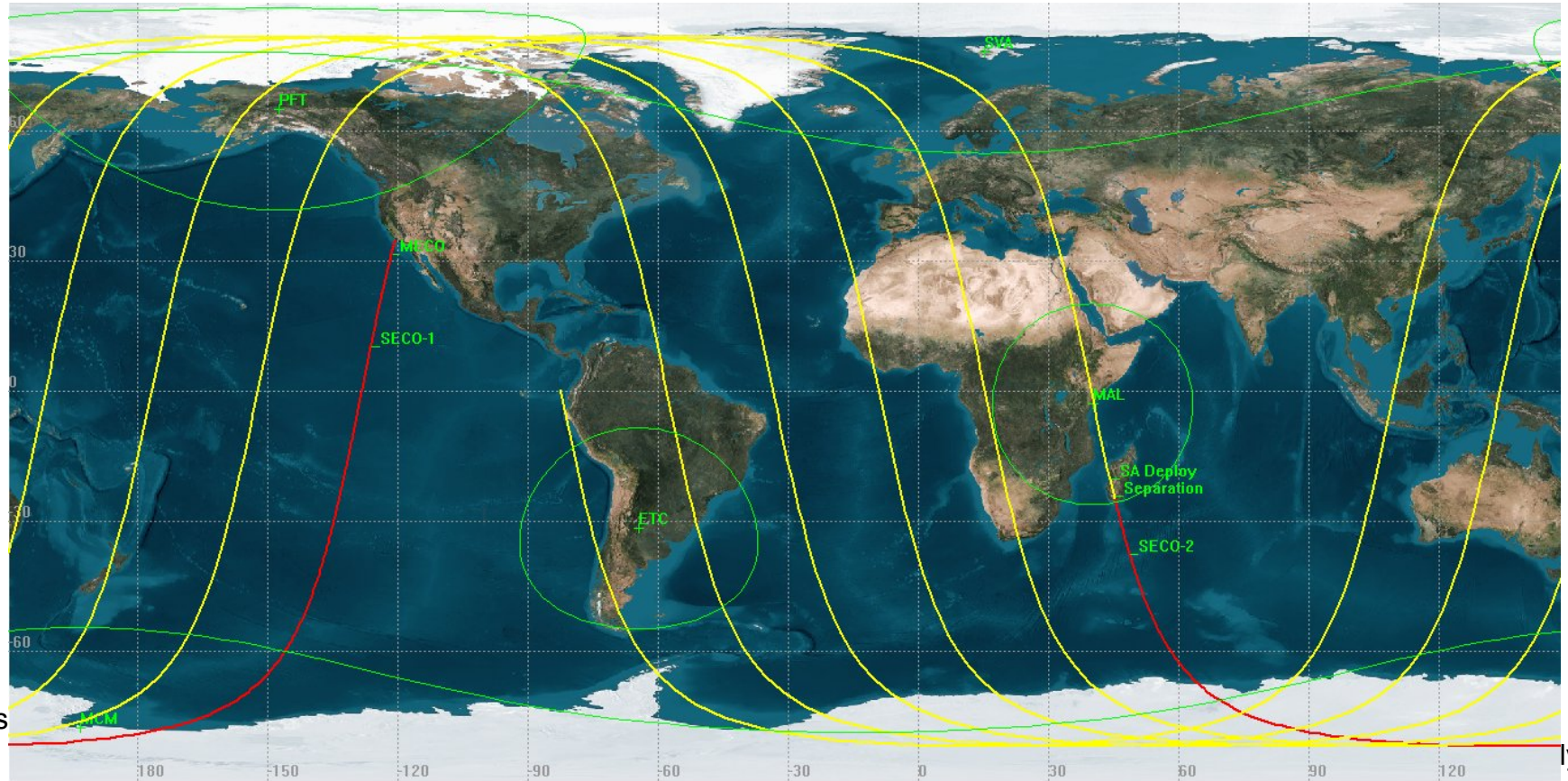
There have been some recent changes to the launch requirements. Details of the launch trajectory analysis are still pending, but should not affect this.

"Baseline Orbit"

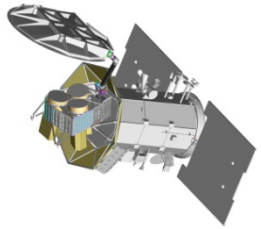


I am defining the "baseline orbit" as the one achieved with the planned launch trajectory.

