



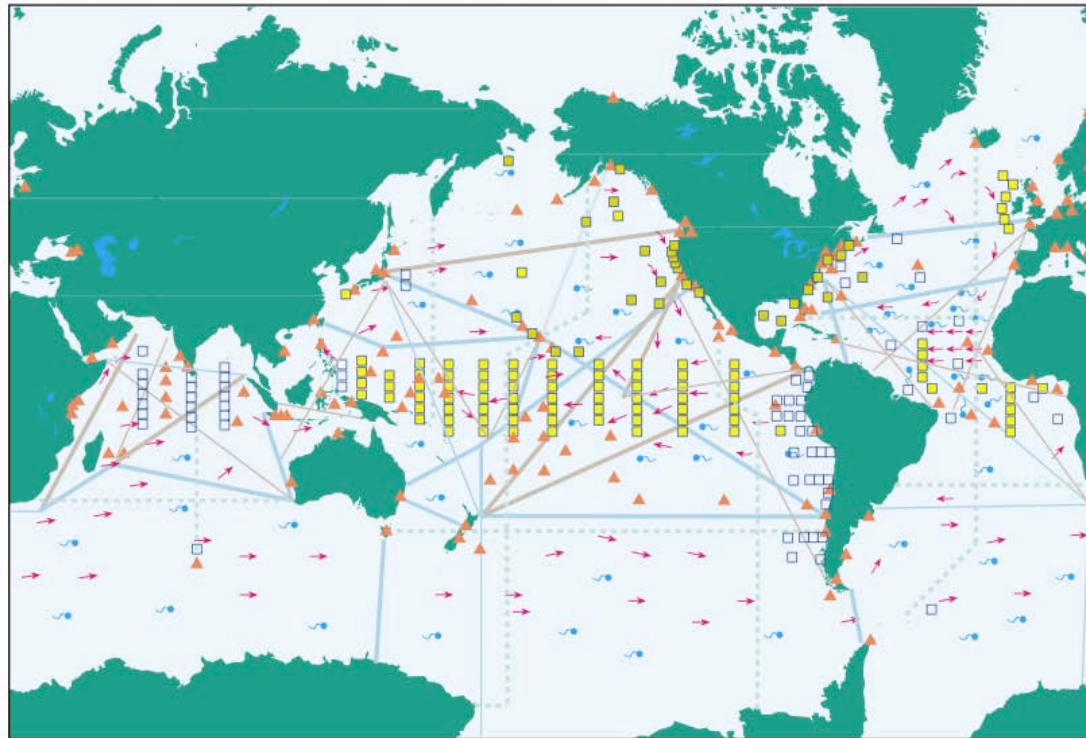
OCEAN OBS 09: A DECADE OF PROGRESS

21 September 2009

Chester Koblinsky
Director, Climate Program Office, NOAA

GCOS OCEAN OBSERVATIONS (2000)

Global Ocean Observing System for Climate and Marine Services

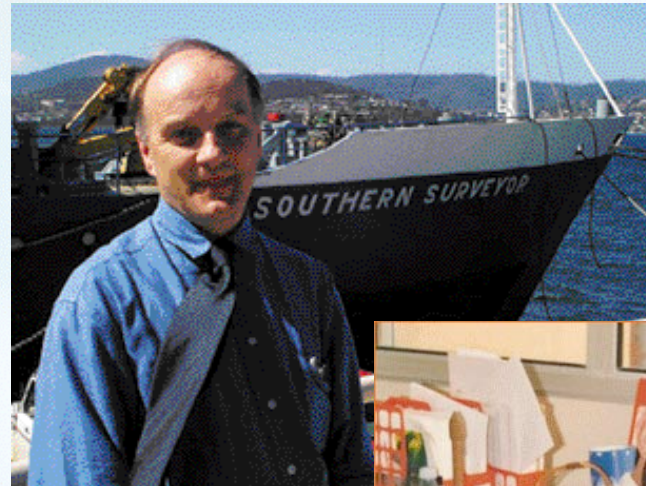


● Profiling floats
 ▲ Tide gauge stations
 ■ Moored buoys
 → Drifting buoys
 — Ship lines

