

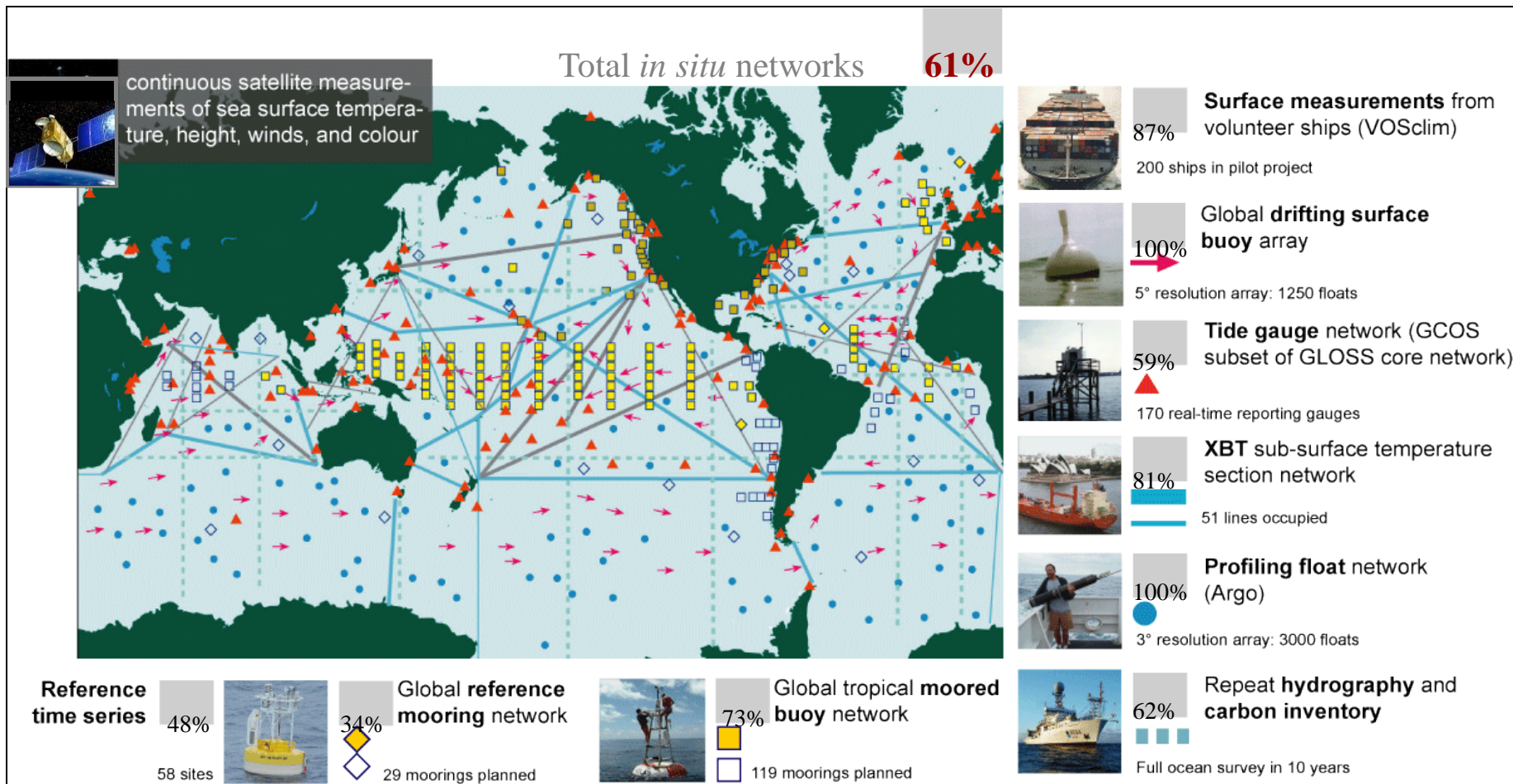
Argo Case Study

Zdenka Willis

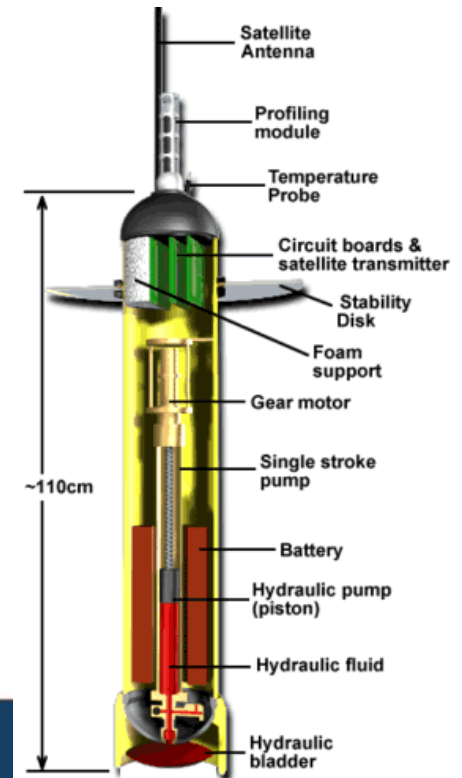
Director, US Integrated Ocean Observing System