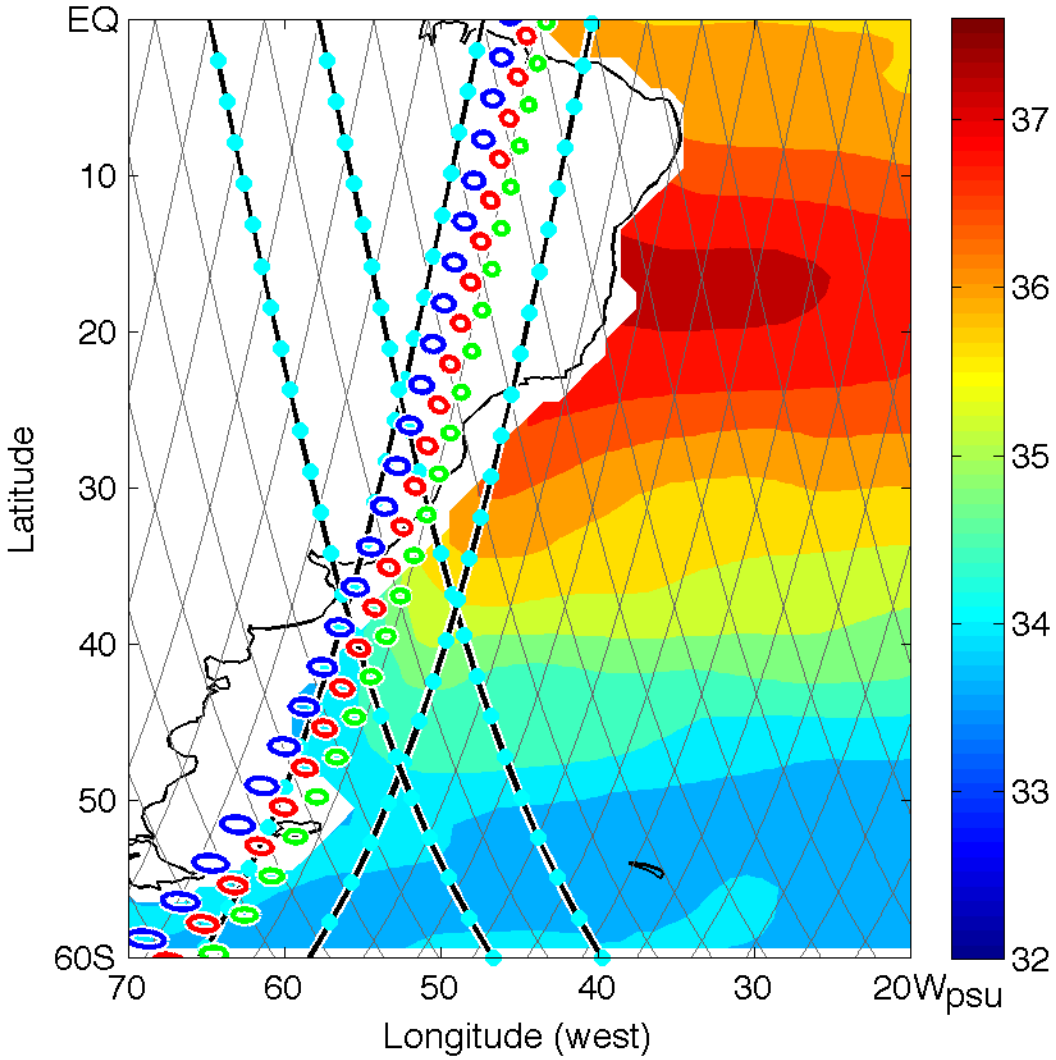
The first ascending node crosses the equator very close to 40 E (east Africa) to pass over the Malindi ground station.



