An abridged history of ALPS

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Why ALPS?

- Autonomous and Lagrangian Platforms and Sensors
- The fundamental observational problem in oceanography is that of sampling a global, turbulent fluid with physical, biological, and chemical processes that are a active over a wide range of scales.
- An approach to ocean observing that relies on many relatively **small**, inexpensive platforms.
- Wide range of scales requires observational systems to be **scalable**
- Intermittence and regionality requires observational systems to be **portable**

Ocean observing in the early 2000's

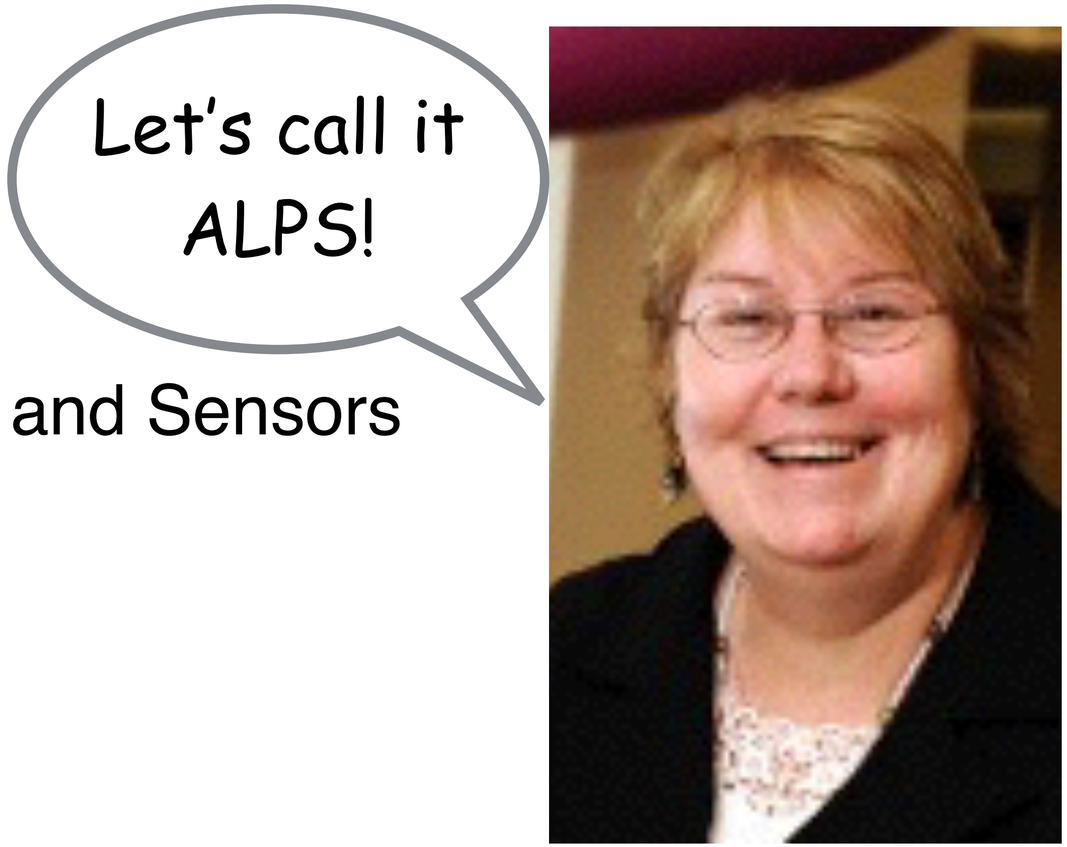
- The US economy was good!
- There were competing ideas on how to observe the ocean.
- The agencies (thought they) had the resources to pursue these ideas.
- Lots of planning exercises. Come on, it was the year 2000!

A proposal for a workshop

- Lagrangian and Autonomous Sampling Methods in Oceanography
- LASMO: That's a really bad acronym!
- We need a team!
- Get a relatively young person (that's me).
- Get somebody who knows the ropes.

I know about them ropes!

