

South Asian Regional Reanalysis (SARR)

Project Implementation

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Ministry of Earth Sciences
Government of India**

Objective

Development of the South Asian Regional Reanalysis (SARR) to advance

Characterization, Understanding, Modeling & Prediction of Monsoon Hydroclimate Variability & Change

Because Interest in Regional Hydroclimate (precipitation, surface temperature, soil moisture, stream flow, drought indices, etc.) is intense and growing, given the direct societal impacts.

It is expected that

The SARR project will provide an Atmosphere-Land-Ocean surface state description **where consistency between circulation and hydroclimate components is assured**

To achieve the goal, additional assimilation of precipitation, radiance, and aerosol observations in numerical weather prediction models shall be carried out

Specific SARR Goals are:

- **Refinement in methods of precipitation and radiances assimilation**
(to achieve reduction of imbalances in the water and energy budget during the assimilation procedure)
- **Conduct a 5-year pilot-phase reanalysis (1998-2002)**
(to test and optimize data stream organization and the geographic domain and assimilating model choices)
- **Develop high-resolution SST analysis for the Indian ocean from satellite and in-situ observations, including moorings, drifters and Argo floats**
- **Design techniques for assimilation of aerosols**
- **Generate a high spatio-temporal resolution (≤ 30 km, ≤ 3 hours) climate data set for the 1979-2006 period over the South Asian land-ocean region.**

Action taken so far

- 1. SARR Project- Included as a part of NCMRWF activity in the document for XI Five-year Plan of Ministry of Earth Sciences**
- 2. Provision for 6 full-time project scientists to work on the SARR project (recruitment shall be made as soon as the Financial approval is obtained)**
- 3. Project Implementation Team from NCMRWF has been identified
(PI: A. K. Bohra)**

Other Participating Institutions from MoES

IMD, INCOIS (observational data)

IITM (Diagnostic Studies)

Activities planned:

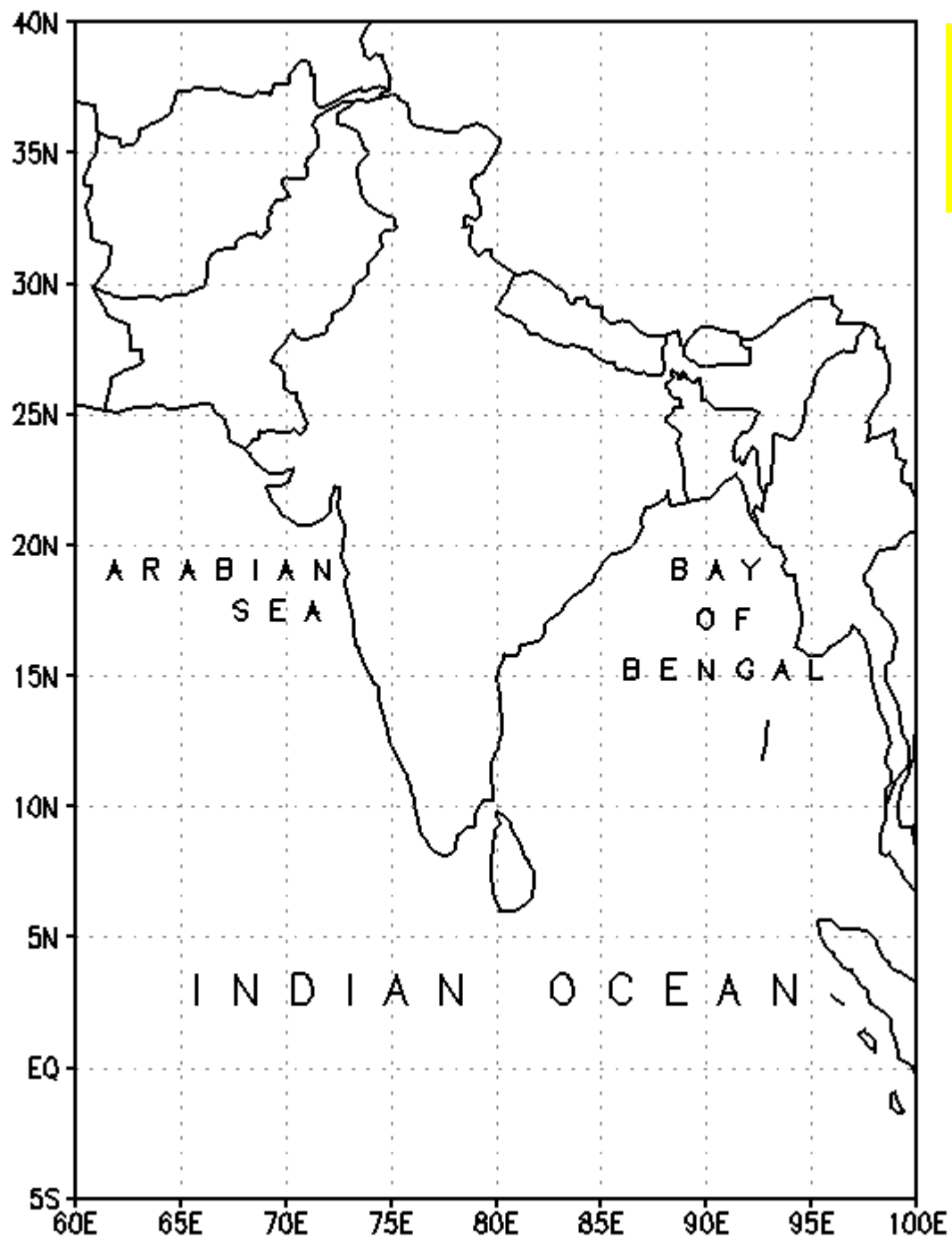
- Scoping Workshop to finalize model, reanalysis domain, etc - Planned for December 2008
- Data assimilation experts and monsoon scientists (order 25 people) from India and USA shall participate

