World Meteorological Organization

Working together in weather, climate and water

WMO

MARCDAT-III workshop

Frascati, 2-6 May 2011

Overview of WMO activities in support of marine climate data

Etienne Charpentier
Observing Systems Division
WMO Secretariat

WMO Strategic Plan expected to be approved by WMO 16th Congress

Five strategic thrusts

1. Improving service quality and service delivery (2 ERs)
2. Advancing scientific research and application, as well as development and implementation of technology (3 ERs)
3. Strengthening capacity-building (1 ER)
4. Building and enhancing partnerships and cooperation (1 ER)
5. Strengthening good governance (1ER)

Expected Results (ER) of Strategic Thrust 2

ER3: Enhanced capabilities of NMHSs to produce bette
weather, climate, water and related environmental
information, predictions and warnings to support in
particular climate impact and adaptation strategies

**ER4: Enhanced capabilities of Members to access
develop, implement and use integrated and
interoperable Earth- and space-based systems fo
weather, climate and hydrological observations,
well as related environmental observations, base
on world standards set by WMO**

⇒ WIS & WIGOS

ER5: Enhanced capabilities of Members to contribute t
and draw benefits from the global research capacity fo
weather, climate, water and environmental science an
technology development

expected to be approved by WMO XVI Congress

- Global Framework for Climate Services (GFCS)
- Aviation meteorological services
- Capacity-building for the developing and least developed countries
- Implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS)
- Disaster risk reduction

About WMO Priorities

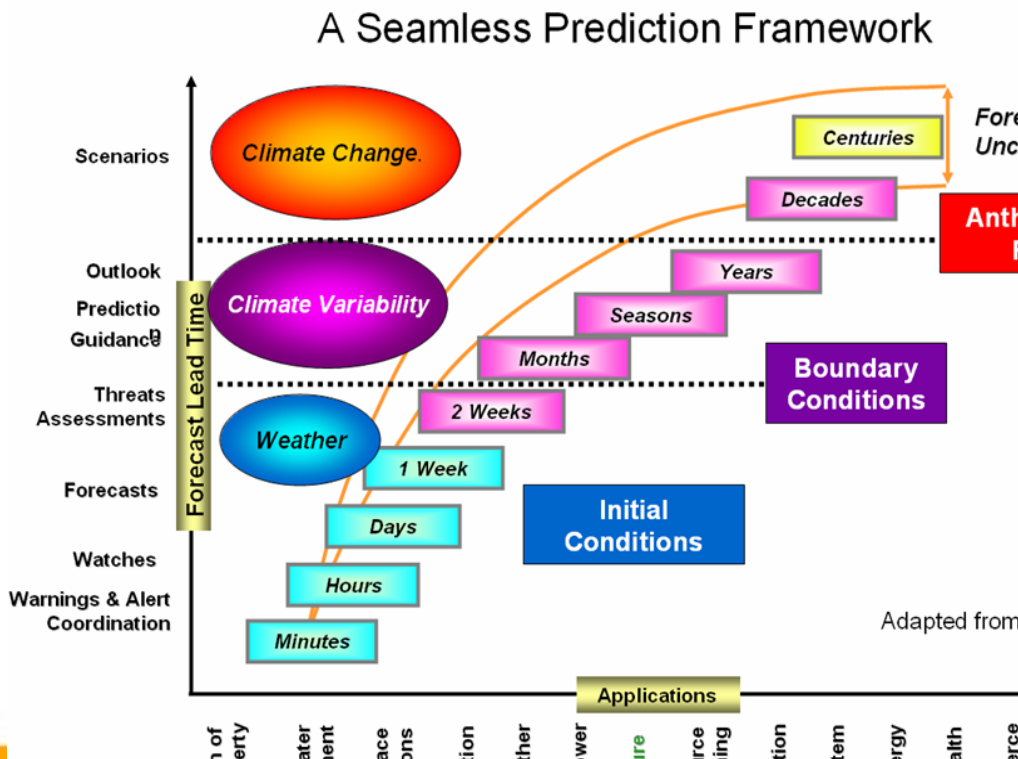
Voluntary resources for project initiatives in priority areas

