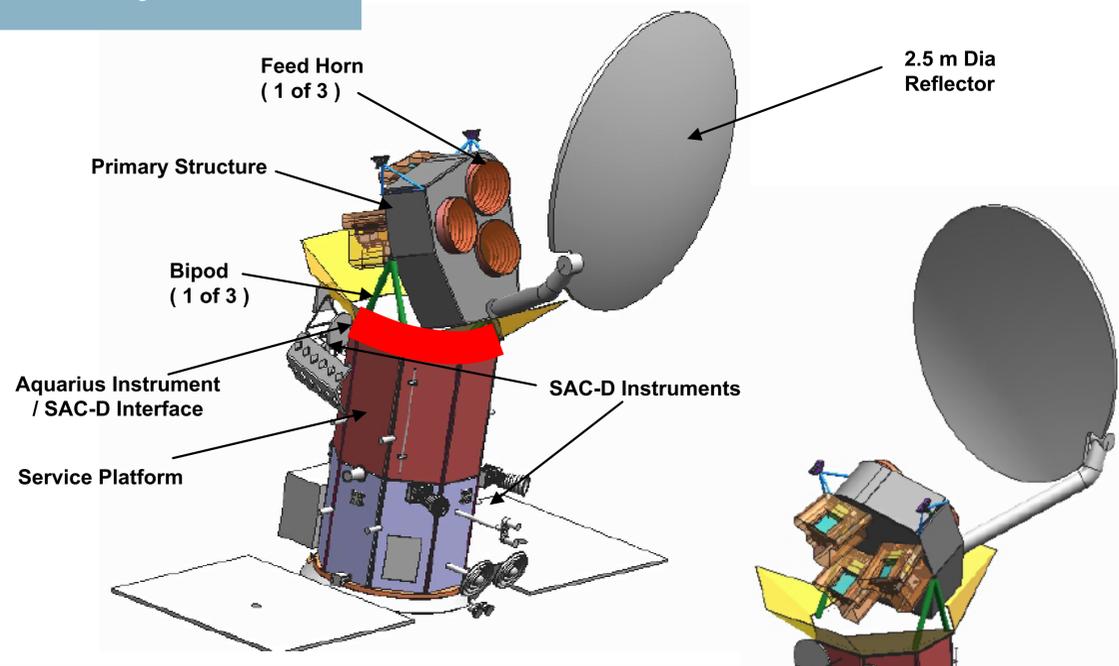


AQUARIUS

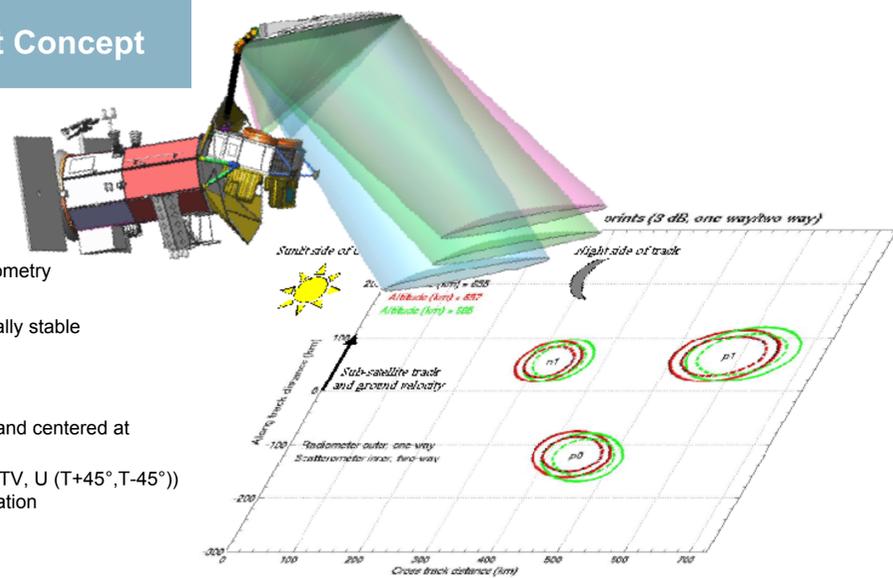
Sea Surface Salinity from Space

Observatory Illustration



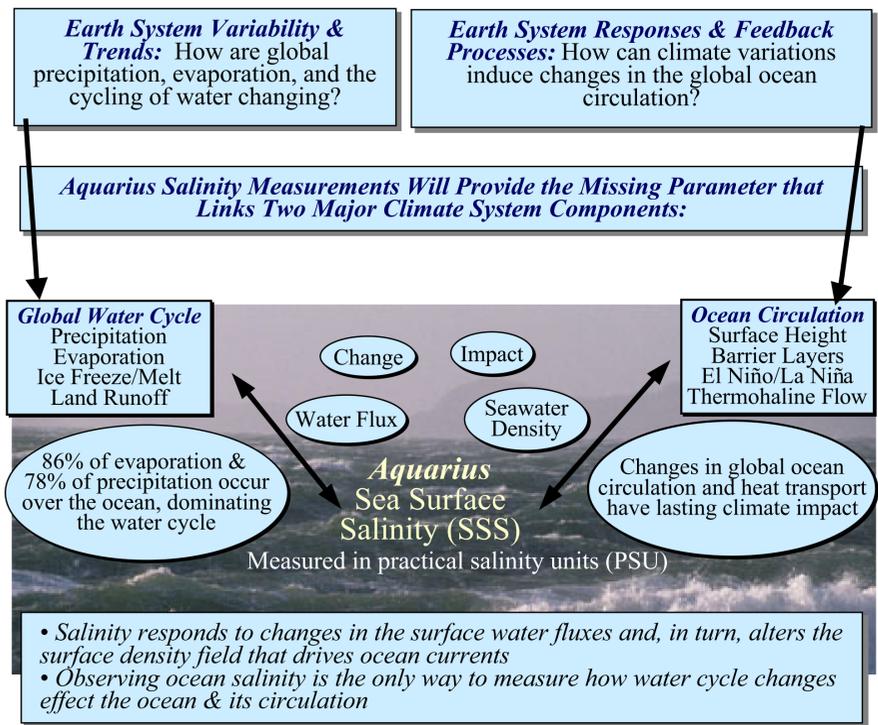
Selected Instrument Concept

- Antenna**
 - Radiometer & Scatterometer share feed and reflector (one antenna subsystem)
 - ≥ 2.5 m reflector diameter
 - Three feeds, in triangular geometry
 - Offset parabolic geometry
 - Three footprints in mechanically stable pushbroom configuration
- Radiometer**
 - Radiometer ~27 MHz wide band centered at ~1413 MHz
 - Polarimetric radiometer (TH, TV, U (T+45°, T-45°)) for correcting for Faraday rotation
- Scatterometer**
 - L-band, in space-radar band
 - Polarimetric (co-pol and cross-pol) for Faraday rotation correction and algorithm improvement
- ICDS (control and data system)**
 - On-board storage, data processing
 - Interface with Service Platform



- Other**
 - 3-year lifetime, single-string
 - 98 minute, sun-synchronous, 6 pm ascending orbit, 657 km equatorial altitude (655 km minimum, 685 km)

NASA RESEARCH PRIORITIES



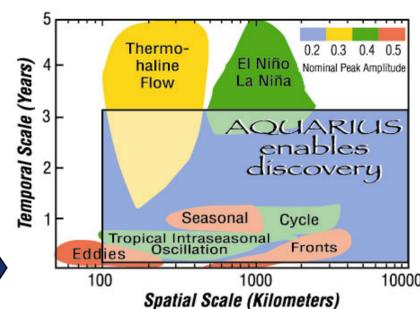
Aquarius Science Goal – To understand the regional and global processes that couple changes in the water cycle and ocean circulation and influence present and future climate.

Science Objectives:

- Seasonal cycle & year-to-year variability**
- Discovery & Exploration** Salinity mapping of unmeasured regions & features unknown to science
- Water Cycle** Salinity response to surface water fluxes
