GEO Health Community of Practice (CoP)
Telecon: Focus on COVID-19 Transmission
June 9, 2020

In Attendance: 40 participants
John Haynes (NASA HQ), Juli Trtanj (NOAA), Helena Chapman (NASA HQ/BAH), Sue Estes (U. of Alabama in Huntsville), Ann Liu (NIEHS), Trisha Castranio (NIEHS), Stan Benjamin (NOAA), Lisa Vaughan (NOAA), Amanda Quintana (USGCRP), Krista Hoevemeyer (USGCRP), Kartik Sheth (NASA HQ), David Green (NASA HQ), Laura Mulvey (NASA HQ), Anna Borovikov (NASA GMAO/SSAI), Cynthia Hall (NASA Earth Science Data Systems), Assaf Anyamba (USRA/NASA Goddard), Dorian Janney (NASA Goddard/GPM), Helen Amos (NASA Goddard/SSAI), Sushel Unninayar (NASA Goddard/GESTAR/MSU), Merrie Beth Neely (GEO AquaWatch), Bob Chen (SEDAC/Columbia University), Kytt MacManus (SEDAC/Columbia University), Corey Hummel (HQ USAF, Directorate of Air Force Weather), Ray Kiess (USAF, 14th Weather Squadron), Bill Frey (USAF, 14th Weather Squadron), Bryan Richards (USGS National Wildlife Health Center), Aaron Naeger (U. of Alabama in Huntsville), Ben Zaitchik (Johns Hopkins U.), Moiz Usmani (U. of Florida), Ali Akanda (U. of Rhode Island), Alex Kowaleski (Cooperative Institute for Research in the Atmosphere/Colorado State U.), Jacob Trzybinski, Rowena Christiansen (U. of Melbourne Medical School, Australia), Susanna Ehlers (Inter-American Institute for Global Change Research), Ian Coady (UK Department for International Development), Mireille Bedirian (Canadian Space Agency), Didier Davignon (Meteorological Service of Canada), Celine Audette (Environment and Climate Change Canada), Melissa MacDonald (Environment and Climate Change, Canada), Serge Olivier Kotchi (Public Health Agency of Canada).

Summary Notes:
**Prepared by Helena Chapman (NASA HQ/BAH) and Helen Amos (NASA Goddard/SSAI)*

John Haynes (NASA HQ) and **Juli Trtanj (NOAA)** opened the telecon by welcoming all participants. They invited GEO members to provide brief updates on upcoming conferences and related activities.

Juli Trtanj (NOAA) mentioned that the Global Heat Health Information Network (GHHIN) will be offering the Heat Health Masterclass Series 2020 in June and July 2020. The class on June 2 (*Setting Operational Thresholds for Heat Early Warning Systems*) was rescheduled for 11:00-12:30PM EDT (GMT-4) on Tuesday, June 9, 2020. The other three virtual classes will be held from 11:00-12:30PM EDT (GMT-4) on June 16 (*Innovating in Urban Planning and Governance for Heat Health*), June 30 (*Economic Valuation of Heat-health Impacts and Interventions*), and July 21 (*Developing an Effective Heat Health Action Plan (HHAP) for your city*). She also shared the GHHIN launch of the Heat and COVID-19 Information Series, which provides additional information on risk management for vulnerable populations, health workers, and city planners.

John Haynes (NASA HQ) provided the link for the Interagency COVID-19 Meeting, led and moderated by **David Green (NASA HQ)** of the NASA Disaster Program, which would follow the GEO Health CoP telecon, at 11AM EDT (GMT-4). He also stated that the GEO Health CoP (Facilitators: John Haynes, Juli Trtanj, Astrid-Christina Koch, Helena Chapman) prepared the agenda for the 90-minute session, *Earth Observations for COVID-19 Response and Recovery*, which will be held on June 15, 2020 from 7:30-9:00AM EDT (GMT-4) at the upcoming GEO Virtual Symposium 2020 (June 15-19, 2020). He encouraged all GEO Health CoP members to complete the event pre-registration. Also, he mentioned that NASA, ESA, and JAXA are co-developing a data dashboard ("one-stop-shop" for end-users), which plans to be launched in late June 2020.

