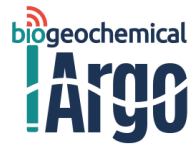


US BGC-Argo Data Management Update

Slides prepared by
Tanya Maurer & Josh Plant (MBARI); Claudia Schmid (AOML)

9th BGC Argo Meeting, ADMT 21
November 30 – December 1, 2020
Virtual



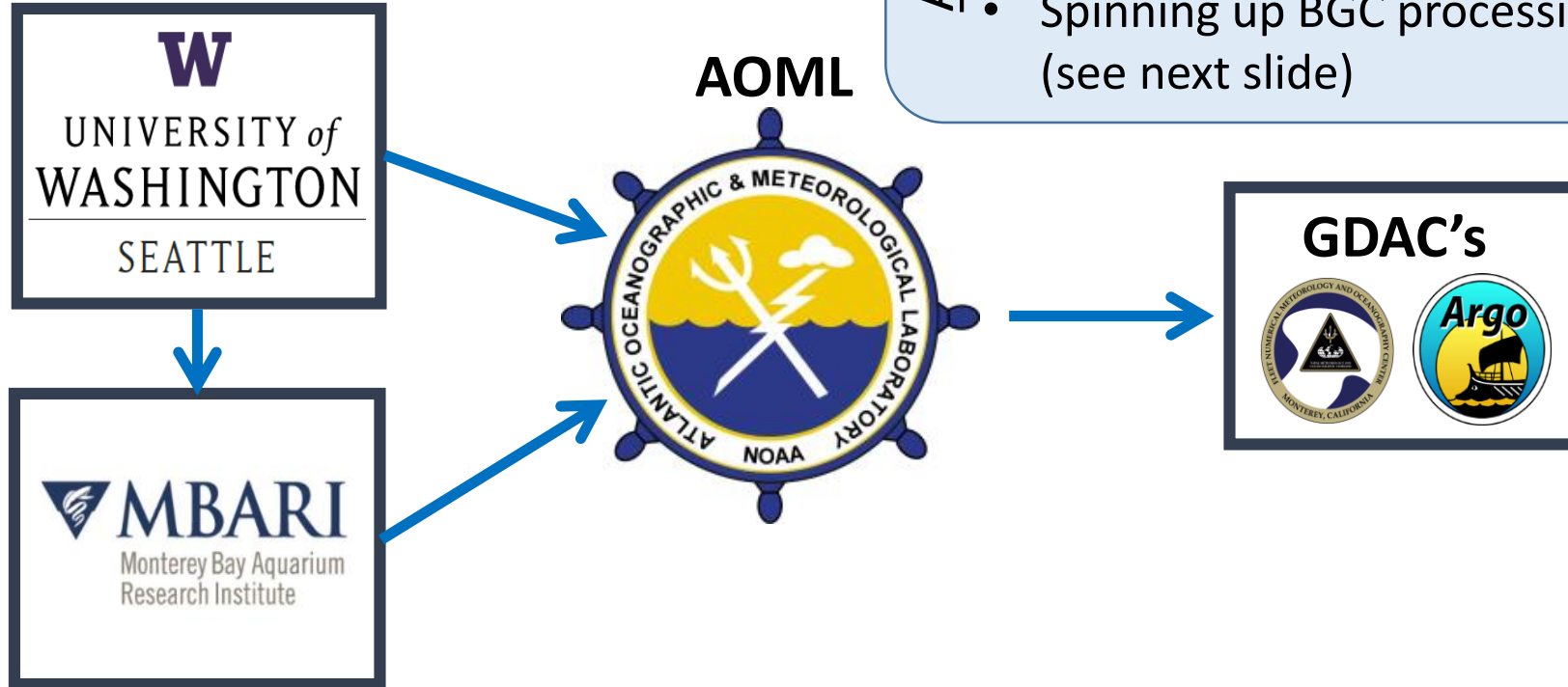
US BGC float data transfer workflow

UW

- Satellite data telemetry
- RT production of intermediate msg files for AOML
- DM for core data (T & S)
- UW historical oxygen floats (Matt Alkire)

