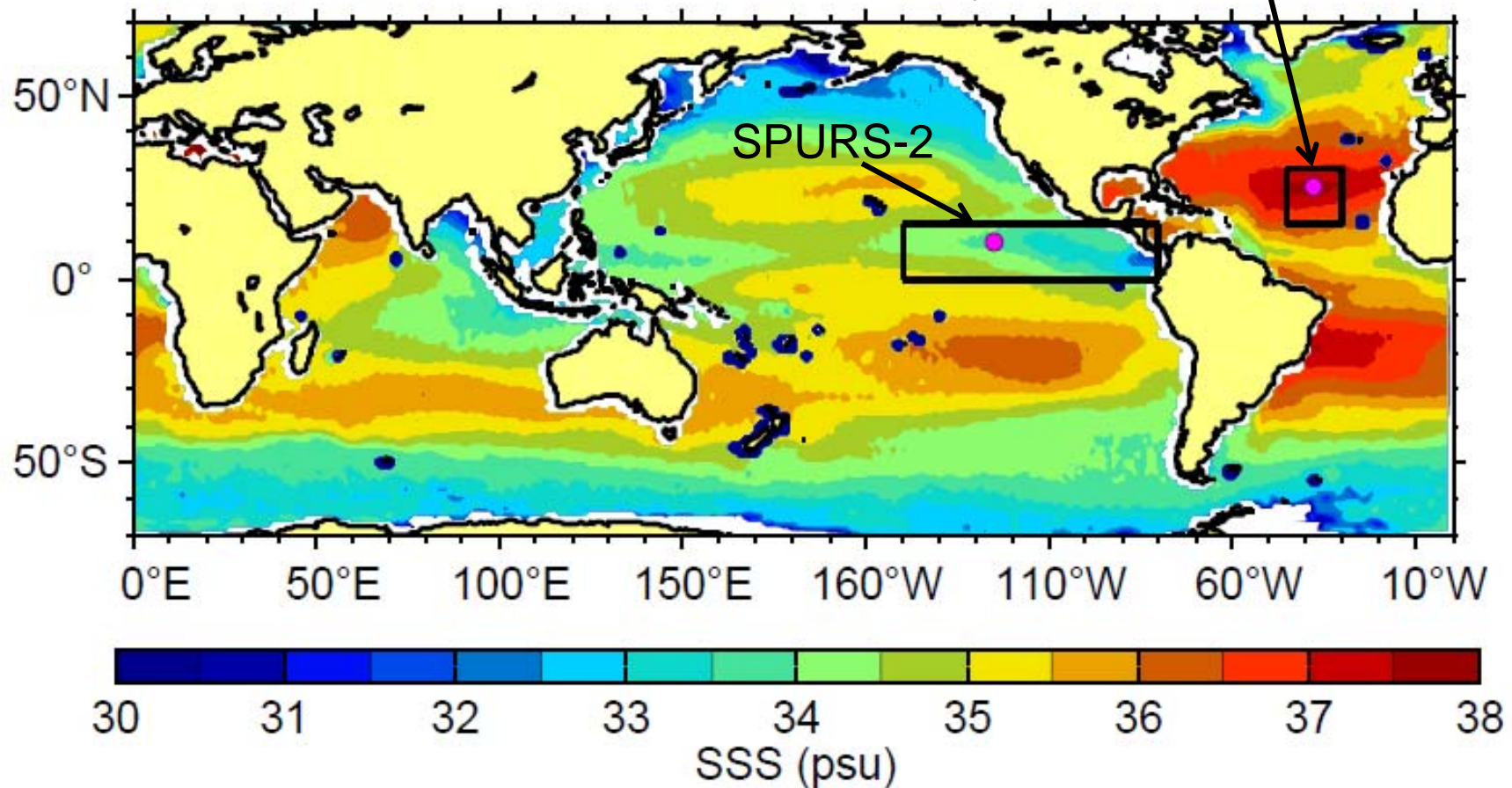


Salinity Processes Upper-ocean Regional Study (SPURS)

Tom Farrar, Woods Hole Oceanographic Institution

SPURS-1

2012-2013 Sea Surface Salinity (Aquarius)



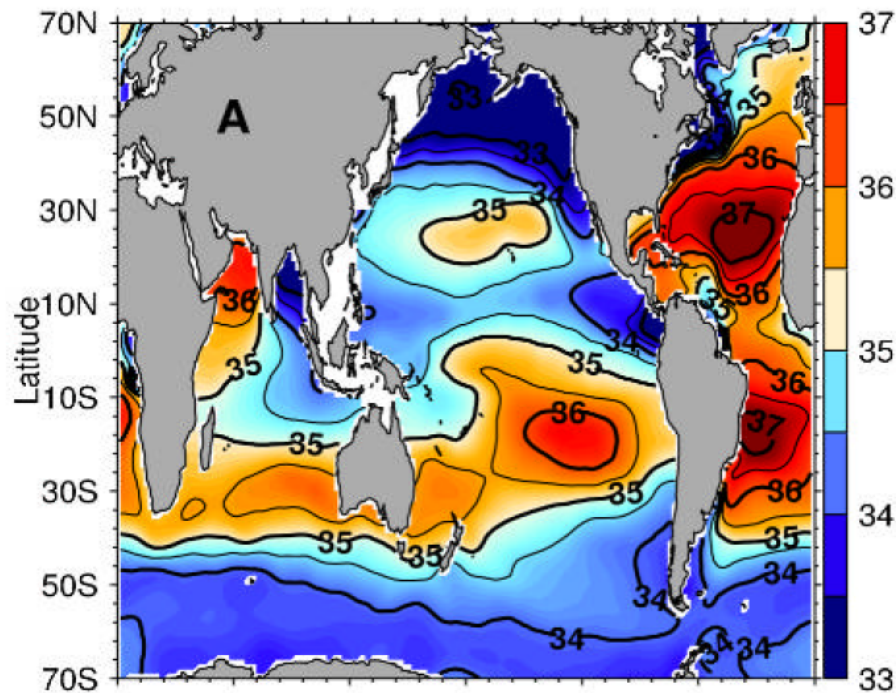
2014 US CLIVAR Summit

Salinity Processes Upper-ocean Regional Study (SPURS)