Juli Trtanj (NOAA) and **Stan Benjamin (NOAA)** shared that NOAA researchers have launched the NOAA COVID-19 Data Page (Environmental Datasets for Infectious Disease Modeling), as a resource designed for researchers and decision-makers. She said that this resource provides historic and predictive data, and they request feedback from the wider community. Then, she stated that the 2nd Global Forum on Heat and Health (Theme: *Heat-healthy Cities and Workplaces*) will be held virtually and include occupational health and urban environment topics. She also shared that the Heat Urban Island Campaign would occur this summer across 13 US cities, and CoP members who are interested in using this information to identify and map vulnerable populations and places can become involved. **David Green (NASA HQ)** mentioned that urban heat island issues are of interest to NASA Earth Science and described an ongoing partnership with Microsoft and a Consortium.

John Balbus (NIEHS) and **Trisha Castranio (NIEHS)** shared the NIEHS Climate Environment and Health Webinar series on Wednesday, June 10, 2020 at 11AM EDT (GMT-4) with Jason West (U. of North Carolina) on climate change and air pollution. They also shared the upcoming Global Environmental Health Day on July 1, 2020, as a virtual event showcasing four seminars.

John Balbus (NIEHS) mentioned that NIH continues to pursue intramural and extramural research on COVID-19 transmission and environmental factors and should soon announce the first awards. He stated that 60-70 NIEHS researchers are working on various aspects of climatologic factors and COVID-19 transmission and collaborating to develop online resources.

Ben Zaitchik (Johns Hopkins U.) mentioned that the COVID-19 Japanese Geoscience Union (JpGU) – American Geophysical Union (AGU) Joint Meeting 2020 (Theme: *For a Borderless World of Geoscience*) will be held from July 12-18, 2020. He stated that their joint session, Environmental Drivers and Impacts of the Evolving COVID-19 Pandemic, will be held on July 13, 2020 (morning session in Japan). There is an open abstract call for late-breaking work, including One Health, and he encouraged CoP members to submit their work. Finally, he mentioned that their team has continued to coordinate logistics for the WMO/WHO Workshop on environmental drivers related to COVID-19 transmission for August 2020. The virtual format of the three-day event will accommodate time zones and include recorded interactive presentations and poster sessions. He hoped that they would be able to announce formal details next week. **Juli Trtanj (NOAA)** agreed that this WMO/WHO Workshop is a wonderful opportunity to highlight research applications and other activities by GEO Health CoP members.

Ben Zaitchik (Johns Hopkins U.) stated that their medRxiv pre-print paper was just accepted in the *Lancet Infectious Diseases*. This paper focused on social mobility from January to April 2020 in the US, where they observed that as the social distancing ratio decreased (e.g. fewer contacts under normal circumstances), the growth-rate ratio (e.g. velocity of increase in COVID-19 cases) decreased. He mentioned that their team found success with growth-rate ratios, which controlled for first order issues related to diagnostic testing. He said that they also found that social distancing ratios were strong in March 2020 (as states added stay-at-home policies), as a direct and quantifiable rate across states. He added that this information can serve as a baseline for future analyses related to hydrometeorological variables.

John Haynes (NASA HQ) mentioned that since most states have entered the reopening phase over the past couple weeks and wondered if there would be a spike in COVID-19 cases. **Ben Zaitchik (Johns Hopkins U.)** stated that although it is too early to identify any spike in new COVID-19 cases due to the variation in policies or activities, he mentioned that they are closely observing the potential impact of these events.

John Balbus (NIEHS) asked if the growth rate ratio could be quantitatively associated with R_0. **Ben Zaitchik (Johns Hopkins U.)** mentioned that although their analysis did not attempt to make a connection between growth rate ratio and R_0, he anticipates a strong correlation, but they do not have the conversion factor.

Sushel Unninayar (NASA Goddard/GESTAR/MSU) asked if he expects a time lag between reopening and COVID-19 case counts. **Ben Zaitchik (Johns Hopkins U.)** confirmed that they expect a time lag for reopening.

Kartik Sheth (NASA HQ) asked if there are any known studies that have compared the relative effectiveness of social distancing vs wearing masks. **Ben Zaitchik (Johns Hopkins U.)** stated that he is unaware of any known studies and mentioned that they did not have data on masking rates. He mentioned that as events are happening quickly, it will be important to define social distancing and behaviors like masking rates.

Sushel Unninayar (NASA Goddard/GESTAR/MSU) asked if the NOAA COVID-19 Data Page would share graphics of COVID-19 statistics and environmental variables. **Juli Trtanj (NOAA)** mentioned that data were intended initially for the research community, but later included decision-makers. **Stan Benjamin (NOAA)** stated that they aimed to provide additional information and not duplicate ongoing resources or dashboards. **Sushel Unninayar (NASA Goddard/GESTAR/MSU)** provided examples of satellite observations to consider: tail pipe emissions as a proxy for social (and industrial) distancing, and night lights as a proxy for population distribution.

