



## **EIS Report for IICWG-XIX 2018**

For the period October 2017 - September 2018

Prepared by Nick Hughes, MET Norway

3rd September 2018

EIS member countries are Denmark, Finland, Iceland, Norway and Sweden. The EIS board have had regular Skype coordination meetings every 1-2 months during the past year. Chairmanship passed from Antti Kangas (FMI) to Nick Hughes (MET Norway) in October 2017.

During the past 12 months activities have included:

- EIS had a *meeting with the European Maritime Safety Agency (EMSA)* in Lisbon, Portugal on 15 May 2018 in which both sides introduced each other to their work and identified areas for collaboration.
- An *Ice Analysts Training Day*, in conjunction with the 27th Baltic Sea Ice Meeting (BSIM), was held in Riga, Latvia 12-13 September 2018. 22 representatives from 12 EIS and Baltic ice services participated and investigated the themes of sources of information for Baltic sea ice data including new sources of satellite data such as Sentinels-2 and -3, and manual short-range forecasting of the ice situation.
- EIS is a key group in a consortium of 15 institutions led by MET Norway that submitted a proposal to the EU H2020 research programme LC-SPACE-02-EO-2018 call *Copernicus evolution – Mission exploitation concepts for the Polar Regions*. The proposal, called *Key Environmental monitoring for Polar Latitudes and European Readiness (KEPLER)*, was successful and the 27 month, 3 MEUR project will start in January 2019. During this period EIS will lead efforts to engage with Copernicus stakeholders with interests in the Polar Regions and develop recommendations as to how the programme can provide better information for them in the 2020's.
- FMI and SMHI have started *common ice chart production for the Baltic* and are continuing development of the GIS system *Vanadis*.
- MET Norway continues development of the open source *Bifrost* ice charting system and is adding improved processing functionality for Copernicus Sentinels 1, 2 and 3.

## NAIS 16: An overview to the IICWG on the 16<sup>th</sup> Annual meeting of the North American Ice Service

**Background:** The North American Ice Service (NAIS) is a collaboration between the Canadian Ice Service, the United States National/Naval Ice Center (NIC) and the International Ice Patrol (IIP) under an annex to the overall ECCC/NOAA MOU.

**Overview:** During the week of September 10, 2018, IIP will host the 16<sup>th</sup> annual meeting of NAIS, approximately two weeks prior to IICWG. As such, this overview covers the intended plan for meeting and discussions.

The meeting is scheduled to be held at the United States Coast Guard Academy in New London, CT, USA from the 10<sup>th</sup> – 13<sup>th</sup> September inclusive (planned agenda as of 24 August attached). The theme of the meeting is: *Modernizing Ice Services: Enabling maritime operations, safety, and security in a changing world*. Overall, NAIS Co-Chairmen and Co-Directors have developed the agenda to address/discuss the following subjects:

- 1) Model validation and verification – transition from development into operations. A workshop will be held to take stock and re-evaluate how each Ice Center is validating model output and using for product development. The discussion time will be guided to see if there are lessons learned/best practices that can be shared among the Centers and will endeavor to establish a documented process for verification and evaluation efforts that would "sanction" a model transition into operations.
- 2) Joint product creation - examining the products we create together to promote discussion on how NAIS members can continue to work together and improve practices to best serve the maritime community and users of ice products. This session should build on the model validation workshop in such that concepts discussed will inform discussion with respect to creating new joint products and refining current ones.
- 3) User group case studies and presentations – with increased traffic in Arctic regions and novel shipboard users of ice information, it is important for members of NAIS to hear how end users access and use the information and products we create and distribute. This session will give NAIS members a better understanding of the information the end user needs and the manner in which it is accessed in order to modernize development and distribution of Ice Products. Additionally, two case studies will highlight how NAIS partners have worked together over the last year on specific events in support of the maritime community.
- 4) Committee Organization Update – NAIS has four committees: Science, IT, Operations, and a Cross-Committee. There is currently limited guidance on the operations and expectations of the committees, so this time period will enable review and development of a "Terms of Reference" document for NAIS committees modeled after the TOR for IICWG Standing Committees.
- 5) Center Briefs allow each NAIS organization to give an overview of their activities and achievements over the past year and highlight priorities for the coming year. This will give all members of NAIS an important understanding of the focus of resources and efforts for each organization in the last year and the coming year, and if efforts will have impact on other partners.
- 6) Lastly, the 19<sup>th</sup> annual meeting of the International Ice Charting Working Group (IICWG) will be held in Helsinki, Finland during the week of Sept 24<sup>th</sup>. NAIS will take the opportunity to discuss and coordinate its involvement.



# North American Ice Service 16<sup>th</sup> Annual Meeting



**“Modernizing Ice Services:  
*Enabling maritime operations, a safety, and security  
in a changing world”***

**September 10-13, 2017**

The mission of NAIS is to leverage the strengths of the three organizations to monitor and provide the highest quality, timely, and accurate ice analysis, in order to meet the need of the maritime interests of the United States and Canadian governments.

## Agenda

**Monday, 10 September 2018**  
**“Committee Workshop - Model Verification”**  
**USCG Academy Alumni Center**

**The morning is intentionally left unscheduled to allow members to travel on Monday.**

### **1230 Check-In and Afternoon Social**

1300 Welcome and Opening Remarks

CDR Kristen Serumgard  
USCG Int'l Ice Patrol (IIP)

1315 Sea Ice Model Verification Efforts

- NIC: “48 Hour Verification”
- CIS:
- NWS-Alaska:
- NRL:

Ms. Alexandra Kabeiseman  
Mr. Brad Drummond  
Mr. Eugene Petrescu  
Mr. David Herbert

1415 Iceberg Model Verification Efforts

- IIP: “IIP & NAIS Models”
- CIS:

Mr. Mike Hicks  
Mr. Dean Flett

### **1445 Break**

1500 Breakout Discussions:

- Sea Ice Modeling – Facilitated by: TBD
- Iceberg Modeling – Facilitated by: Mr. Mike Hicks

1600 Re-group & Share Discussion Results

**1630 Closing Remarks**

CDR Kristen Serumgard, IIP

**1645 Icebreaker Social at Lee Rail USCGA O’Club**

**Tuesday, 11 September 2018**  
**“Committee Day”**  
**USCG Academy Leamy Hall**

**0800 Morning Social and Check In**

0815 Welcome and Admin Remarks CDR Kristen Serumgard, IIP  
0845 Review of Strategic Plan Co-Directors

**0945 Break**

**Committees Separate to Break-Out Rooms**

1000 Committee Meetings  
1430 Co-Chair Meeting with Co-Directors Co-Chairs and Co-Directors  
1530 Entire Group Reconvenes Committee Chairs/  
Co-Directors  
Identify Cross-Committee Issues  
1630 Closing Remarks and Discussion CDR Kristen Serumgard, IIP

**1700 Meeting Adjourned**

\*Note: Lunch and dinner on own. Committees free to schedule lunch as appropriate.