The Initial Global Ocean Observing System for Climate

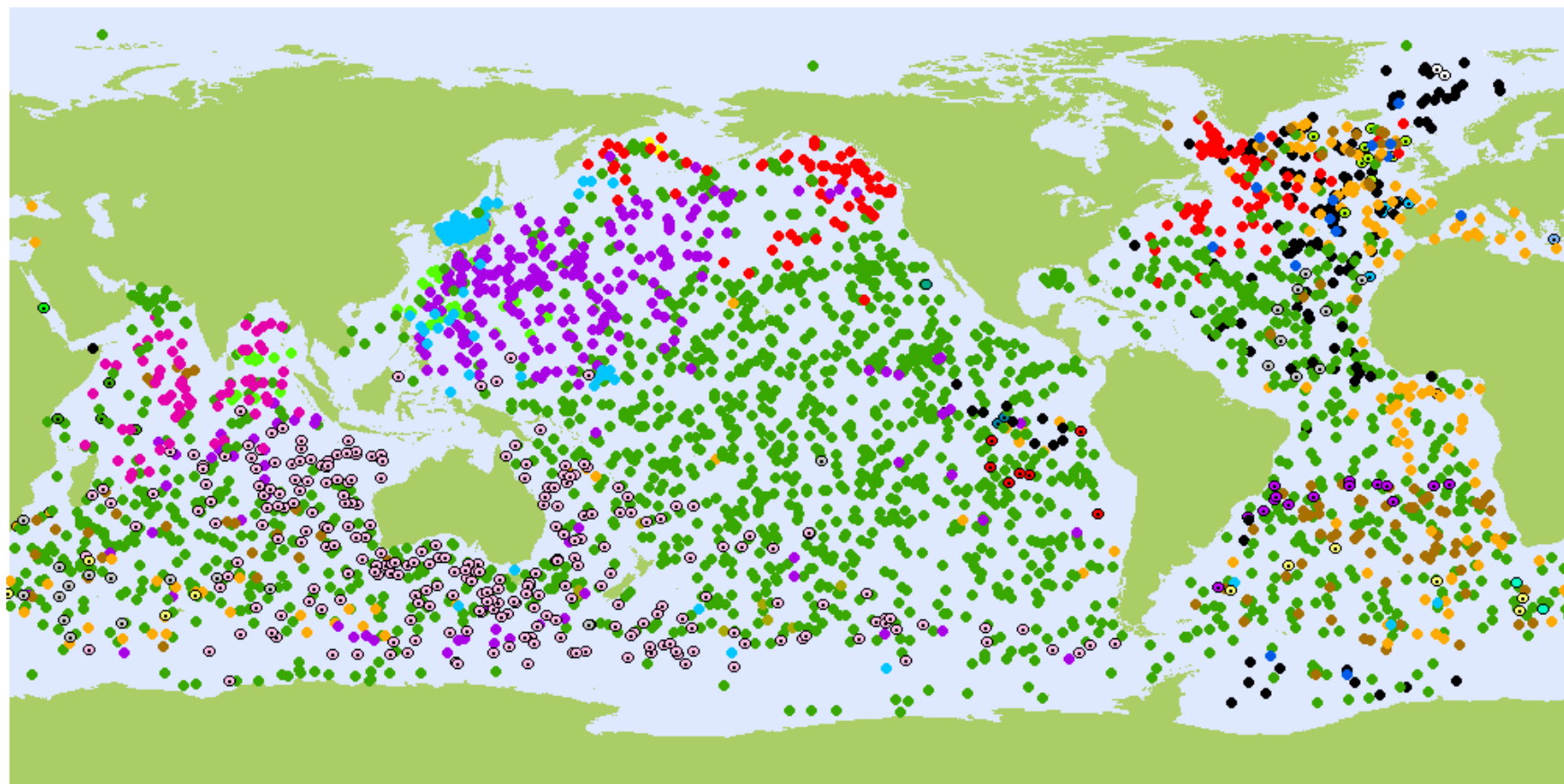
Status against the GCOS Implementation Plan and JCOMM targets