Juli Trtanj (NOAA) stated that regarding the role of COVID-19, water, and wastewater, there is minimal evidence of COVID-19 transmission in coastal environments due to UV radiation. She encouraged CoP members who are working on these issues to highlight the real issues surrounding water quality and potential COVID-19 transmission.

Ali Akanda (U. of Rhode Island) mentioned that his interest lies in how water insecurity affects COVID-19 transmission. He stated that several Latin American and Asian countries are observing an increase in dengue infections in areas with COVID-19 cases. He said that they aim to understand the factors affecting the rise in dengue and COVID-19 cases. He shared two examples: 1) people may hoard water because they are practicing extra hygiene measures; and 2) people may adhere to stay-at-home restrictions and be susceptible to more mosquito bites while at home.

Sushel Unninayar (NASA Goddard/GESTAR/MSU) mentioned that one *Science* article reported an increase in dengue cases due to the lockdown measures related to urban/rural settings and vegetation. **Dorian Janney (NASA Goddard)** mentioned that **Assaf Anyamba (USRA/NASA Goddard)** who studies vector-borne and water-related disease, has information on the impact of precipitation on mosquito populations. She mentioned that his work has reported significant correlations with mosquito-borne disease outbreaks related to drought conditions and close contacts. **Assaf Anyamba (USRA/NASA Goddard)** said that although he is not currently working on COVID-19 topics, he confirmed that social distancing in densely populated areas results in people living closer (close contact) in the home setting. Hence, he said that if risk factors for dengue exist, then close contact within the home settings will result in increased dengue cases.

Juli Trtanj (NOAA) asked if any CoP members were working on food-borne consumption and COVID-19 transmission.

David Green (NASA HQ) provided an overview on the weekly COVID-19 Interagency Discussion Meetings, which have paralleled the GEO Health CoP telecons. He mentioned that the COVID-19 pandemic has raised a new set of questions that can only be answered by bringing the disasters and health communities together. He stated that researchers need to look at COVID-19 with a systemic perspective (disaster risk reduction includes pandemics). In particular, he stated that around 2015, the community perceived a disaster as a combination of the hazard, vulnerability of the community, and capability to cope, versus just a natural event. He encouraged researchers to look at frameworks (e.g. Sendai Framework for Disaster Risk Reduction) and agendas that aim to reduce disaster risk, minimize climate impacts, and examine urban priorities. Then, he described the disaster management cycle – preparation, response, recovery, mitigation – and the need for a call to action for multidisciplinary collaborations to tackle the challenge. He mentioned that researchers and decision-makers will be challenged by the direct and indirect impacts of the COVID-19 pandemic, such as the pandemic combined with other natural events (e.g. wildfires), exhaustive data collection and synthesis, and other related impacts (e.g. economic, air quality).

Sushel Unninayar (NASA Goddard/GESTAR/MSU) asked if COVID-19 pandemic is considered a natural disaster. **David Green (NASA HQ)** mentioned that the COVID-19 pandemic meets the criteria to be considered a disaster. He mentioned that as it has served as a disruption to lifelines and livelihoods, it has attributes of immediate (e.g. earthquake) and long-term (e.g. droughts) effects. He emphasized that the compound linkages require researchers and practitioners to develop new partnerships.

Juli Trtanj (NOAA) asked the CoP members about strategies where we can bridge gaps – especially between health and disaster communities – in scientific projects that use Earth observation data. She mentioned that FEMA has taken the lead with the COVID-19 pandemic, but unsure about connections between FEMA and HHS. **David Green (NASA HQ)** mentioned that FEMA – rather than HHS/CDC/NIEHS – has managed the significant amount of data since they have a longer legacy of synthesizing these data. He emphasized the importance for partnerships on how to obtain and connect data.

Juli Trtanj (NOAA) asked about other programs or research institutions that are fostering this interface. **David Green (NASA HQ)** stated that they have seen approaches work differently across countries. He stated that some institutional barriers have hindered collaborations. He noted a positive collaboration in the UK, where health and disasters communities have been integrated. **Sushel Unninayar (NASA Goddard/GESTAR/MSU)** stated that this COVID-19 pandemic can provide an opportunity to integrate these institutions.

Mireille Bedirian (Canadian Space Agency) mentioned that the Canadian Space Agency has had a long partnership with US/Europe and look forward to collaborating on these issues. She stated that her team was interested in examining the impacts of the COVID-19 pandemic to better inform decision-making.