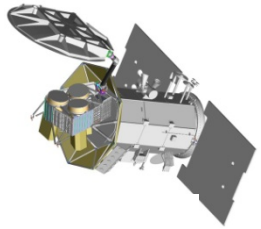
Examples – Baseline Orbit



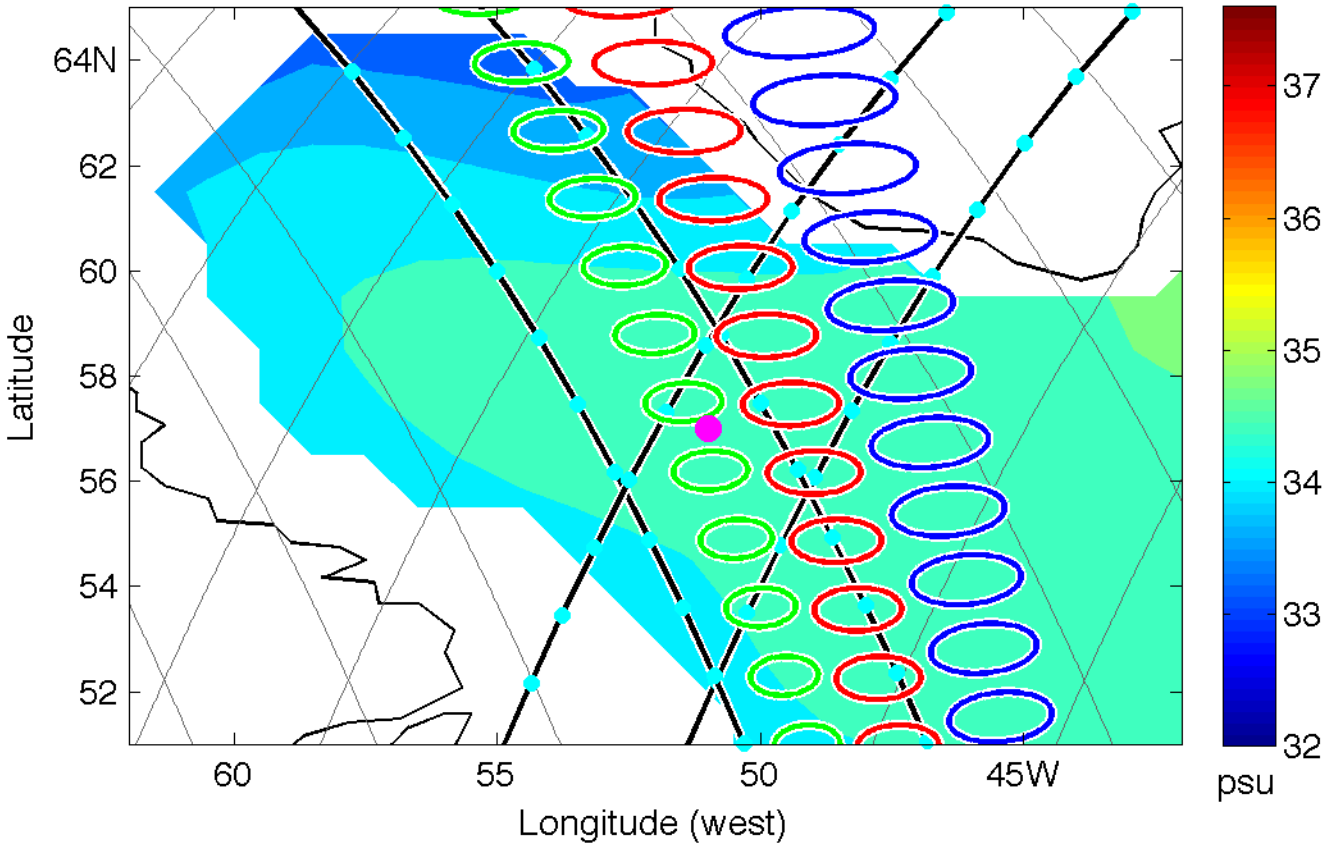
Western South Atlantic



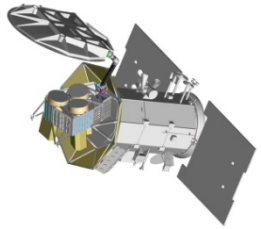
Examples – Baseline Orbit



