GEO Health Community of Practice
Annual Meeting 2021
December 7, 2021 from 11:00AM-12:00PM EST (GMT-5)

Flash Talks by CoP Members

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<td><a href="mailto:dorian.w.janney@nasa.gov">dorian.w.janney@nasa.gov</a></td>
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<td>Global Precipitation Measurement (GPM) Mission’s Education and Outreach Efforts</td>
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<td>University of Oklahoma</td>
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<td>Allan Auclair</td>
<td><a href="mailto:oaktree1234@verizon.net">oaktree1234@verizon.net</a></td>
<td>USDA APHIS Policy and Program Development, retired</td>
<td>Antigenic Hₐ Shifts Linked to 11-year Solar Cycle Explain Timing of Historic (1889-2021) Suite of Pandemics Originating in South Central China</td>
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<td>Effects of Hydrometeorological Factors on COVID-19 Reproduction Number in Three Contiguous Countries of Tropical Andean South America</td>
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<td>University of Rhode Island</td>
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<td>Ben Zaitchik</td>
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<td>Seeing Heat Risk Through an Equity Lens: Putting High Resolution Temperature Data to Work for Urban Environmental Justice</td>
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CholeraMap: Satellite-derived Waterborne Disease Early Warning for the Masses
Ali Akanda (University of Rhode Island; USA; akanda@uri.edu)
The CholeraMap project is designed to provide cholera early-warning risk maps for the Matlab region in Bangladesh through direct dissemination of cholera risk maps to grass-root workers and rural populations. We designed and deployed an interactive, user-friendly and innovative smartphone application to disseminate EO-derived water and cholera risk information to non-technical users to build resilient averting behavior among household end users. Our project focuses on enhancing grassroots decision making capacity to promote sustainable water use behavior, with a focus on gender and equality dimensions.

Antigenic H_α Shifts Linked to 11-year Solar Cycle Explain Timing of Historic (1889-2021) Suite of Pandemics Originating in South Central China
Allan Auclair (USDA APHIS Policy and Program Development, retired; USA; oaktree1234@verizon.net)
We develop a unique numeric database (very earliest onset, progression, peak, end year) of major viral pandemics based on critique of a broad, diverse array of medical literature. We hypothesize recurring H_α hemagglutinin antigenic shifts coincide with 11-year changes in solar flux and serve as an outbreak mechanism, enabling prediction. Work in progress aims to improve understanding, prediction, forecast, and early warning of future pandemics.

Effects of Hydrometeorological Factors on COVID-19 Reproduction Number in Three Contiguous Countries of Tropical Andean South America
Josh Colston (University of Virginia School of Medicine; USA; josh.colston@virginia.edu)
As the COVID-19 pandemic approaches its third year, and with the increasingly likely prospect that SARS-CoV2 will continue to circulate as an endemic, seasonal and vaccine-preventable virus for the foreseeable future, attention has turned again to the role of meteorological drivers on COVID-19 transmission. The aim of this study was to quantify the effects of weather on the district-level SARS-CoV2 reproduction number (R_t) for three contiguous countries of Tropical Andean South America (Colombia, Ecuador, and Peru), with an expanded suite of EO-derived hydrometeorological parameters and after further adjusting for environmental, policy, healthcare infrastructural and other factors. While healthcare accessibility had the largest effect on Rt, the association with specific humidity was of a comparable magnitude and shape to those documented elsewhere, and soil moisture – included as a negative control exposure – had the smallest effect, suggesting that biologically plausible effects can be captured by EO-derived exposure estimates.

Global Precipitation Measurement (GPM) Mission’s Education and Outreach Efforts
Dorian Janney (NASA Goddard/GPM; USA; dorian.w.janney@nasa.gov)
During this presentation, I will share some examples of how the GPM Outreach team is highlighting examples of IMERG data end-user’s STEM education and careers, as well as finding ways to leverage the work they are doing. Participants will be invited to contact me if they would like their work highlighted or are interested in learning more about the IMERG data products.
Using Social Media to Improve Dengue Nowcasting in Brazil

Julie Spencer (Los Alamos National Laboratory; USA; jaspencer@lanl.gov)

Our goal is to use social media to improve nowcasting accuracy for dengue at the state level in Brazil. We find that Google Health Trends data perform well as predictors in states with high populations. Improving nowcasting and forecasting accuracy for infectious diseases can decrease disease burden by informing communities of changing risk in a timely manner.

Implementing a System for Environmentally-driven Arbovirus Forecasting across Multiple Geographic Regions

Michael Wimberly (University of Oklahoma; USA; mcwimberly@ou.edu) and Dawn Nekorchuk (University of Oklahoma; USA; dawn.nekorchuk@ou.edu)

Climate-driven early warning systems can provide early warning for vector-borne disease outbreaks based on observed changes in environmental risk factors. We developed the ArboMAP system for integrating remotely-sensed environmental observations with public health surveillance of human cases and mosquitoes to generate seasonal predictions of West Nile virus risk in the United States. Model evaluations have shown that WNV transmission is sensitive to temperature and atmospheric moisture and demonstrated that incorporating environmental data into WNV forecasting improves prediction accuracy.

Seeing Heat Risk Through an Equity Lens: Putting High Resolution Temperature Data to Work for Urban Environmental Justice

Benjamin Zaitchik (Johns Hopkins University; USA; zaitchik@jhu.edu)

We apply spaceborne and in situ Earth Observations to map the distribution of extreme heat in the City of Baltimore, Maryland. These maps are leveraged for participatory scenario analyses in which communities and government officials set priorities for reducing heat exposure. Scenarios are generated by combining heat maps with a multi-criteria optimization tool (the City Heat Equity Adaptation Tool: City-HEAT) to identify priority heat mitigation and adaptation investments.