

**GOAPP**

Global Ocean-Atmosphere  
Prediction and Predictability

# Overview of Theme I

Funded by the Canadian Foundation for Climate and Atmospheric Sciences

# What does GOAPP plan to do, and how will it be done?

***Goal:*** Improve predictions of ocean and atmosphere on time and space scales of days to decades, and tens of km to global scales

***Approach:*** Improvements in data assimilative models of ocean and atmosphere, and better understanding of the physical mechanisms that give, and limit, predictability.

# Structure of the Research

Two themes distinguished by time-scale:

**Theme I:** Days to Seasons

**Theme II:** Seasons to Decades

These two themes reflect:

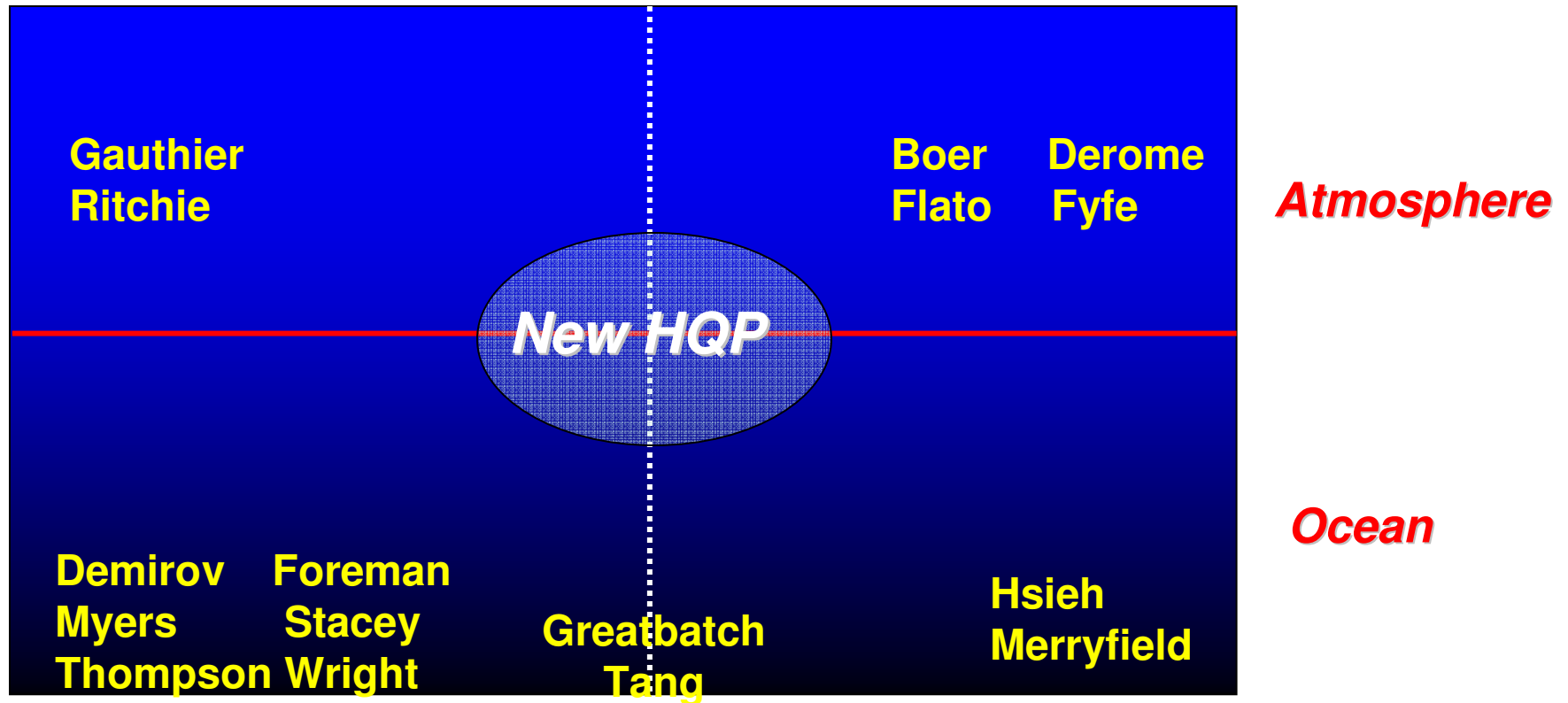
- ❑ Present expertise in weather and climate modelling and prediction in Canada
- ❑ Potential advantages of a multi-model approach