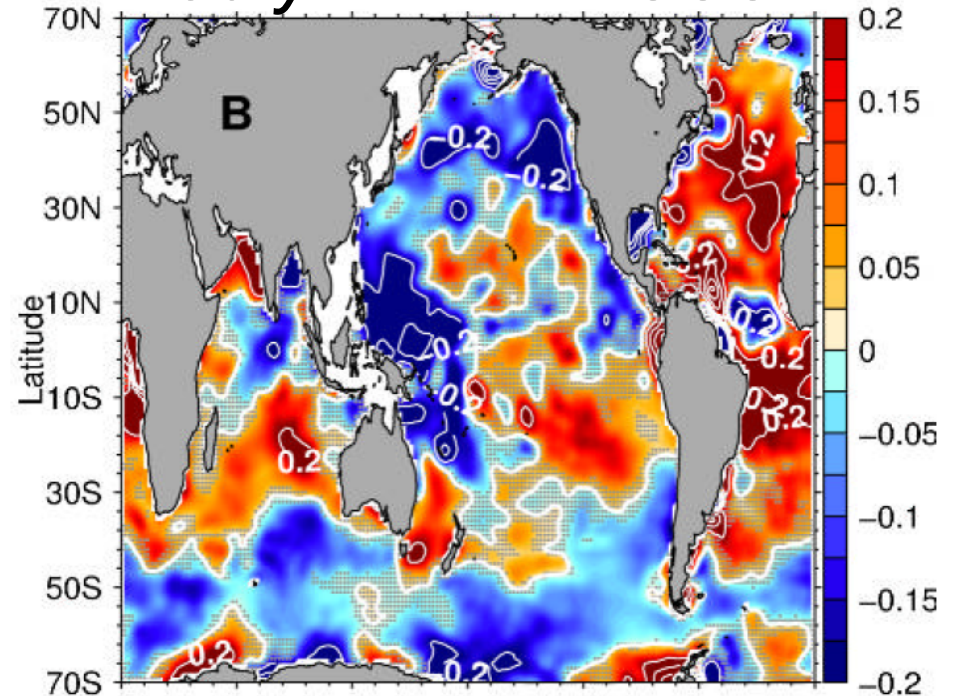
- SPURS aims to improve understanding of the physical processes influencing upper-ocean salinity, in support of two broad goals:
 - To better understand the relationship between the global water cycle and ocean salinity

Salty areas are getting saltier, fresh areas are getting fresher, indicating intensification of the water cycle

Mean SSS



50 yr trend in SSS



Durack and Wijffels, 2010, *J. Climate*

→ Sea surface salinity extrema are of special interest

Salinity Processes Upper-ocean Regional Study (SPURS)

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Salinity Processes Upper-ocean Regional Study (SPURS)

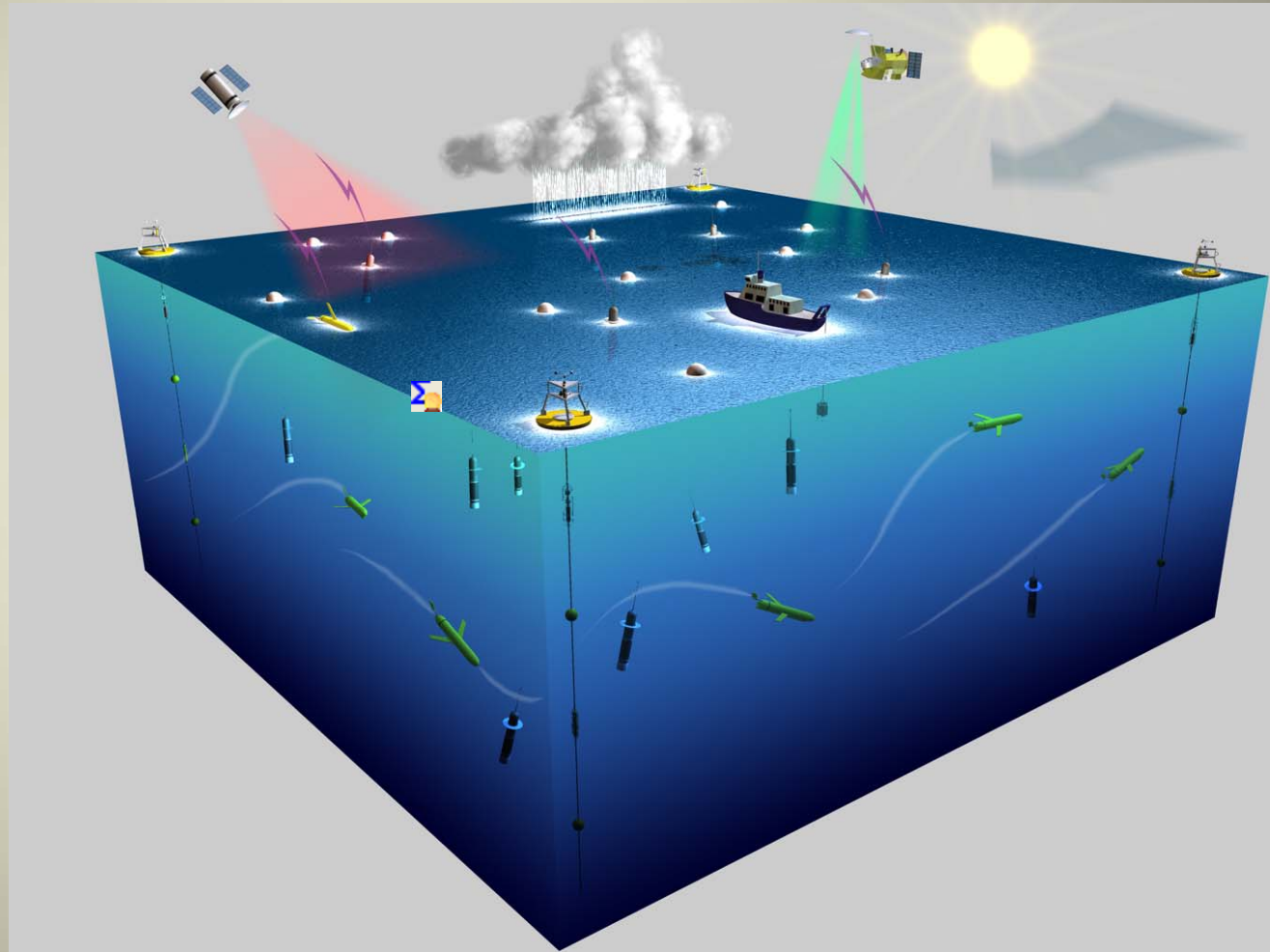
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Salinity Processes Upper-ocean Regional Study (SPURS)