The first ALPS workshop

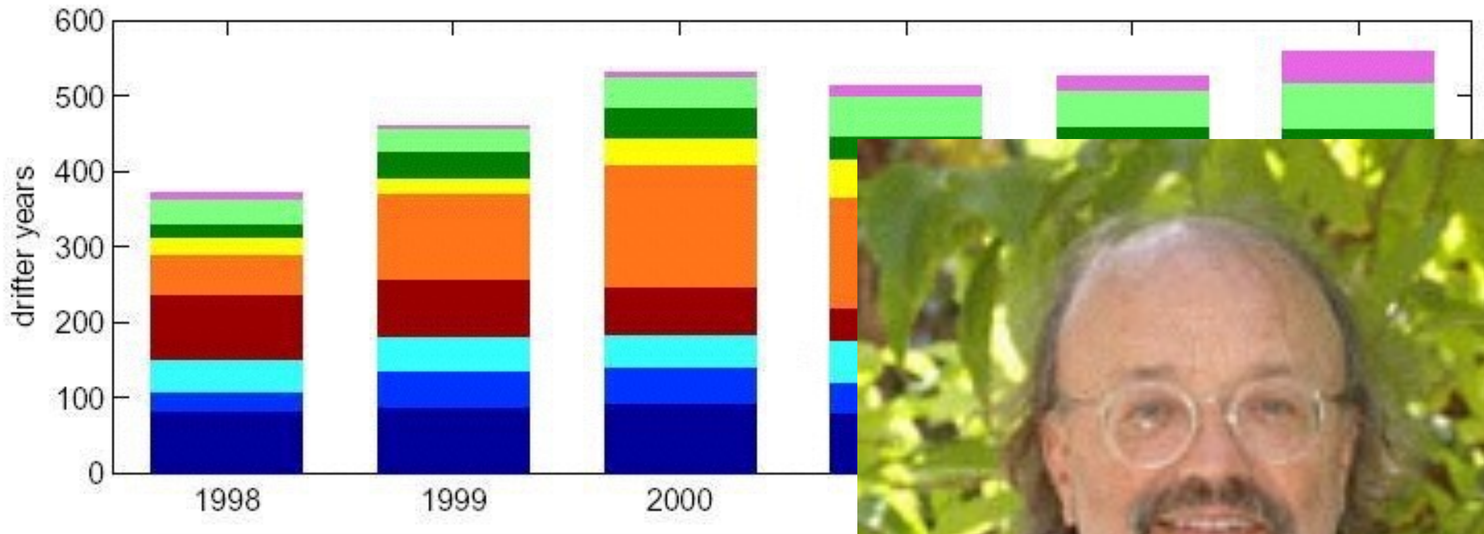


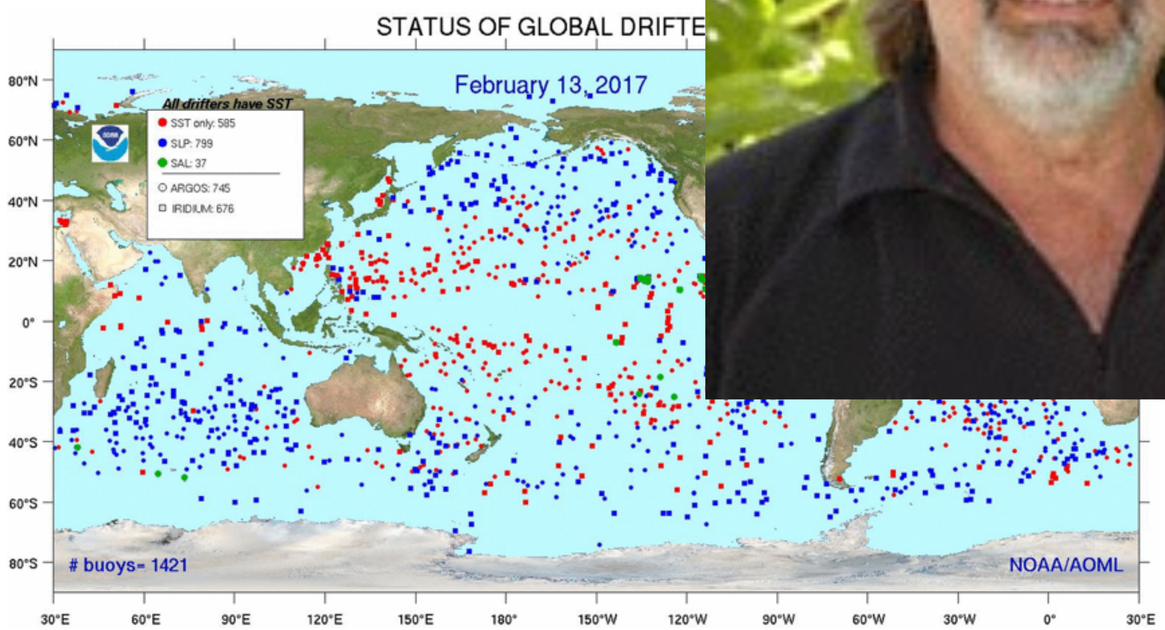
- Autonomous and Lagrangian Platforms and Sensors
- 31 March - 2 April 2003
- 52 attendees
- Sea Lodge, now the La Jolla Shores Hotel