GFCS, WIS, and WIGOS directly relevant to MARCDAT as Marine climate data & metadata are:

- Required for GFCS (e.g. validation)
- Need to be exchanged, discoverable, accessed, ar retrieved in an interoperable way through WIS
- Need to be produced according to harmonized standards and practices, and uncertainties understood in line with WIGOS requirements

WMO Application areas for realizing socio-economical benefit

Global NWP
High Resolution NWP
Synoptic Meteorology
Nowcasting and Very Short Range Forecasting
Seasonal to Inter-annual Forecasts
Aeronautical Meteorology
Atmospheric Chemistry
Ocean Applications
Agricultural Meteorology
Hydrology
Climate Monitoring
Climate Applications
Space Weather



Requirements for marine data

Numerical Weather Prediction

Ocean Applications

- Marine forecasting (marine transportation & operations)
- Safeguard of life and property at sea
- Marine pollution response
- Protection & sustainable development of the ocea and marine environment
- Efficient management of marine resources

Seasonal to Inter-Annual climate prediction

Climate monitoring

Climate Applications

Requirements for marine climate data

Observing & understanding of climate

- Past & present climate
- Variability & trends
- Detection of anomalies, extreme events
- Re-analysis
- Indices

Climate (and other) models

- Validation/verification
- Understanding uncertainties of observations (weighting)
- Downscaling

Validation of satellite products

WMO Integrated Global Observing System (WIGOS)

Initiated by Cg-XV (2007)

Working with partners, WIGOS is a framework for promoting **standardization**, and **interoperability** between the components observing systems adressing the requirements of WMO applications

WIGOS is Multidisciplinary

- WMO “owned” Systems (GOS, GAW)
- Working with partners on co-sponsored systems (e.g. GOOS, GCOS, …)

Areas of standardization:

- Instruments and methods of observations
- Data and metadata exchange
- Quality management

WIGOS Test of concept : 2007 - 2011

WIGOS Implementation : 2012 – 2015

Operational phase: 2016 and beyond

WMO Information System (WIS)

Initiated by Cg-XIV (2003)

- A single, coordinated global infrastructure for the collectio and sharing of information required by WMO applications
  - » Routine collection and dissemination service for time-critica data & products
  - » Timely delivery service for data & products (push)
  - » Data discovery, access, and retrieval (pull)
- ISO standards used (e.g. 19115, 19139, 23950)

Structure

- Global Information System Centres (3 GISCs are pre-operational in Germany, China, Japan)
- Data Collection and Production Centres (15 DCPCs are pr operational)
- National Centres (NCs)

WIS Manual to be approved by Cg-XVI

- Describes Service Oriented Architecture (SOA) with 15 Interfaces

JCOMM role in WIS & WIGOS

Pilot Project completed (2008-2010), and legacy recommendations made e.g.