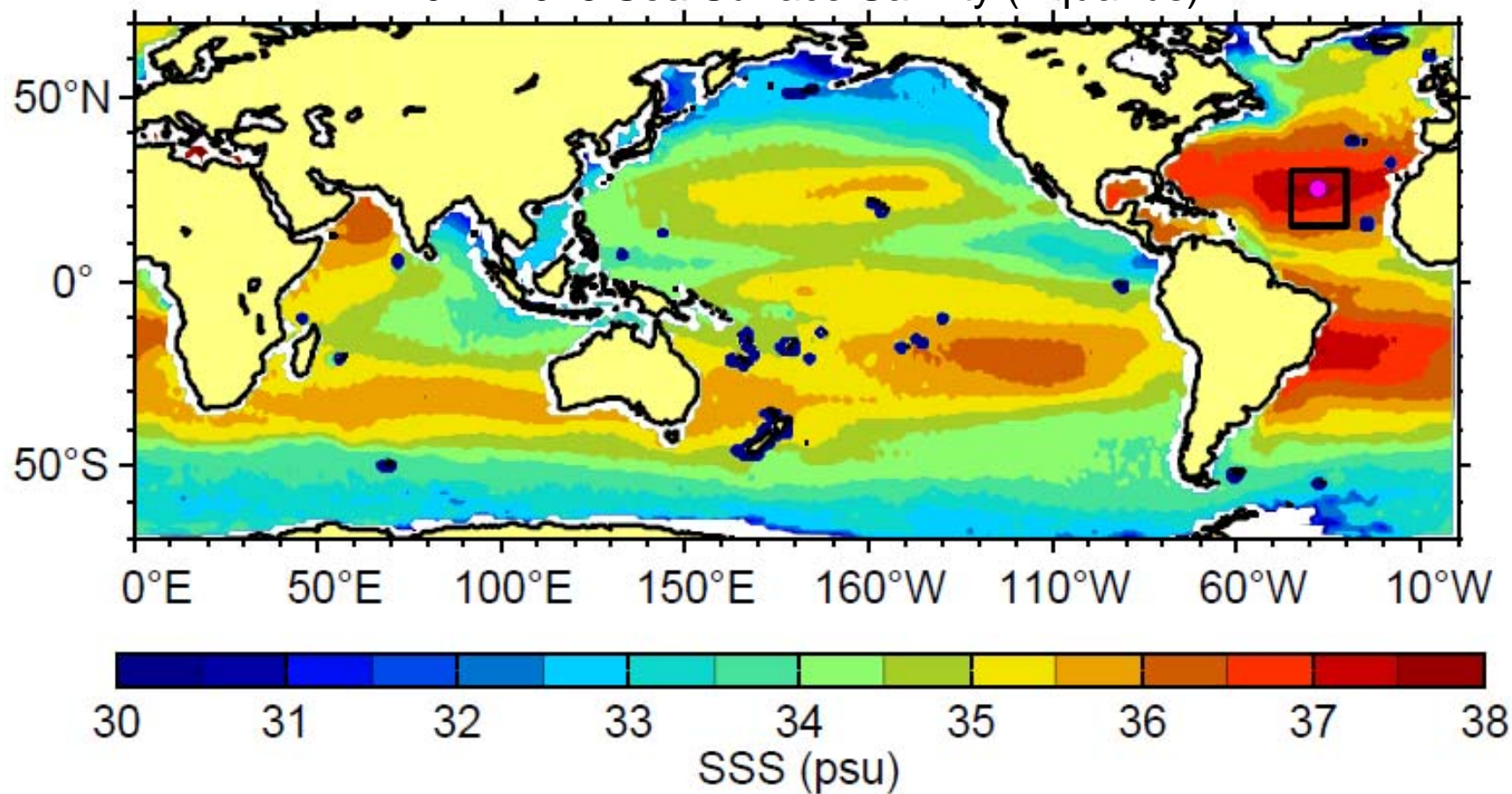
- SPURS aims to improve understanding of the physical processes influencing upper-ocean salinity, in support of two broad goals:
 - To better understand the relationship between the global water cycle and ocean salinity
 - To better understand the processes affecting sea surface salinity on regional to small scales
- Interagency (NASA, NOAA, NSF)
- International (US, Spain, France, Ireland, UK)
- 1-year field campaign concluded Oct 2013