ALPS agenda

- Drifters
- Floats
- AUVs
- Gliders
- Optics
- Acoustics
- Chemical sensors
- Molecular sensors
- Microsystem technology

Drifters

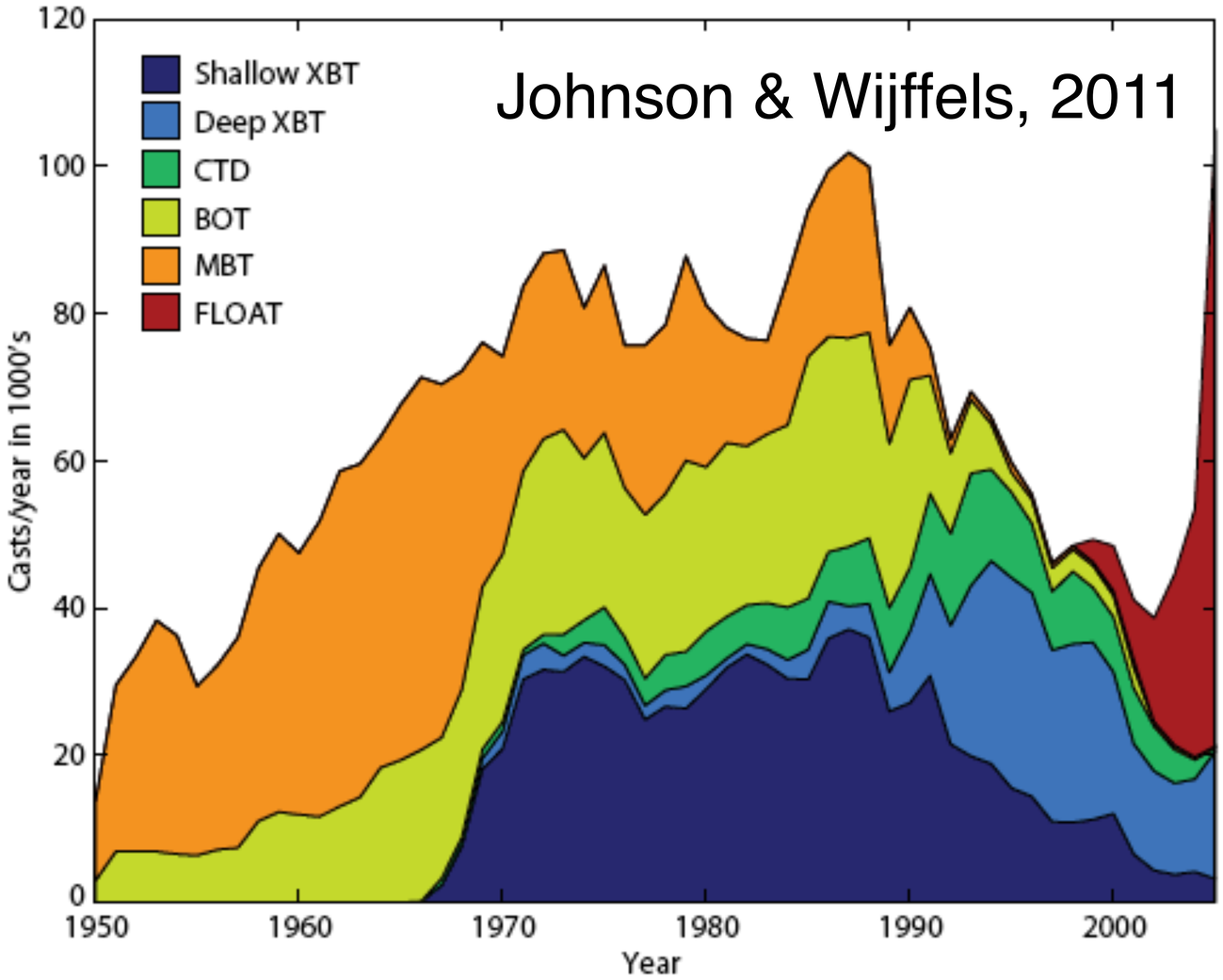




"There will be there will be a brightly colored drogue …with a flashing strobe in it"