AOML

- RT production of tech, meta, core traj and core R files
- Other historical oxygen floats
- Spinning up BGC processing capabilities! (see next slide)



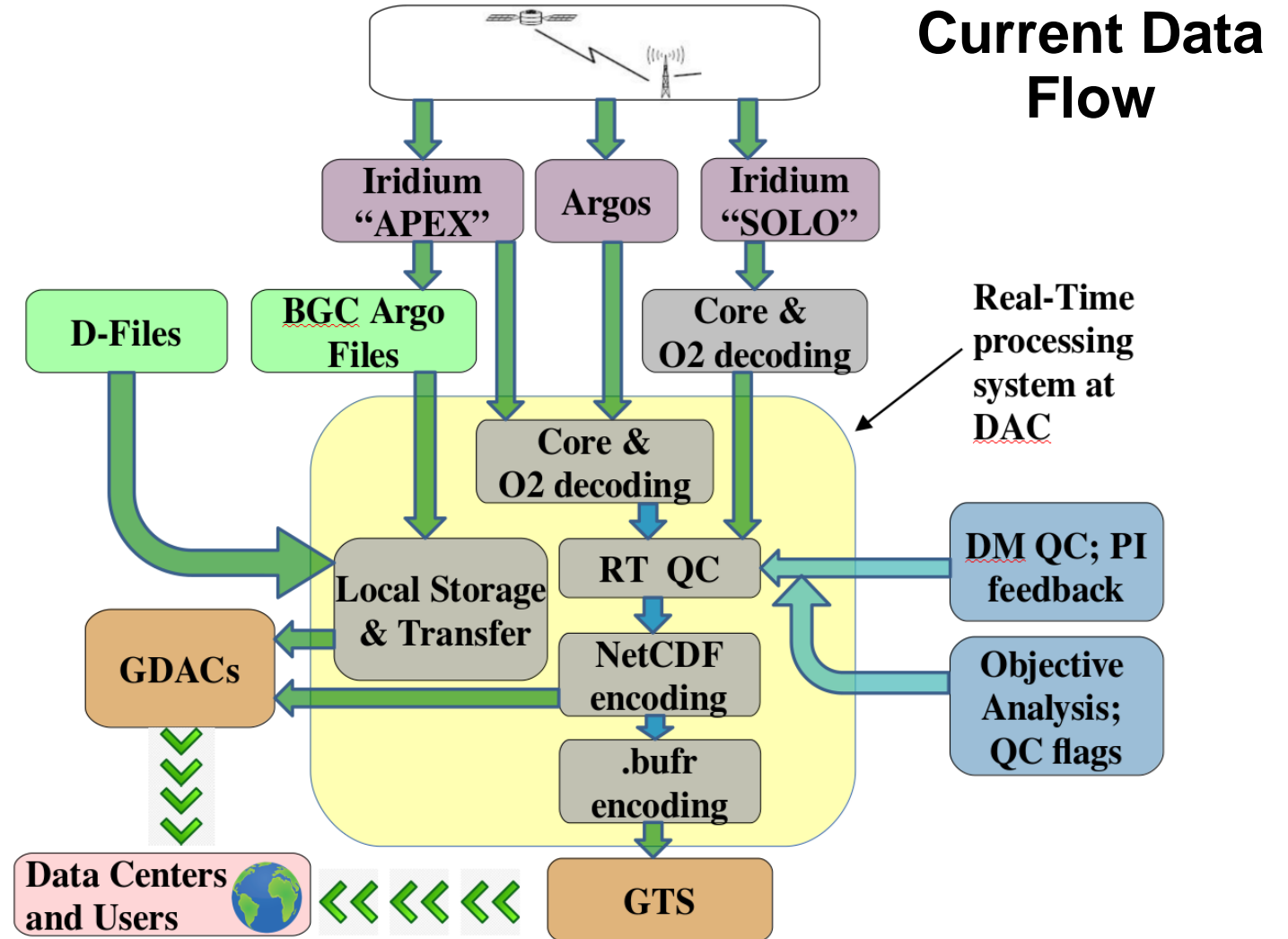
MBARI

- Scientific Processing of SOCCOM and pre-SOCCOM BGC float data (total 267 floats)
- RT production of BR-files
- 'A' and 'D' mode adjustments