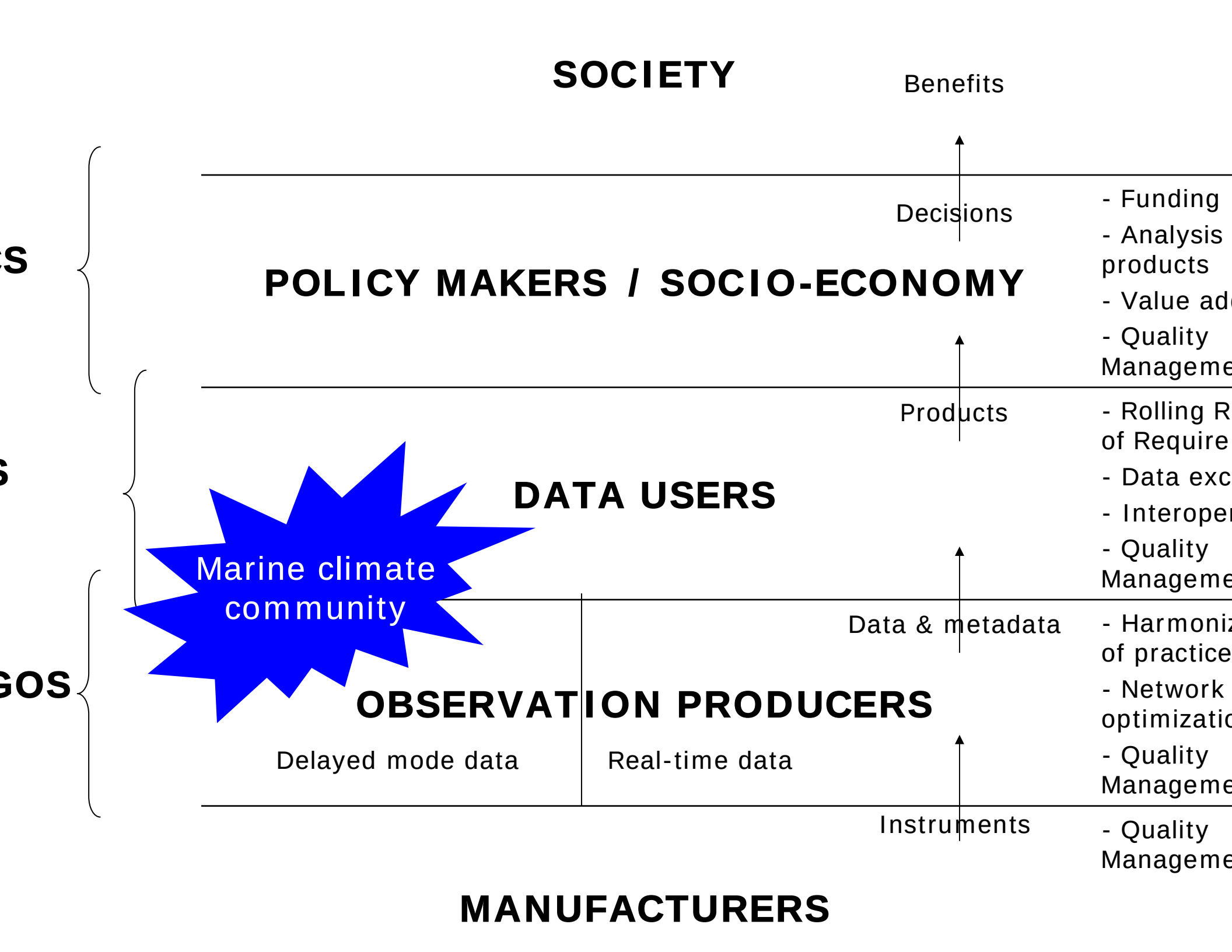
- IODE/JCOMM Ocean Data Standards process
- Interoperability of ocean data systems with IOC Ocean Data Portal (ODP) and/or WIS
- Collection of data & metadata
- Network of Regional Marine Instrument Centres (RMICs)
- Forum of users of satcom
- Review of WMO & IOC Publications (standards)
- Guidelines for instrument intercomparisons
- Strengthen JCOMMOPS
- Capacity Building (PANGEA)
- Promote pilot activities e.g. integration satellite/*in-situ*

Global Framework for Climate Services (GFCS)

High Level Task force (HLT) was established after WCC

Some findings/Recommendations of HLT

- Present capabilities for climate services fall short of present/future requirements and are not delivering thei full & potential benefits; esp. for developing countries
- Focus on user needs, and more integration required between providers & users of climate services
- **High quality observations are required across the entire climate system, and commitments are need to enhance & sustain existing networks**
- **Potential of existing knowledge must be strengthened**
- **New research & strong support/collaboration between all relevant research communities**
- Capacity building required for effective climate risk management; better coordination needed