Profiling Floats - Basic Operation



Active Argo Floats as of 30 September 2010

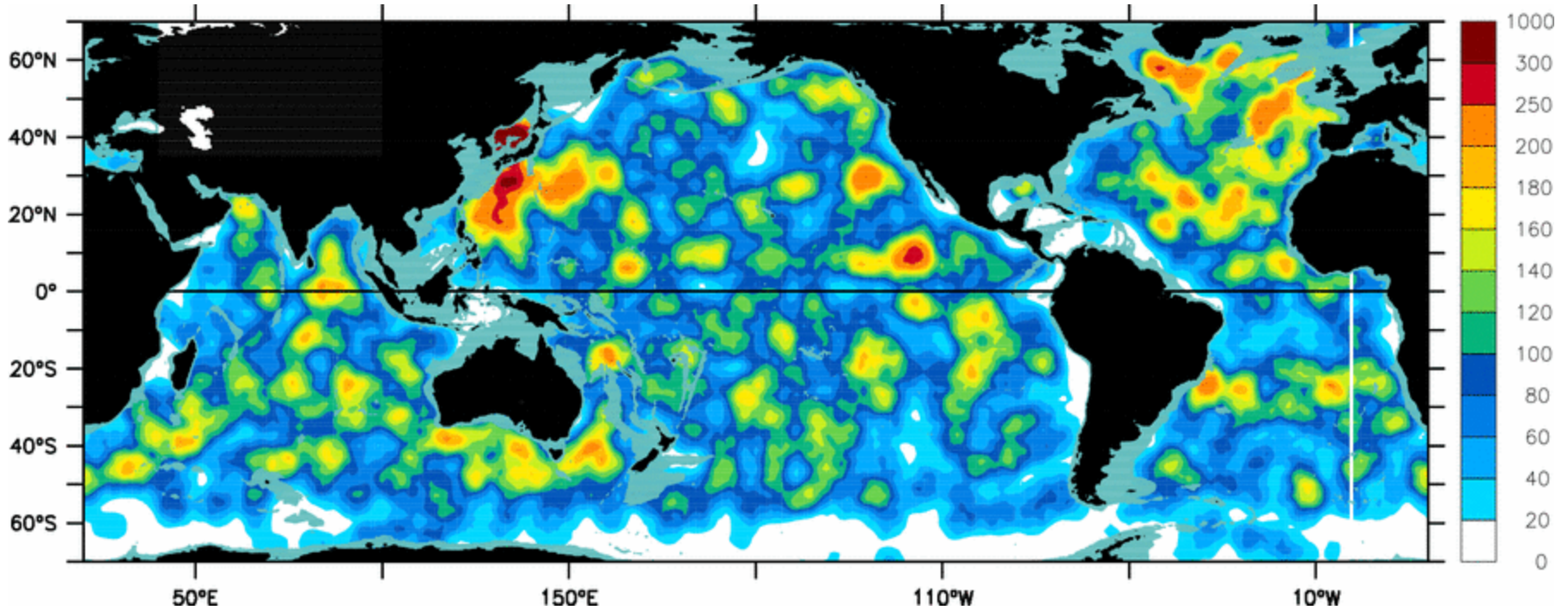


3159 Argo Floats

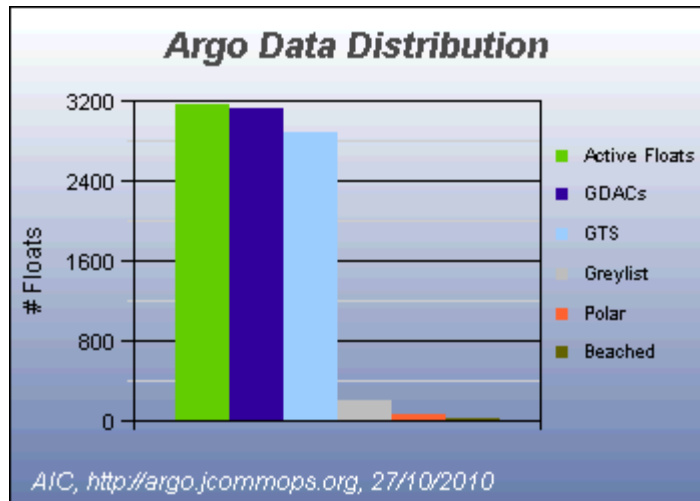
September 2010

○ ARGENTINA (10)	● CHINA (41)	● GABON (1)	● JAPAN (270)	○ NETHERLANDS (24)	● SAUDI ARABIA (1)
○ AUSTRALIA (266)	● ECUADOR (3)	● GERMANY (146)	● KENYA (4)	● NEW ZEALAND (9)	● SOUTH AFRICA (2)
