WGSIP-TFSP-AAMP Interactions

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AAMP-WGSIP-TFSP Interactions

- Rigorous Evaluation of Seasonal and Sub-Seasonal Prediction Skill in Currently Available Models
  - WGSIP SMIP/HFP, APCC, TFSP, DEMETER, ENSEMBLES
  - **AAMP Participation in WCRP Seasonal Prediction Workshop?**
  - **AAMP Participation in TFSP Seasonal Prediction Experiment?**

- Monsoon Predictability and Variability
  - Air-Sea Feedbacks in Surrounding Seas
  - Land-Atmosphere Feedbacks
  - Impact of Aerosols

http://www.clivar.org/organization/wgsip/spw/main.html

WCRP Workshop on Seasonal Prediction

Barcelona Spain June 4-7, 2007

Co-sponsored by: Servei Meteorològic de Catalunya

The World Climate Research Program (WCRP) Task Force on Seasonal Prediction (TFSP) in collaboration with the International CLIVAR Working Group on Seasonal to Interannual Prediction (WGSIP) announce the first WCRP Workshop on Seasonal Prediction. The Workshop is also co-sponsored by the Servei Meteorològic de Catalunya and will be held at the Barcelona World Trade Centre.

General Information

NEW Invited Speakers NEW

Schedule (final version available May 1st 2007)

Organising Committees

Download Flyer

Please complete the following form to register. There is no attendance fee associated with this workshop.

Registration

The workshop will feature both oral and poster presentations. The abstracts should not be longer than one page. Please specify your preference for an oral or poster presentation in the following abstrat submission form:

Abstract Submission

Does AAMP Want to Organize a Monsoon Session at the Workshop?

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Workshop Objectives:

1. To validate and assess the state-of-the-art and skill in seasonal forecasts using high quality retrospective forecast data issued from the SMIP/HFP and DEMETER Projects together with the latest results from the ENSEMBLES Project. Assessment is needed in terms of scientific quality aswell as in terms of the value for applications and society.

2. To highlight issues important for interfacing seasonal forecasts with applications including calibration, downscaling and validation, looking at whether there is an emerging consensus on approach and methodology. Several regional CLIVAR panels will be contributing to the Workshop (VAMOS, VACS, AAMP) and there will be be contributions from the AMMA Project.

3. To address seasonal prediction from a wide-ranging multi-disciplinary perspective looking at the role of cryospheric processes, stratospheric processes and air-land interactions on seasonal prediction, as well as the role of ocean initialization. Sessions will be organized by other WCRP Projects (SPARC, CLiC and

TFSP Seasonal Prediction Experiment

- There is currently untapped seasonal predictability due to interactions (and memory) among all the elements of the climate system (Atmosphere-Ocean-Land-Ice)
- Seasonal Predictability Needs to be Assessed with Respect to a Changing Climate
  - Use IPCC Class Models: Relevance
- Weather Prediction Models (NWP Resolution) Should also Tested on Seasonal Time Scales
  - Collaboration with THORPEX

Interactive Atmosphere-Ocean-Land-Ice Prediction Experiment

- Best Possible Observationally Based Initialization of all the Components of Climate System
- Seven Month Lead Ensemble (10 member) Fully Interactive Predictions of the Climate System
  - Predictions Initialized Four Times per Year for Each Year 1979-Present [Additional Levels]
  - Some Predictions by Some Groups Extended to Decadal
- Interactive Model:
  - Ocean – Open but interactive (e.g., slab mixed layer or GCM)
  - Atmosphere – Open but interactive, most likely a GCM
  - Land – Open but interactive, e.g. SSiB, Mosaic, BATS, CLM, Bucket …
  - Ice – Open but interactive (e.g., thermodynamic or dynamic)

Experimental Design (Level 1)

- Atmospheric initial states to be taken from NCEP (or ECMWF, or other analysis products) reanalysis each February, May, August and November each year from 1979-present. Initialized on 00Z and 12Z on the last five days of each preceding month forming a 10-member ensemble. Other strategies for generating the ensemble members are acceptable as long as the basic principle of no future information as the forecast evolves is not violated. Each ensemble member should be run for at least seven months. Additional ensemble members and longer leads are encouraged.
- Oceanic initial states: (if appropriate) to be taken from most appropriate ocean data assimilation system.
- Sea Ice initial states: (if appropriate) to be taken from best available observational data.
- Land initial states: (if appropriate) to be taken from most appropriate land data assimilation system or consistent offline analyses driven by observed meteorology (i.e., GLACE2;)
- Soil wetness: predicted (i.e., interactive Land Model)
- Snow cover and depth predicted (i.e., interactive Land Model)
- Chemical Composition (carbon dioxide, ozone …) prescribed and varying. This explicitly includes the transient changes in the chemical composition from 1979-present.