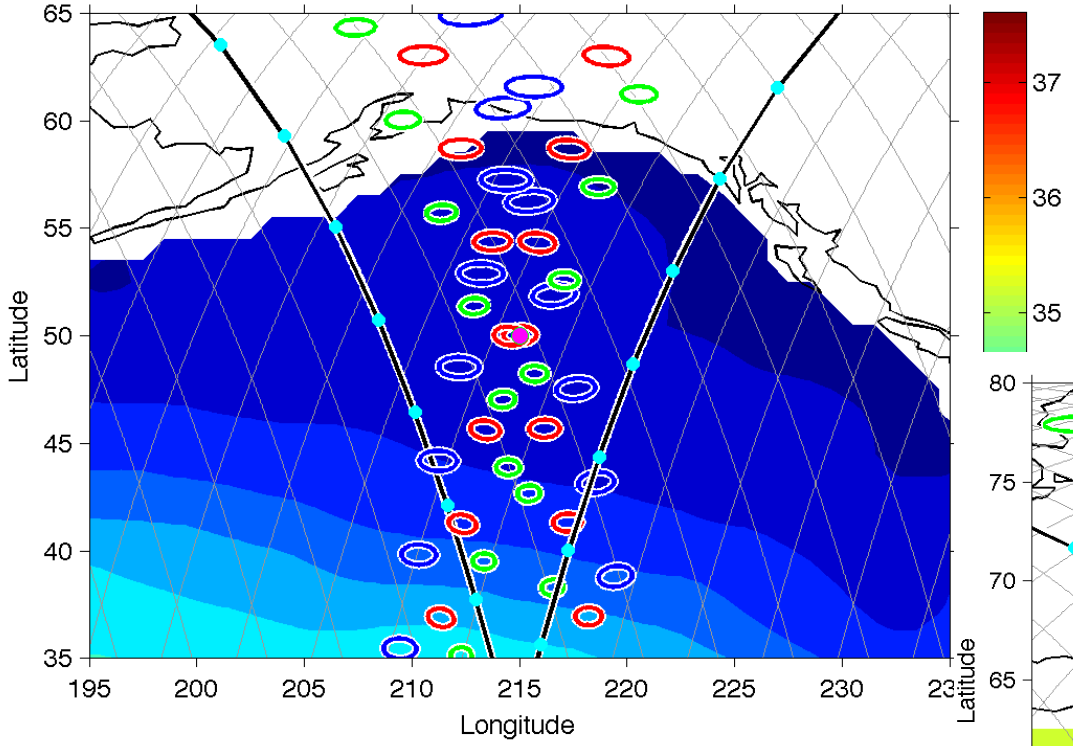
Labrador Sea



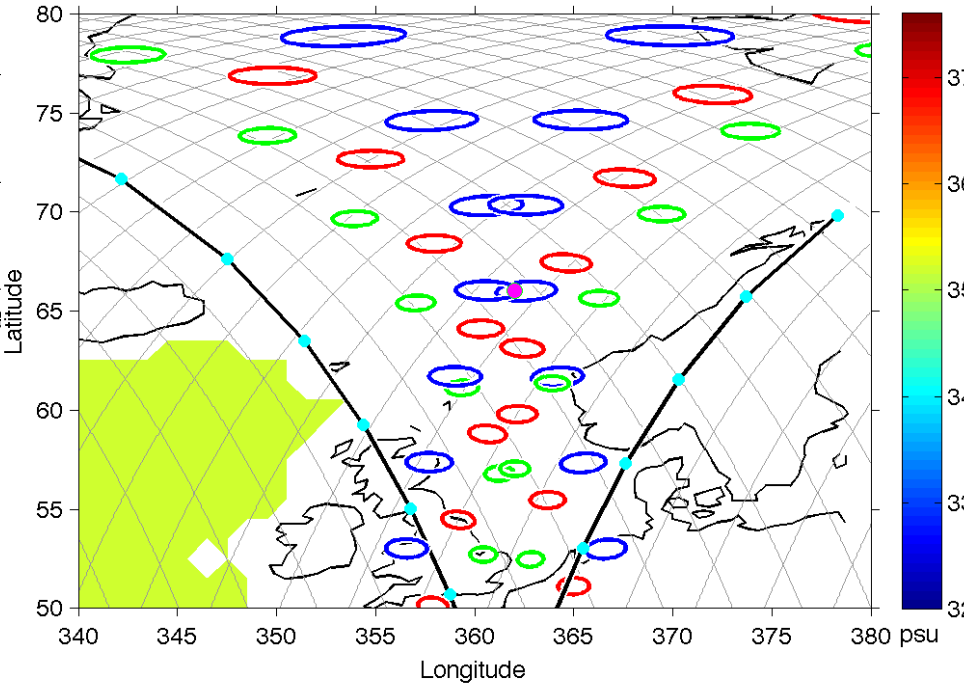
Examples – Baseline Orbit



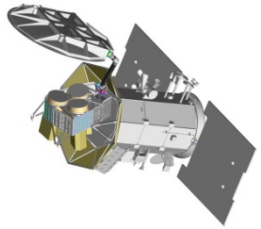
OWS Papa