SOCIETY
Benefits
Decisions
- Funding
- Analysis
products
- Value ad
- Quality
Manageme
POLICY MAKERS / SOCIO-ECONOMY
Products
- Rolling R
of Require
- Data exc
- Interope
- Quality
Manageme
DATA USERS
Marine climate community
Data & metadata
- Harmoniz
of practice
- Network
optimizatio
- Quality
Manageme
OBSERVATION PRODUCERS
Delayed mode data
Real-time data
Instruments
- Quality
Manageme
MANUFACTURERS

anography and Marine Meteorology (JCOMM)

servations ogramme Area	Data Management Programme Area	Services and Forecasting Syster Programme Area
Coordination (OCG) uoys (DBCP) hips (SOT) SOOP VOS ASAP ide-gauges (GLOSS-GE) ssociated: Profiling floats (Argo) Ref. stations (OceanSITES) Ocean carbon (IOCCP)	▪ Coordination (DMCG) ▪ DM Practices (joint JCOMM/IODE ETDMP) ▪ Marine Climatology (ETMC) •TT-DMVOS •TT-MOCS	▪ Coordination (SCG) ▪ Wind waves & storm surges (ETWS) ▪ Maritime safety serv (ETMSS) ▪ Operational ocean forecasting (ETOOFS ▪ Sea-ice (ETSI) ▪ Associated: • GODAE OceanVie ST

Marine climate community

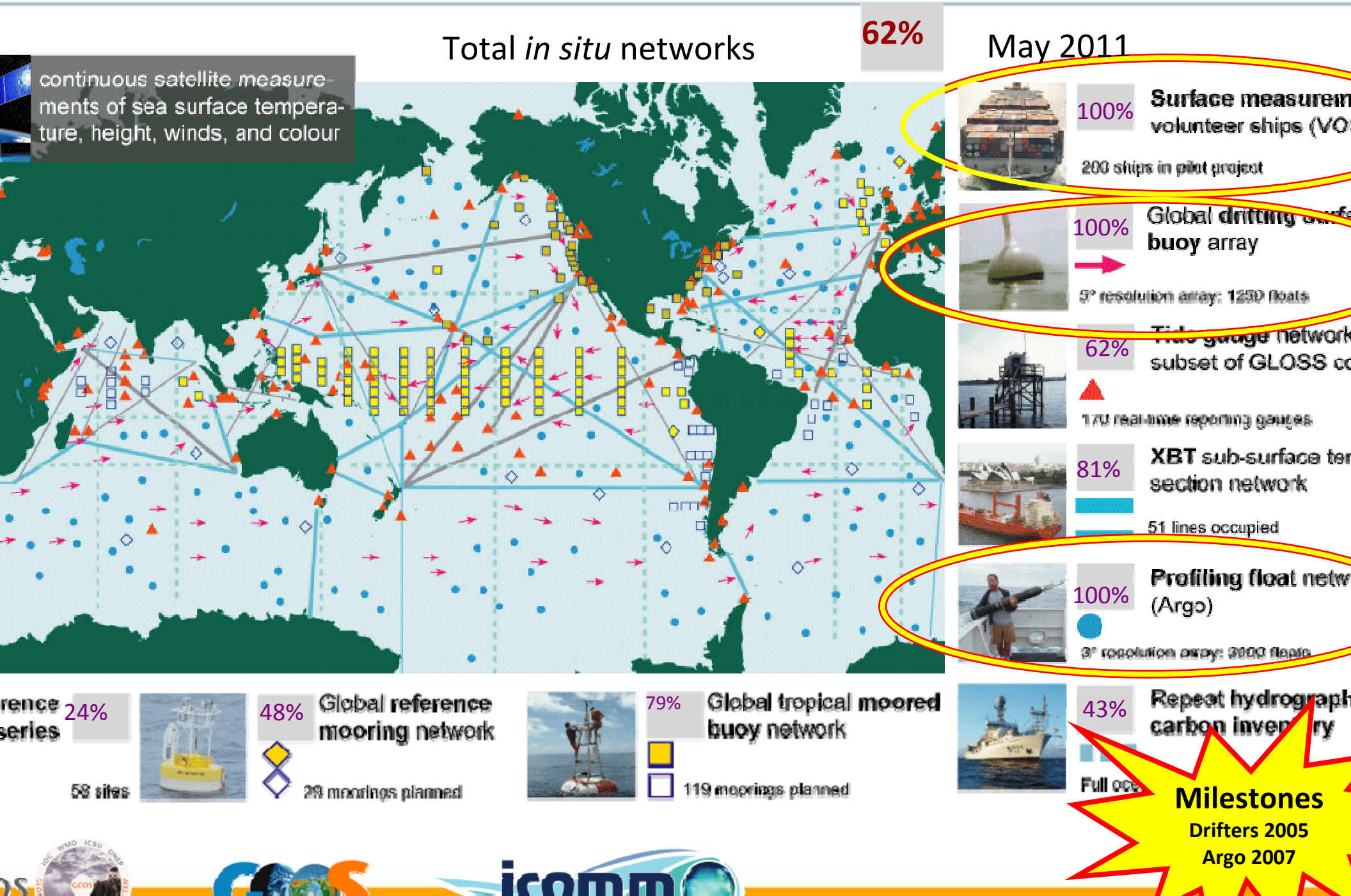
Climate change detection & indices
(joint CCI/CLIVAR/JCOMM ETCCDI)

