Message from Climate and Cryosphere (CliC) Project

Ocean Observation Panel for Climate
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representing CliC and IGOS-P Cryosphere

Thanks to their members esp Barry Goodison, Vicky Lytle, Vladimir Ryabinin, Tony Worby, Jeff Key, Mark Drinkwater and many more

GEWEX 1988 →

WGNE
WGCM
WGSF

SPARC 1992→

WCRP Observation Assmilation Panel

WCRP Modelling Panel

Coordinated Observation and Prediction of the Earth System

CLIVAR 1995 →

SOLAS 2001 ->

CliC 2000 →

CliC Goal and Objectives

Principal Goal:

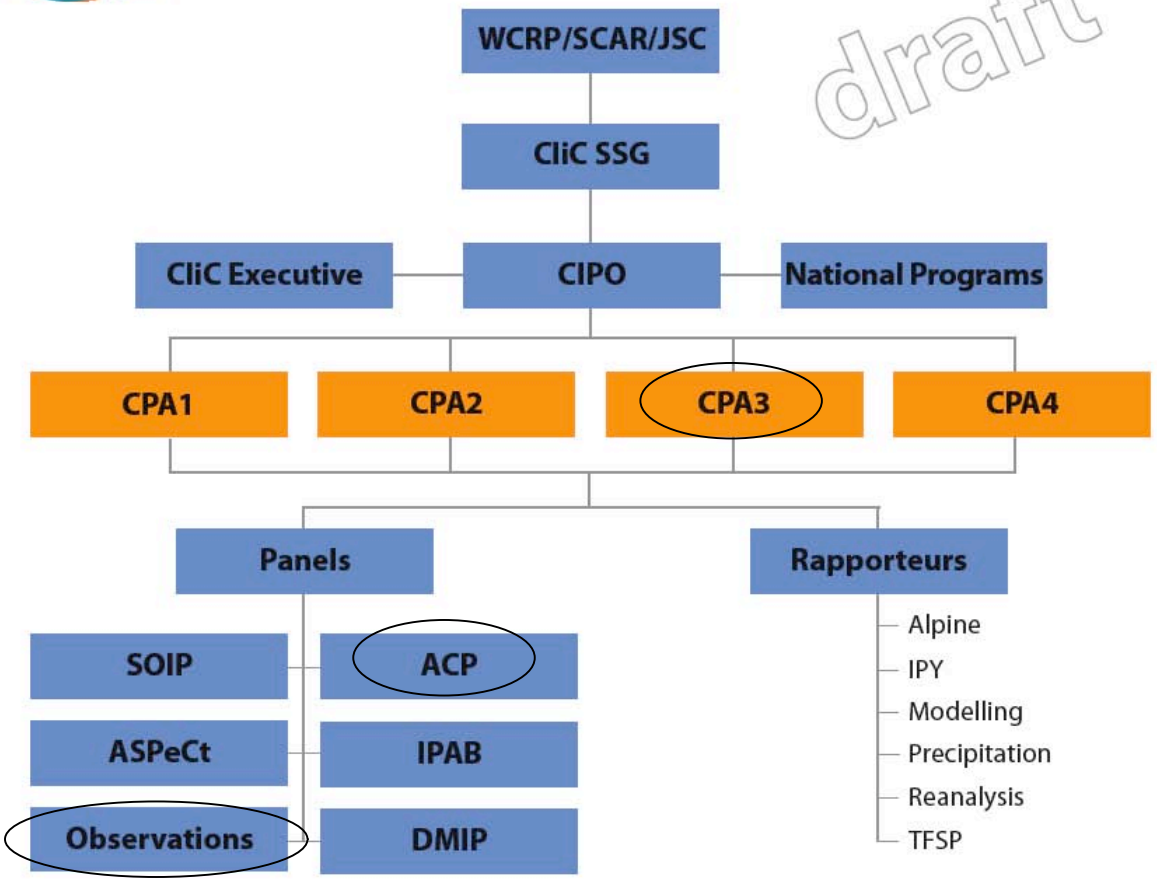
To assess and quantify the impacts that climatic variability and change have on components of the cryosphere and the consequences of these impacts for the climate system.

