



World Meteorological Organization

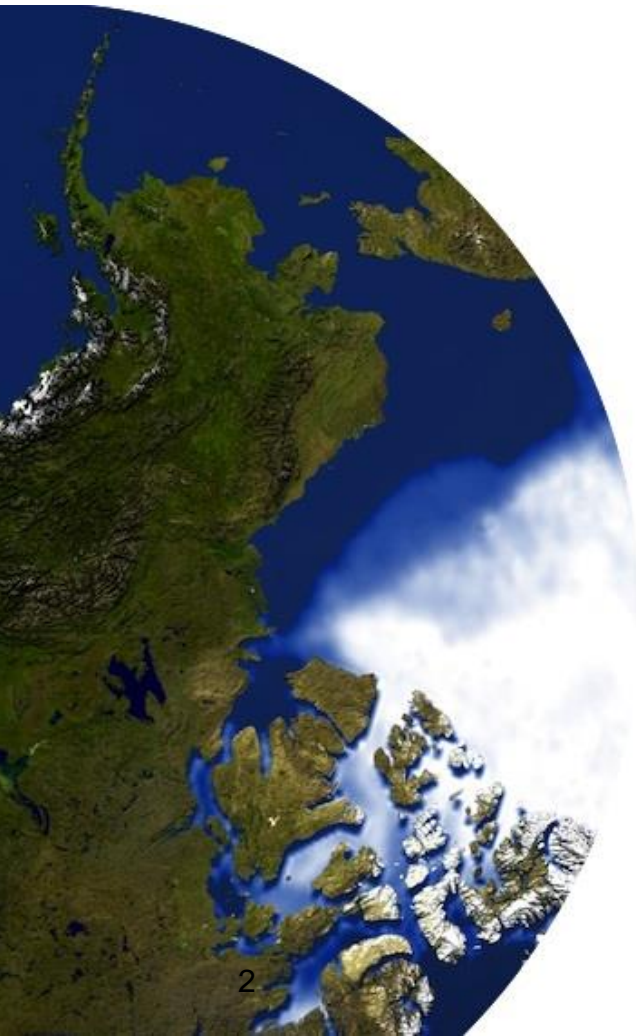
Weather • Climate • Water

# WMO GLOBAL CRYOSPHERE WATCH

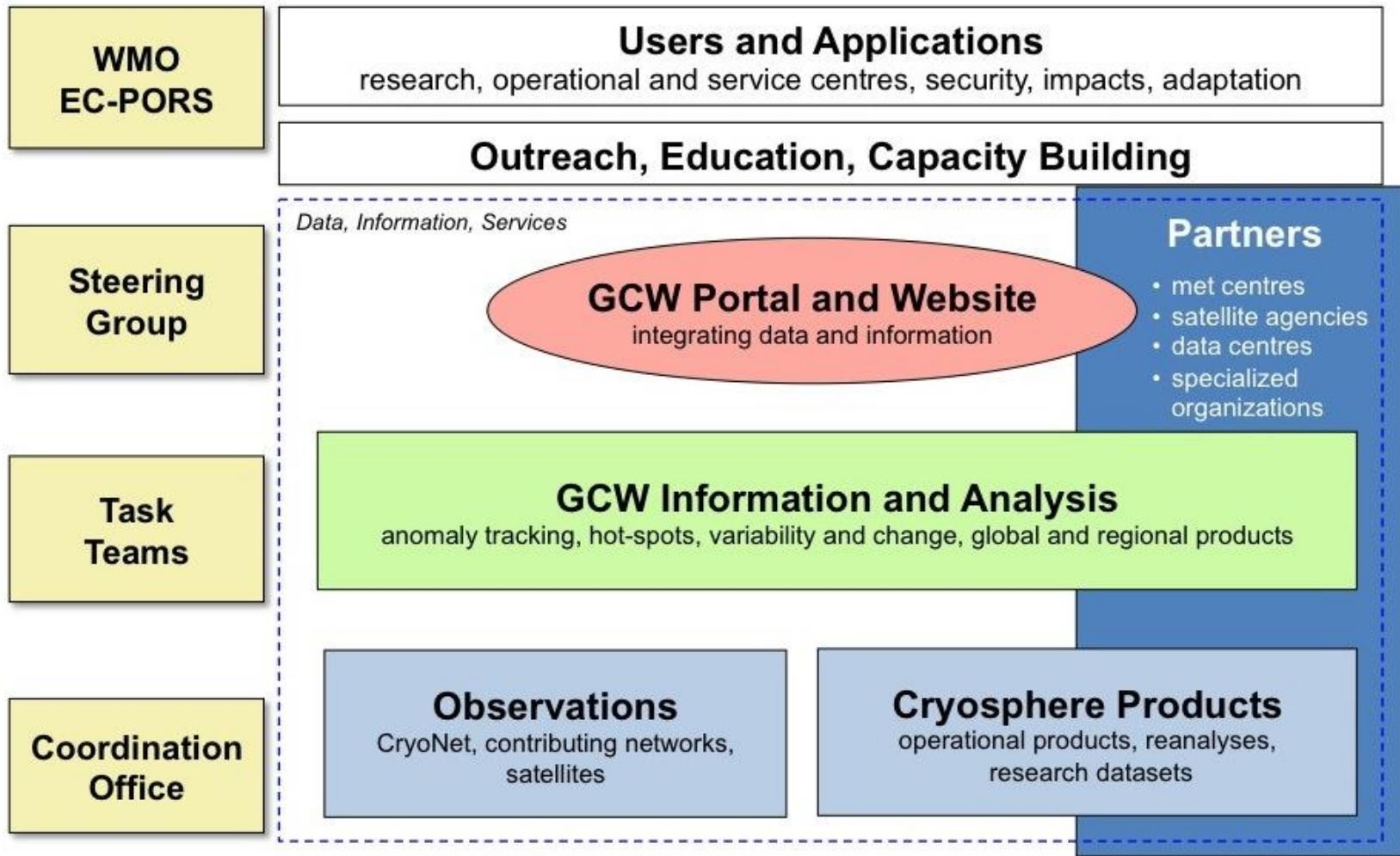
# The Global Cryosphere Watch

## *The GCW Steering Group*

Árni Snorrason (IMO),  
Chair, GCW Steering Group



# Organization: GCW Conceptual Framework



*The WMO Executive Council expert panel on Polar Observations, Research, and Services (**EC-PORS**) oversees GCW.*





# Steering Group

The *GCW Steering Group* (GSG) provides high-level guidance on GCW development and implementation.

It is concerned with process and general direction more than specific actions.

The GSG is comprised of experts from EC-PORS, relevant WMO Programmes, contributors, partners and co-sponsors.

In the near-term, the Steering Group will provide guidance on Task Team formation and on initial GCW activities and tasks to be conducted, given the available budget.

The GSG will guide preparation of GCW for discussion at World Meteorological Congress in 2015

It currently reports to EC-PORS.



# GCW Task Teams

1. **CryoNet Team** establishes the surface-based observational network, including its core standardized CryoNet network
  2. **Requirements and Capabilities Team** assesses user needs, periodically reviews and updates observing system requirements and capabilities and contributes to the WMO RRR
  3. **Infrastructure and Practices Team** conducts an inventory of the current network, including infrastructure and practices, compiles best practices, guidelines, and standards, determines what should be measured
  4. **Products Team** selects key GCW products and datasets
    - *Snow Watch Group and Snow Data Access and Exchange Group*
  5. **Portal and Website Team** is developing the GCW web portal and GCW information website
    - *Terminology Group*
  6. **Outreach Team** is an authoritative voice on cryosphere issues
- **Nominations of experts from Partners are welcome!**



# GCW Stakeholders & Engagements

- GCW will engage WMO co-sponsored programmes, technical commissions (TCs), Regional Associations (RAs), **inter-governmental bodies**, and **scientific bodies** that have cryospheric interests and responsibilities.