**Wednesday, 12 September 2018**  
**“Plenary Session – Day 1”**  
**USCG Academy Leamy Hall**

**0800 Morning Social and Check In**

0830 Welcome and Admin Remarks CDR Kristen Serumgard, IIP  
0845 Co-Chair Introductions and Opening Remarks NAIS Co-Chairs

0915 Signing of NWS-Alaska as Official NAIS member

0930 Center Briefs (10 minutes each, with time for questions)

- IIP
- CIS
- NIC
- DMI
- NWS-Alaska

CDR Kristen Serumgard  
Mr. John Parker  
CDR Ruth Lane  
Mr. Søren Olufsen  
Mr. Eugene Petrescu

1030 Committee Updates (15 minutes each)

- Co-Directors
- Science
- Operations
- IT
- Cross - Committee

Committee Chairs

1145 Discussion and Q&A from Committee updates

All

## 1230 No-Host Lunch

### 1315 Ice Information User Group Presentations, Discussions, Q&A

- Great Lakes Environmental Research Lab Mr. George Leshkevich
- Greenland Cruise Ships Mr. Keld Qvistgaard
- USCG RDC Arctic Group (tentative) TBD

### 1430 Satellite Iceberg Detection Validation

- IIP: NASA JPL Machine Learning effort/update Mr. Mike Hicks
- DMI: Greenland Satellite Iceberg Detection Mr. Keld Qvistgaard
- CIS: SAR Iceberg Detection: Recent Research and Operational Demo Mr. Dean Flett

## 1530 Break

1545 Case Study: USCGC MAPLE Northwest Passage Transit After Action Report Ops Committee

1615 Case Study: Canadian Coast Guard & CIS Ice Specialists Support of USS LITTLE ROCK Canadian CG & CIS Ops

1645 Discussion and Wrap-Up Co-Chairs / Co-Directors

1715 Meeting Adjourned CDR Kristen Serumgard, IIP

1800 No Host Dinner: Olio Restaurant & Bar, 33 Kings Highway, Groton

## Thursday, 13 September 2018 “Plenary Session – Day 2” USCG Academy Leamy Hall

## 0800 Morning Social & Check In

0815 Welcome and Admin Remarks CDR Kristen Serumgard, IIP

0830 Report on Model Verification Workshop Mr. Mike Hicks, IIP

0900 IceBerg Analysis and Prediction System (BAPS) Sustainment & Replacement Ms. Barb Lis, IIP  
Mr. Scott Fitzgerald, CIS

## 0945 Break

1000 Joint NAIS Product Overview Operations Committee

- IIP/CIS/DMI – NAIS Iceberg Limit product
- CIS/NIC – Great Lakes Product
- CIS/NIC/NWS – Bering Strait Product

1045 Joint NAIS Products Panel Discussion Co-Directors

Some Discussion Questions:

- Are there other areas of product overlap where NAIS members can share efforts and create a joint product?

- Can the coordination for creating joint products be improved; are there modernization efforts that can improve how the centers work together?
- Are there any shortcomings to the production and distribution of joint products?
- Can the Contingency Plans be improved; are the proper steps in place to ensure consistency of product delivery to the Mariners/Users of NAIS products?

#### 1145 No-Host Lunch

1300 ICECON Update

CDR Ruth Lane, NIC

1315 Year of Polar Predictions Updates and Activities (~5 min update from each center)

- IIP
- CIS
- NIC
- DMI
- NWS

#### 1400 Break

1415 NAIS 16 Action Items

Ms. Shanna Pitter, NOAA

1530 IICWG

CDR Kristen Serumgard, IIP

- Report on 18<sup>th</sup> IICWG – Hobart, Australia (2017)
- Discussion & Preparation for 19<sup>th</sup> IICWG – Helsinki, Finland (2018)

Theme: *“Ice Information for Navigating the Sub-Polar Seas”*

#### 1600 Break

1615 Recap and Closing Remarks

Co-Director’s & Co-Chair’s

1700 Meeting Adjourned

CDR Kristen Serumgard, IIP

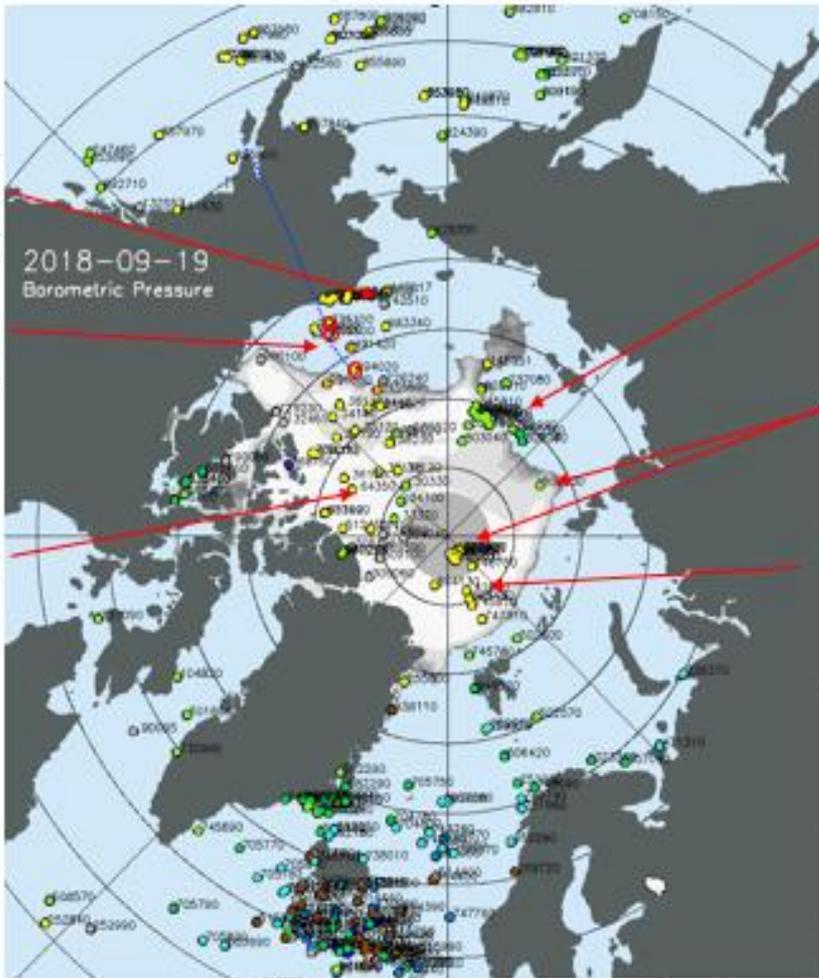




# **International Arctic Buoy Program (IABP) and International Program for Antarctic Buoys (IPAB) Update**

*International Ice Charting Working Group  
19<sup>th</sup> Meeting, Helsinki, Finland  
September 24 – 28, 2018*

# International Arctic Buoy Program Update



USN ICEX and  
USCG Healy  
Deployments

USCG C-130  
Deployments

ECCC/RCAF/ICEPPR  
18 buoys deployed

Polarstern and  
NABOS Deployments

AARI, EUMETNET, and  
USIABP deployments  
from Russian Ice  
Breakers

Oden  
Deployments

- IABP has 131 buoys reporting
- Healthy network in Bering, Chukchi, Beaufort, and North Atlantic

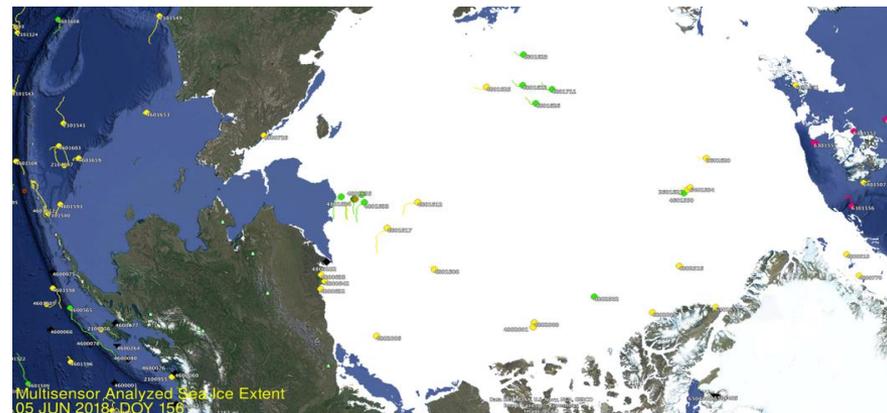
# Increasing Arctic Observations U.S. Interagency Buoy Program