● BRAZIL (15)	● EUROPEAN UNION (14)	○ GREECE (1)	● SOUTH KOREA (95)	● NORWAY (0)	● SPAIN (7)
● CANADA (132)	○ FINLAND (2)	● INDIA (66)	● MAURITIUS (2)	○ POLAND (0)	● UNITED KINGDOM (110)
● CHILE (7)	● FRANCE (154)	● IRELAND (10)	● MEXICO (1)	● RUSSIAN FEDERATION (2)	● UNITED STATES (1764)

Argo Density – 26 October 2010



Data delivery

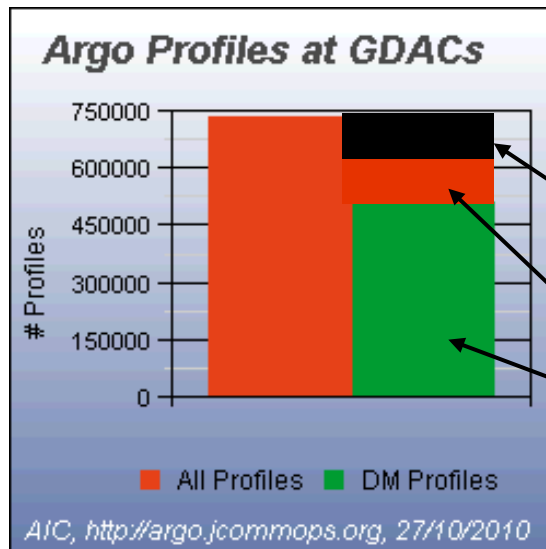


Real-time:

Argo data are freely available via the internet (GDACs) and GTS.