Tools for the SPURS Study:

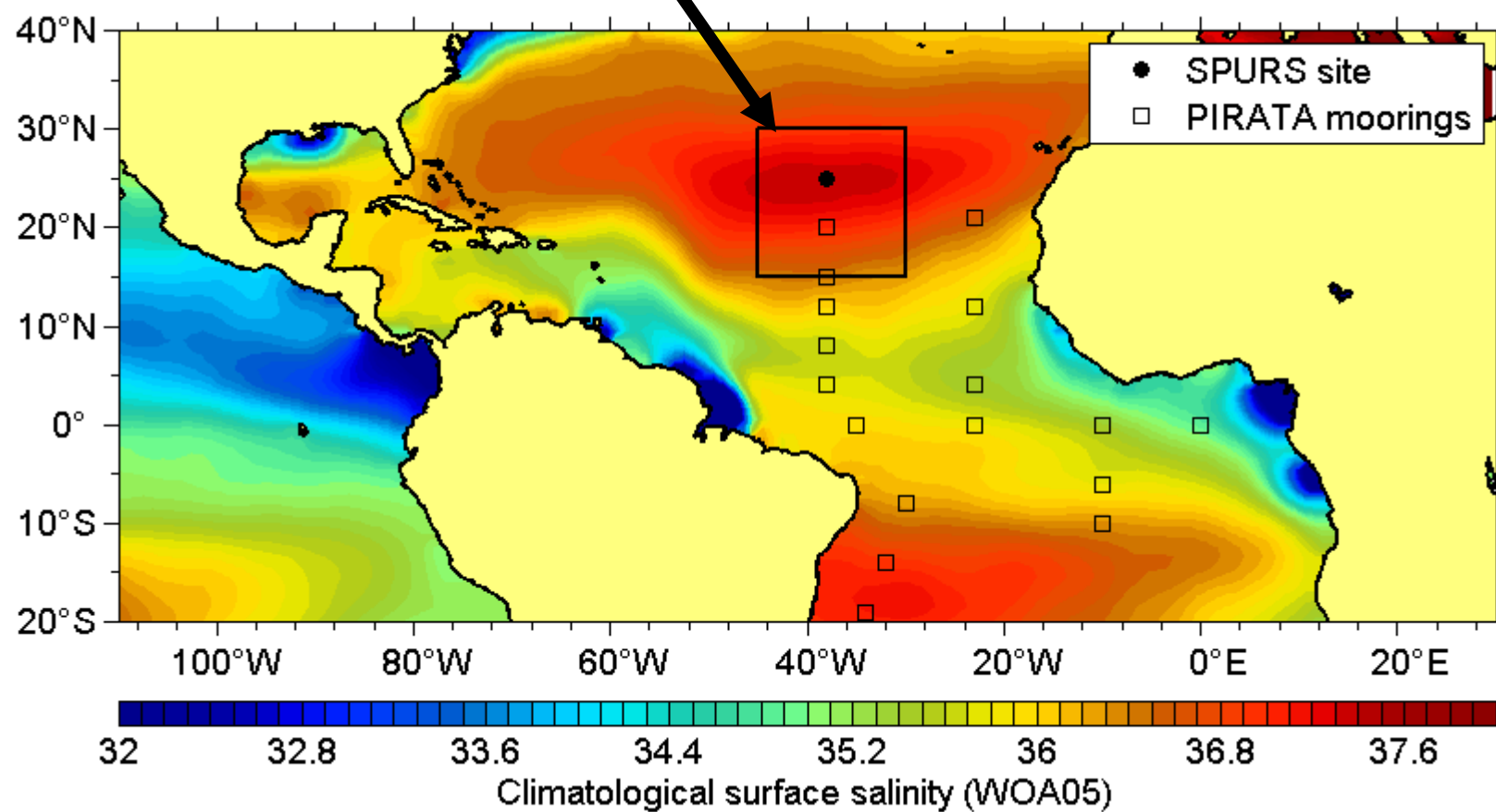
- Floats
- Gliders
- Drifters
- Moorings
- Ships
- AUVs
- Satellites
- CTD & Micro-structure profiling



2012-2013 Sea Surface Salinity (Aquarius)

