

## **Intra-Seasonal Climate Predictions for Sri Lanka and Maldives for Water Resources Management**

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**Institution(s):** Foundation for Environment, Climate and Technology, Digana Village, Sri Lanka

**Duration:** June 2012 – April 2013

**Summary:** Overall in terms of the milestones set and outputs achieved, we have largely achieved our objectives in most areas with ongoing work. We have taken advantage of opportunities that have come our way. Our journal articles record has to be expanded. Our work plan for the next year has become clearer and we shall be able to build on this foundational first year.

### **Objectives and outputs**

#### **i. Characterization of MJO Influence**

- a. Updated data management and analysis systems.
- b. Assessment of predictability based on MJO and other indices for the region.
- c. Case study on Tropical Cyclone 5 that traversed the region from November 23rd, 2011.

#### **ii. Intra-seasonal rainfall prediction system**

- a. Skill assessment of current prediction schemes.
- b. Development of confidence bands for IS predictions.
- c. Implementation of IS prediction model in Sri Lanka,
- d. Analysis of gains in skills due to refinements of the IS prediction model.

#### **iii. Translating Intra-seasonal predictions into hydrological variables:**

- a. Hydrological model customized for selected parts of Mahaweli basins.
- b. Archive of predicted stream flow, drought and flood indices by subcatchments.

#### **iv. Communicate Hydro-climatic advisories**

- a. Archive of Advisories and Compilation of feedback from water managers

#### **v. Capacity Building**

- a. Resources for research on IS variability and predictions established in Sri Lanka
- b. Two junior scientists and hydrologists shall be trained Course materials for the graduate course in climate change at University of Peradeniya.

### **Workshop and Conference Participation:**

Apart from the two-workshop organized under this project, the project staff also participated and had peer-reviewed abstracts accepted for presentation at multiple venues. These included the US Office of Naval Research (ONR) sponsored conference in the Bay of Bengal, the South Korean Based Asia Pacific Climate Centre conference in Busan, the National Aquatic Research Agency (NARA) in Sri Lanka, the Sri Lanka National Water Week conference.

### **Publications**

- Abstract on climate model downscaling (S. Ratnayake, S. Chandrasekera and L. Zubair)
- Abstract on use of climate information in land surface models (S. Mahanama and L. Zubair)
- Abstracts on the skill of Intra-Seasonal Climate Prediction for Sri Lanka (L. Zubair, P. Agalawatte) – Oral Presentation
- Abstract on the Predictability of Cyclone TC5 in the Indian Ocean (L. Zubair, Z. Yahiya, P. Agalawatte, Zahid, A. Sobel) – Meteorology and Predictability of Tropical Storm ARB-04 (TC5) in the Indian Ocean during November 2011 – Poster Presentation
- Abstract on the MJO impacts in Sri Lanka (S. Chandrasekera, S. Ratnayake and L. Zubair). December 2012 at Sri Lanka National Aquatic Research Agency Annual Meeting
- Downscaling Global Climate Model to fine scales over Sri Lanka for application in the Fisheries sector (S. Ratnayake, S. Chandrasekera, and L. Zubair). December 2012 at Sri Lanka National Aquatic Research Agency Annual Meeting 22-24th of March - Experimental Climate Advisories for Sri Lanka and Maldives (S. Chandrasekera, P. Agalawatte, Z. Yahiya, L. Zubair, Michael Bell)
- River Margins (S. Chandrasekera) – Meteorology and Predictability of Tropical Storm ARB-04 (TC5) in the Indian Ocean during November 2011 – (Poster Presentation)

### **Technical Research Presentations:**

- Institutional issues with water resources management in Sri Lanka – (Sewwandhi Chandrasekera)
- October 15, 2012: At Maldives National University - Climate and Climate Change in Maldives (Zubair) - Water Resources Management in Maldives with a focus on Male (Rasheed) - Opportunities and Need for Research in Climate and Water Resources Management (Rasheed and Zubair)
- December 2012: At Asia Pacific Climate Change Centre, South Korea - Paper drafted on seasonal climate downscaling using APCC software (S. Ratnayake, S. Chandrasekera and L. Zubair). Presented by S. Ratnayake,
- February 2013: Climate Services for Adaptation, at the Cochin University of Science and Technology, Kochi, Kerala, (L. Zubair), (<http://www.cusat.ac.in/>)