- Ocean Circulation & Climate**
 - Tropics** Climate feedback processes, El Niño, La Niña
 - Mid-Latitudes** Subduction and mode water formation
 - High-Latitudes** Deep water formation processes

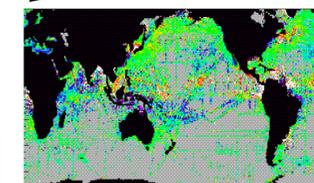
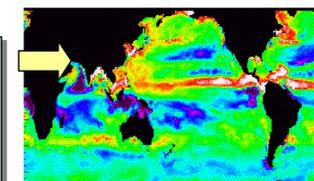
Aquarius Measurement Objectives:

Resolve key ocean and climate phenomena at 100 km and larger spatial scales, monthly and longer time scales.



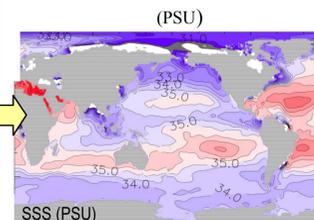
SCIENTIFIC RETURN

Aquarius will show details of global SSS variability, shown with this March-April-May map from an ocean model. Compare with lower map that shows historical data May.

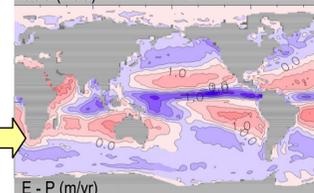


Aquarius will aid understanding of:

- Seasonal cycle & mixing in climate models
- Salinity transport by currents
- Ocean state & freshwater budget
- SSS impact on tropical climate models & El Niño
- SSS impact on ocean subsurface dynamics
- Ice-ocean interaction
- Processes that keep the Atlantic relatively salty



Surface salinity is linked to the water cycle: Mean SSS is highest where evaporation exceeds precipitation (E-P > 0), and is lowest where there is excess precipitation, especially in the tropics



It's the right time for Aquarius:

- Global array of profiling floats will follow surface salinity and density response at depth
- Aquarius** will complete a satellite-based climate observing system (i.e., rain, wind, sea level, sea surface temperature)

