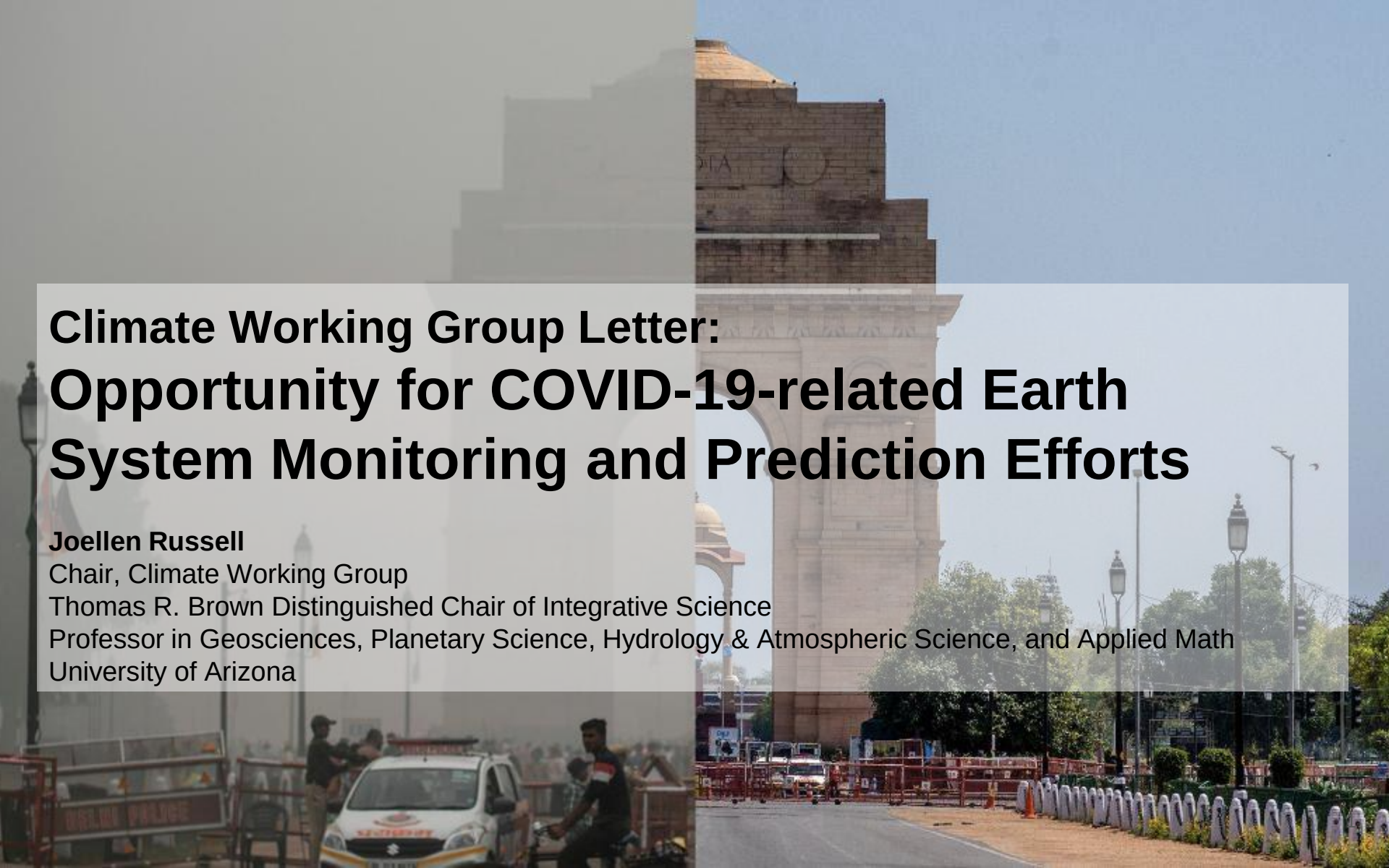


Climate Working Group Letter:

Opportunity for COVID-19-related Earth System Monitoring and Prediction Efforts

Joellen Russell
Chair, Climate Working Group
Thomas R. Brown Distinguished Chair of Integrative Science
Professor in Geosciences, Planetary Science, Hydrology & Atmospheric Science, and Applied Math
University of Arizona

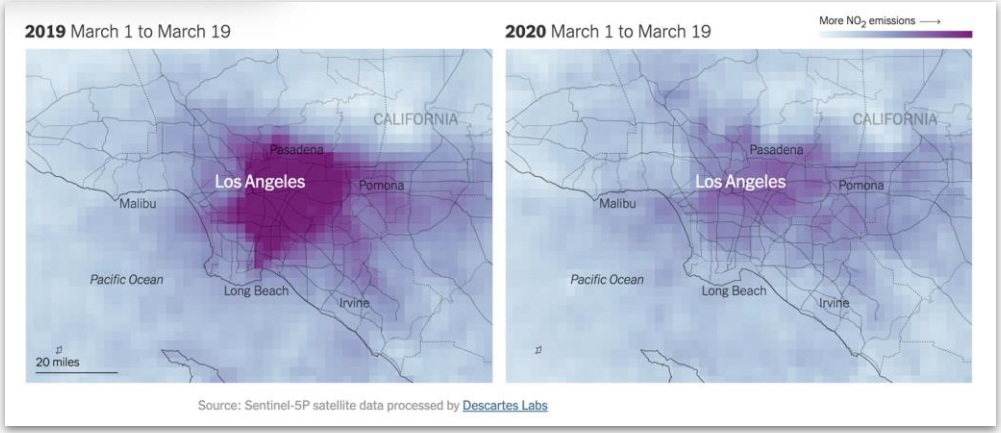
The Request

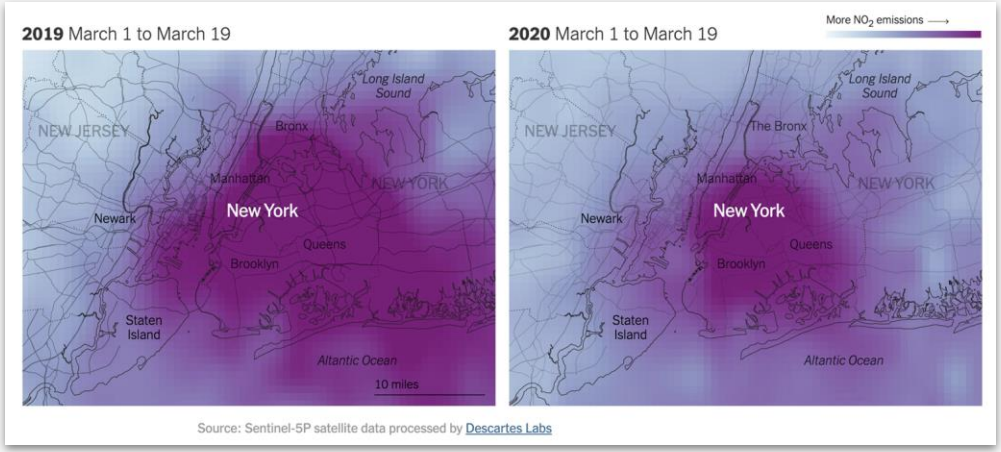
The Climate Working Group (CWG) requests that the Science Advisory Board (SAB) recommend immediate actions by NOAA related to COVID-19-related Earth Systems Monitoring and Prediction efforts.

Why?

- There have been precipitous drops in aerosol and carbon emissions as industries and transport networks shut down in response to the COVID-19 pandemic.
- Declines in aerosols, nitrous oxide, and carbon dioxide emissions vary regionally.
- Unique opportunities to assess our predictive capabilities and to provide data on health-pollution relationships.