90% of profiles are available within 24 hours.

Automated RTQC procedures are applied; bad data are excluded from the GTS.



Delayed-mode: Salinity drift and other known problems are corrected through DMQC within about 1 year.

~120K profiles not yet eligible (< 1 year)

Backlog ~100K profiles, to be done this year.

Completed DMQC, ~600K profiles.

Caution: best-quality data may require several years.

Profile Data in World Ocean Database

Southern Hemisphere (excluding moorings and animal-mounted sensors) as of 31 December 2009

Observation	All Non-Argo	Profiling Floats
Temperature Profiles	984,438	241,131
Salinity Profiles	289,136	228,765
Salinity Profiles with Measurements Below 500 meters	133,548	271,801

Profiles – Coriolis (France) Data Center

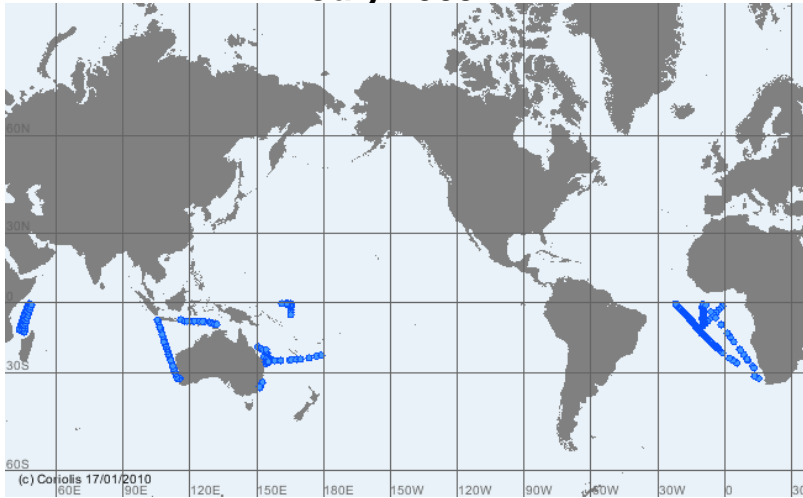
(2009 Total/Salinity: Argo – 111,825/110,079; XBT + CTD – 39,484/23,313)

Location/Month (2009)	XBT plus CTD Profiles	Argo Profiles
Global/July	4,026	9,339
Global/December	2,621	12,803
Southern Hemisphere/July (Austral Winter)	378	4,687
Southern Hemisphere/December (Austral Summer)	398*	5,050
Including and South of 30° S (July)	13	2,298
Including and South of 30° S (December)	302*	2,627

* - CTD profiles are primarily obtained by research vessels and there is a time delay in their receipt by Data Centers.

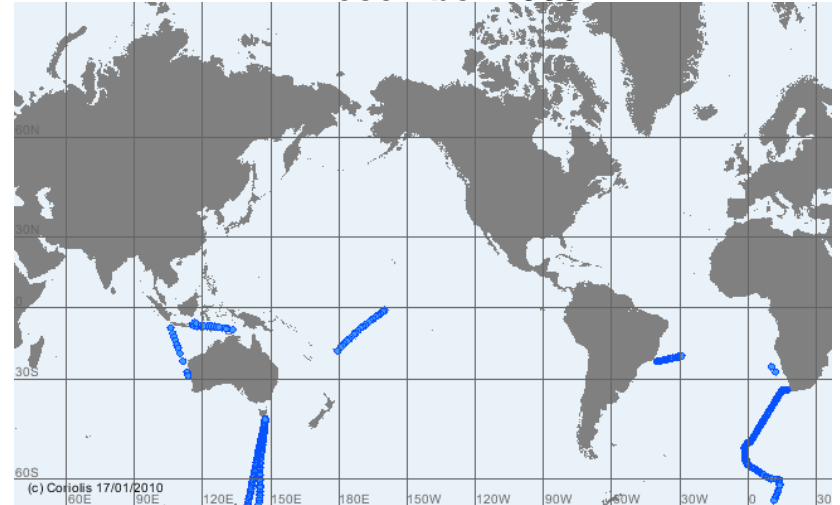
Profiles at Coriolis (December 2009)