Pilot Phase

- **SARR for 1998-2002 (5 years) - to test and optimize data stream organization geographic domain and assimilating model choices.**

- This short, but modern period reanalysis will be evaluated against satellite observations (e.g., TRMM) and global analysis (e.g., ERA40)
- The assimilating technique shall be refined based on experience for the entire Re-analysis period

- Preliminary work on reanalysis domain choice, model choice and data stream organization has begun



A tentative Domain for SARR

40E-120E, 15S-45N

Analysis Resolution: 25km

South Asian Countries to be involved in the Project- (so far as Observational data sharing and Diagnostic studies)

- 1. Afghanistan,**
- 2. Pakistan,**
- 3. Nepal,**
- 4. Bhutan,**
- 5. Bangladesh,**
- 6. Thailand,**
- 7. Myanmar,**
- 8. Sri Lanka,**
- 9. Maldives**

**❖ Sensitized BIMSTEC member countries to take part in the SARR
(under the aegis of BIMSTEC Centre for Weather & Climate)**

**❖ SAARC framework can be utilized to bring other countries in the
South Asian Region on board**

❖ Other countries e.g. China (Tibet), Indonesia etc

Meteorological Observations

Surface - SYNOP, SHIP, AWS, BUOY

Upper-air - RS/RW, PILOT BALLOON WINDS

Aircraft Observations - AIREP, AMDAR

Radar observations : DWR

Satellite Observations :

Radiance (AMSU-A,B, HIRS, METOP)

AMVs (geostationary satellite), Polar winds

Ocean Surface Winds (QSCAT, ERS, SSM/I, ...)

Precipitation: Rain Gauge, Satellite (TRMM, SSMI etc)

- **NCMRWF has an Archival of GTS data since 1994**
- **GTS data Quantity varies with the GTS link Capability at IMD RTH, New Delhi**
- **It is expected that through the joint SARR project, GTS data over the South Asian Region (used by Global reanalysis at NCEP) shall be made available.**
- **Public domain Satellite data are being downloaded at NCMRWF. It is expected that through the joint SARR project Additional Satellite Data over the South Asian Region (used by Global reanalysis at NCEP) shall be made available.**
- **Precipitation data 3B42RT (25km resolution) shall be merged with Station data (to be obtained from IMD, and other South Asian Countries)
(3B42RT data is at 3hrly resolution different from Station data)**

- **Land Surface Characteristics over India are being collected (to some extent)**
(Vegetation Cover, Type, Leaf Area Index, Soil Type, Wetness etc.)
- **Additional data shall be arranged from Agriculture Department**
- **Remote sensed data from SAC/IIRS**
- **Data from other countries shall be collected through mutual discussion**
- **SST data (TMI) has been downloaded at NCMRWF**
- **Other data for SST analysis shall be collected**

Summary

- Preparatory work for the SARR project is going on at NCMRWF
- Focused work on the project shall begin after the Scoping Workshop planned in December 2008
- It is hoped that MoES and NOAA shall provide full support to the Project

Thank you