Will work toward a ***seamless prediction capability*** that bridges these time-scales (consistent with developing international activities e.g. THORPEX, WCRP)

# The GOAPP Researchers

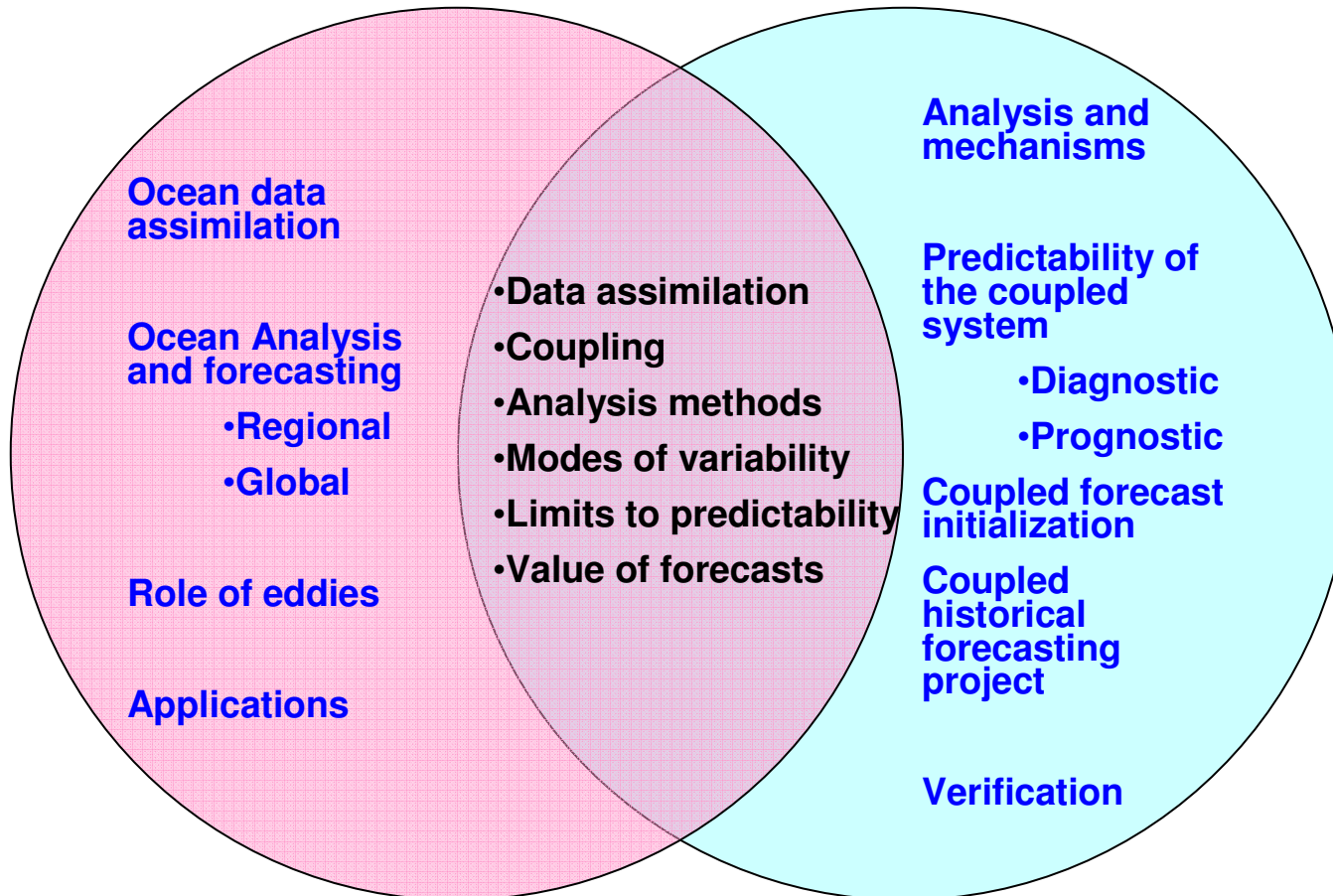
*Days to Seasons*

*Seasons to Decades*



# Theme I

# Theme II



# Theme I Projects: Days to Seasons

## Ocean Modeling and Data Assimilation

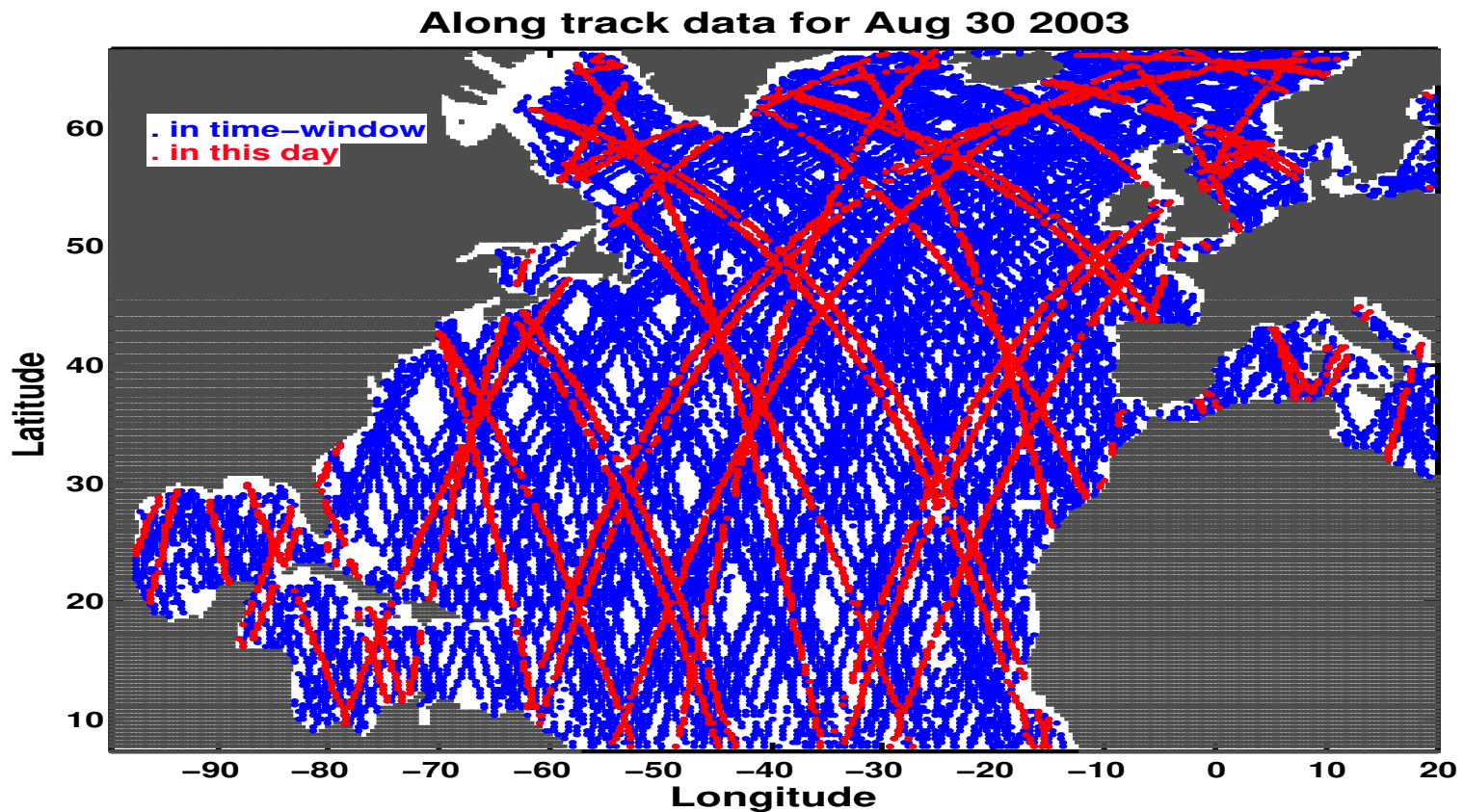
- ❑ **Suppression of bias and drift in ocean model components**
- ❑ **Statistics of observed variability for model testing and improvement**
- ❑ **Multivariate assimilation of altimeter and Argo data**
- ❑ **Ocean reanalysis and forecasting**
- ❑ **Modelling and assimilation of sea ice**

## Coupled AO Modeling and Data Assimilation

- ❑ **Assimilation into coupled atmosphere-ocean models**
- ❑ **Studies on joint assimilation into coupled models**