July 2009

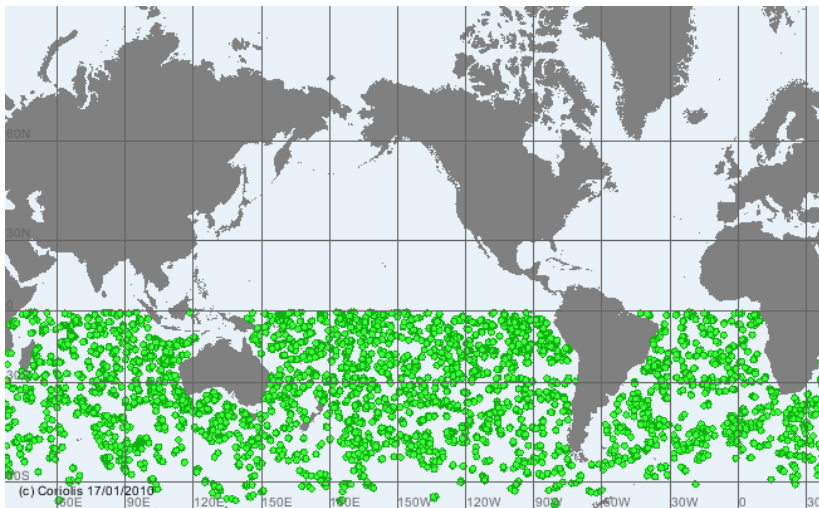


(XBT + CTD) – 378

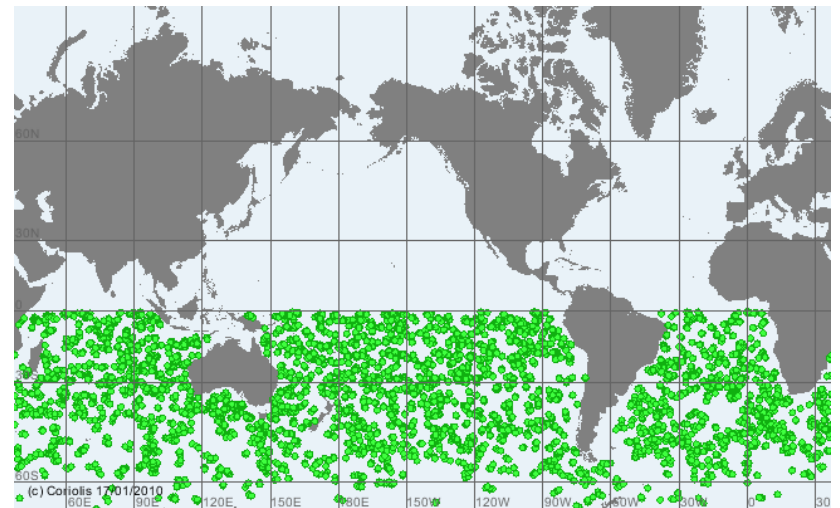
December 2009



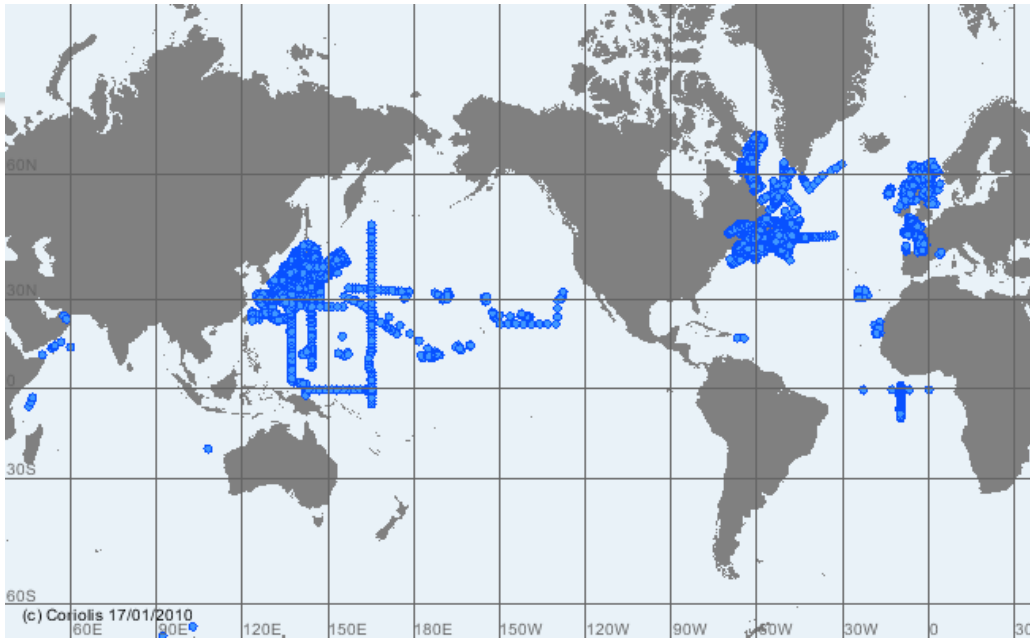