In addressing this aim, CliC also seeks to determine the stability of the global cryosphere

Supporting Objectives:

- ***Enhance the observation and monitoring of the cryosphere and the climate of cold regions in support of process studies, model evaluation, and change detection.***
- ***Improve understanding of the physical processes and feedbacks through which the cryosphere interacts within the climate system***
- ***Improve the representation of cryospheric processes in models to reduce uncertainties in simulation of climate and predictions of climate change (role of the cryosphere on predictability of the climate system)***
- ***Facilitate assessment of changes in the cryosphere and their impact, and to use this information to aid the detection of climate change***

Climate and Cryosphere (CliC) Project



CliC project areas

CliC/CLIVAR

Arctic Climate Panel (ACP)

ASPeCt - Antarctic Sea Ice Processes and Climate
ACP - Arctic Climate Panel
CIPO - CliC International Project Office
CPA - CliC Project Area
DMIP - Data Management and Information Panel
IABP - International Project for Antarctic Buoys
IPY - International Polar Year
SCAR - Scientific Committee on Antarctic Research
SOIP - Southern Ocean Implementation Panel
TFSP - Task Force on Seasonal Predictions
WCRP - World Climate Research Programme

CPA1: The terrestrial cryosphere and hydrometeorology of cold regions.

CPA2: Glaciers, ice caps and ice sheets, and their relation to sea level.

CPA3: The marine cryosphere and its interactions with high latitude oceans and atmosphere.

CPA4: Links between the cryosphere and global climate.

Sea ice

CliC and SCAR are developing IGOS-P

Integrated Global Observing Strategy Cryosphere:

The overall goal of IGOS is to produce comprehensive global, regional and national data and information to satisfy the environmental information needs of policy-makers, and so support scientific and operational environmental programmes.

IGOS has adopted a process of themes in which observations are made for selected fields of common interest among a group of partners, including Global Carbon Cycle, Ocean, Water Cycle, Atmospheric Chemistry, and Geohazards, and now Cryosphere is in the process (Theme report under development)

Sea ice requirement for IGOS-P Cryosphere (complied by Mark Drinkwater of ESA)

1 Stetement of product/dataset:

- *Gridded products on sea ice extent, concentration, thickness and drift with complementary data on albedo and surface temperature*

2 Required use/application:

- *The long-term sea ice climate record is one of the most fundamental indicators of high latitude climate change*
- *Needed for global heat and freshwater budget*

3 Spatio-temporal resolutions:

- *The current time-space (0.5d & 12km) resolution capabilities of passive microwave satellites are sufficient for many climate applications*
- *Possible significance of sub-daily variations in ice concentration*

Sea ice requirements (continued)

3 Spatio-temporal resolutions (continued)

- *Seasonal and interannual variations must be resolved on a scale of order $10^6 km^2$*

4 Particular action sought and possible partners

- *Continuation of the existing DMSP SSM/I class series w/*
- *AMSR on GCOM-W in 2009/2010*
- *CMIS on NPOESS C-2 in app 2011*
- *Recovery action of CryoSat2 is essential for ice thickness derivation capability*
- *Operationalisation of the sea-ice thickness measurement is a high priority*
- *IceSat follow-on mission supplements the all-weather data by a SAR altimeter of the CryoSat SIRAL instrument class*

5 Immediate production opportunities (action items)

- *Consolidation of existing sea-ice products (1978-present) is a high priority – requiring inventory*
- *There is a high need for estimates of uncertainties in ice concentration retrievals, together with QC information – especially for data assimilation (a possible joint task between CliC and AOPC/OOPC SI group?)*

Sea ice requirements (continued)

