ZP11 Weekly Notes
9/30/15

HIRAD MEASURES HURRICANE MARTY NEAR ACAPULCO, PREPARES FOR TROPICAL STORM JOAQUIN NEAR EAST COAST (email to: daniel.j.cecil@nasa.gov/256-961-7549): The Hurricane Imaging Radiometer (HIRAD) has been installed on a NASA WB-57 aircraft at Ellington Field in Houston, TX, along with the High Definition Sounding System dropsonde instrument to be used in the Tropical Cyclone Intensification (TCI) experiment throughout the 2015 hurricane season. HIRAD is used to measure ocean surface wind speed, with the dropsondes characterizing the vertical profile of the atmosphere in hurricanes and developing tropical storms. The HIRAD Team deployed to Harlingen, TX to conduct two flights over Hurricane Marty offshore from Acapulco. Marty was a strong tropical storm during Sunday's flight, and was upgraded to a hurricane during Monday's flight. The dropsonde coverage in Marty was unprecedented. Preparations have begun for redeploying to Warner Robins, GA, for operations over Hurricane Joaquin. Hurricane Joaquin is forecast to threaten the East Coast over the weekend.

CENTER INNOVATION FUND (CIF) PROPOSAL AWARDED FUNDING (email to: dale.quattrochi@nasa.gov/256-961-7887; cory.morin.nasa.gov/256-961-7812; brad.zavodsky@nasa.gov/256-961-7914; jonathan.case-1@nasa.gov/256-961-7504): A Center Innovation Fund (CIF) proposal with Dr. Dale Quattrochi (ZP11) as principal investigator entitled "Meteorologically Driven Dengue and Chikungunya Forecasts" has been awarded funding. Co-investigators from ZP11 are Dr. Cory Morin (NASA Postdoctoral Fellow), and Brad Zavodsky and Dr. Jon Case (Short-term Prediction Research and Transition SPoRT Center). Dengue fever (often referred to as 'breakbone fever') and Chikungunya are vector-borne pathogens carried by the *Aedes aegypti* mosquito that affect millions of people world-wide, and are a major public health concern in the Caribbean. These diseases have also been introduced in the U.S. with incidences appearing in south Texas and south Florida. This study will incorporate weather forecasts and reported Dengue fever and Chikungunya case data into a dynamic mosquito population and virus transmission model to create a forecast for disease incidence in Caribbean countries. Weather forecasts driving the model will be provided by the SPoRT project using Weather Research and Forecasting and numerical weather prediction system meteorological modeled data, and enhanced by additional high-resolution NASA datasets, to create weekly forecasts of dengue fever and Chikungunya for Puerto Rico, Dominican Republic, Haiti, the American Virgin Islands, and Jamaica during the primary transmission period (May-September). Predictions will be evaluated against reported dengue fever and Chikungunya case data for these areas. The project will produce a prototype for an innovative vector-borne disease forecast system and provide a much needed assessment of the feasibility, accuracy, and current limitations of vector-borne disease forecasting for use by public health agencies and officials. The Centers for Disease Control and Prevention (CDC) is a collaborator in this effort.

ELECTED TO THE EXECUTIVE COMMITTEE OF THE INTERNATIONAL SOCIETY OF GEOSPATIAL HEALTH (GNOSISGIS) AS US REPRESENTATIVE (mail to: jluvall@nasa.gov/256 961-7886): Dr. Luvall (ZP11) was elected to the Executive Committee of GnosisGIS to strengthen the members understanding of NASA's current and planned satellite missions to provide measurements of the critical environmental measures environmental state functions important to vector & disease life cycles. The mission of GnosisGIS includes international networking, international school, international journal and

annual symposia. Journal of Geospatial Health is an international peer-reviewed journal launched in 2005 that publishes research papers, short communications and reviews on application of the geospatial sciences to global health issues. Geospatial Health is part of the Master Journal List of Thomson Reuters, the publishers of Web of Science. The journal of Geospatial Health has an Impact Factor of 1.194 (2014)

KEYNOTE SPEAKER FOR SCIENTIFIC SESSIONS AT THE 9TH EUROPEAN CONGRESS ON TROPICAL MEDICINE AND INTERNATIONAL HEALTH (ECTMIH 2015) AND PLENARY KEYNOTE SPEAKER-9TH INTERNATIONAL SYMPOSIUM ON GEOSPATIAL HEALTH (mail to: jluvall@nasa.gov/256 961-7886): Dr. Luvall (ZP11) was invited and sponsored to give two keynote presentations at the 9th ECTMIH and (GnosisGIS) in Basel, Switzerland September 4-10, 2015. Dr. Luvall presented a talk entitled "A New Age in Epidemiology - A Thermodynamic Paradigm for Studying Disease Vector's Habitats & Life Cycles Using NASA's Remote Sensing Data". NASA's current and planned satellite missions provide measurements of the critical environmental measures environmental state functions important to vector and disease life cycles such as precipitation, soil moisture, temperature, vapor pressure deficits, wet/dry edges, and solar radiation. Satellite data provide landscape scale process functions represented by land use/cover mapping and actual measurements of ecological functions/structure: canopy cover, species, phenology, and aquatic plant coverage. These measurements are taken in a spatial context and provide a time series of data to track changes in time.

The ECTMIH brings together some 2,000 of the most distinguished scientists and experts in the field of tropical medicine & public health. It is the premier European Congress in this field. Through plenaries, symposia and twelve parallel scientific sessions, the conference focused on global health challenges, neglected diseases and neglected populations, clinical issues, the forthcoming sustainable development goals and the world's revived collective ambition to reach universal health care. The International Society of Geospatial Health (GnosisGIS) is a scientific organization dedicated to development of GIS-based infectious disease forecast systems and developing health applications in the geospatial sciences for disease risk mapping and ecological niche modeling.