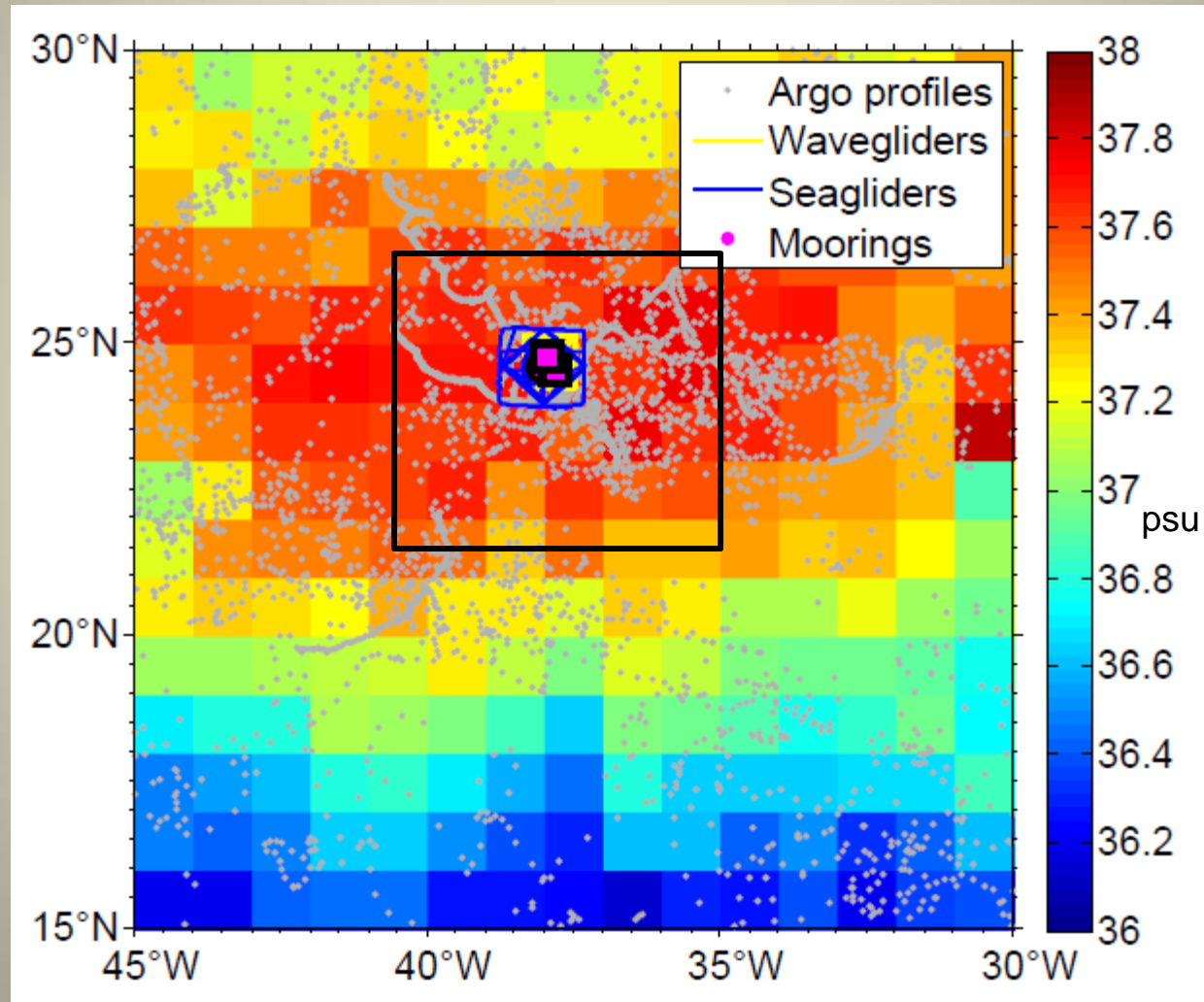


The SPURS “large box”



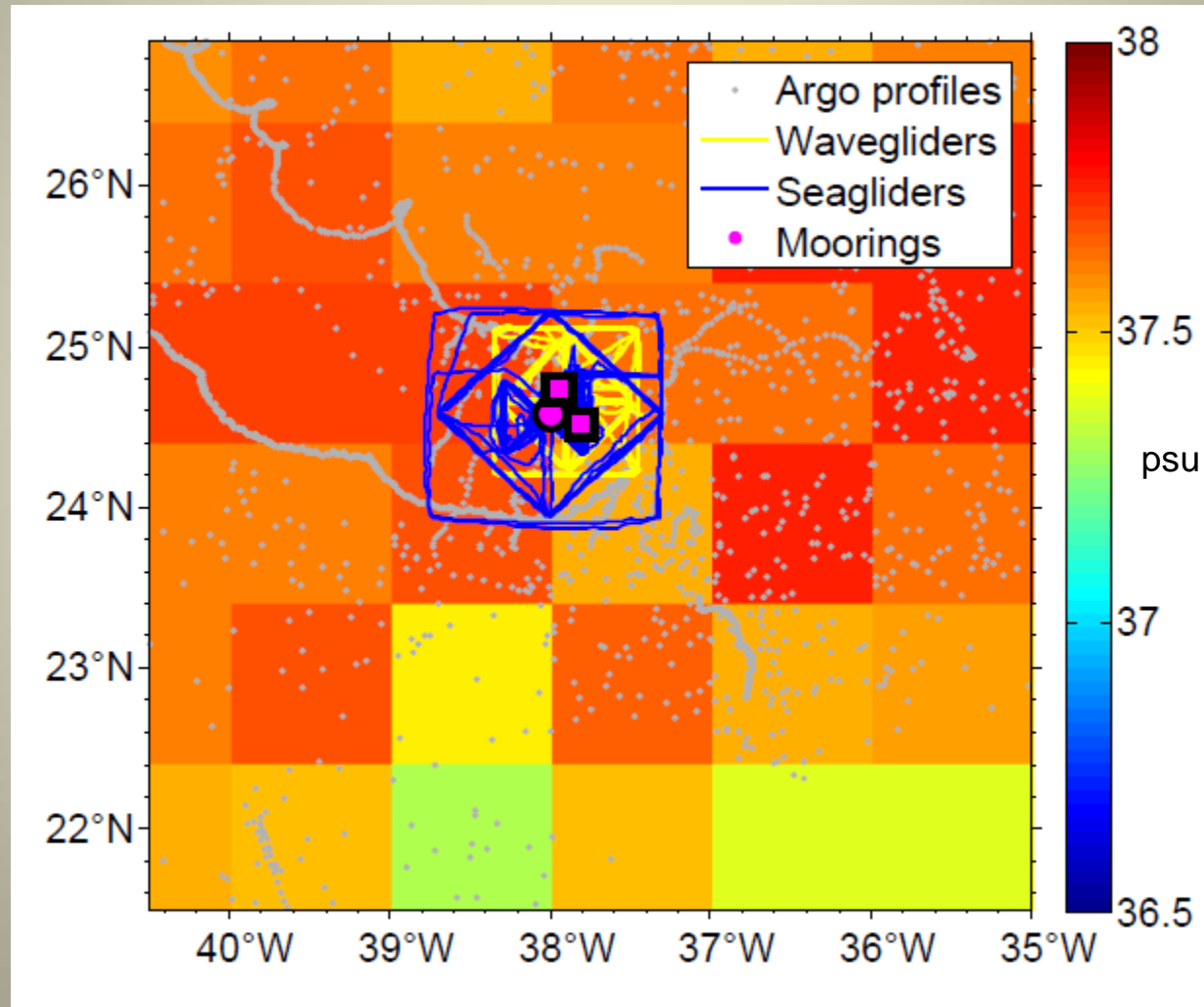
The SPURS “large box”