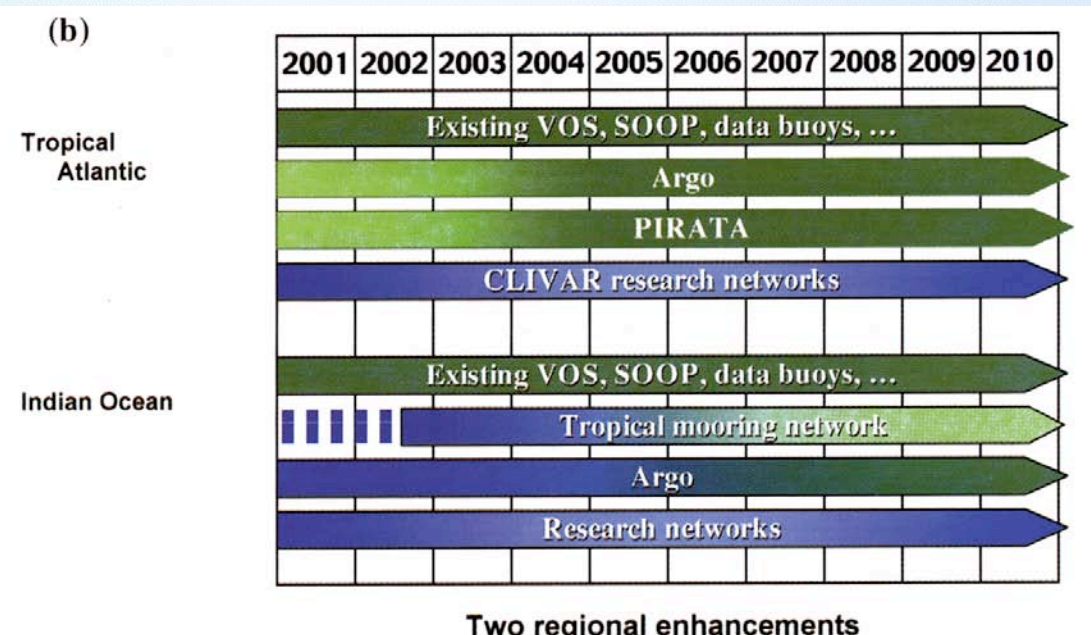
	2000	%Complete
Tide Gauge Stations	51	30%
Surface Drifting Buoys	807	65%
Tropical Moored Buoys	77	65%
VOS Clim Ships	0	0%
Ships of Opportunity	23	45%
Argo Floats	20	0.7%
Reference Stations	15	17%
Ocean Carbon Network	0	0%



