OUTLINE

• Overview of GOOS

• Framework for Ocean Observing

• Structure

• Future of GOOS
GOOS Overview

• Voluntary collaborative system of observations
  – in situ and satellite
  – operational and sustained research observations
  – driven by requirements, linked to data management and product generation activities
  – global-scale and coastal
  – reconciles top-down and bottom-up approaches
GOOS Overview

• Platform for enabling collaboration
  • identify requirements, promote best practices and standards, assess readiness, synergies, technical coordination

• Promote global participation through capacity development
Framework for Ocean Observing

High level objectives

• Take lessons learned from successes of existing observing efforts – **best practices**

• **Guide** observing community as a whole to sustain and expand the capabilities of the ocean observing system

• Deliver an observing system that is **fit-for-purpose**

• Promoting **collaborative alignment** of independent groups, communities and networks, **building on existing structures** as much as possible
Framework for Ocean Observing

A simple system

Input (Requirements)

Output (Data & Products)

Process (Observations)
Structure of the Framework

Issues (Scientific and societal drivers)

Requirement

What to Measure

Essential Ocean Variables

Data Assembly

Data/Info. Products

Issues Impact

Observations Deployment and Maintenance

Argo

VOS

IMOS

SOOP

Satellite Constellation

OceanSITES

IOOS

Satellite
Driven by requirements, negotiated with feasibility

Essential Ocean Variables

- We cannot measure everything, nor do we need to
- basis for including new elements of the system, for expressing requirements at a high level
- Driven by requirements, negotiated with feasibility
- Allows for innovation in the observing system over time
Towards sustained system: requirements, observations, data management

**Readiness**

**Concept**
- Attributes: Peer review of ideas and studies at science, engineering, and data management community level.

**Pilot**
- Attributes: Planning, negotiating, testing, and approval within appropriate local, regional, global arenas.

**Mature**
- Attributes: Products of the global ocean observing system are well understood, documented, consistently available, and of societal benefit.
Framework for Ocean Observing

Societal drivers 2012

Climate and Weather
Societal drivers next decade

- Fisheries
- Regional priorities
- Climate and Weather
- Real-time services
- Assessments and management of ecosystem services

Framework for Ocean Observing

Expanded observing systems and networks

Data Products

Requirements
Expanded EOVs

Issues

Essential Ocean Variables

- Requirement
- What to Measure

Argo

SODA

Satellite Constellation

VGS

IMOS

ICOS

Observations
Framework for Ocean Observing

Characteristics

– Common language and consistent handling of requirements, observing technologies, and information flow among different, largely autonomous, observing elements

– Seeks to support self-funding and self-managing elements

– Essential Ocean Variables as common focus

– Assessment and promotion of Readiness

– for coastal and open ocean

– An “Integrated Observing System” will be a derivative of an EOV-based approach driven by requirements.
IOC Resolution XXVI-8
GOOS reform

• Reaffirmed GOOS as a priority for IOC
• Considered that ocean observations were important for:
  – maritime and coastal safety services
  – marine biodiversity targets under the Convention on Biological Diversity (CBD)
  – climate monitoring, research and prediction; a future Global Framework for Climate Services
  – managing ocean ecosystems
  – assessment of marine environment and UN World Ocean Assessment
• Considering links to
  – WMO and in particular JCOMM
  – UNEP and in particular Regional Seas
  – ICSU and the scientific community
IOC Resolution XXVI-8
GOOS reform

• Recommit to GOOS
  – GOOS as a **holistic system** encompassing global, regional, and coastal observations and products
  – **aligned with a Framework** for Ocean Observing and Essential Ocean Variables
  – GOOS to set **requirements based on the needs**
  – **reinforce global participation** through (extrabudgetary) capacity development

• Streamline and strengthen governance
  – IOC governing bodies directly responsible for GOOS
  – Dissolution of I-GOOS, GSSC, and subsidiary panels
  – Creating the **GOOS Steering Committee**
New GOOS Structure

