

## **Project No 1: 2016 CREST Urban New York Summer Field Study (CUNYFS)**

**Research Mentors: Profs. Jorge González & Prathap Ramamurthy**

The CUNY-CREST center has vast resources to monitor and profile the urban environment. The capacity to instantaneously measure surface energy fluxes, monitor the hydro-meteorological conditions using NYCMetNet and Urban HydroMetNet and observe boundary layer profiles of heat, momentum and aerosol concentration is very unique to urban meteorology. Add to it our capacity to model these interactions with the uWRF tool, we are one of the few institutes around the world who have this impressive capability. However, we have been lagging behind in terms of research publication. One of the central problems is the lack of co-ordination between personnel. We want to address this deficiency by organizing a compact field campaign starting July 2016 with focus on heat and moisture transport. The campaign will last for 3 weeks where we will operate all possible instruments (lidar, ceilometer, microwave radiometer, flux tower, and ground weather stations) concurrently. This will be a first step to demonstrate our organizational mettle as we gear up for future challenges.

Several CREST faculty (Gonzalez, Ramamurthy, Moshary, Arend) will lead and participate in this campaign. To efficiently conduct our campaign, we will further include the involvement of undergraduate students for the period of 4 weeks. This will be an excellent opportunity for our undergrads to have hands-on experience in field campaigns. The UG students will specifically work on running and analyzing data from the Doppler wind lidar, in the deployment of compact weather stations, and in model comparison with the sensors data. The lidar equipment needs two persons to operate. Compact weather stations maybe available to better represent the geo-spatial distribution of a typical summer climate in and around New York City. We will rotate these duties between the available faculty and the two undergrads. We anticipate for post-campaign data analysis.

### **Schedule**

**1 July 2016 – 31th July 2016:** Literature review, Sensor Calibration, Data Collection & Analysis.

**1 August – 12 August 2016:** Literature review, write ups, preparation for presentations and reports.

**Requirements:** Proficient MatLab programming, GIS training preferred.

## **Project No. 2: CAST Summer 2016**

**Research Mentors:** Prof. Jorge E. González and Dr. Nathan Hosannah

### **The Broad Picture:**

**Convection, aerosol, and synoptic effects in the Tropics (CAST) experiment** is a focused effort to study convection, aerosol, and synoptic impacts on water availability in the Caribbean via the existing observational network, and the inclusion of radiosonde launches on the west coast of Puerto Rico, high resolution radar at three western sites, continuous ceilometer monitoring (also on the west), and air sampling in concentrated two to three week phases. During the first three CAST measurement phases (22 June 2015 – 10 July 2015, 6-22 February 2016, and 25 April 2016 – 7 May 2016), we captured the most extreme Caribbean drought in recent history and anonymously wet Dry and Early Rainfall Seasons. Phase IV of CAST is set to be to run from 27 June 2016 through 11 July 2016.

### **Participant Project:**

We require a student to investigate the chemical properties of aerosols (speciation, air sampling) in the La Parguera area of Puerto Rico. This would include (although is not limited to):

- 1) Conducting a literature review of aerosol speciation in the tropics and the chemical effects of aerosols on precipitation.
- 2) Analyzing speciation data from Phases II through IV.
- 3) Performing air sampling measurements during Phase IV.

### **Schedule**

**3 July 2016 – 10th July 2016:** Literature review, Data Collection in La Parguera, Puerto Rico. (Travel required)

**15 July 2016 – 31 July 2016:** Literature review, Data Analysis of EPA and CAST data.

**1 August – 12 August 2016:** Literature review, write ups, preparation for presentations and reports.

Proficient MatLab programming, GIS training preferred.