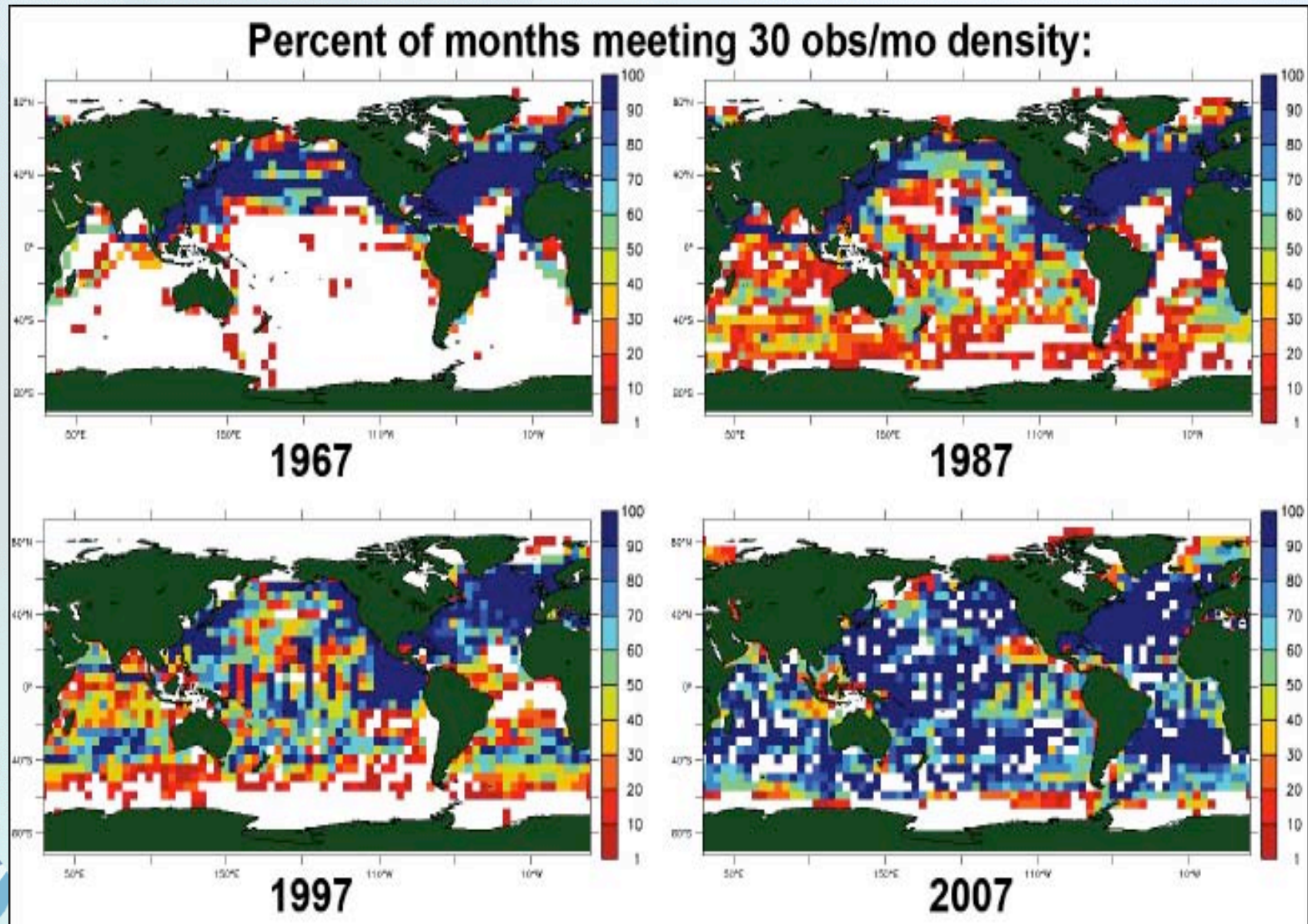
1999 A NEW ERA FOR OCEAN OBSERVATION



1999 A NEW ERA FOR