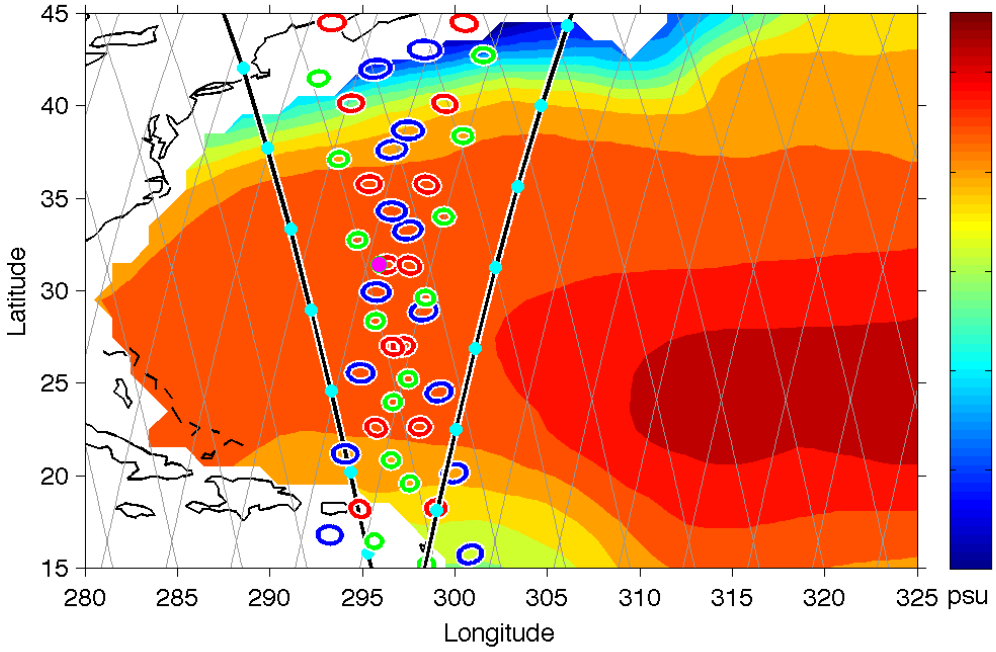
OWS Mike



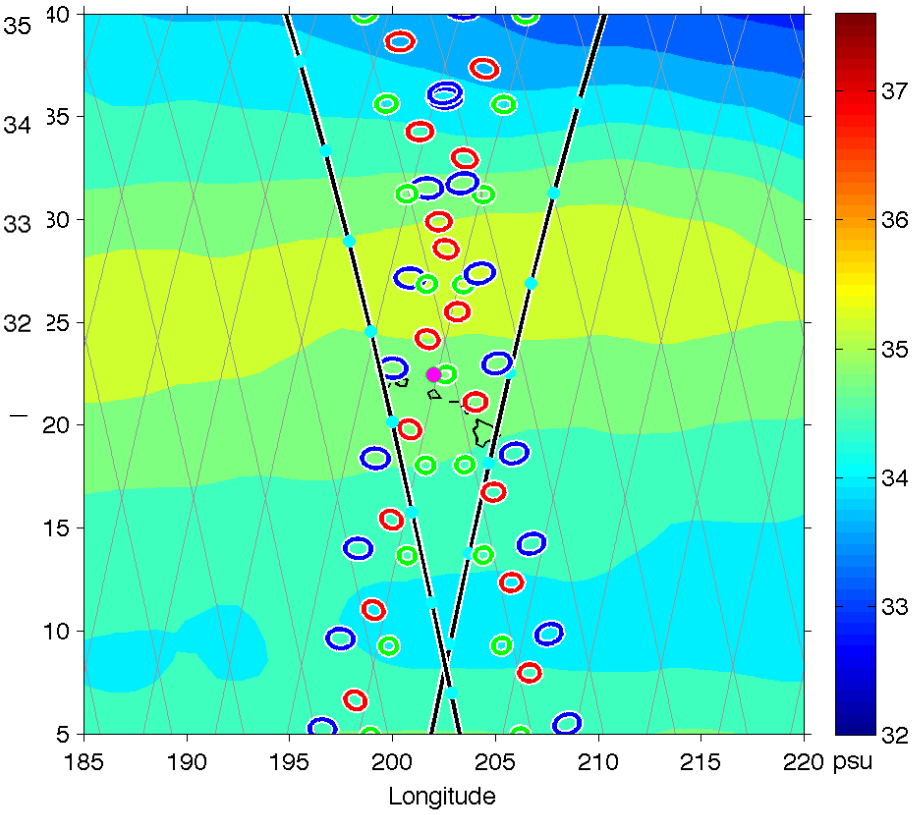
Examples – Baseline Orbit



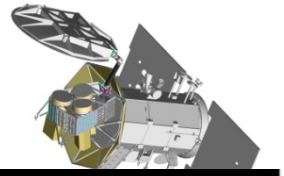
Bermuda Atlantic Time Series (BATS)