5 Immediate opportunities (continued)

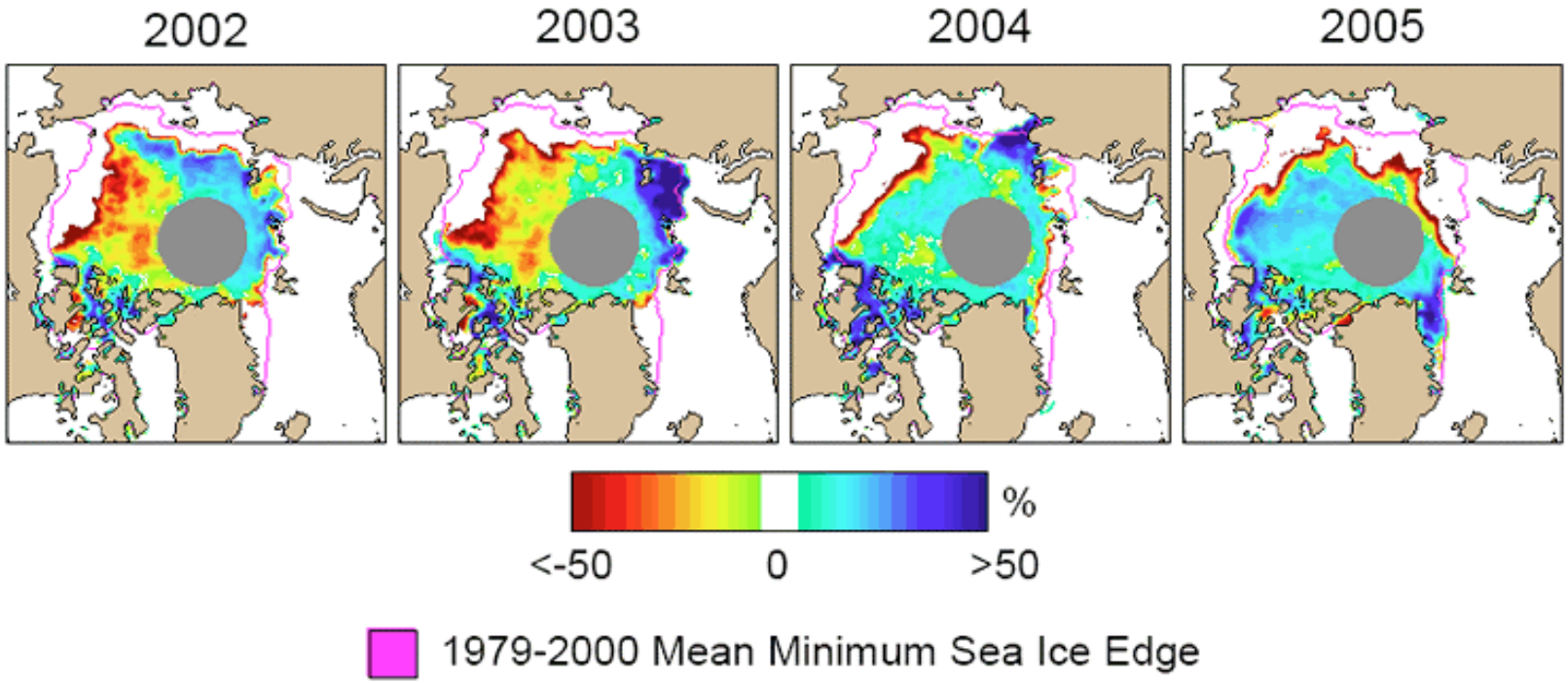
- ***Consistent bipolar sea-ice drift records from the combination of Global SAR (Envisat ASAR GMM), Passive microwave (SSMI AMSR) and radar (QuickScat) datasets with uncertainty estimates via inter-comparisons with IBAP (Arctic) and IPAB (Antarctic) buoy programs***
- ***Opportunities exist for combining in-situ Upward Looking Sonars with the satellite thickness and extent/coverage – aiming at quantifying variations in sea ice volume, mass, and fluxes at gateways (could be a key constraint for models?)***