## • International Cooperative Engagement Program for Polar Research (ICE-PPR) Deployments

- 2017-3 (RDAF)
- 2018-18 (RCAF)
- 2019-19+ (RDAF)

## • ICE-PPR collaboration saved USIABP approximately \$500k in fuel costs; redirected towards buoy purchases

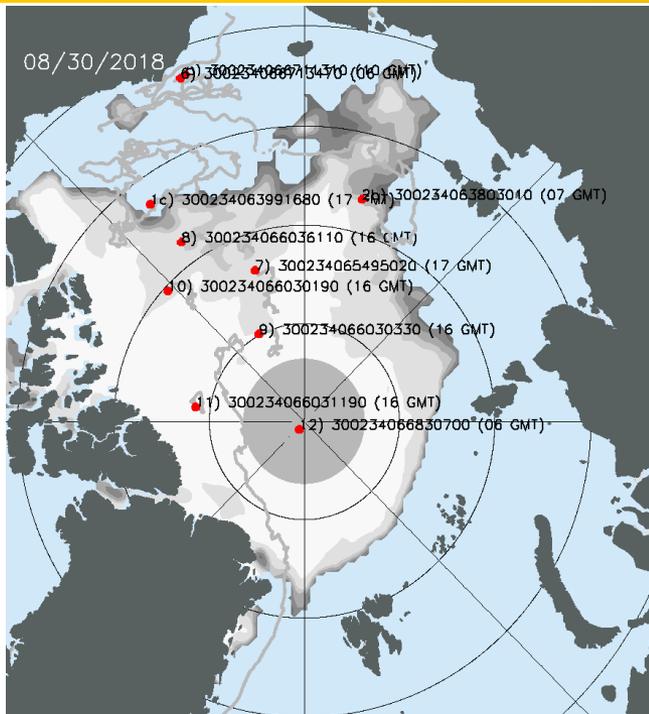


Buoys reporting to GTS prior to ICE-PPR deployment.

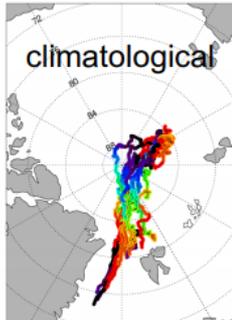
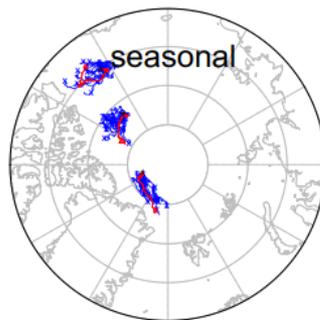
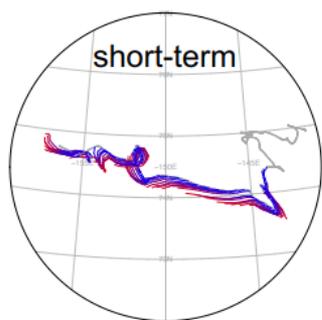


Buoys reporting to GTS after ICE-PPR deployment. Note large increase in coverage in central Arctic (red circle).

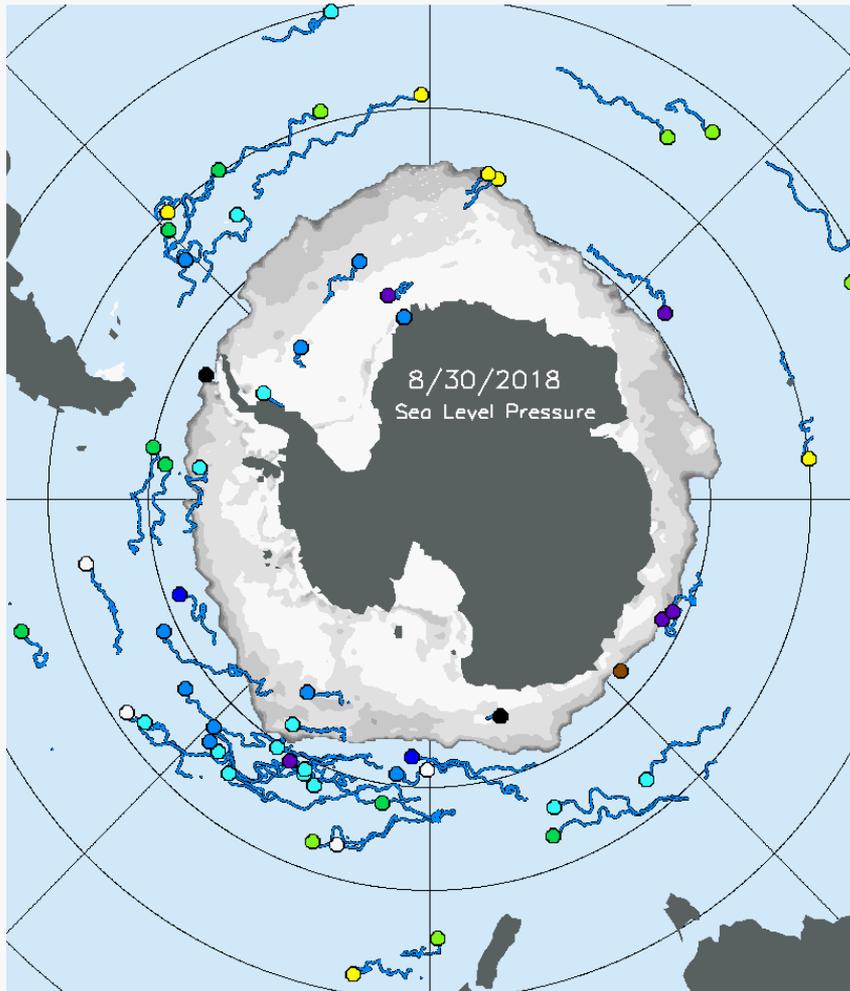
# International Arctic Buoy Program Update



- **Sea Ice Drift Forecast Experiment (SIDFEx) is a community effort to collect and analyze Arctic sea-ice drift forecasts**
- **Goals to improve capability to forecast sea ice trajectories; diagnose shortcomings of models, obs, atmospheric forcing; understand predictability of sea ice drift**



# International Program for Antarctic Buoys Update



- IPAB has 55 buoys reporting (~9 within the pack ice)
- Antarctic region more challenging for funding, deployment opportunities
- Once deployed buoys drift away from the Antarctic Coast