Change in automobile related emissions





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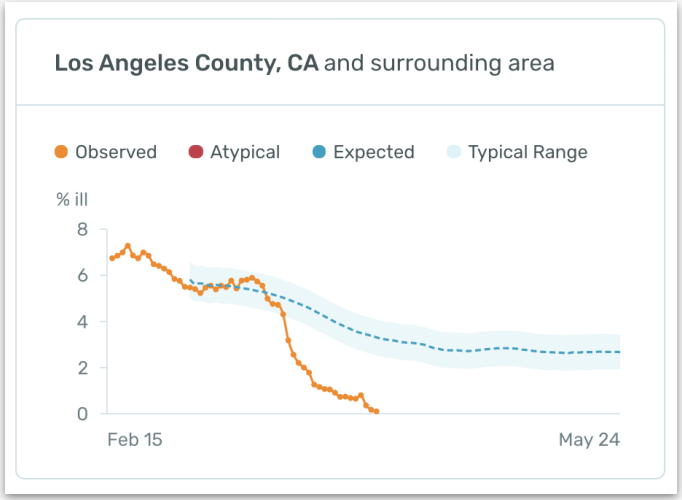
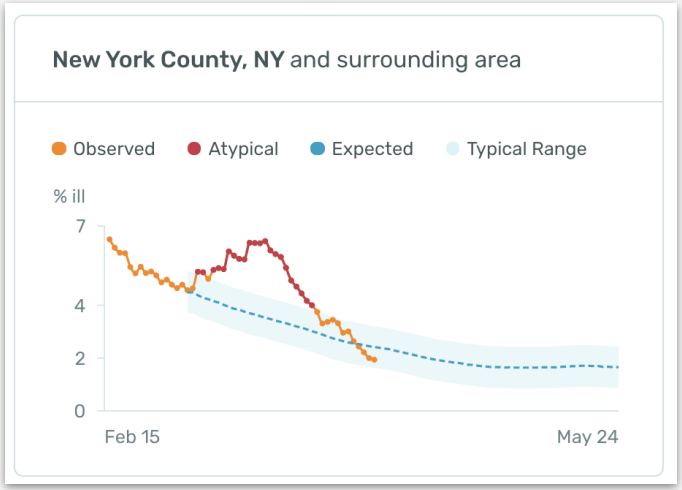
Cumulative Illness





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We acknowledge NOAA's valiant efforts to maintain their unique service to the nation under these challenging conditions and recognize that capitalizing on this opportunity may not be possible, but we are inspired to hope because of NOAA's tradition of ingenuity and resilience by providing environmental intelligence for better decision making.

The Request

The Climate Working Group suggests to the NOAA Science Advisory Board that NOAA:

1. ***Assess "What can NOAA do?"*** – NOAA should assess the feasibility of rapid response studies of the impact of COVID-19 "shelter-in-place" practices on atmospheric constituents and their effects on the radiation budget.
2. ***Assess "What can NOAA organize?"*** – NOAA should implement appropriate cross-agency and external organization to capture the impacts of COVID-19 "shelter-in-place" practices on our ability to predict the Earth System.
3. ***Assess "How can NOAA help?"*** – NOAA should collaborate with health and epidemiological agencies to assess whether these direct pollution and climate effects have quantifiable and predictive human health repercussions.

Acknowledging the importance of individual safety and health, and the emerging challenges to maintaining current observing systems, NOAA should determine whether it is possible to direct internal NOAA personnel to this opportunity and potentially critical objectives.

Objectives:

1. **Observe, aggregate, and quantify aerosols, radiatively active gases, and their radiative effects, occuring in response to the pandemic-related decrease in transportation and manufacturing.**
   This would require securing ongoing aerosol, atmospheric chemistry, and radiation monitoring from space and *in situ* networks. A rapid response to obtain these data is essential.

1. **Bring together key modelling centers to explore and compare the impacts in their systems.**
   This might involve initializing forecasts with COVID-era versus normal emissions to determine where the simulations diverge (or don't) from observations to evaluate our understanding of the atmosphere and Earth System and our predictive capabilities.

1. **Collaborate with public health agencies and assess NOAA's environmental prediction capability**
   In particular, forecasting favorable/unfavorable conditions for vector-borne diseases and in understanding the spreading mechanism of epidemic or pandemic (e.g. airborne disease) that may be (partially) attributed to physical environment changes (in such as temperature, humidity, airflow, aerosol, weather-climate pattern, etc.)


Suggestions
?
Questions?
Comments?