***Motivation for Theme I  
comes in part from  
availability of new data ...***

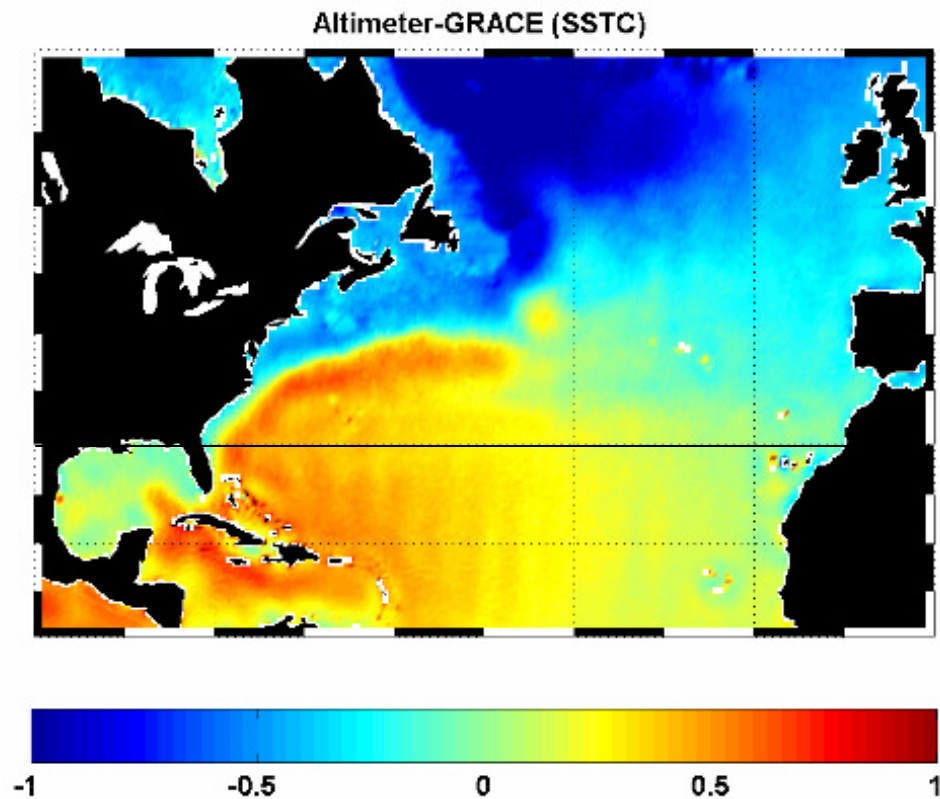
# Along-Track Altimeter for 7 day Period