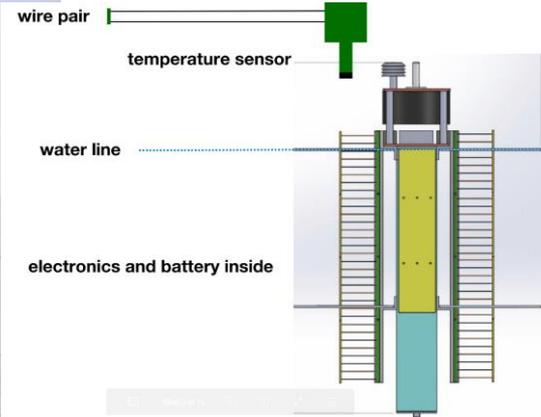
# Thank You



**"Eyak"**  
Oct 16, 2017



**"Adak"**  
Oct 20, 2017



# MIST

Microstructure Insitu Salinity and Temperature





# ETSI Update

Vasily Smolyanitsky

Arctic and Antarctic Research Institute, St.Petersburg, Russia

Expert Team on Sea Ice, chair

International Ice Charting Working Group – 19

24-28 September 2018, FMI, Helsinki, Finland

# Expert Team composition

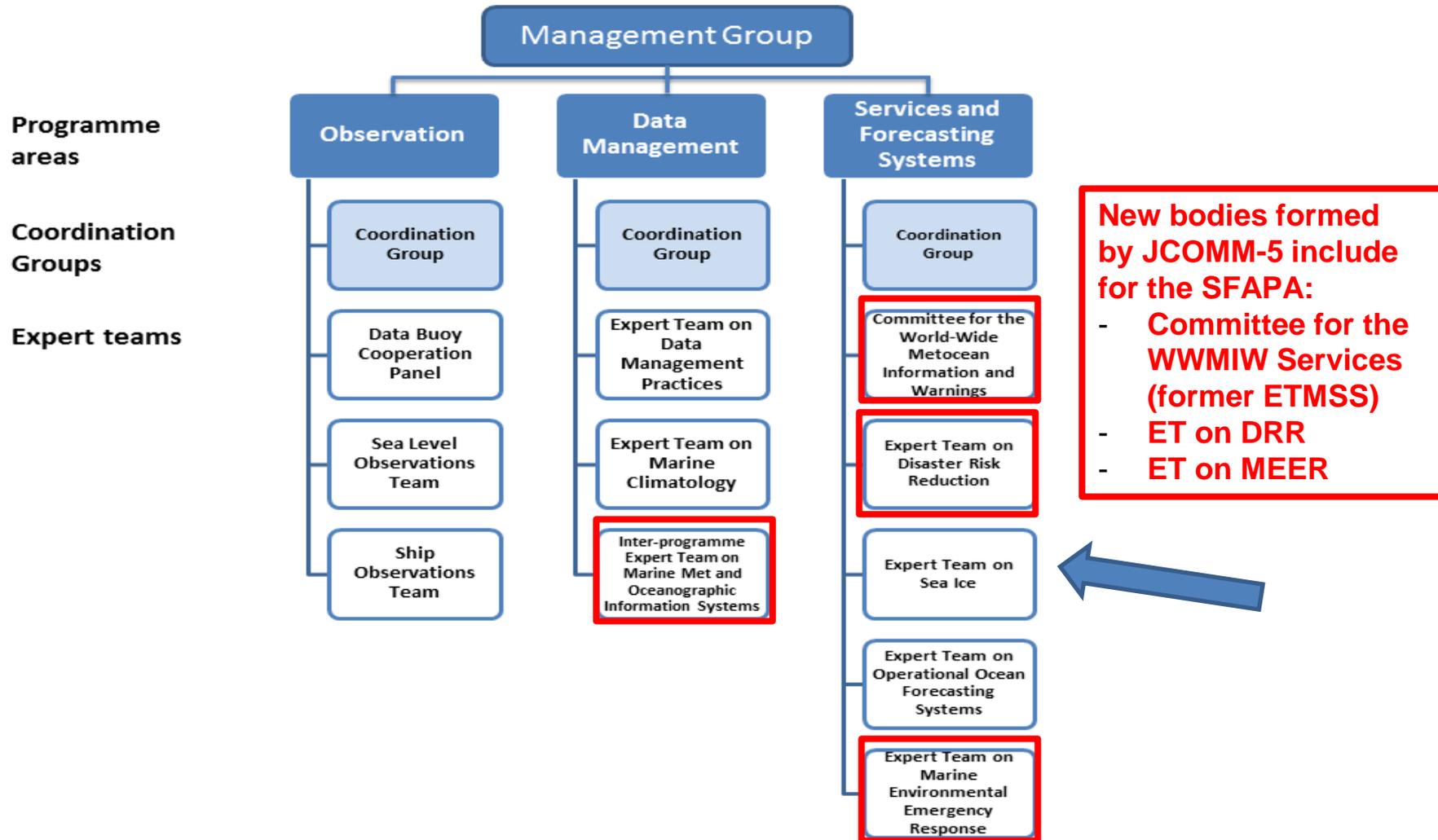
Name	Affiliation	RA
<b>Alvaro Scardilli</b>	SHN, Argentina	RA III
Marc-Andre-Lebel	CIS/ECCC, Canada	RA IV
Eriksson, Patrick	FMI, Finland	RA VI
<b>Holfort, Juergen</b>	BSH, Germany	RA VI
<b>Hamada, Keiji</b>	JMA, Japan	RA III
<b>Hughes, Nicholas</b>	NMI, Norway	RA VI
<b>Vasily Smolyanitsky</b>	AARI, Russia	RA II/VI
<b>Panowicz, Caryn</b>	NIC/NOAA, USA	RA IV
<b>Quistgaard, Keld</b>	DMI, Denmark	RA VI
Concha, Gonzalo	CNWS, Chile	RA III
Yang, Qinghua	NMEFC, China	RA II

**Bold – members prior to 2017**

- ❑ Confirmed as an ET within JCOMM Services and Forecasting Systems PA by JCOMM-5 session in October 2017
- ❑ Members reelected following letters of endorsement from national PR
- ❑ Last changes in June 2018 due to change in membership from CIS
- ❑ 7 members from previous membership, 4 new members

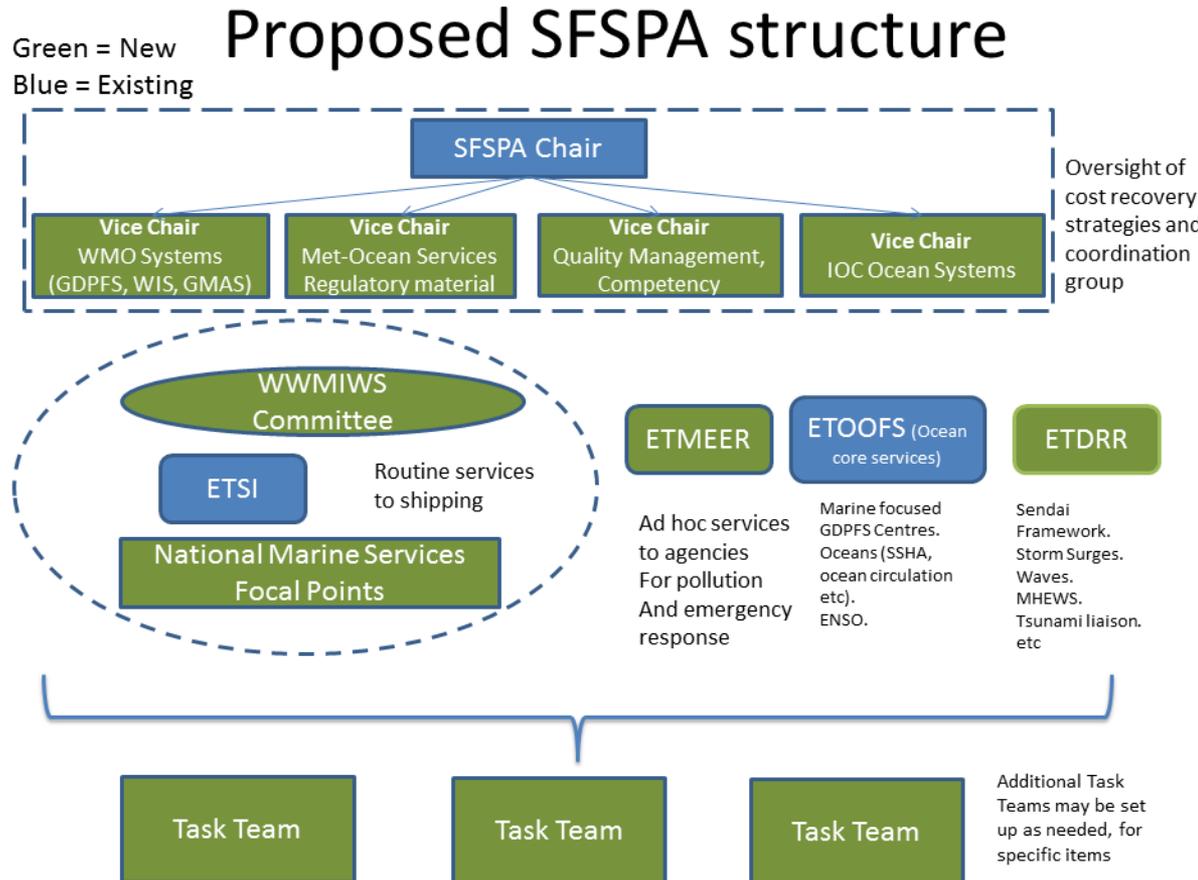
# Position of ETSI inside JCOMM:

*Structure of JCOMM as adopted by JCOMM-5 (Oct 2017)*



# Position and role of ETSI inside SFSPA:

*SFSPA structure (Decision 5.1/1 (JCOMM-5) - Approval of the SFSPA vision, new structure and governance )*



1.2 The vision for SFSPA is to focus resource ...on...responsibilities under the UN Convention on the Safety of Life at Sea (SOLAS)... In the future, it would be managed by JCOMM's Worldwide Met-Ocean Information and Warning Service (WWMIWS) Committee...proposed to reflect the governance of the IHO/IMO Worldwide Navigational Warning Service.... In addition, the ETSI, in close cooperation with its technical and scientific advisor, the IICWG, would continue to provide a wide-ranging and comprehensive range of information for ships operating in the Polar regions, which are likely to become more relevant as the waters become less ice-bound through the year. This includes the implementation of Polar Code for vessels operating the in polar regions.....

# The WMO constituent body reform (TBD by Cg-18)

- ✓ Commission for Basic Systems
- ✓ Commission for Instruments and Methods of Observation
- ✓ Commission for Hydrology
- ✓ Commission for Atmospheric Sciences
- ✓ Commission for Aeronautical Meteorology
- ✓ Commission for Agricultural Meteorology
- ✓ Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
- ✓ Commission for Climatology



- A. Commission for Observation, Infrastructure and Information Systems (COIS)
- B. Commission for Weather, Climate, Water and Related Environmental Services and Applications (CSA)

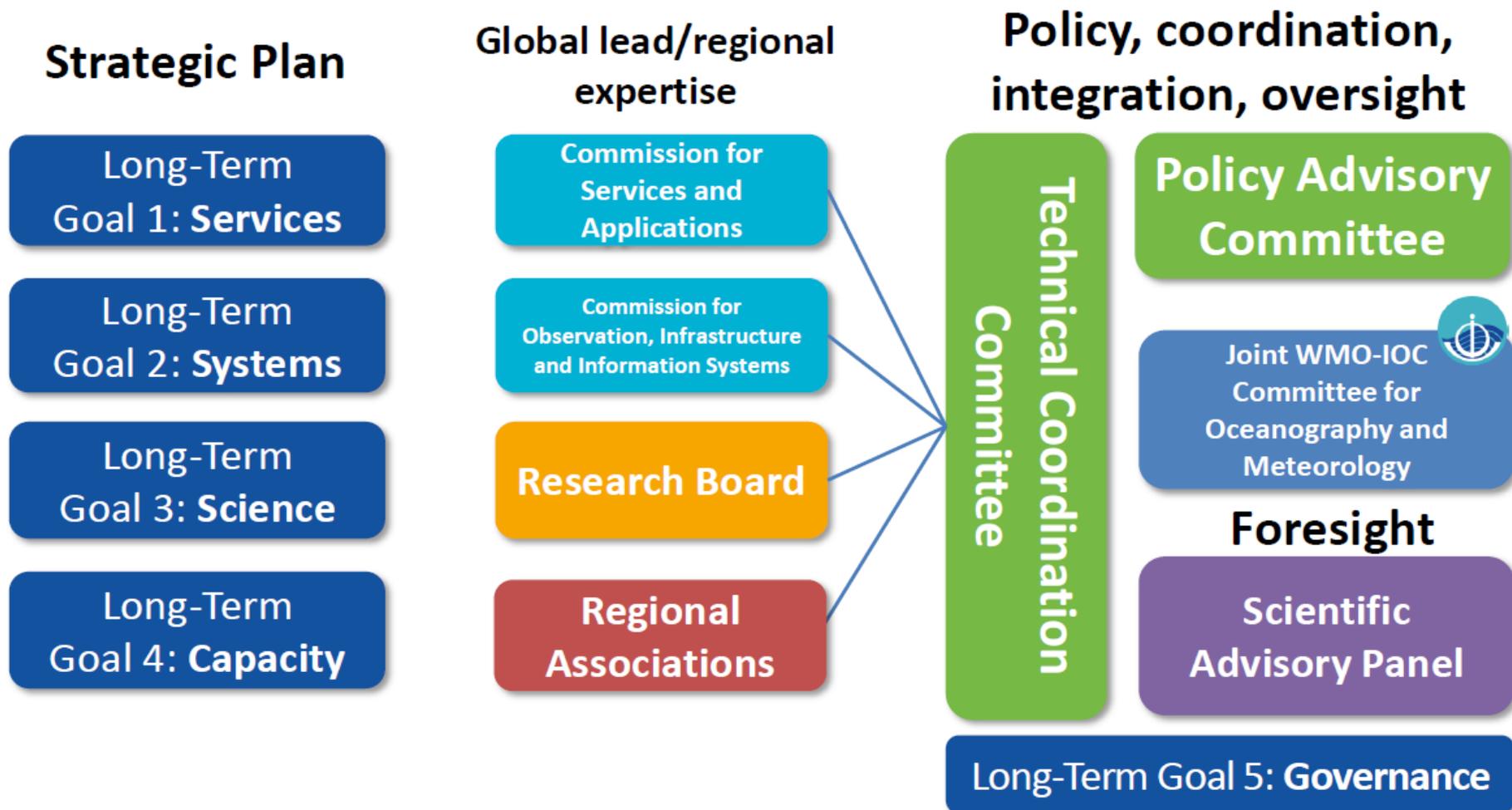
Scientific advisory panel

**Joint WMO-IOC Committee for Oceanography and Meteorology**

Research Board on Weather, Climate, Water and the Environment

[Draft Recommendation 16.3\(4\)/1 \(EC-70\)](#)  
[Information doc on JCOMM reform](#)