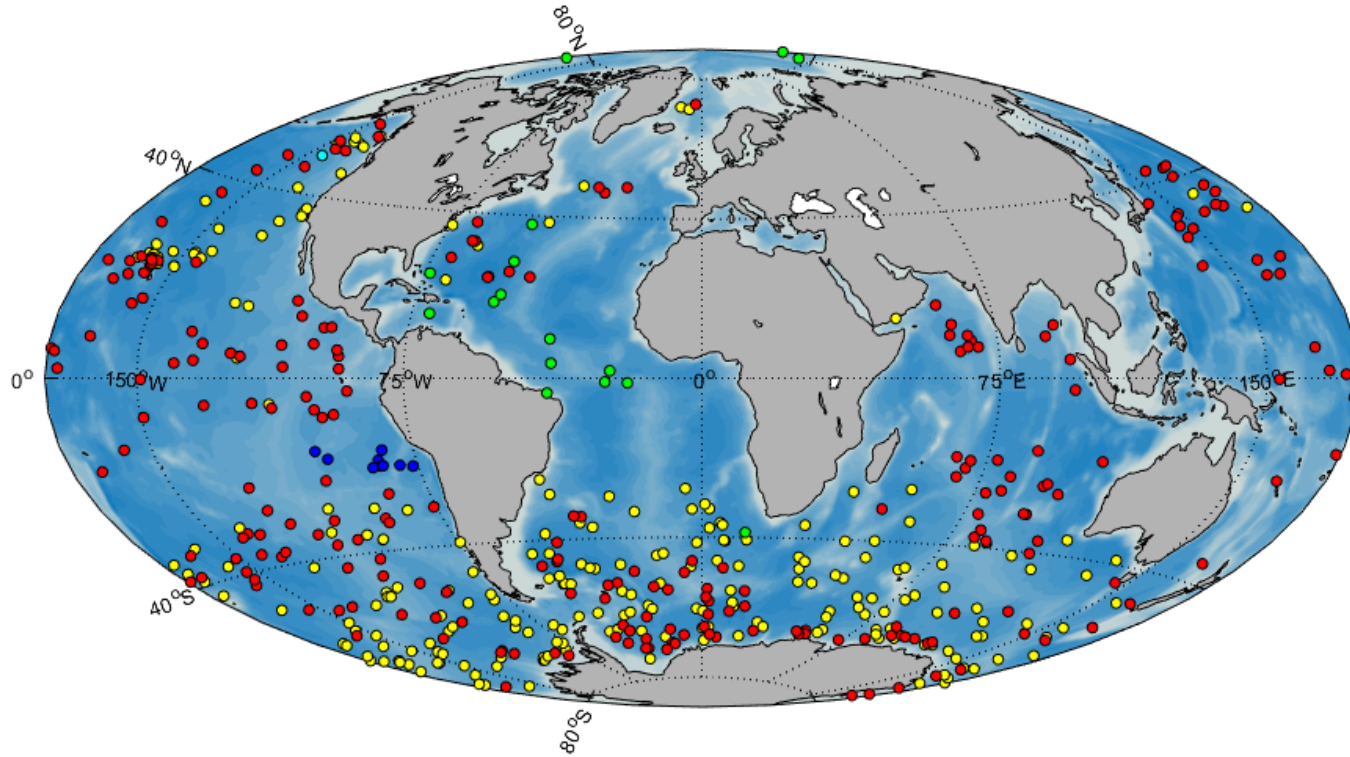
Development of BGC processing system at AOML

- Finished development of BGC decoding software for NAVIS and APEX iridium floats (following cookbook instructions).
- Currently working on writing output files & QC modules.
- Outlook: ready to implement in 2-3 months; start working on processing of SOLO-type BGC floats once format is specified.