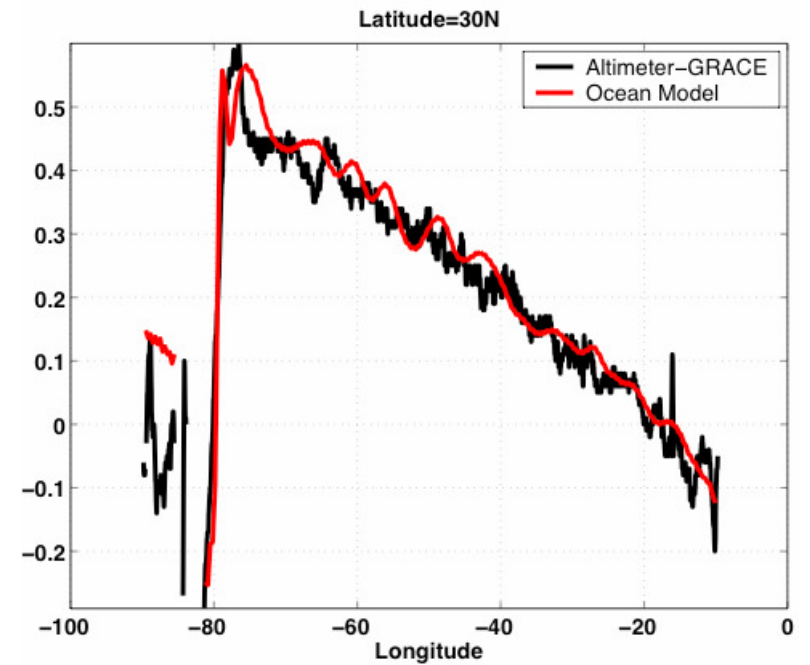


# Mean Sea Surface Topography From Space

Observed from space

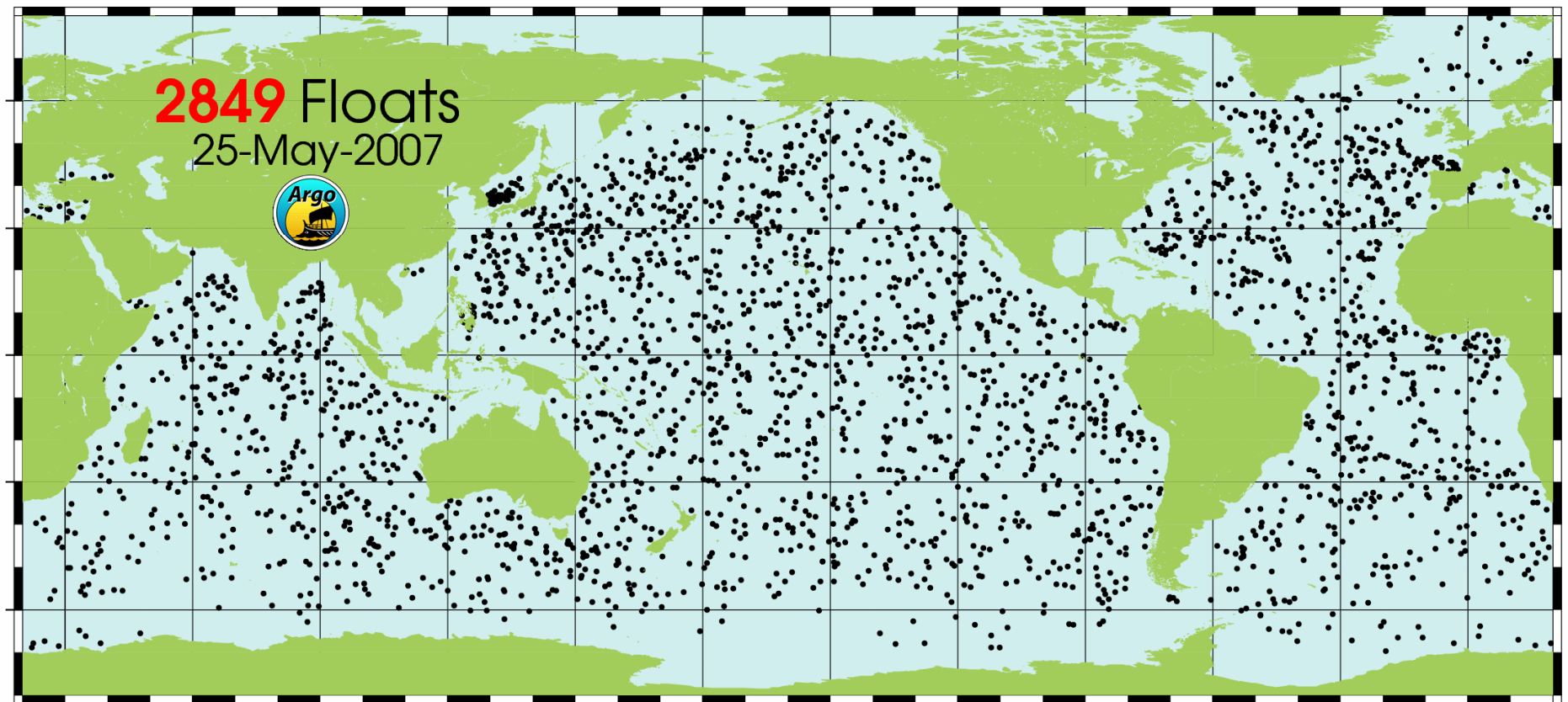


Comparison with model



# Global Distribution of Argo Floats

## 25 May 2007



***Motivation for Theme I also due to  
availability of improved  
ocean models and assimilation systems...***

- Research versions of the OPA model have been implemented globally and for the North Atlantic and North Pacific
- Mercator operational system (OPA model and assimilation software) is soon to be officially installed at CMC

***Motivation for Theme I  
also comes from a recent  
interdepartmental initiative  
(EC, DFO, DND) to build a  
new operational coupled AO  
forecast system ...***

**Multiple agency (EC, DFO, DND) interest in coupled atmosphere-ice-ocean prediction has led to the establishment of**

***CONCEPTS: Canadian Operational Network of Coupled Environmental Prediction Systems***

**To coordinate the national development and implementation of ocean models, DFO has just established**

***COMDA: Centre for Ocean Model Development and Application***

***Theme I of GOAPP will contribute to, and benefit from, CONCEPTS.***