Aquarius salinity, March 2012

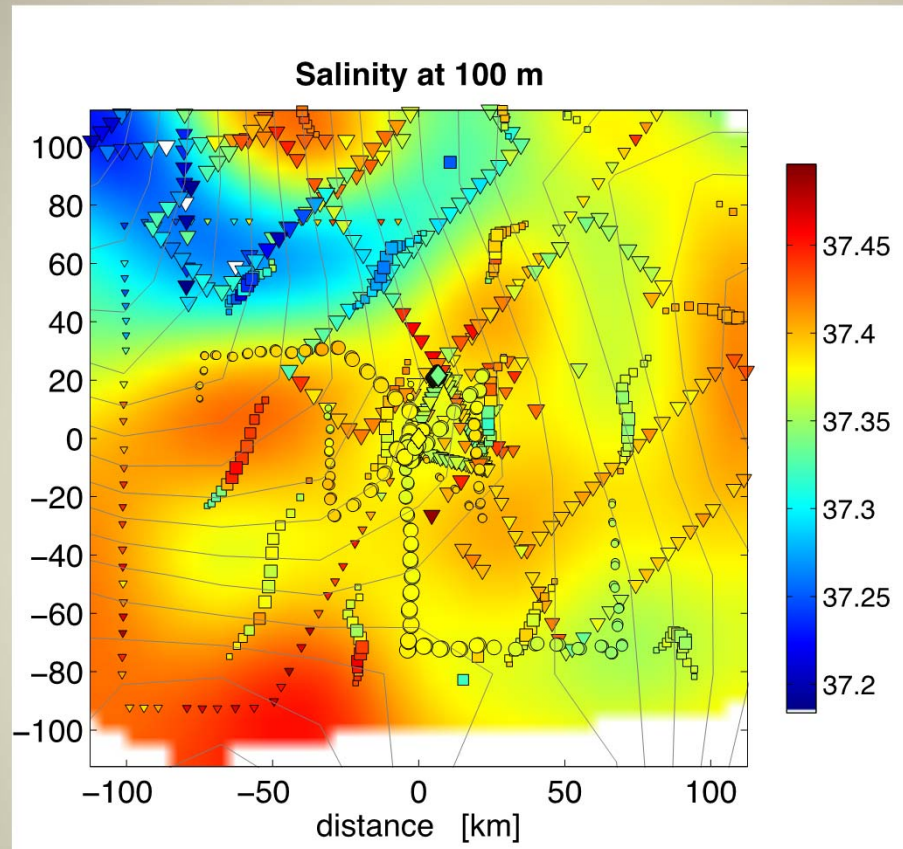


The SPURS “small box”

Aquarius salinity, March 2012



Looking inside the “small box”