COMM in situ Observations Programme Support Centre (JCOMMOPS)

apacity Building Activity leaders

atellite Activity leaders; Task Team on Satellite Data Requirements

GCOS Implementation Plan and JCOMM targets



JCOMM Priorities (Observations)

- Compile & sustain the initial observing system
- WIGOS integration (RMIC, interoperability, QM
- Enhance in situ wave measurements
- High data rate satellite data telecommunicatio
- Capacity Building through PANGEA concept
- JCOMMOPS to partner with space agencies
- Cookbook for the submission of data in real-time & delayed mode

JCOMM *in situ* Observations Programme Support Centre (JCOMMOPS)

Day to day assistance for implementation of ocean observing programmes

Focal point between platform operators, data centres & users, manufacturers and satcom providers

Assist in demonstrating the scientific value of global ocean observing programmes

Collect & distribute information on

- Requirements (GOOS, GCOS, WWW)
- Status maps
- Performances metrics
- Instruments, satcom providers
- Deployment opportunities

JCOMM in-situ Observing Platform support

Assist on instrument practices and standards issues

Promote data exchange, and technical assistance

Facilitate flow of data & metadata to archive centres

Encourage synergies

JCOMM Data Management

Marine climatology, climate change monitoring, climate indices

Closer integration with IODE and implementation of pilot projects

- E2EDM prototype
- Metadata
- Data assembly, QC, QA

Participation in broader WMO/IOC DM work

- WMO Information System (WIS) development and WMO Integrated Global Observing System (WIGO
- IOC DM strategy implementation

JCOMM Priorities (Data Management)

- Standards & best practices
- JCOMM Pilot Project for WIGOS & Ocean Data Portal
- Metadata (BUFR, META-T)
- Modernize MCSS
- Update Data Management Plan; Catalogue of standards & best practices
- DMPA website;
- MARCDAT-III and CLIMAR-IV

WMO Commission for Climatology (CCl)

Mission Statement: *To stimulate, lead, implement, assess and coordinate international technical activities within WMO under the World Climate Programme a the Global Framework for Climate Services to obtain and apply climate information and knowledge in support of sustainable socio-economic development and environmental protection*

OPACE-1 : Climate Data Management (e.g. data rescue)
OPACE-2 : Climate Monitoring & Assessment (e.g. Indices)
OPACE-3 : Climate Products & Services
OPACE-4 : Adaptation & Risk Management

OPACE-2 & 3 provide standards & best practices in climatology e.g. observations , data management, data sets, extremes & indices (guidelines, Guide to climatological practices, technical regulations)

JCOMM/CCl/CLIVAR Expert Team on Climate Change Detection and Indices (ETCCDI)

CBS, CIMO

WMO Commission for Basic Systems (CBS)

- Integrated Observing Systems (GOS, WIGO
- Information Systems (GTS, WIS)
- World Weather Watch (WWW, GDPFS)
- Public Weather Services

WMO Commission for Instruments and Methods of Observation (CIMO)

- WMO Publication No. 8
- Cooperation with JCOMM on WMO-IOC Regional Marine Instrument Centres (RMICs

Thank you for …

Collecting ocean data & metadata
Recovering, improving, digitizing
Doing Quality control
Estimating Uncertainties
Making bias adjustments
Blending data
Producing Grid data, Statistical products
Quantifying data & analysis
Preserving, archiving data
and … contributing to the development of international standards (and using them!)