# Strategic alignment – Logical framework (Aligning WMO structures with Strategic Plan)



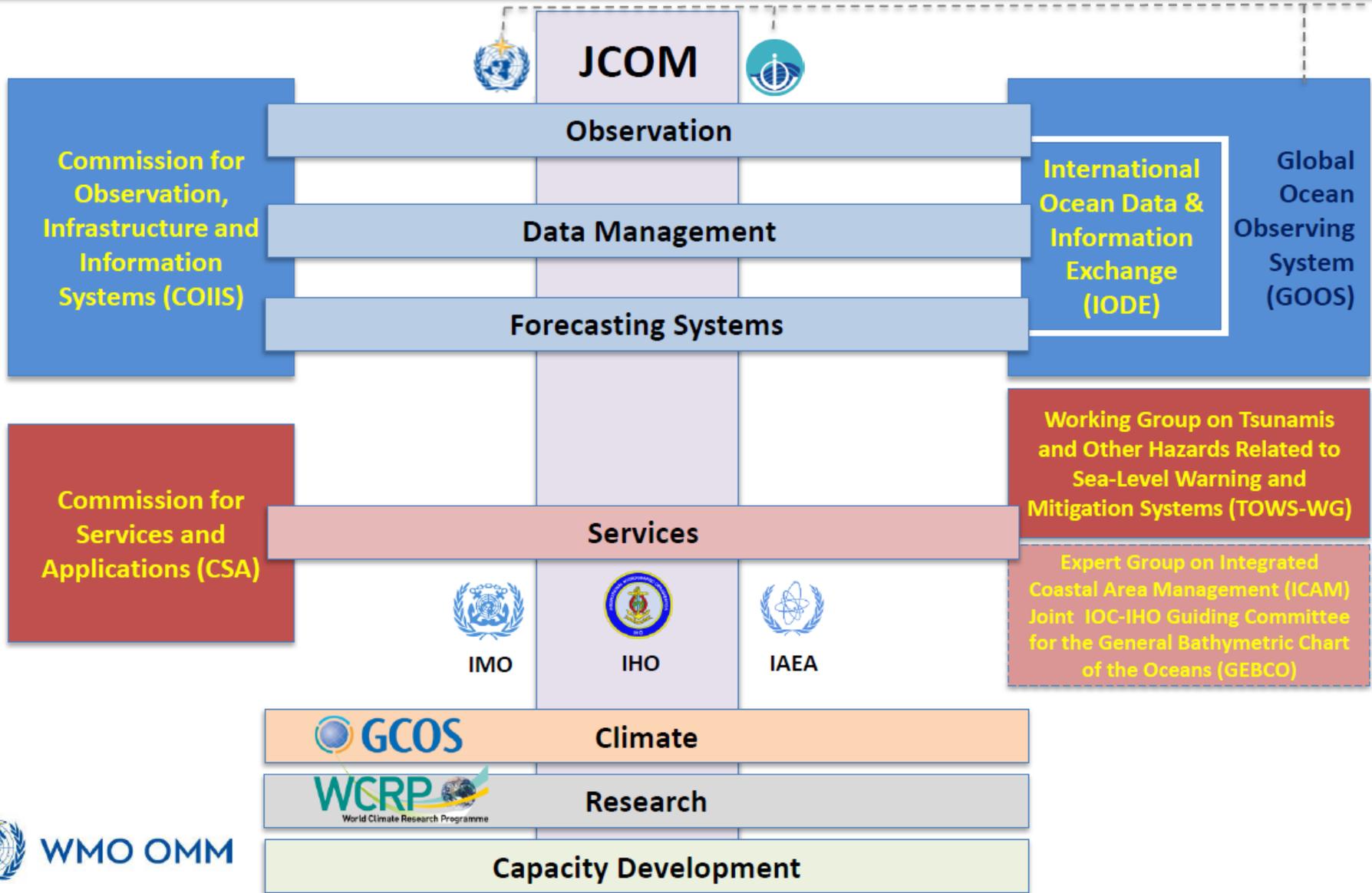
**New integrated process of strategic priority setting**

WMO OMM

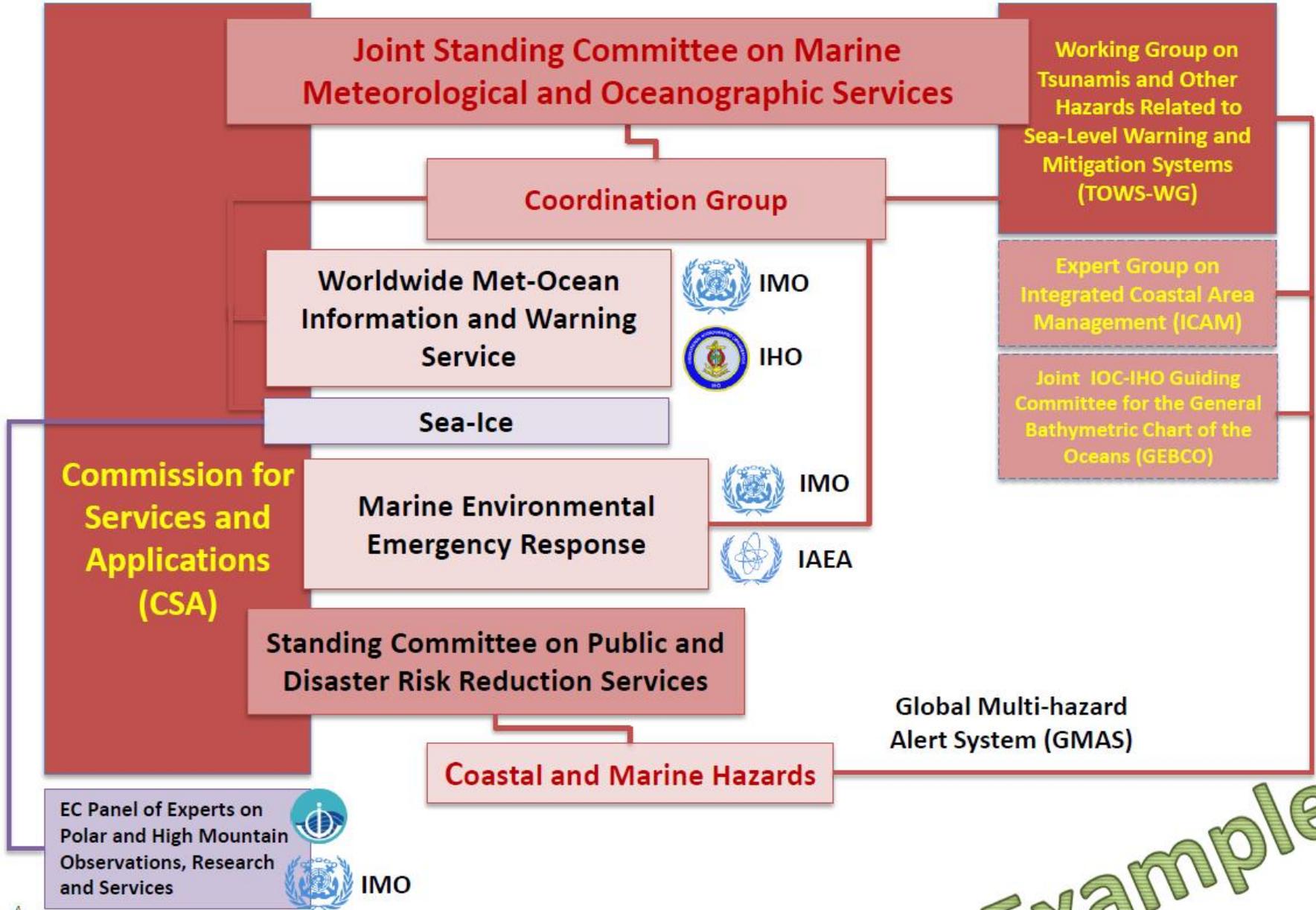
*Hydrology – TBC after CHy-Ext*

# Suggested coordination and integration role of JCOM

(To be further defined by the joint WMO-IOC consultation group)