- WMO's co-sponsored programmes are essential partners, e.g. WCRP, GCOS.
- WCRP/CliC coordinated the development of the GCW feasibility study and co-led with SCAR the development of the Integrated Global Observing Strategy Partnership (**IGOS-P**) Cryosphere Theme (hereinafter "**CryOS**").
- The WMO-IOC-UNEP-ICSU Steering Committee for GCOS **endorsed** the creation of GCW as a mechanism for integrating cryospheric observations.
- Potential co-sponsorship of GCW is an option. **Memorandum of understanding** or agreements would have to be established among all sponsors, as appropriate





# GCW Stakeholders & Engagements

- GCW is an initiative **sponsored** by WMO in which **WMO** and **partners** individually and collectively **contribute to GCW's Mission** and objectives.
- Collaboration and cooperation are essential to successful conduct of GCW activities at the international, regional and national levels.
- From the very **beginning** of GCW, **partnerships** were being developed, with **government agencies, institutions, international bodies** and services involved in cryospheric obs., research, services.
- These include, but are not limited to, the International Permafrost Association (**IPA**), the World Glacier Monitoring Service (**WGMS**), a service of the International Association of Cryospheric Sciences (**IACS**), the Scientific Committee for Antarctic Research (**SCAR**), the Global Precipitation Climatology Centre (**GPCC**), and the US National Snow and Ice Data Center (**NSIDC**).
- Additionally, international organizations, such as the International Council for Science (**ICSU**), the Intergovernmental Oceanographic Commission (**IOC**) and International Hydrological Programme (**IHP**) of UNESCO, and regional bodies such as the International Centre for Integrated Mountain Development (**ICIMOD**) are being engaged in the development and implementation of GCW.
- Through EC-PORS: AMAP, IASC, and major Satellite operators.