Hawaii Ocean Time Series (HOT)



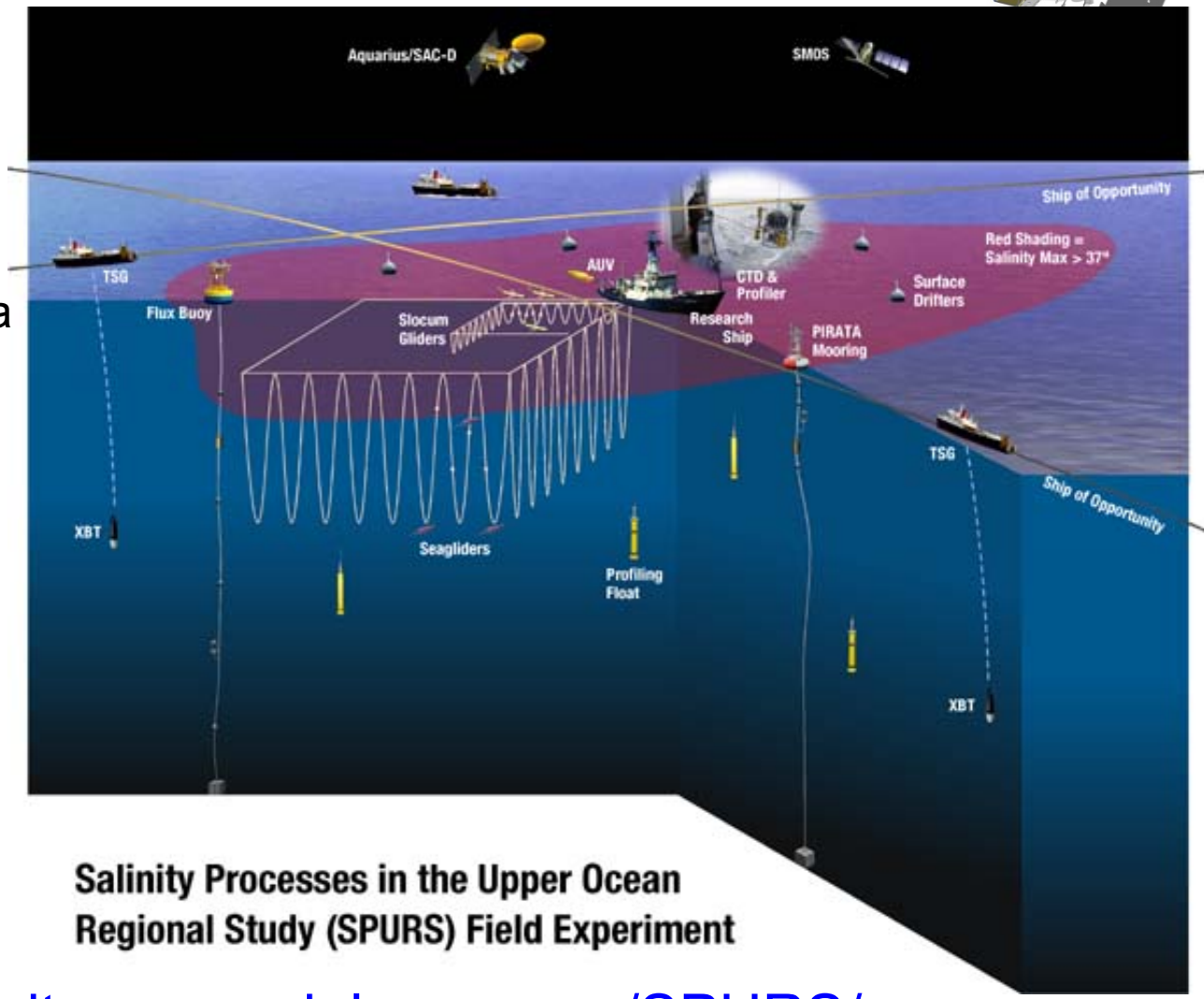
SPURS Field Experiment - 2012



1. A study of the physical processes responsible for the location, magnitude and maintenance of the subtropical Atlantic sea surface salinity maximum.

