SMALL DATA FOR A BIG OCEAN
A Tale of Fire and Ice (Cream)

Steve Diggs
Research IT Faculty Showcase
2019.04.23
Constant Change
(No Change)
“There should be a World Ocean Circulation Experiment to understand quantitatively the present state of the general circulation, in order to assess the sensitivity of the climate system to changes in external forcing, whether natural or anthropogenic, on time scales of decades to centuries should be implemented vigorously”.

The Joint Scientific Committee

The Committee on Climatic Changes and the Ocean

Tokyo
1982
**CCHDO:** CLIVAR & Carbon Hydrographic Data Office

**Officially:** Data Office for GO-SHIP, CLIVAR, WOCE, pre-WOCE

**Location:** Scripps Institution of Oceanography / UCSD

**Data:** 2295 Cruises / 100,026 profiles

**Purpose:** Data Assembly and Dissemination Center

**Contacts:**
- Technical Dir. : **Steve Diggs**
- Scientific Adv. : **Sarah Purkey**
- Director : **Karen Stocks**

**Type of Data Managed:** Sustained hydrographic observations of *trans-oceanic reference quality hydrographic*, ocean carbon, and tracer measurements.
The Deep Ocean is Warming

- The deep ocean is warming around the global on decadal time scales
- Strongest warming in the Southern Ocean, weaker but significant warming along the bottom limb of the MOC

(Purkey and Johnson 2010)
Use of Historical CTD to assess Argo float salinity drift

WMO: 5902351 (Green)
SIO SOLOII
Deployed: 23 Oct 2014
Star: Present Location

Background:
Argo Historical CTD dataset (Ver2017)
Red: Since 2008
Blue: Prior to 2008

The OW software suggests an adjustment to the positively drifting salinity of amplitude 0.02 psu by profile

Blue: Float data
Red: Mapped Historical CTD salinity
Green: Float salinity after suggested adjustment

CTD data are critical for adjusting Argo data for sensor drift.

Green: OW suggested linear correction (set for no piecewise fit) with errors

Slide courtesy of John Gilson, SIO
Global Warming of 1.5°C

An IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.
Serving Our Users: 24/7/365
Next Phase

A hybrid approach:

- PID (DOI) minting
- State lives in the cloud (S3, RDS),
- Stateless application run time (i.e. Docker) lives in Scripps CoLocation Facility
- Everything reverse proxy through UCSD
SCRIPPS @ UCSD

Capricorn Expedition, 1952. First Scripps expedition to use scuba.
1903  Founded at Hotel del Coronado boathouse

1912  Scripps joins the University of California

1925  Renamed Scripps Institution of Oceanography

1960  Scripps becomes a department within UC San Diego
OUR RESEARCH FLEET CONSISTS OF FOUR SHIPS

R/V Sally Ride

RP Flip

R/V Robert Gordon Sproul

R/V Roger Revelle
Investigations and impact on every continent and in every ocean.

Scripps research vessel tracklines, 1952-2016.
ESTABLISHED LONG TERM EARTH MONITORING PROGRAMS

Keeling Curve
Scripps Institution of Oceanography works to understand and protect the planet, and investigate the oceans, earth, and atmosphere to find solutions to our greatest environmental challenges.
THANK YOU
THERE IS HELP

siodata@ucsd.edu