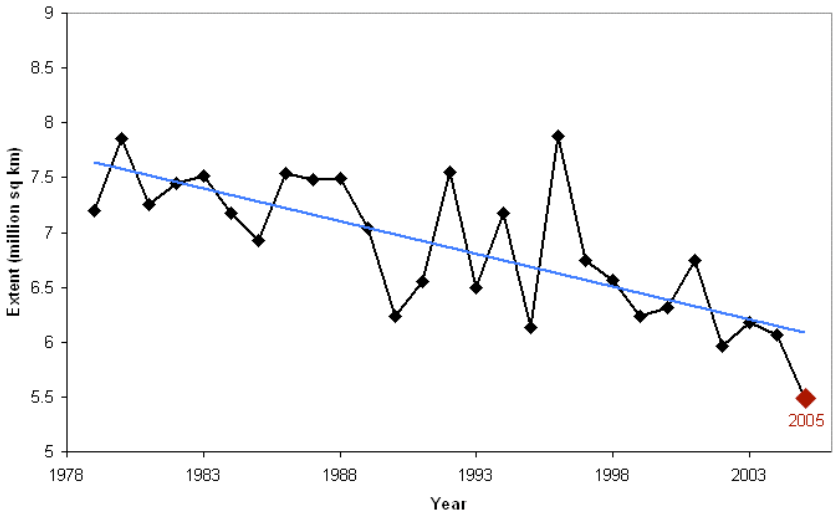
Message from CliC

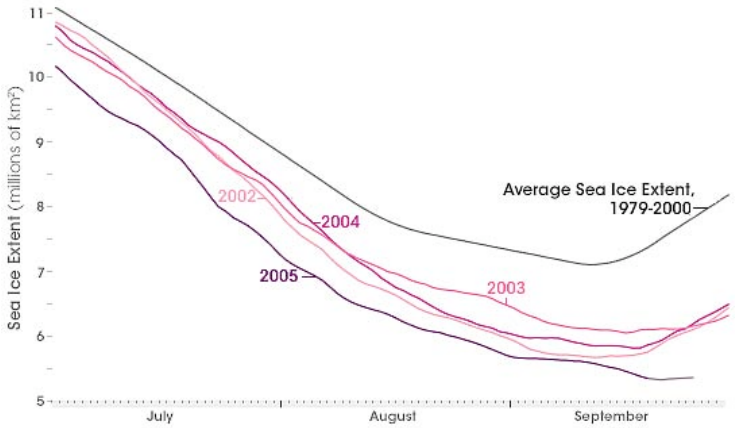
- ***CliC is responsible within WCRP for making the sea-ice part of climate predictions as good as possible, translating into better SI models and adequate representation of sea-ice components in climate models***
- ***From the CliC perspective, sea-ice data need to be consolidated, archived, validated, inter-compared, and open and kept well***
- ***Future cooperation and coordination between OOPC and CliC are essential not only for sea-ice observations but also for ocean observations***
- ***Strong links need to be established between***
  - ***AOPC/OOPC WG on SST and Sea Ice (chair Soren Andersen)***
  - ***CliC Project Area 3 (led by Tony Worby, vice Helen Fricker)***
  - ***IGOS Cryosphere Theme/sea ice part (chair Jeff Key, vice Mark Drinkwater and Jinro Ukita)***
  - ***IGOS Ocean Theme (co-chairs Paul DiJiacomo and Keith Alverson)***
  - ***International Ice-Charting WG***
  - ***JCOMM Expert Team on Sea-ice***
- ***Observations on sea-ice, ocean temperature and salinity, and river run-off to the Arctic Ocean should be parts of the Arctic Ocean Observing System***

Message from CliC (continued)

- ***Need to establish a committee to lead an Arctic GOOS Regional Alliance (possibly through the IPY framework)***
- ***Links with iAOOS and DAMOCLES***
- ***EuroGOOS Arctic Task Team (?)***







Courtesy NSIDC