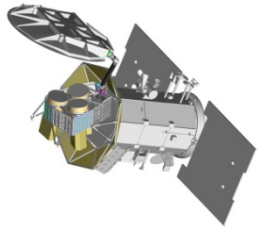
2. More on SPURS later in this conference.

3. The next slide shows the Aquarius sampling with the baseline orbit….

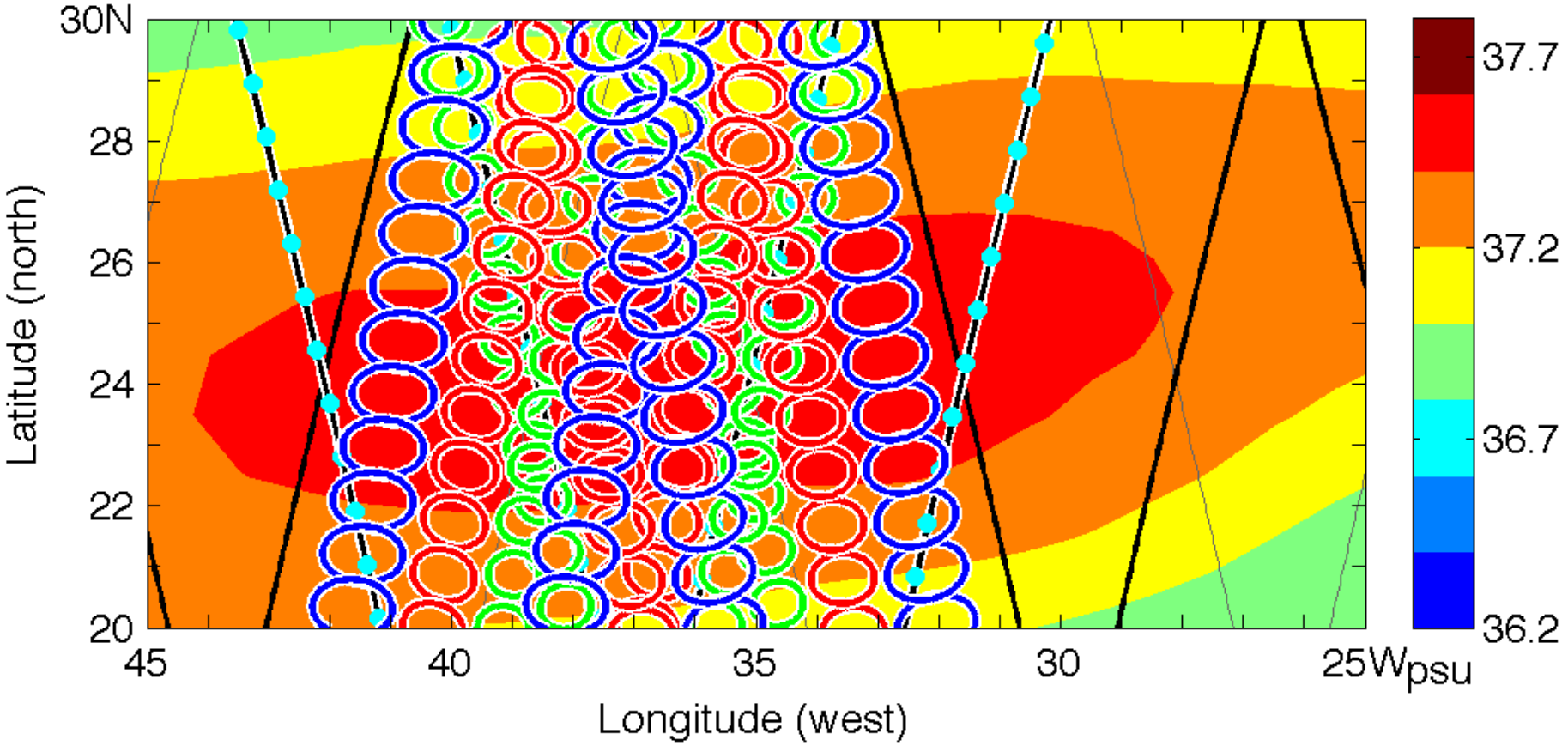


Website: spurs.jpl.nasa.gov/SPURS/

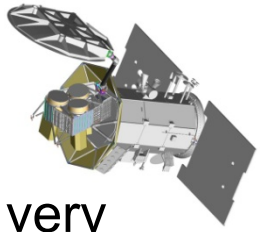
Examples – Baseline Orbit



SPURS Region – Subtropical North Atlantic Salt Maximum



Baseline Orbit Assessment

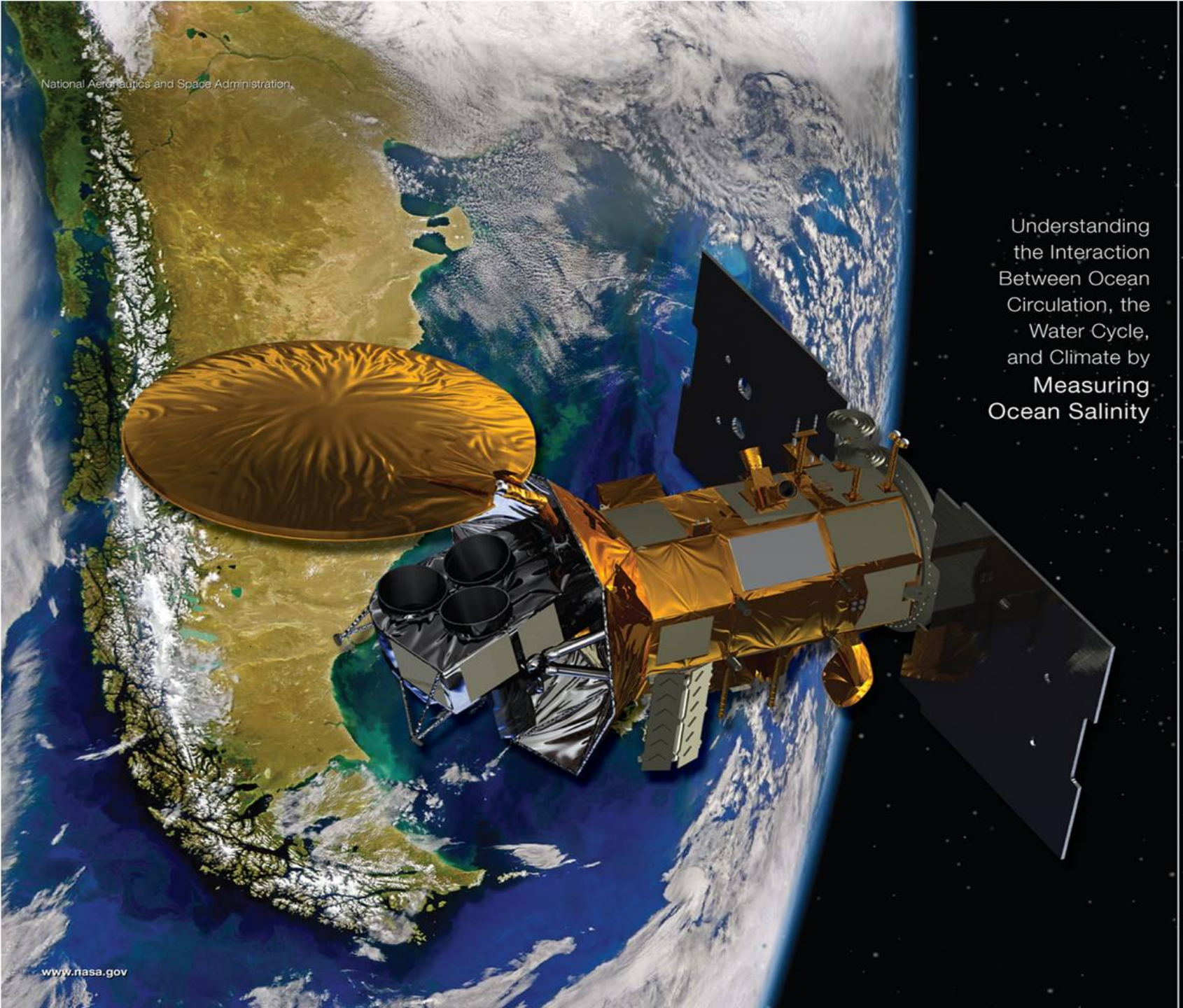


- A cursory assessment shows that the baseline orbit provides very good coverage over key ocean time series stations and important study regions.

- Adjusting the longitude will not affect the sampling statistics needed to meet the mission science requirements.

- All our simulations apply the baseline orbit, and a decision to change the orbit position well make the current simulations obsolete.

- My opinion now is that I see little scientific benefit to deviate from the baseline orbit and am ready to make the decision *not* to require any special longitude adjustments.



Understanding the Interaction Between Ocean Circulation, the Water Cycle, and Climate by Measuring Ocean Salinity

Aquarius/SAC-D

NASA

CONAE