Main US BGC DAC team: Jodi Brewster, Bo Yang, Claudia Schmid
With assistance from: Jaya Nair (QC), Charita Atluri (decoding)

AOML BGC Argo Floats



14 November 2020

- Riser & Johnson (245)
- Riser (242)
- Owens (21)
- Weller (10)
- Fassbender (1)

- Total 519 Floats
- 459 APEX, 29 Navis, 31 SOLO-1
- 48 floats deployed since ADMT20
 - 34 SOCCOM
 - 3 CalCurrent (NOAA/PMEL)
 - 11 NOAA TPOS

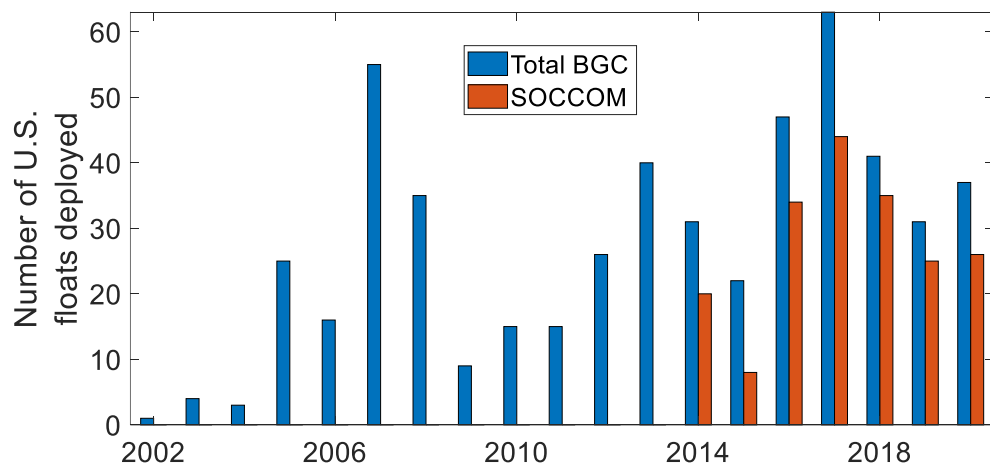
PARAMETER	N FLOATS
DOXY	519
NITRATE	245
PH_IN_SITU_TOTAL	215
CHLA	209
BBP	209
CDOM	28
DOWN_IRRADIANCE	0
UP_IRRADIANCE	0