OCEAN OBSERVATION

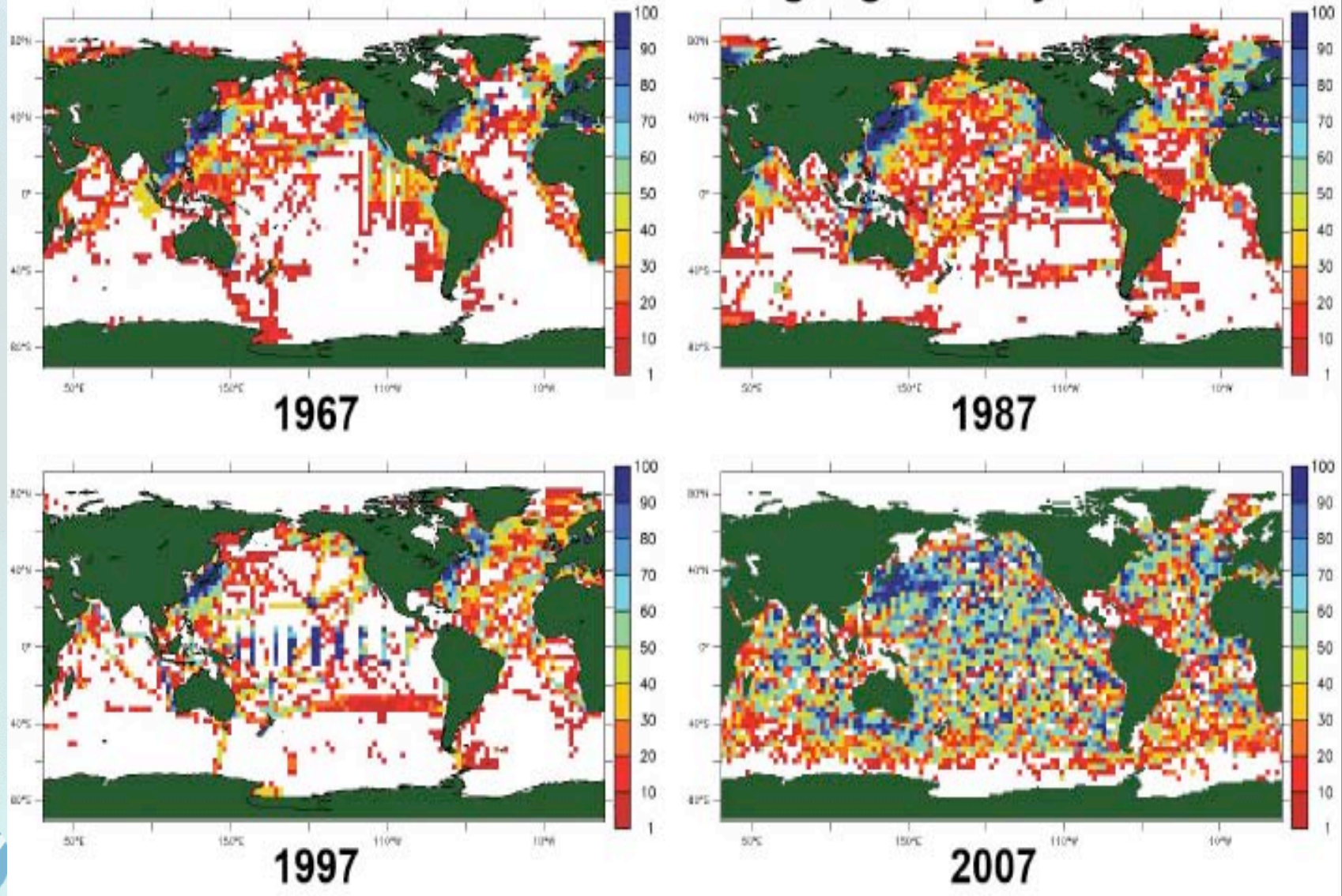


5x5 regions meeting 'climate SST