(XBT + CTD) – 398



Argo - 4687



Argo - 5050



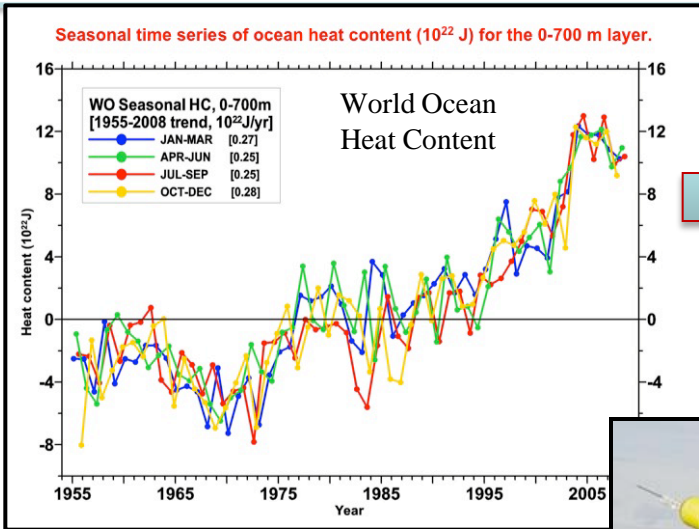
XBT + CTD Profiles Received at Coriolis in 2009