Sushel Unninayar (NASA Goddard/GESTAR/MSU) suggested that one way to collaborate is to seek funding for joint projects. **David Green (NASA HQ)** mentioned that he is unsure if collaborative proposals (e.g. Earth and health sciences) are being supported and agreed that there is a need for interdisciplinary work. **Juli Trtanj (NOAA)** mentioned that International Research and Applications (IRAP) (Lisa Vaugh, NOAA) has funded interdisciplinary work, especially in the Caribbean region. She asked how we can translate this engagement and unique opportunity with the COVID-19 pandemic to encourage innovative collaborations for long-term change.

John Balbus (NIEHS) mentioned the Belmont Forum and potential opportunities to align the Belmont Forum with Disaster HCRA**. Juli Trtanj (NOAA)** stated that this could result in funding and institutional alignment.

David Green (NASA HQ) emphasized the need to leverage expertise and resources, establish a consortium around risk and resilience, and develop a common list of questions that require collaboration. He mentioned that one challenge with interdisciplinary research is that interdisciplinary experts are difficult to find since many researchers focus on one discipline. He also said that it would be important to identify success criteria. **Juli Trtanj (NOAA)** agreed that defining success criteria can be a challenging task for agencies.

John Haynes (NASA HQ) mentioned that Earth observations and commercial satellite data have examined human mobility during disasters and now during the COVID-19 pandemic. He stated that some reports identified that traffic in Wuhan and at hospitals had dramatically increased in late summer and early fall 2019. These reports have hypothesized if the COVID-19 pandemic occurred earlier than what was officially reported. Hence, he wondered about the use of satellite data to monitor social distancing and human mobility.

David Green (NASA HQ) stated that the Caribbean Disaster Emergency Management Agency (CDEMA), which represents 18 countries, aims to understand population density and proximity to different factors (e.g. urban/coastal areas). He mentioned that some researchers are looking at economic considerations for health and recovery and are exploring ways to partner on human mobility as a key element.

Ian Coady (UK Department for International Development) stated that his team uses Earth observations to better understand risks of vulnerable populations. For example, he mentioned that they have a program (GRID3) in Africa with more static views of the population, and now in the COVID-19 pandemic, they are combining Earth observations with call data records to examine mobility. He stated that although they have made forward steps to incorporate Earth observations with cross-government working groups in the UK, they have not fully connected the disaster response and humanitarian teams. He mentioned that his team has established a data science hub to scale Earth observation applications to be more applicable for humanitarian working groups. Moving forward, they aim to bridge this gap between technical and sectoral aspects with this work. **Bob Chen (SEDAC/Columbia University)** shared the links for POPGRID.

Juli Trtanj (NOAA) mentioned that several CoP members met to discuss WHO indicators related to migration. Although disaster and humanitarian efforts tend to be more closely linked to health experts, she asked about the best approach about how CoP members can foster this intersection and coordinate robust discussions on these topics.

David Green (NASA HQ) mentioned that we should look at these issues and understand the physical distribution of the population (e.g. day/night activities, work location, evacuation locations).

Didier Davignon (Meteorological Service of Canada) stated that disaster response in Canada is managed at the federal and provincial levels. He mentioned that the federal response (e.g. Public Health Agency of Canada) aims to produce active research to inform decision-making. However, there are challenges to coordinate the research and development efforts at the same time as the disaster response. He added that they are entering a new phase to better coordinate research and development efforts and expand the number of department collaborations.

David Green (NASA HQ) mentioned that we should not wait until next season to ask these critical questions. He encouraged CoP members to coordinate research projects and start the governance dialogue now. He mentioned that we should be more proactive and address these institutional items before they happen.

John Haynes (NASA HQ) and **Juli Trtanj (NOAA)** thanked **David Green (NASA HQ)** for his outstanding presentation, continued contributions to the field, and engagement in the group discussion. They agreed that this telecon had provided an opportunity to share information, connect researchers, and leverage resources that can amplify current activities related to the COVID-19 response. They also requested that GEO Health CoP members share the CoP telecon schedule with their colleagues.

John Haynes (NASA HQ) and **Juli Trtanj (NOAA)** closed the telecon and mentioned that the next telecon would be scheduled for Tuesday, June 23rd at 8:30AM EDT (GMT-4). The focus area would be determined later this week. They also mentioned that there would be no CoP telecon on Tuesday, June 16th, due to the GEO Virtual Symposium (June 15-19, 2020).

Adjourned: 10:00 AM EDT (GMT-4)