bias' data requirement

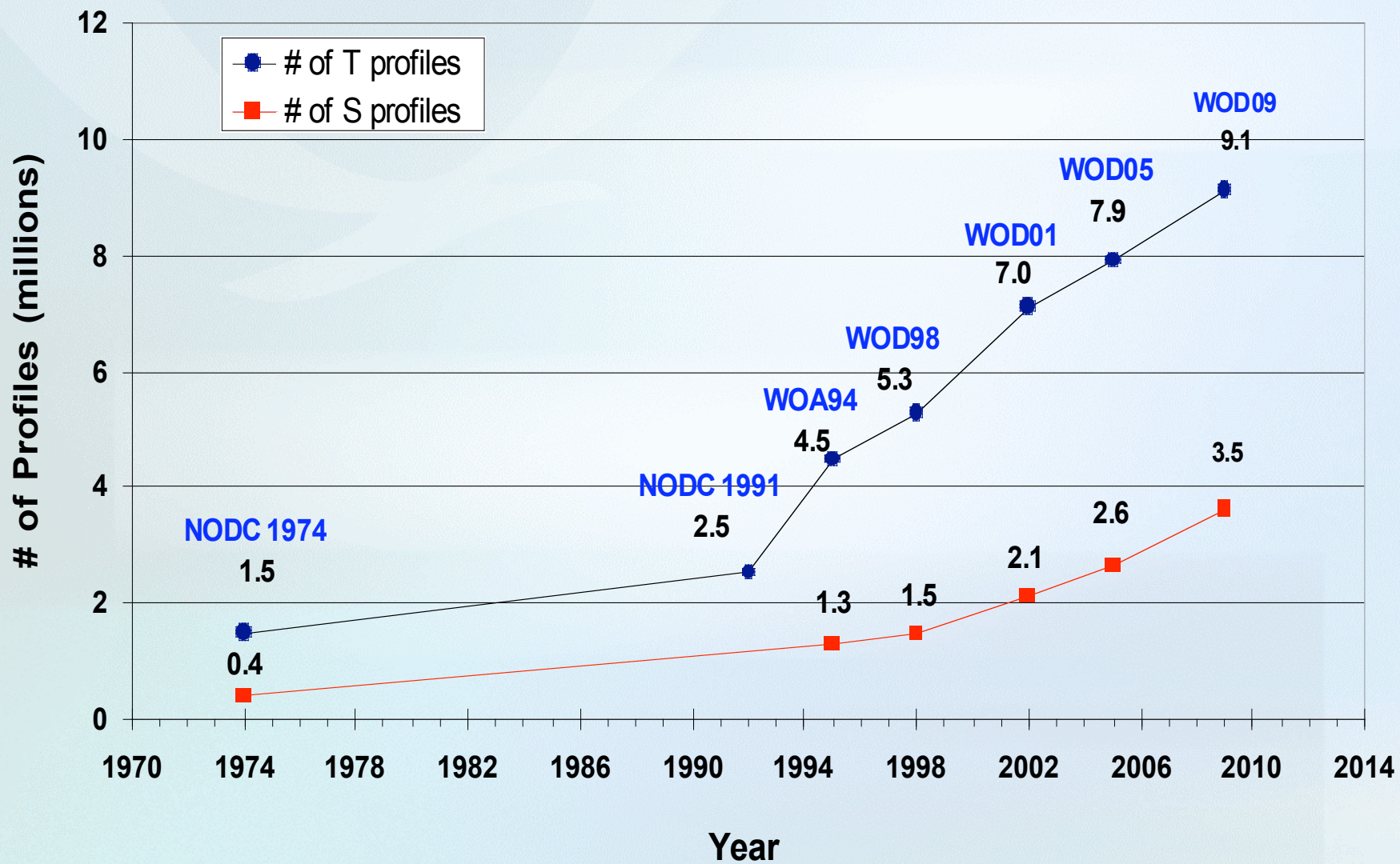


Argo Density – 3 profiles/month per 3x3 region