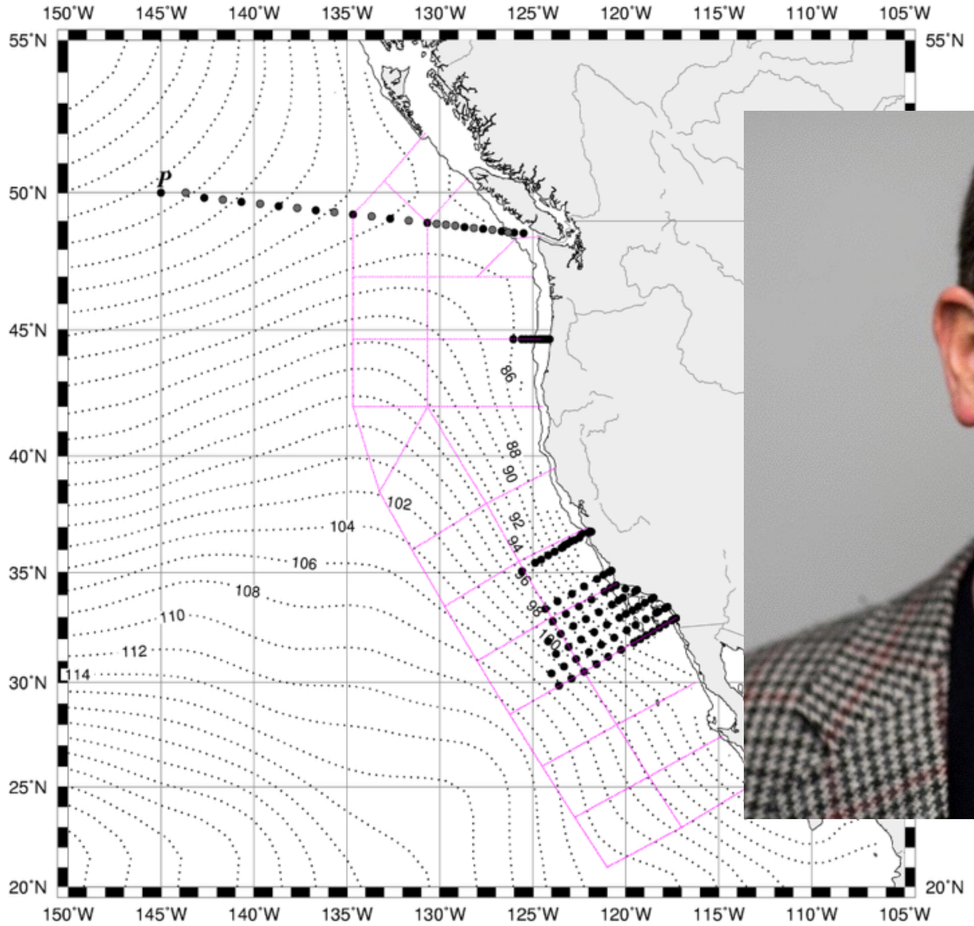
2017

Floats



The hand off.

Underwater gliders

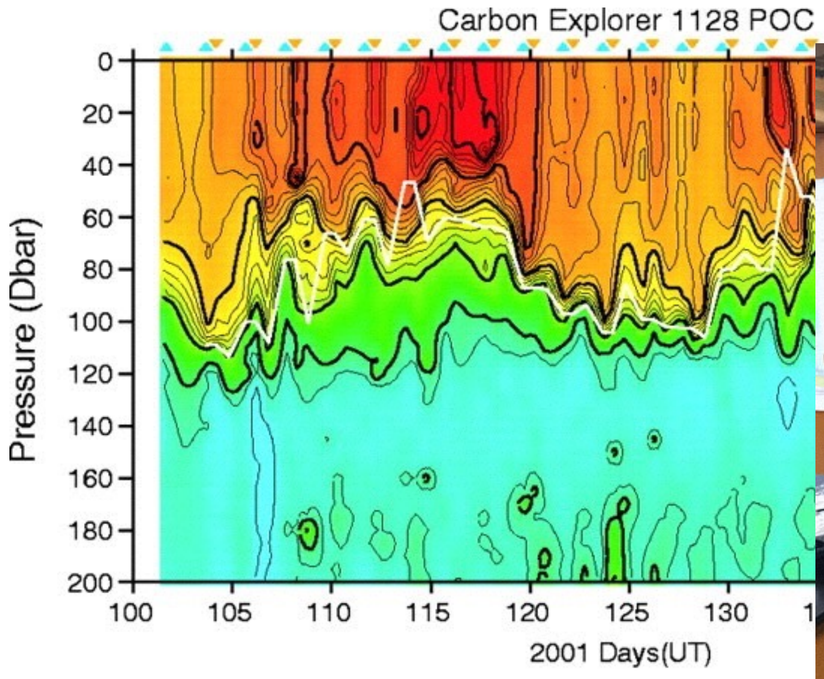


I like pink!