**GOOS overall management and steering**

- **IOC Assembly**
  - co-sponsors: ICSU, WMO, UNEP

**Observing system panels:**
- requirements, obs coordination, data systems
- **GOOS Steering Committee**

**Physical EOVs**
- OOPC, JCOMM OCG

**Geochemical EOVs**
- IOCCP

**Biological / ecosystem EOVs**
- new panel

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**Implementation**

- GOOS Regional Alliances
- ROOS / RCOOS
- JCOMM, IODE
- observing networks
- data systems
- information generators
GRAs work with data providers & users in their respective regions to:
- Specify observing system requirements for products & services
- Set priorities for capacity building
- Establish R&D test beds

Based on user specifications, GRAs build Regional Coastal Ocean Observing Systems (RCOOSs) by:
- Integrating existing data streams & data bases as needed,
- Contributing to building the GCN,
- Identifying sentinel sites for in situ observations,
- Increasing spatial & temporal resolution of observations & models, &
- Measuring more variables as needed.
GOOS for climate
in situ observing networks

Total in situ networks: 62% as of April 2012

- **Surface measurements** from volunteer ships (VOS)
  - 100% coverage
  - 250 ships in VOSlim pilot project

- **Global drifting surface buoy array**
  - 100% coverage
  - Ice buoys
  - 5° resolution array: 1250 floats

- **Tide gauge network** (GCOS subset of GLOSS core network)
  - 66% coverage
  - 170 real-time reporting gauges

- **XBT sub-surface temperature section network**
  - 81% coverage
  - 51 lines occupied

- **Argo profiling float network**
  - 100% coverage
  - 3° resolution array: 3000 floats

- **Repeat hydrography and carbon inventory**
  - 62% coverage
  - Full ocean survey in 10 years

**Transport monitoring**
- 48% coverage
- 29 sites

**Global time series network**
- 34% coverage
- 58 moorings planned

**Global tropical moored buoy network**
- 79% coverage
- 119 moorings planned

**Representative milestones**
- Original goal for full implementation by 2010
- 2000: 30
- 2001: 34
- 2002: 40
- 2003: 45
- 2004: 48
- 2005: 55
- 2006: 56
- 2007: 59
- 2008: 60
- 2009: 62
- 2010: 62
- 2011: 62
- 2012: 100%
Major outcomes of iGSC-I

• Long-term work plan and initial actions
  – Articulating 10-year goals for GOOS, to inform a two-year work plan;
  – Engaging with key conventions and assessments on their needs for ocean information,
  – Improving outreach for GOOS,
  – Engaging IOC Member States, with a focus on raising awareness and information exchange,
  – Identification and developing engagement with potential donors for GOOS
Major outcomes of iGSC-I

• Long-term work plan and initial actions
  – Broadening the variables examined by GOOS and establishing three disciplinary panels for Physics, Carbon/Geochemistry, and Biology/Ecosystems,
  – Improving GOOS Regional Alliance (or like) implementation, starting with a focus on collecting information on priorities and capacity from each GRA,
  – Capacity Development, beginning by developing a statement of needs for GOOS, and
  – Analyzing the challenge of data interoperability
iGSC-I committee

• John GUNN (co-chair)
• Eric LINDSTROM (co-chair)
• Margarita GREGG
• Ashley JOHNSON
• Anthony KNAP
• Pierre-Yves LE TRAON
• Shao Hua LIN
• Ali MAFIMBO
• Jose MUELBERT
• Frederico A. SARAIVA NOGUEIRA
• Alexander POSTNOV
• Rosalia SANTOLERI
• Maria SNOUSSI
• Song SUN
• Susan WIJFFELS
GOOS and GODAE OceanView

- GODAE OceanView participating systems are important to GOOS: you transform data into useful information
- You have a role in helping to evaluate the fitness-for-purpose of the observing system
- Coastal forecast systems are particularly important for GOOS Regional Alliances and national observing systems: can we improve links?
- GOOS SC particularly wants to work with GODAE OceanView as a key user of ocean observations
  - GOOS SC leads for this: PY Le Traon, R. Santoleri, S. Wijffels, E. Lindstrom
  - suggest a bilateral teleconference with GOVST leadership
Thank you for attention!