SOCCOM

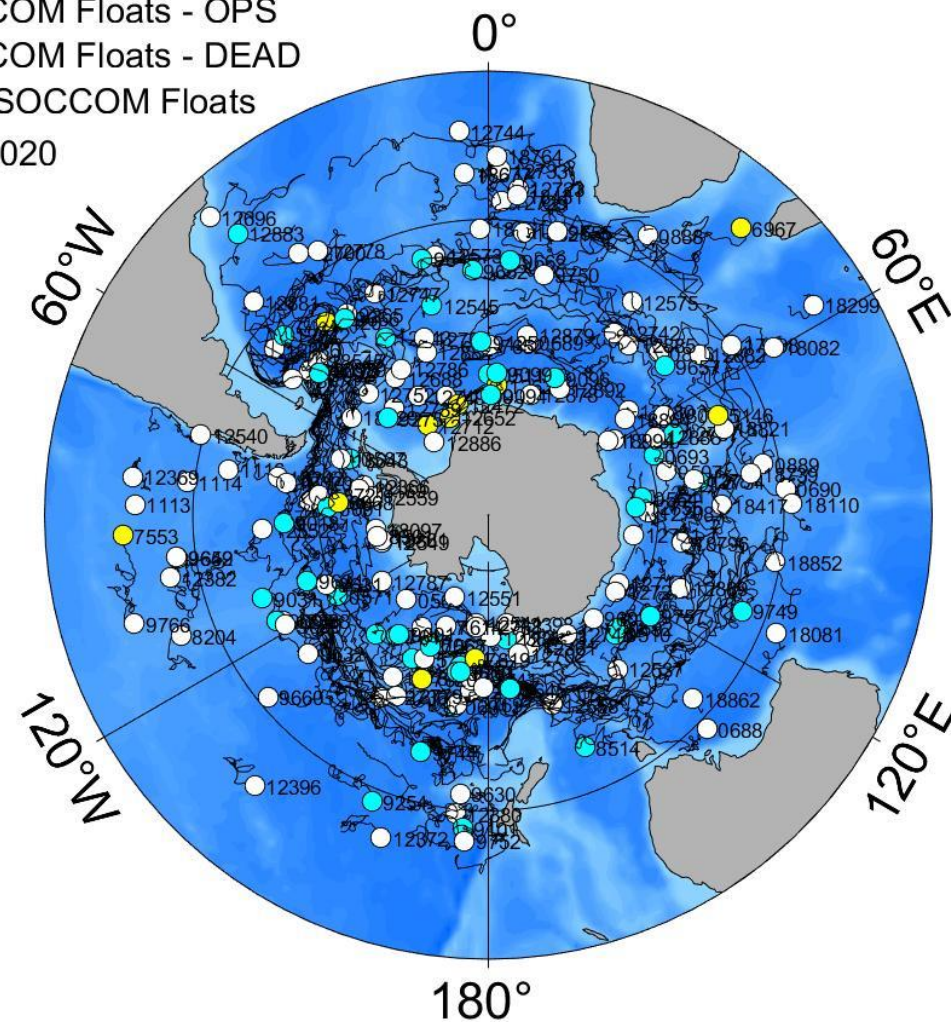
Southern Ocean Carbon and Climate Observations and Modeling

- **193 floats deployed!**
- **128 operational**
- **65 dead**
- **Program extended by NSF to 2014 (150 more floats)**
- **Largest US BGC program over the last 7 years (17,675 profiles on the GDAC)**



- SOCCOM Floats - OPS
- SOCCOM Floats - DEAD
- PRE-SOCCOM Floats

24-Nov-2020



DOXY Audit

ftp://ftp.mbari.org/pub/BGC_argo_audits/DOXY/

- MBARI-lead effort, developed by Josh Plant
- Identifies potentially bad profiles by comparing profile gains against global gain statistics for Argo array (all gains computed using WOA %sat reference)
- DACs are addressing anomalies and feeding back to the data system!
- Since July, 2020:
 - 14% increase in DOXY_ADJUSTED data (80% of total good DOXY profs are now adjusted!)
 - 16% reduction in anomalous profile count

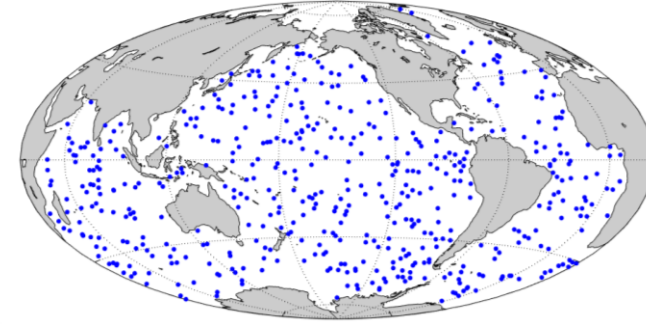
The screenshot displays the SAGE (SOCCOM Assessment and Graphical Evaluation) software interface. The interface is divided into several panels. On the left, there are sections for 'File Selection' (showing '9752SOCCOM.TXT' and 'Show Map'), 'Profile Window' (showing 'Pressure Range (Bar)' and 'GLODAP cross-over range (m)'), 'Plot Type' (showing 'Surface' and 'Depth'), 'Reference Data' (showing 'LIR', 'GLODAP 1974', 'GLODAP 1990', and 'GLODAP 2010'), and 'Parameter to Plot' (showing 'Strain', 'Salinity', and 'Temperature'). The main area displays three plots. The top plot is titled 'Raw' and 'QC', showing 'Nitrate (μmol kg⁻¹)' vs. 'Date' (from 02/01/16 to 07/30/20). It includes a 'Float trend = 0.1139 μmol kg⁻¹ yr⁻¹' and a 'LIR trend = 0.0051 μmol kg⁻¹ yr⁻¹'. The middle plot shows 'Anomaly trend = 0.1088 μmol kg⁻¹ yr⁻¹' and 'Mean Diff (FIR-MLR) = -1.454 μmol kg⁻¹'. The bottom plot shows 'Nitrate (μmol kg⁻¹)' vs. 'Date' (from 02/01/16 to 07/30/20). The right panel shows a legend for 'RAW data', 'LIR', 'GLODAP 1974', 'GLODAP 1990', and 'data1'. The bottom right panel shows statistics: 'BIC = 1.01', 'BIC N = 148', 'BIC K = 6', 'RSS = 2.16E+00', and 'Total N = 1.48E+02'.