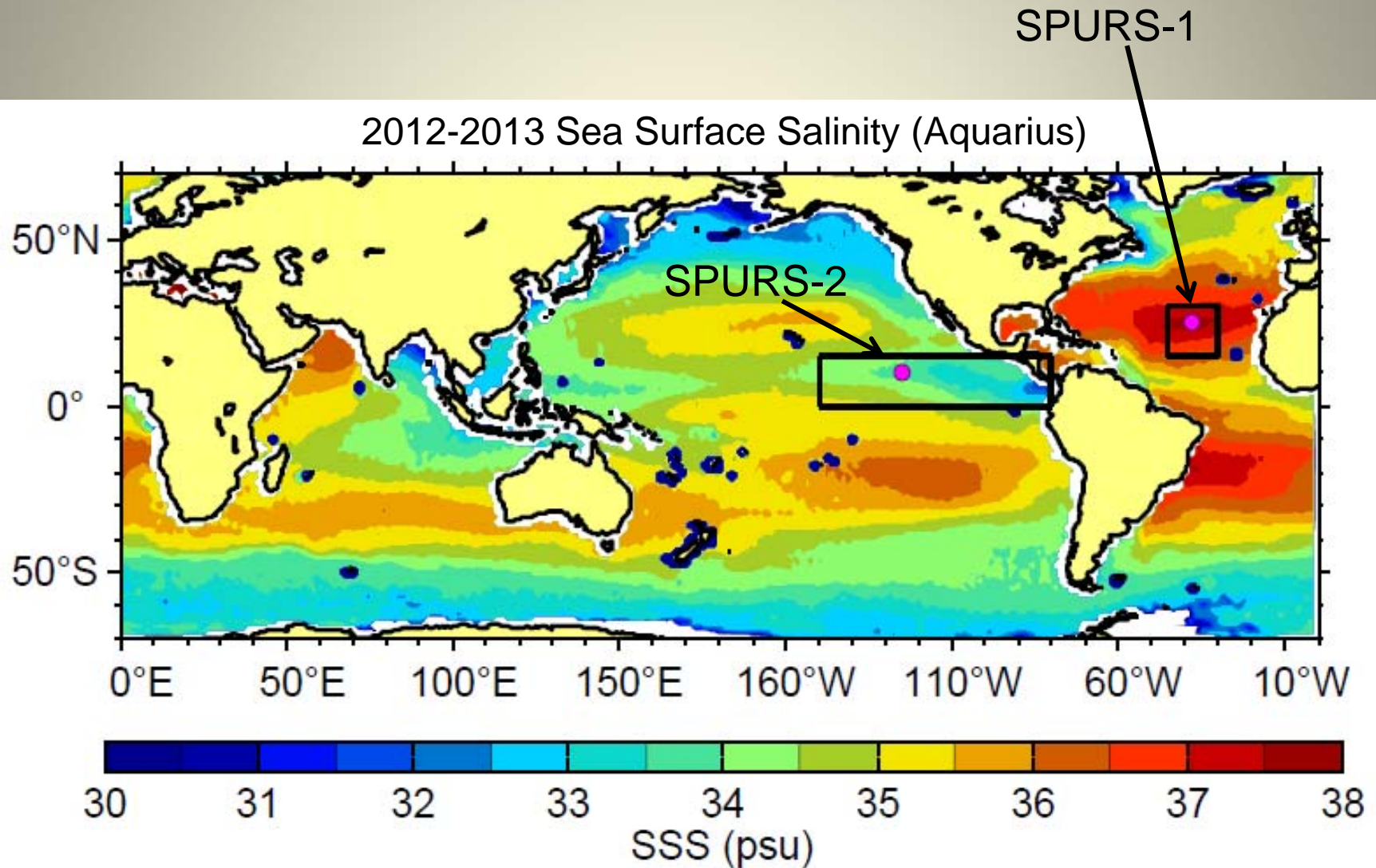


Mapped in situ data showing variability “inside an Aquarius pixel”

Programmatic aspects of SPURS:

- SPURS is currently in the early analysis phase (fieldwork completed last fall)
- Data management has been excellent
 - Program included a dedicated (i.e., funded) data management effort from inception
 - Data management plan developed and made clear at the same time fieldwork was being planned
 - The data management team collected data from fieldwork PIs at each stage (real-time during campaign, preliminary data, quality-controlled data).
 - The data management team will shepherd the QC'ed data into a permanent data archive center (PO.DAAC)
 - This timely sharing has made a real difference in making the data more useful to the other team members and the project as a whole.
- The education/outreach effort was successful for the same reasons
- There has been good integration of modeling (planning, fieldwork, interpretation, assimilation), but no direct connection to model development