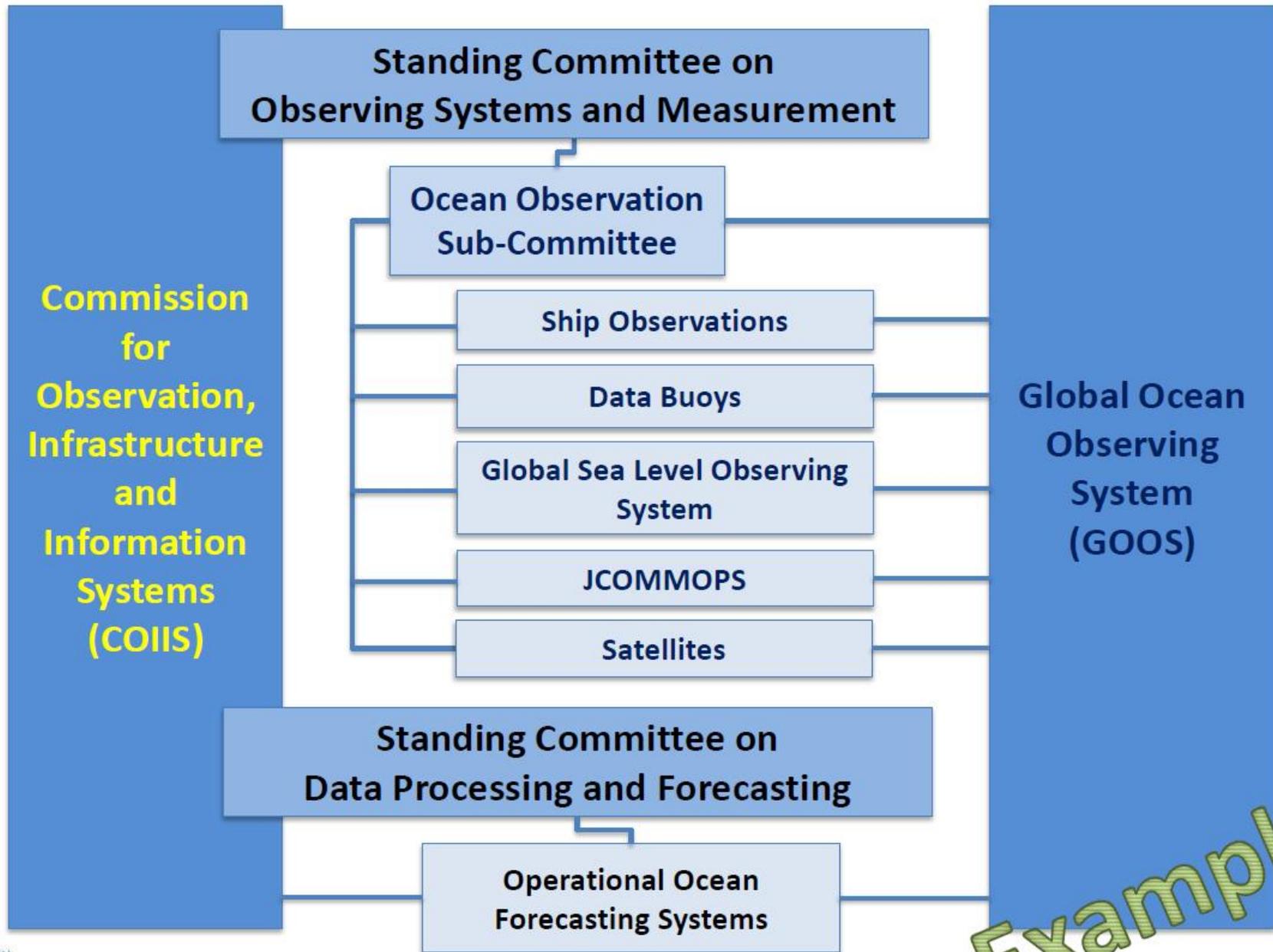


# Possible transition



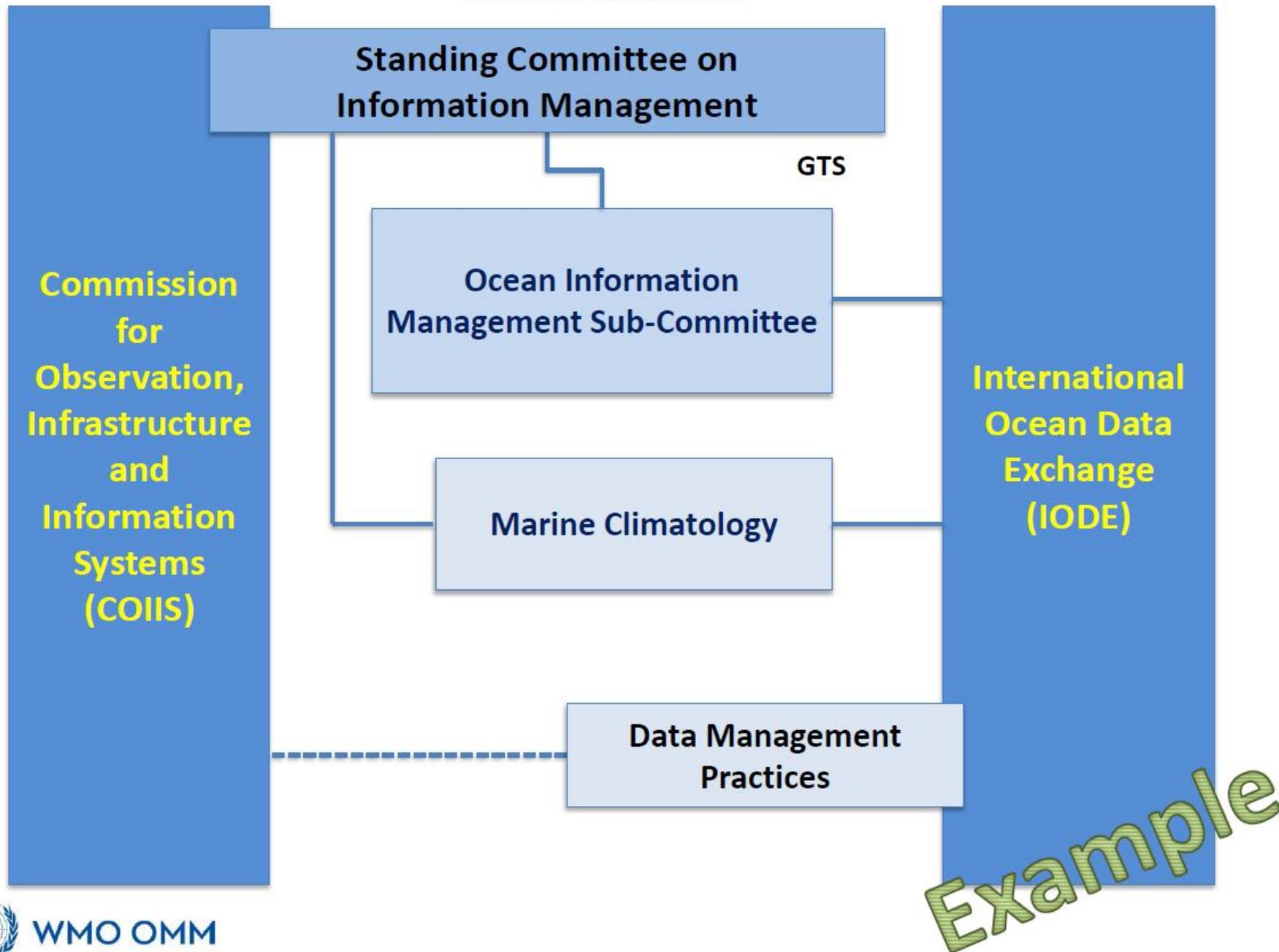
Example

# Possible transition



**Example**

## Possible transition



# Key elements for ETSI WP following the team's ToRs (jointly with IICWG)

## *(1) Support Capacity Development workshops*

- Continue with Ice Analysts Workshops following IAW-5, held in May 2016 (NIC, Washington DC) and the mini-IAW in Sept 2017, both contributed to training in the Southern Ocean sea ice and icebergs analysis and automated GMDSS analysis

## *(2) Support and enhance the Polar components of GMDSS*

- Coordinate implementation of the WMO No.558 edition 2017 standards for GMDSS bulletins for sea ice and icebergs (synopsis, warnings) for the Arctic and SO remains key task
- Coordinate implementation of Polar Code, including risk assessment techniques and issuing Polar Certificates