The Global Ocean Biogeochemistry (GO-BGC) array has been funded!!

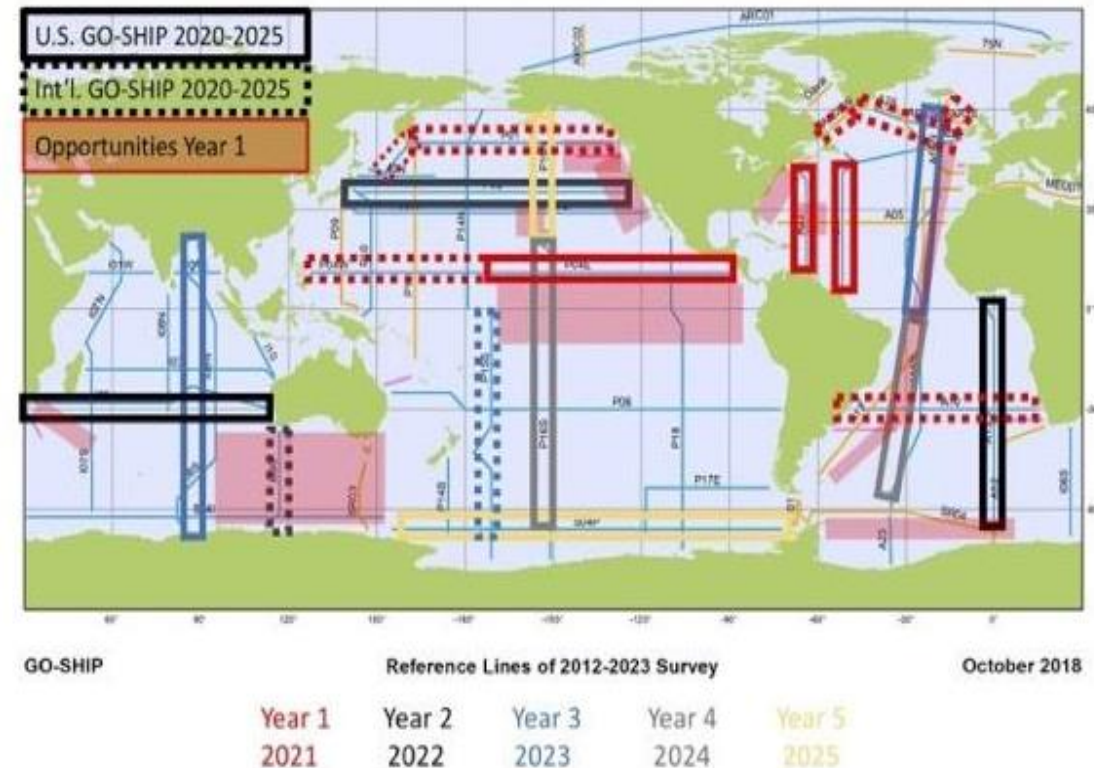
Mid-scale RI-2 Consortium:

GO-BGC: A global robotic network to observe changing ocean chemistry and biology

- 500 BGC profiling floats deployed globally
- \$52,900,000 over 5 yrs (no science funding)
- 5 institution consortium PI team
- MBARI to lead BGC Argo processing; core Argo processing managed by deployment institutions (ops proposal just submitted)
- Float deployment opportunities via US GO-SHIP



biogeochemical
Argo



Ken Johnson
MBARI
PI



Lynne Talley
SIO
Co-PI



Steve Riser
Univ. of Wash.
Co-PI



Susan Wijffels
WHOI
Co-PI



Jorge Sarmiento
Princeton Univ.
Co-PI

A Look Ahead...