Plans for a SPURS-2 experiment in a high precipitation region

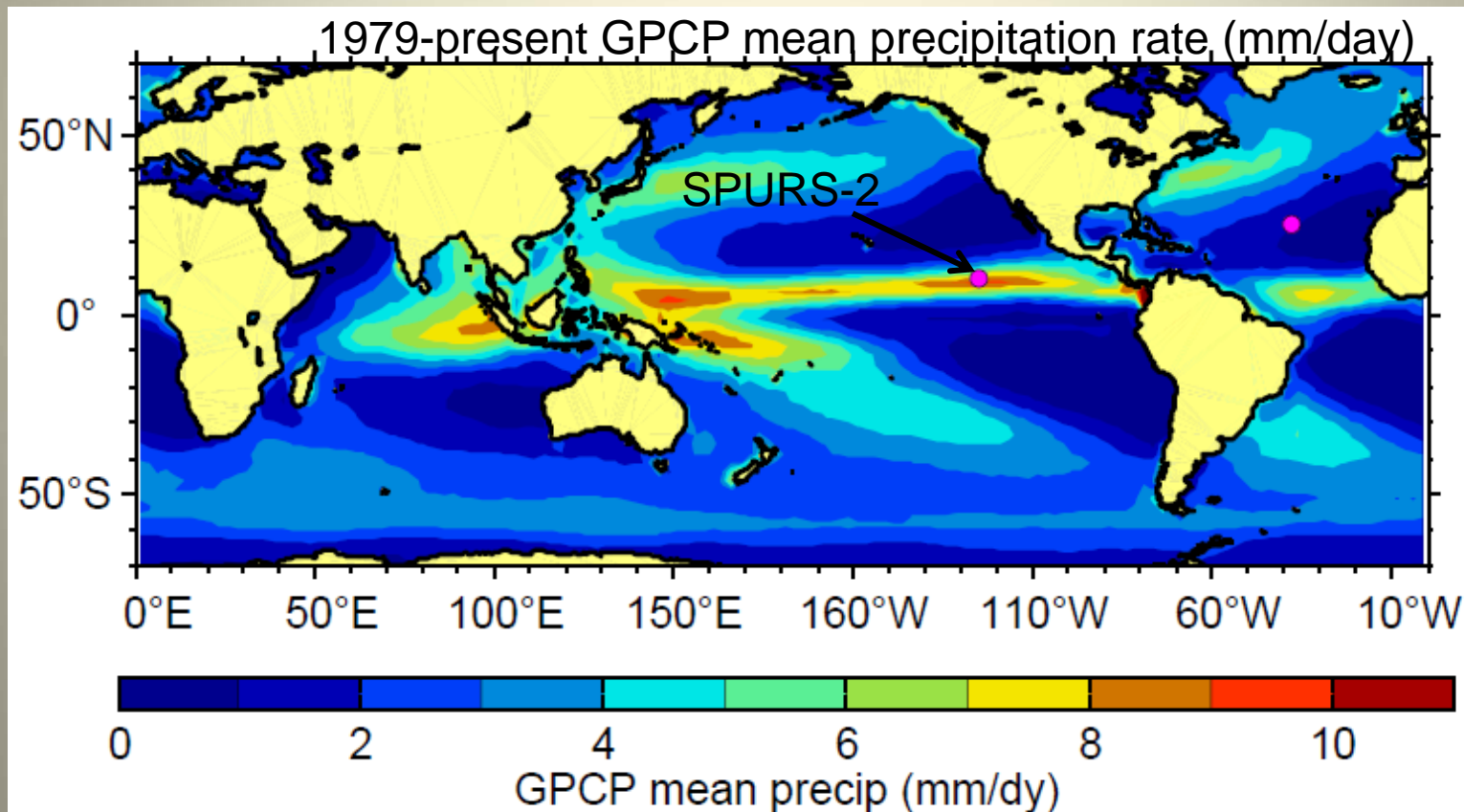


SPURS-2 science questions

What governs the structure and variability of upper-ocean salinity near the ITCZ?

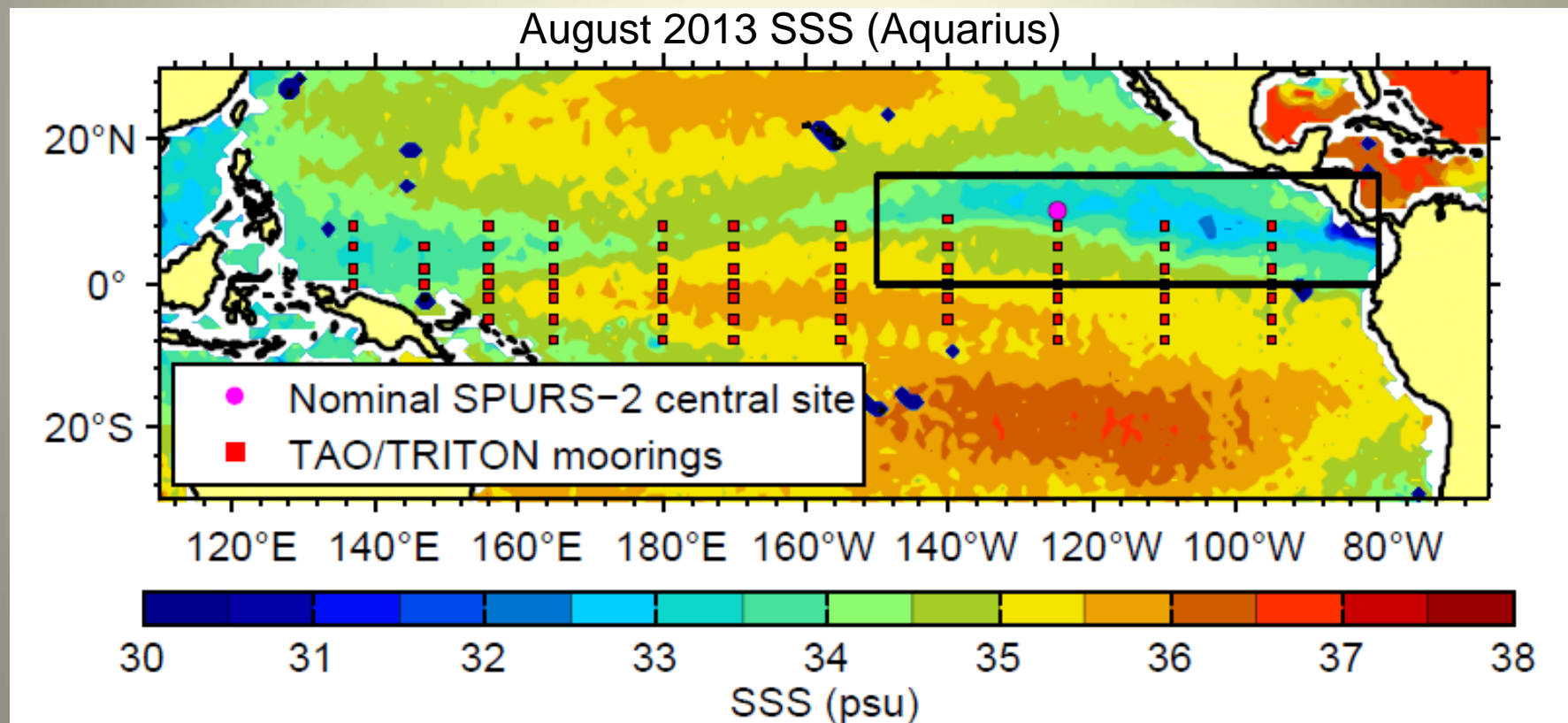
Where does the fresh water go, and how does the ocean distribute it from the small scales of the input (atmospheric mesoscale) to the regional scale of the east Pacific fresh pool?

What local and non-local effect does the freshwater flux have on the ocean and what are the feedbacks on the atmosphere?



Plans for a SPURS-2 experiment in a high precipitation region

- Open workshop held, April 2014
- Site selected in eastern Pacific ITCZ region



Plans for a SPURS-2 experiment in a high precipitation region

- Open workshop held, April 2014
- Site selected in eastern Pacific ITCZ region
- Anticipated start of fieldwork summer 2016, to last one year
- Whitepaper/planning document posted:
<http://spurs.jpl.nasa.gov/SPURS/>