### **Meetings**

- Meeting with Paul Roundy, and Adam Sobel, August 2012, SUN Albany New York
- Meetings regarding data access and collaboration, Department of Meteorology, Maldives, May 2012
- Meeting with Ms. Mary Ackley (Environmental Officer), USAID, Colombo, May 2012
- Meeting with Ms. Zameela (Climate Security and Water Scarcity Project), USAID, Maldives, May 2012
- Meeting regarding scientific collaboration with Director of Climate (Dr. Zahid) and Mr. Mushin, the Deputy Director General, Maldives Meteorological Service, Male, Maldives, 12-16 October 2012

- Discussion regarding capacity building for climate research in the Maldives. with Mr. Ahmed Saleem, Permanent Secretary, Ministry of Environment, Maldives.
- Discussions regarding archives of past work on water resources with Mr. Ishaque, Maldives Environmental Protection Agency of the Ministry of Environment.
- Discussions with Directors regarding piloting use of climate information for water resources management in the Maldives, Land Marine and Environmental Management group (LaMER)
- Discussion regarding capacity building needs with Mr. M. Rasheed Chief Engineer, Male Water Supply Company.
- Workshop on Climate Change and Water Resources in the Maldives, Maldives National University, October 15, 2012
- Email discussion with Mary Ackley environmental office USAID Colombo, Sri Lanka, November 2012.
- Special meeting on Oceanography of the Bay of Bengal, US Naval Research Laboratory and the Sri Lanka National Aquatic Research Agency, Colombo, November 28-29, 2012
- presentation at the NARA Scientific Sessions 2012 on “Meeting Challenges in Fisheries and Aquatic Resources Development, National Aquatic Research Agency, Colombo, December 4, 2012- Ms. Sewwandhi Chandrasekera (Intermediate Research Assistant)
- Met with the Secretary Mrs, S.M. Mohamed, Disaster Management Ministry, December 2012.
- Met with the Dean of Environmental Sciences (Prof. K. Mohankumar) and Emeritus Prof. P.V. Joseph and the faculty members of the Department of Atmospheric Sciences.
- PI met with the Director (Dr. Ajith Joseph), for future collaboration and for assistance with instrument purchases, Nansen Environmental Research Centre, India
- Rice Research and Development Institute, Batalagoda, Kurunegala, Project Staff Meeting with Meteorological Staff, 8th February 2013
- Discussions on project implementation, Visit to USAID Development Projects in the Northern Province (Killinochchi, Mannar and Mullaitivu Districts, 11-13 February 2013
- Symposium on Pinga Oya – a branch of the Mahaweli River Basin, Department of Geography, University of Peradeniya, 19 February 2013
- Presentation on “Experimental Climate Service for Water Management in Sri Lanka. BMICH, Colombo, 21st March 2013- Ms. Sewwandhi Chandrasekera & Mr. Prabodha Agalawatte
- 25-29 of March 2013 International Center for Research in the Semi-Arid Tropics. Ms. Sewwandhi Chandrasekera attended a training course on Climate and Crop Modeling in India.
- 3 months Training workshop at Asia Pacific Climate Centre, Busan, South Korea, September – December 2012, Ms. Sewwandhi Chandrasekera (Intermediate Research Assistant)
- 3 months Training workshop at Asia Pacific Climate Centre, Busan, South Korea, Mr. Sanjaya Ratnayake (Junior Researcher), Nov 2012 – Jan 2013

### **Training and Mentoring:**

Ms. Zeenas Yahiya (attached to FECT) attended a short course on GIS and Applications in a 6 -day residential program at the Post-Graduate Institute of Science. - Ms. Ranmalee Bandara (researcher at FECT currently finishing her Ph.D at Monash University, Australia) was supported by the PI and co-PI in developing a proposal on Land Surface Modeling for Sri Lanka to the International Foundation for Science, Sweden.

November 2011: Kenneth Sinclair undertaking the Masters in Climate and Society at Columbia University completed his term paper on a Tropical Cyclone that affected Sri Lanka and Maldives under the supervision of Columbia University partner Adam Sobel with co-supervision by the PI. This is a contribution to the research that is complementary to the work being done by the PI, Adam Sobel (NSF collaborator) and Prabodha Agalawatte (Researcher)