# GCW Meetings

- 1<sup>st</sup> Implementation Workshop, Geneva, Nov.2011
- 1<sup>st</sup> CryoNet Workshop, Vienna, Nov. 2012
- Snow Watch Workshop, Toronto, Jan.2013
- EC-PORS – GCW component, Lanzhou, Mar.2013
- Informal mtg on CryoNet in Asia, Lanzhou, Mar. 2013
- 1<sup>st</sup> Asia CryoNet Workshop, Beijing, Dec. 2013
- 1<sup>st</sup> CryoNet Team mtg, Reykjavik, Jan.2014
- 1<sup>st</sup> GCW Steering Committee mtg, Reykjavik, Jan.2014
- 1<sup>st</sup> South America CryoNet Workshop, Santiago, Oct.2014

**Drilling**



**Sampling surface water**



**Sampling ground ice**





# GCW Steering Group- Members

- **Chair:** Árni Snorrason (IMO);
  - **Vice-Chair:** Barry Goodison (Expert)
- Members:**
- Jenny Baeseman (CliC IPO)
  - Gianpaolo Balsamo (ECMWF)
  - Sue Barrell (WMO CBS)
  - Eric Brun (Météo France)
  - Gino Casassa (Geoestudios, UMAG)**
  - Michele Citterio (GEUS)
  - Aimee Devaris (NOAA)
  - Mark Drinkwater (ESA)
  - Charles Fierz (IACS)
  - Øystein Godøy (Metno)
  - Hans-Wolfgang Hubberten (AWI)
  - Jeff Key (NOAA)
  - Kari Luojus (FMI)
  - Tetsuo Ohata (JAMSTEC)
  - Wolfgang Schoener (ZAMG)
  - Vasily Smolyanitsky (AARI)
  - Cunde Xiao (CAS)



## *Way Forward: WMO Executive Council, 2014...*

- noted the recommendation....regarding the development and implementation of the GCW, in particular the proposal of its governance and the establishment of the GCW Steering Group (GSG) .... **The inclusion of partners on the GCW Teams, in specific tasks and on the GSG, is recognized as critical for the long term success of GCW as a cross-cutting initiative.**
- acknowledged the significant progress .... including **development of the core GCW observing network called CryoNet, ...., tangible progress on the observation and exchange of in-situ snow depth data, and the satellite snow products intercomparison and evaluation exercise being supported by the European Space Agency (ESA).**
- noted that the GCW website and GCW data portal and catalogue are now operational and provide a useful outreach mechanism.
- **noted that the resources of the GCW Coordination Office.....would be reflected in the budget proposal.**



## ***Way Forward: WMO Executive Council, 2014...***

- urged Members to **support the operation of CryoNet stations and support efforts to improve exchange of all cryosphere data** for the benefit of weather, climate and water, and related environmental research and operations, **including the GFCS.**
- concurred with the decision of EC-PORS to **approve the proposed GCW working structure, the Terms of Reference and membership of the GSG, the process for the establishment of CryoNet, including its initial sites and criteria for inclusion of the candidate sites into CryoNet, and the GCW partnership criteria.**
- agreed that the GCW Implementation Plan (GCW-IP) be submitted to Cg-17 for consideration.
- **agreed that GCW should be mainstreamed and implemented in WMO Programmes as a cross-cutting activity;** requested EC-PORS to provide oversight and guidance to GCW for its development and implementation.



# Way Forward: WMO Executive Council, 2014...

- The Council considered the draft WMO Strategic Plan 2016-2019 and decided to recommend it to Congress with further improvements to:
  - .....**making the priorities** the centrepiece of the document and ensuring that they are **explicitly linked to budget requests** set out in the revised budget proposal;
  - Have the **following as priorities**:
    1. ....
    2. ....
    3. ....
    4. **Implement operational polar weather, climate, and hydrological services focusing on operationalizing the Global Cryosphere Watch** and advancing the Global Integrated Polar Prediction System (GIPPS);
    5. ....
    6. ....