## *(3) Support and enhance ENC/ECDIS/ECS for ice navigation*

- Update the “*Ice Object Catalogue*” (JCOMM-TR-080), version 5.2.1/5.3 synchronously with *S-411* (JCOMM-TR-081), version 1.x, covering icebergs, and subjects extending vector charts;
- Interact with manufacturers and coordinate implementation of S-411 in on-board ECS/ECDIS systems

# Key elements for ETSI WP following the team's ToRs (jointly with IICWG)

## *(4) Maintain and update sea ice technical documentation*

- Update of SIGRID-3 and Colour Standard, new versions should cover new specs for sea ice and icebergs products including uncertainties
- Update of the WMO Sea Ice Nomenclature, at least, for new icebergs symbology and color standards (vol iii)
- Sea Ice Information Services in World – update following review

## *(5) Support for sea ice climatology and ice information systems*

- Keep regular update of the Global Digital Sea Ice Data Bank (GDSIDB) depositories at AARI and NSIDC and their visibility to JCOMM and WMO projects and systems
- Reinforce of the GDSIDB by integration with the Marine Climate Data System (MCDS) as a CMOC

## *(6) Support for the GCW and Arc & AntRCC*

- Develop joint standards including best practices
- Support seasonal monitoring products

# Challenges and Opportunities

## ○ Challenges

- ✓ New role and liaisons for ETSI within the reformed WMO structure
- ✓ Demands for new products beyond the vector charts – standards for animations, risks, uncertainties, satellite imagery, etc
- ✓ Demands for services and standards supporting e-navigation in polar regions – standards for extended ENC/ECDIS
- ✓ Harmonization of Polar Code implementation
- ✓ Request for sustained (daily) sea ice and icebergs information for GMDSS bulletins with existing constraints in radar satellite coverages
- ✓ Growing requests to improve seasonal forecasting

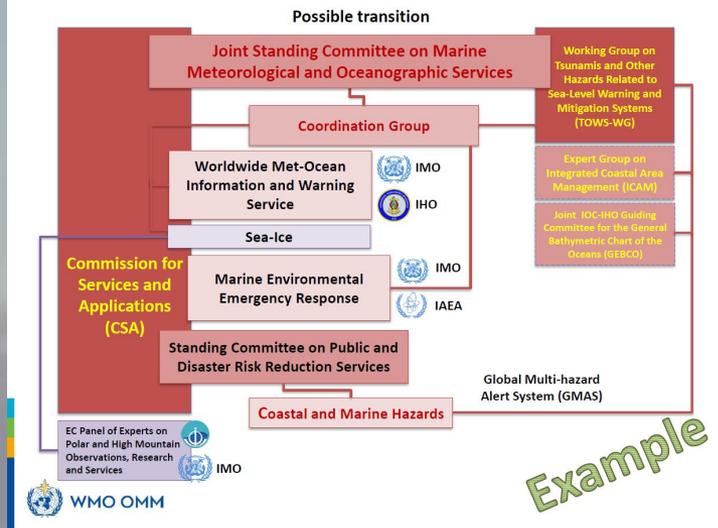
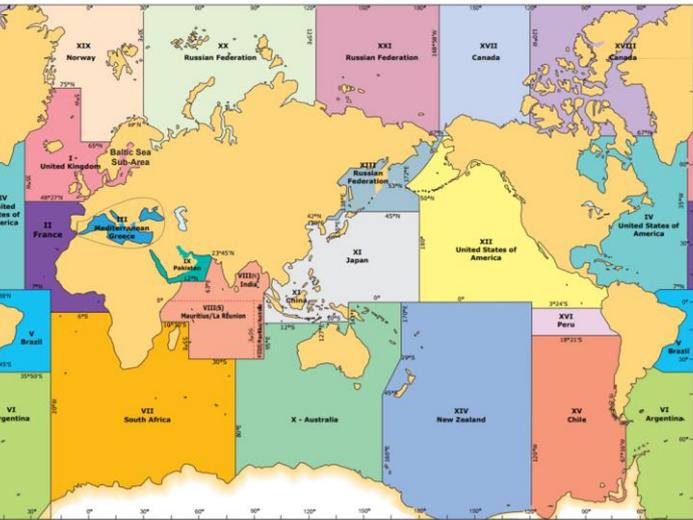
## ○ Opportunities

- ✓ Growing demands for more frequent ice services on the routes in the Arctic, sub-Arctic, with constantly increasing amount for SO
- ✓ Growing flexibility to deliver GMDSS products due to new service providers in the Polar Regions – SafetyNET-2, IRIDIUM
- ✓ Requests for additional tactical and climatological products from the Ice Services following implementation of Polar Code
- ✓ Cooperation with GCW and Arc/AntRCC on sea ice and icebergs products and seasonal forecasting

# Upcoming Activities/Goals

- IICWG-19, 24-28 September 2018, FMI
  - ✓ Report to IICWG on ETSI, JCOMM SFSPA and WMO
  - ✓ Determine tasks for JCOMM ETSI within IICWG WP
- Support for PARCOF:
  - ✓ 'virtual' PARCOF-2 (25 Sep – 30 Oct, NMI)
  - ✓ 'physical' PARCOF-3 (May 2019, FMI)
  - ✓ Scoping workshop on AntrCC (May 2019 ?)
- ETSI-7 session (spring 2019, time and place TBD with WMO Secretariat), key anticipated outcomes may include:
  - ✓ Updates to WMO sea ice/icebergs technical documentation
  - ✓ Input for the WMO 18<sup>th</sup> Congress (WMO-574, WMO-259 ?)
  - ✓ Sea ice information for GMDSS - extension METAREAs, by regions, parameters, due to new service providers (e.g. SafetyNET-2 and IRIDIUM)
  - ✓ WP (?) on implementation of Polar Code – global and regional aspects and implications for Ice Services

Limits of metareas - 2017



# Thank you !

Most Visited Scientific Data Hub todays-sentinel-n-3d...

**Ice Logistics Portal**  
jcomm

Worldregions: Southern; Northern 90W; Northern 90E; Metareas; Position Home; Contact Us

411 ECMS charts  
Actual 5411 charts  
Background Information  
Sea Ice Service of the World  
Manual of Standard Procedures for Observing and Reporting Ice Conditions  
SIGRID-3: A Vector Archive Format for Sea Ice Charts  
Ice Chart Colour Code Standard

**NORTHERN HEMISPHERE (90W) (90W)**  
Click on a region to view the data products in the area:

Arctic Basin, Kara Sea, Laptev Sea, East Siberian Sea, Chukchi Sea, Beaufort Sea, Canadian Basin, Barents Sea, Norwegian Sea, Labrador Sea, Hudson Bay, Gulf of St. Lawrence, Gulf of Alaska, Bering Sea, Arctic Ocean, Kara Sea, Laptev Sea, East Siberian Sea, Chukchi Sea, Beaufort Sea, Canadian Basin, Barents Sea, Norwegian Sea, Labrador Sea, Hudson Bay, Gulf of St. Lawrence, Gulf of Alaska, Bering Sea, Arctic Ocean.

Links  
JCOMM-ETSI  
GMDS-MetAreas

Map of the Arctic region showing various data overlays. The map includes latitude and longitude coordinates (60° 00' N to 65° 00' N, 150° 00' W to 180° 00' W). The interface includes a control panel with various options and a data table.

CHRT	SCALE	LEVEL	MOB
ROUTE	POINT	ETE	MSG
APPS	RIS	MARK	PLST
CON	COLOR	PRED	SHOW
DR	ALARM	TIME	REDA
PRIN	AXIS		
REED	SAR	CALC	ERIC
TIDE	EDS	SINS	PRINT
LAT	LONG		
ACX			