Publications

NESDIS HMS Improves Air Quality Forecasts: The CISESS Scientists at the NOAA Air Resources Laboratory (HyunCheol Kim, YouHua Tang, Daniel Tong, and Barry Baker) coauthored an article on fire smoke prediction for air quality forecasts. The article, published last month in EGU Geoscientific Model Development, is an evaluation of a new fire smoke algorithm that incorporates the NESDIS Hazard Mapping System (HMS). The National Air Quality Forecasting Capability (NAQFC) includes smoke simulations in its daily PM$_{2.5}$ operational forecast. Smoke emissions from fires are largely uncontrolled, transient and unpredictable, making them a challenge for air quality forecasting. In validation with in situ measurements, they found the new system captures most of the observed fire signals. Usage of HMS-detected fire hotspots and smoke plume information was valuable for deriving both fire emissions and forecast evaluation.

The figure above shows the HMS-observed fire spots (red) and detected plume shapes (white) with the forecast aerosol optical depth (AOD) on the right for 14 June 2013.

Contact: HyunCheol Kim, [hyun.kim@noaa.gov](mailto:hyun.kim@noaa.gov), Funding: ARL

**Ocean Carbon on the Coasts:** CISESS Scientist Liqing Jiang, who specializes in ocean acidification data stewardship, took on a new project this year to develop a separate Ocean Carbon Data System (OCADS) and is working with Dwight Gledhill of the NOAA Ocean Acidification Program on it. The two recently coauthored a publication on surface water carbonate chemistry, which was published on June 1 in *Nature Communication*. It discusses the complexity of ocean carbon in North American coastal areas. The dissolved inorganic carbon (DIC) and carbonate mineral saturation state ($\Omega$) depend on sea surface temperature, atmospheric interactions, upwelling, and net biological production, each working on different time scales. The figures below show that observations of DIC and $\Omega$ do not line up with calculations based on equilibrium with atmospheric CO$_2$.

There are no simple patterns, which leads to contrasting property distributions within and among the margins of the oceans. This article Illustrates the need for making the coastal carbon data that we do have more accessible to researchers.

Training and Education

**CISESS Summer Interns:** CISESS will have a smaller group of summer interns this year who will all be working remotely with their mentors due to COVID-19 restrictions. CISESS Scientist Cezar Kongoli is working with USC undergraduate Alan Goldfarb on a data assimilation process involving satellite snow data. Xi Shao is mentoring two students this summer. Selena Ding, an undergraduate in computer science at New York University, will build interactive webpages and 3D contextual visualization tools for the VIIRS knowledge database. She will also support building data searching webpages for reprocessed SNPP VIIRS data distribution. Clarence Lam, a high school student at Montgomery Blair High School and member of the USA Computing Olympiad Gold division, will be supporting the Radio Occultation project that Shao leads. He will work on GPS signal decoding and precision orbit determination code development. Our three high school interns from Eleanor Roosevelt High School (Ayyub Abdulrezak, Idris Akala, and Jason Chen) have come back on board to work on Lightning-related projects with Jonathon Wynn Smith and Mason Quick. Scott Rudlosky works with these students as well.

The photos above are of this year’s mentors: Cezar Kongoli, Xi Shao, Jonathan Wynn Smith, Mason Quick and Scott Rudlosky.

*(POC: D. Baker, drb@umd.edu, Funding: Task I, JSTAR, COSMIC2)*

Media and Outreach

**Daile Zhang joins NLSC:** Last week, Daile Zhang became a member of the National Lightning Safety Council (NLSC, http://lightningsafetycouncil.org/), which was established to promote lightning safety education and awareness. The NLSC will work with NOAA to provide the public with safety information about lightning, especially during the upcoming National Lightning Safety Awareness Week during June 21 - 27, 2020 and the International Lightning Safety Day on June 28, 2020. Daile has worked closely with some of the members since she was a PhD student. *(POC: Daile Zhang, dlzhang@umd.edu, Funding: GOES-R PGRR)*