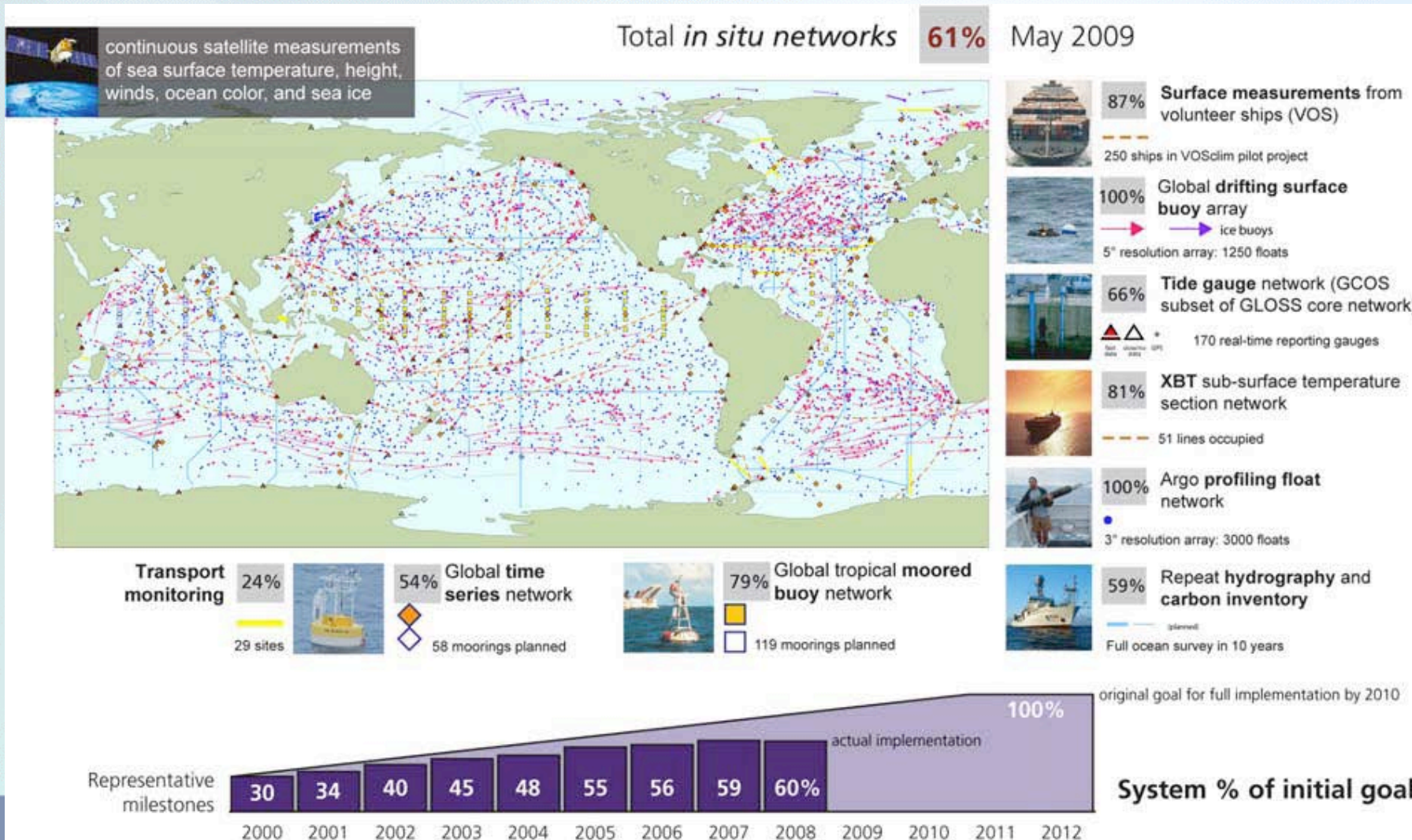
Percent of months meeting Argo density:



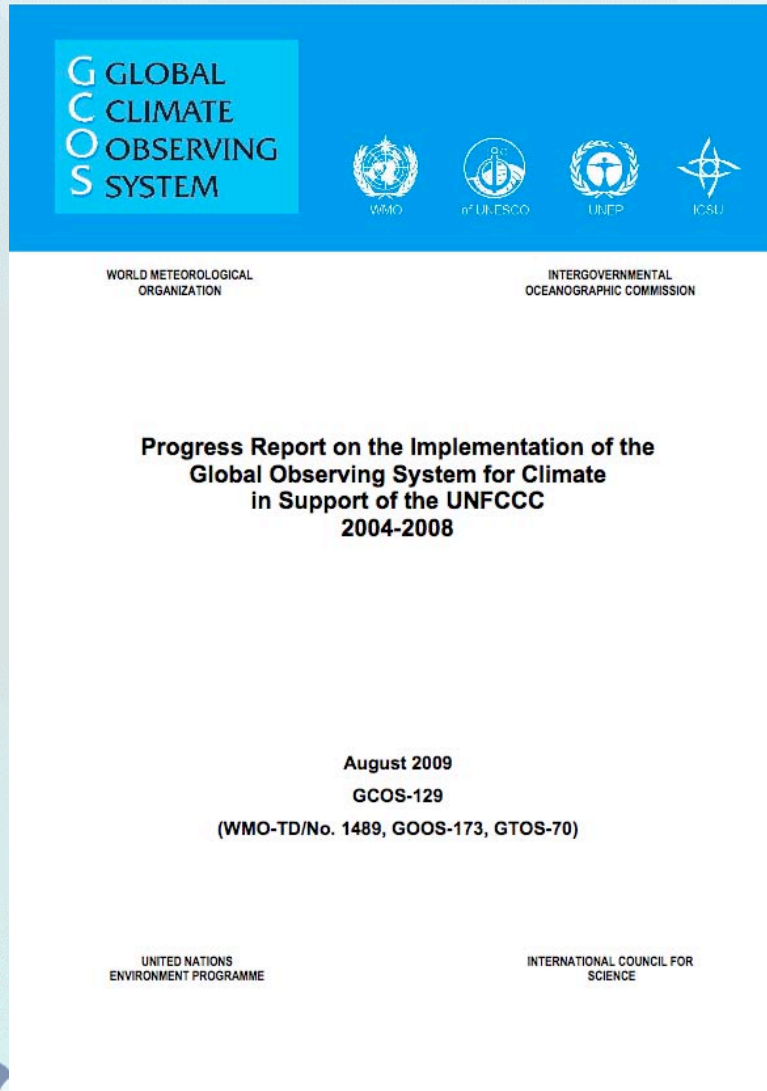
NODC/WDC TEMPERATURE & SALINITY PROFILE TIME SERIES GROWTH- AS OF APRIL 2 2009



GCOS OCEAN OBSERVATIONS



2009 GCOS PROGRESS REPORT



Report on the past five years of progress on implementation of the global observing system for climate in support of the United Nations Framework Convention on Climate Change (UNFCCC)

Evaluate progress on Actions in the GCOS Implementation Report of 2004

Developments since 2004:

IPCC AR4

GEOSS

Increased attention to observations in support of adaptation

Coordinate UN action on climate change

2009 GCOS PROGRESS REPORT

Low	Low-Moderate	Moderate	Moderate-Good	Good
Ocean current data	Coasts	Multi-national participation	Sea-level gauge network	Ocean Plan review
Wave reference measurements	Sea-surface salinity	Voluntary ship obs (climate)	Sea level obs from space	R&D
Reference Network: biogeochemical and ecosystem ECVs	Sea-ice research	Satellite SSTs	Satellite sea-surface salinity	Partnerships
Data/analysis centers	Arctic Ocean	Autonomous obs: biogeochemical and ecosystem ECVs	Water column ship-based sampling	Plans for satellite obs
	Metadata standardization	Sea level measurements	Surface current analyses	Data rescue
		pCO ₂	Sea-ice obs from space	Global SST measurements
		Sea-ice products	Ocean color satellites	Argo array
		Voluntary ships obs (temp.)	Model data assimilation products	Ocean surface reference mooring network
		Tropical Moored Buoy arrays		Reanalysis
		Sea-level in coastal zones		
		Monitor implementation of data policy		
		Data management		
		Data transmission and exchange		
		Telecommunication links		
		Coordination of data assembly		

SUMMARY OF GCOS PROGRESS

IN SITU OCEAN OBSERVATIONS FOR CLIMATE

Most in situ networks have made progress.

The Argo profiling floats and surface drifting buoy arrays which have reached global coverage at their target numbers enabled observations of the ice-free upper 1500 meters of the ocean systematically for temperature and salinity for the first time in history

There has been a substantial increase in the number of tide gauges now reporting both in near real-time and with tsunami-detection capability

Important progress has been achieved in the development of historical ocean reanalysis and in high-resolution ocean forecasting capabilities.

Promising developments in improved methods and standards will allow wider measurement of biological and chemical ECVs.

SUMMARY OF GCOS PROGRESS

IN SITU OCEAN OBSERVATIONS FOR CLIMATE

Most in situ observing activities continue to be carried out under research agency support

Data sharing remains incomplete, particularly for tide gauges and biogeochemical ECVs

Although progress has been made on recovery of the historical ocean dataset, continuing efforts in data rescue, digitization and data sharing are needed

Toward World Climate Services

A “global framework for climate services” (GFCS) is the outcome of the World Climate Conference-3 (WCC-3) held in Geneva, Switzerland, this September

WCC-3 - HIGH-LEVEL DECLARATION

OP 1: Decide to establish a Global Framework for Climate Services ... to strengthen production, availability, delivery and application of science-based climate prediction and services;

“To work, solutions must fit local circumstances and produce results that people can use. Climate services must be relevant, accessible, timely, open, reliable, and sustainable.”

Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere, NOAA

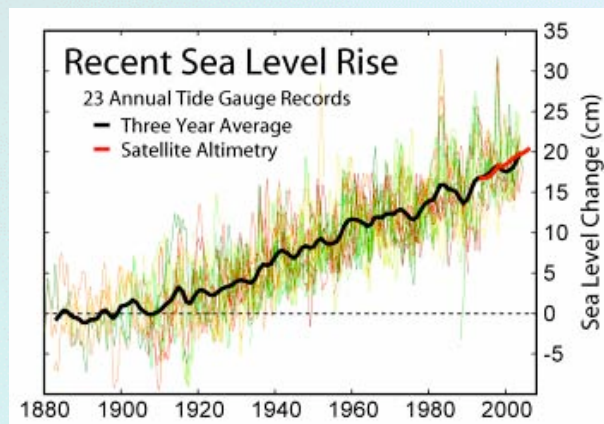


A poster for the World Climate Conference - 3. The top half features a young girl with braids smiling and holding a globe of the Earth. The text on the poster includes: "World Climate Conference - 3", "Better climate information for a better future", the WCC-3 logo, the website "www.wmo.int/pages/world_climate_conference", the location "Geneva, Switzerland", the dates "31 August - 4 September 2009", and the venue "International Conference Center, Geneva". The bottom section contains logos for the World Meteorological Organization and several partner organizations, including Canada, the European Union, and the Spanish government.

CLIMATE SERVICE CASE STUDY: COASTAL REGIONS

Solution and problem focused:

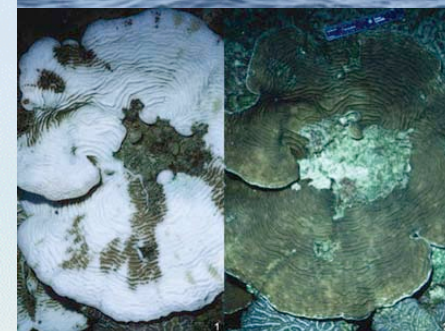
- 🌊 Sea level
- 🌊 Precipitation patterns and associated effects on freshwater, nutrient, and sediment flow
- 🌊 Ocean temperature
- 🌊 Circulation patterns
- 🌊 Frequency, track and intensity of coastal storms
- 🌊 Levels of atmospheric CO₂ and ocean acidification



CLIMATE SERVICE CASE STUDY: LIVING MARINE RESOURCES

Problem focused:

- Attribution of Climate Signals impacting ecosystems : Long Term Change & Natural Variability
- Ocean Warming: Impacts on Distribution & Productivity (phenology, production, invasives)
- Impacts of Loss of Sea Ice on Living Marine Resources (at both poles)
- Physical and Chemical Changes to the ocean (Ocean Acidification Impacts on Marine Biota)
- Severe Weather
- Water Quality and Quantity
- Freshwater Supply & Resource Management
- Sea Level Rise (Natural Resource Implications)



CLIMATE SERVICE CASE STUDY: ARCTIC

Solution and problem focused:

- 🌐 Understanding relative contributions of natural climate variability and anthropogenic forcing
- 🌐 Impacts of lower latitude activities on the Arctic climate
- 🌐 The region's role overall in global climate change and ecosystem impacts
- 🌐 Potential actions to prevent or mitigate climate changes in the Arctic and globally

Specific needs:

- 🌐 Sea Ice Forecasts – Daily to Decadal
- 🌐 Sea Level Rise (Impacts on Coastal Erosion, Monitoring, Predictions)
- 🌐 Understanding of Arctic Climate Processes



Village of Shishmaref,
on the Chukchi Sea,
Alaska



Thank you
Danke
Xie
Khawp khun
Yum
Salamat
Juspa
SPACIBO
Arigato
Mahalo
Obrigada