2002

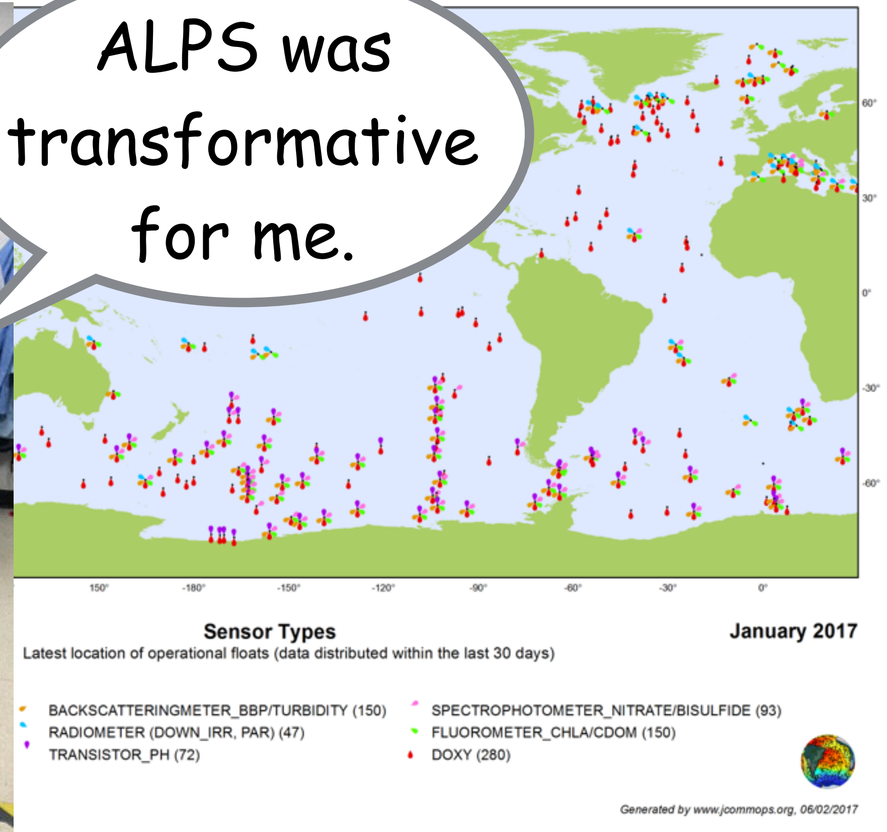
2017

Biogeochemical sensors



Bishop et al., 200_

ALPS was transformative for me.



BGC-Argo, 2017

What did the original ALPS miss?

- Autonomous surface vehicles
- Unmanned aerial vehicles
- Animals as platforms
- ALPS and models: state estimates and forecasts, vehicle control
- There was a followup to ALPS, that was called ALPS 2 at the time. We will call it ALPS 1.5! An outcome was a special issue in L&O in 2008.

ALPS-II mission

- To survey progress in autonomous platforms and sensors for ocean research since the original ALPS meeting 13 years ago
- To assess future prospects and challenges

ALPS-II agenda

- BGC sensors
- Floats
- Underwater gliders
- Autonomous underwater vehicles
- Autonomous surface vehicles and drifters
- Marine mammals
- Unmanned aerial vehicles
- Global scale physics, biogeochemistry, biology
- Carbon system
- Coastal and boundary current systems
- Ice-based observing
- Acoustics
- Process studies
- Living marine resources
- State estimation and forecasting
- Control
- Outreach

Breakouts

- Technologies
- Science on a global scale
- Science on a regional scale
- Infrastructure and access
- Forecasting and other modeling needs
- Focus on the future

A few thoughts on the future

- The over/under on how many research vessel days there will be in the future per year relative to today? I take the under.
- What are we going to do about it?
- ALPS is a realistic answer to advance research in the future.
- Ease of use and access must be addressed.
- Take advantage of the widespread interest in robotics.