		Year 1					Year 2					Year 3				Year 4				Year 5				All
Lab	Float	GO-BGC	NOAA NASA	NOP P	SOC COM	Total	GO-BGC	NOAA	NOP P	SOC COM	Total	GO-BGC	NOAA	SOC OM	Total	GO-BGC	NOAA	SOC OM	Total	GO-BGC	NOAA	SOC OM	Total	
UW	APX	40	5		30	75	40	5		30	75	40		30	70	40		30	70	40			40	320
	NAV	6		4		10	24	3	5		32	25			25	25			25	25			25	105
WHOI	NAV	10	5			15	15				15	25			25	30			30	35			35	120
	IDG																							
SIO	SOL			4		4																		4
	MRV SOL						5	2	1		8	15			15	30			30	30			30	83
Total						104					130				135				155				130	654



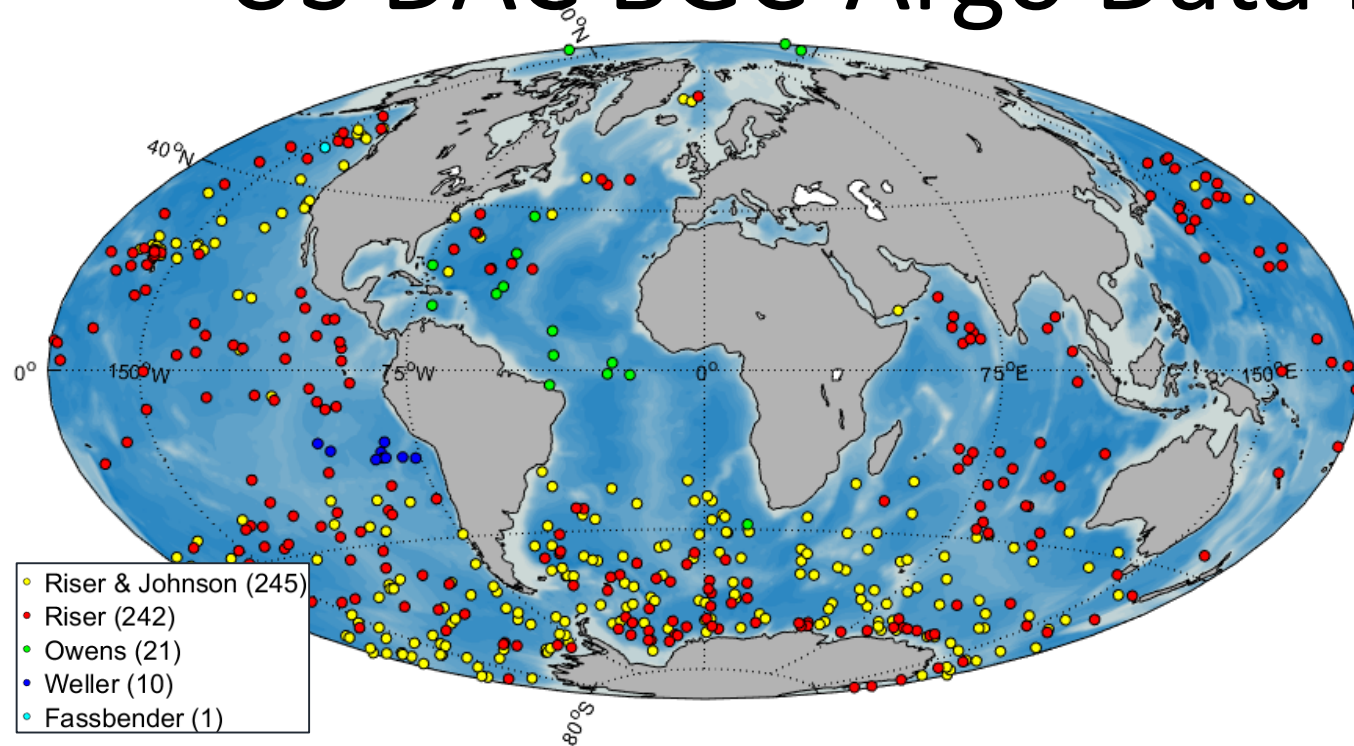
U.S. DAC to manage 654 more BGC floats over the next 5 years!