Atmospheric output:

- Every 24 hours at 00 GMT-
  - Pressure levels (instantaneous): Geopotential Height, Temperature, Velocity and specific humidity for 850, 500, 200, (if available 100, 50, 10; these higher pressure levels are used for interactions with SPARC) hPa.
  - Surface (instantaneous): 2m Tmax – daily, 2m Tmin – daily, Total soil moisture, Snow depth, Snow Water Equivalent, Sea surface temperature and skin temperature (surface radiative) over land, Mean sea level pressure, Soil Heat Flux.
  - Surface (accumulated): Total precipitation, Downward surface solar radiation, Downward surface longwave radiation, Surface net solar radiation, Surface net longwave radiation, Top net solar radiation, Top net longwave radiation, Surface momentum flux, latent and sensible heat flux.
- Every 6 hours at 00, 06, 12, 18 GMT-
  - Surface (instantaneous): Total cloud cover, 10m wind, 2m Temperature, 2 m specific humidity.

Oceanic output (where appropriate):

- Every Month -
  - Accumulate temperature, salinity and currents in the (at least) the upper 400 meters, surface fluxes of heat, momentum and fresh water, sea level height, mixed layer depth (monthly means)
- Every 24 hours at 00 GMT-
  - Vertical temperature, salinity and currents sections in the (at least) upper 400 meters at the equator and 2N and 2S (5N and 5S optional)
- Every 6 hours at 00, 06, 12 18 GMT-
  - Surface fluxes of heat, momentum, and freshwater. Sea Surface Temperature and mixed layer depth

Sea Ice output (where appropriate):

- Every 24 hours at GMT –
  - Surface fluxes of heat and momentum. Snow cover, Sea ice concentration, thickness and temperature.

Proposed TFSP Time Line

- JSC Letter to Community (March 2006)
  - Announce Seasonal Forecast Skill Assessment
    - SMIP/HFP2, DEMETER, CTB, APCC, …
    - Semi-Regular Assessments
    - Workshop June 2007
      - Results from First Assessment and Preliminary Results from TFSP Experiment
      - Need to Push Interactions with Regional Panels in advance of Workshop
      - CLIVAR to Charge Panels with this interaction
  - Announce TFSP Forecast Experiment
    - US DEMETER, ENSEMBLES, APCC, …
    - Hindcasts to be Completed Fall 2007
      - Numerical Hypothesis Testing
    - Workshop Early 2009
- Future Regular Assessments Managed by WCRP/CLIVAR
  - Quasi-Regular Reports

Monsoon Predictability and Variability

- ENSO-Monsoon Interactions
- Monsoon Predictability
  - Extreme Events, Variations in Predictability, Forecast Skill, …
- Air-Sea Interactions in Surrounding Seas
  - Role of Ocean Dynamics in Western Pacific and Indian Ocean
  - Importance of Coupled Feedbacks
- Atmosphere-Land Interactions
- Systematic Errors
  - Model Improvements
  - 1-Tier vs. 2-Tier Prediction Systems
- Interactions with Modes of Variability
  - Diurnal Cycle, Intraseasonal Variability, IOZM, PDO, AO,…
- Aerosols, Land Use Change, Changing Climate

$\Rightarrow$ Coordinated WGSIP-TFSP-AAMP Numerical Experiments

Example 1: 1-Tier vs. 2-Tier

- 2-Tier Prediction System has Inconsistency Between Surface Fluxes and SSTs
- 1-Tier Prediction System Allows for the Removal of the Systematic Error
- How Does this Inconsistency Impact Atmosphere-Ocean Co-Variability?
- How Does this Impact Predictability and Prediction Skill?

Example 2: Coupled Processes in Indian Ocean and Western Pacific

- Relative Roles of Thermodynamic vs. Ocean Dynamical Feedbacks in Monsoon Variability
  - Global Coupled Model
    - Use Mixed-Layer Model in Indian
    - Use Mixed-Layer Model in West Pacific
    - Flux Over-Ride Experiments

Example 3: Land-Atmosphere Interactions

- Role of Soil Moisture in Monsoon Variability and Predictability (GLASS)
  - Local Land-Atmosphere Coupling Strength (GLACE)
- Land Use Change and Monsoon Variability (GEWEX)
- Land Initialization in Monsoon Predictability (TFSP/GLASS)

WGSIP-TFSP-AAM Interactions

- Seasonal Prediction Workshop June 2007
  - AAMP To Organize a Session on Monsoons?
    - Assess Skill of Currently Available Seasonal Hindcasts
- TFSP Seasonal Prediction Experiment
  - AAMP to Analyze Results of Core Experiment
    - Assess Skill of Hindcasts
  - AAMP/WGSIP to Propose Follow-on Numerical Experiments
- WGSIP-AAMP Coordinated Numerical Experiments (see possible examples)