Salinity



Temperature

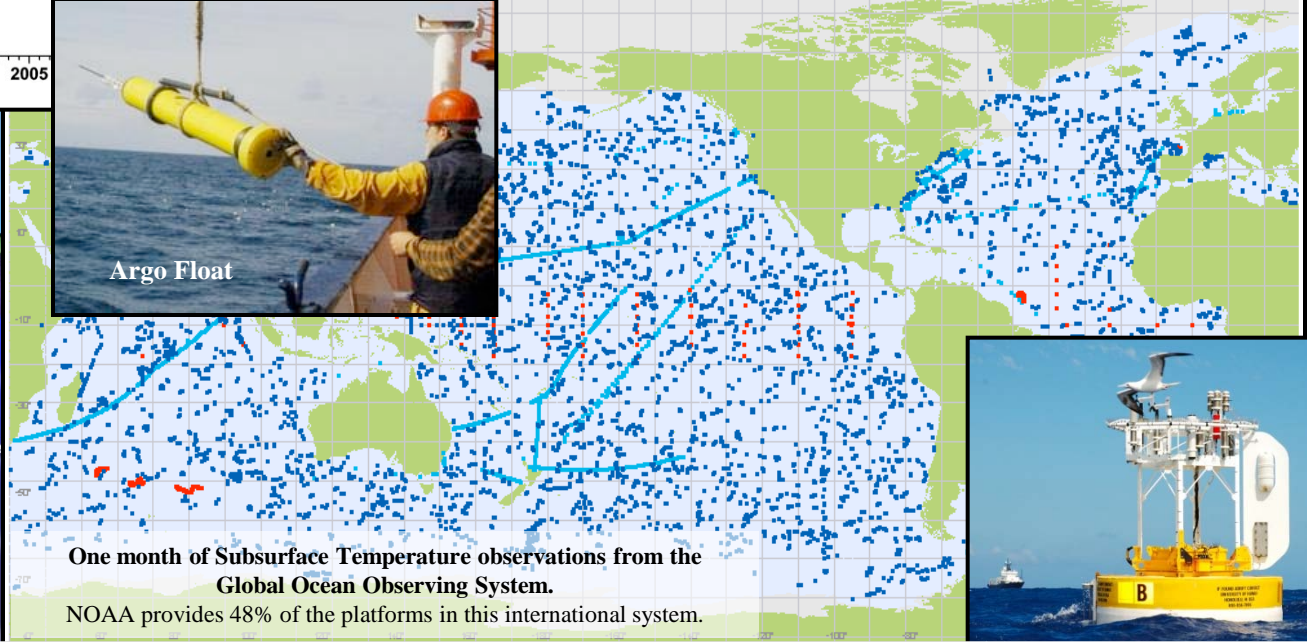
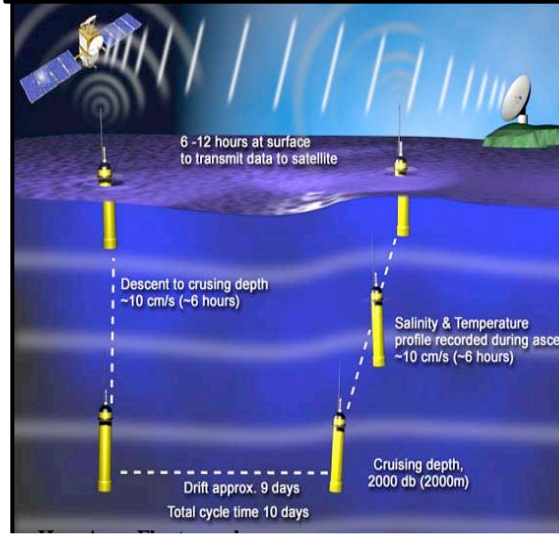
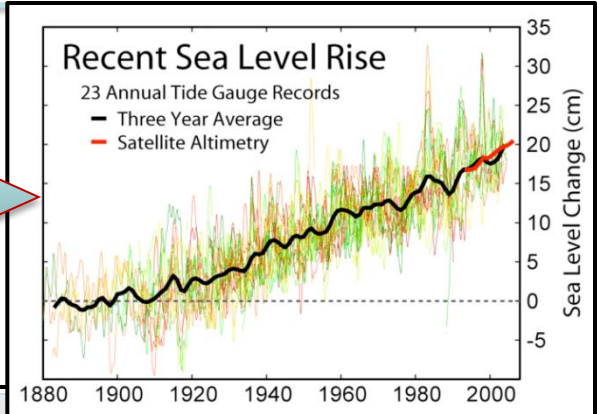
Climate Monitoring & Ocean Observations



Warming ocean water expands, leading to Sea Level Rise



Measuring Ocean Temperature with buoys, ships, Argo profiling floats, and satellites



The Ocean has potential to store 1000X more heat than the Atmosphere.