GO-BGC Global Ocean Biogeochemistry Array

END

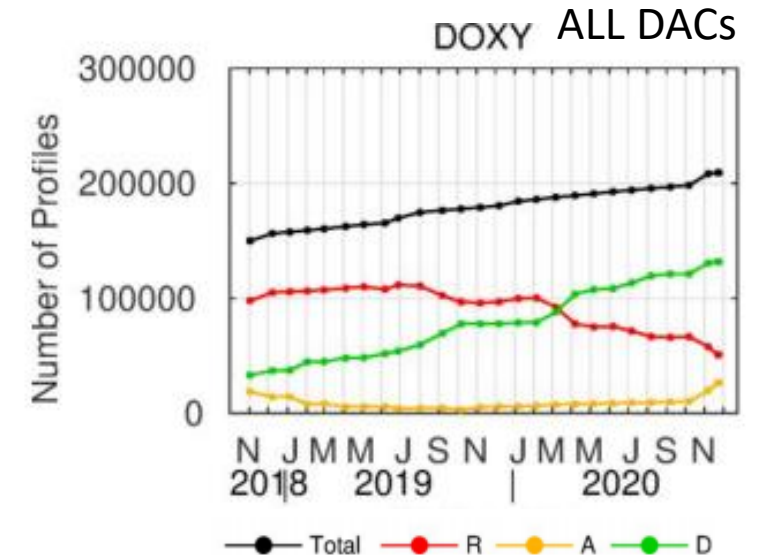
US DAC BGC-Argo Data Management: STATUS



- US BGC data management a collaboration between MBARI, UW, AOML
- BGC processing system at AOML is maturing
- DMQC of historical UW O2 floats lead by Matt Alkire (UW)
- MBARI-developed tools & reports help to increase level of adjusted data on the GDAC!
 - DOXY audit by Josh Plant (80% of total good DOXY profs are now adjusted!)
 - SAGE tools being utilized by other DACs

- **Total 519 Floats**
- **459 APEX, 29 Navis, 31 SOLO-1**
- **48 floats deployed since ADMT20**
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US DAC BGC-Argo Data Management: FUTURE

- SOCCOM project extended by NSF to 2024 (150 more floats)!
- The Global Ocean Biogeochemistry (GO-BGC) array has been funded!!
 - \$52,900,000 & 500 floats (via US GO-SHIP)
 - 5 institution consortium PI team (MBARI, SIO, UW, Princeton, WHOI)
 - MBARI to process BGC data, core data managed by deployment institutions
- *654 more BGC floats managed by US DAC over the next 5 years!*

		Year 1					Year 2					Year 3					Year 4					Year 5					All
Lab	Float	GO-BGC	NOAA NASA	NOP P	SOC COM	Total	GO-BGC	NOAA	NOP P	SOC COM	Total	GO-BGC	NOAA	SOC OM	Total	GO-BGC	NOAA	SOC OM	Total	GO-BGC	NOAA	SOC OM	Total				
UW	APX	40	5		30	75	40	5		30	75	40		30	70	40		30	70	40			40	320			
	NAV	6		4		10	24	3	5		32	25			25	25			25	25			25	105			
WHOI	NAV	10	5			15	15				15	25			25	30			30	35			35	120			
SIO	IDG SOL			4		4																		4			
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Total						104					130				135				155				130	654			

