Weekly Report

SCSB/CISESS
Cooperative Research Program Division (CoRP)
STAR/NESDIS
National Oceanic and Atmospheric Administration (NOAA)

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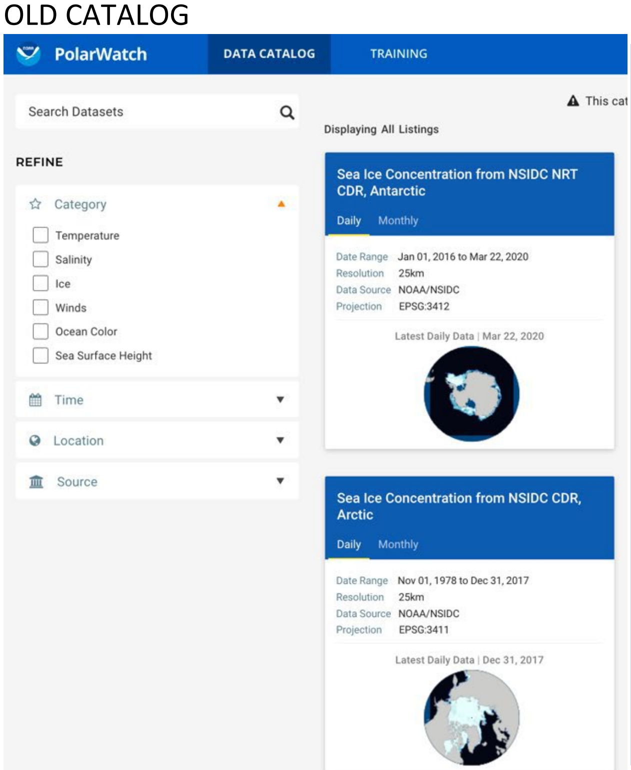
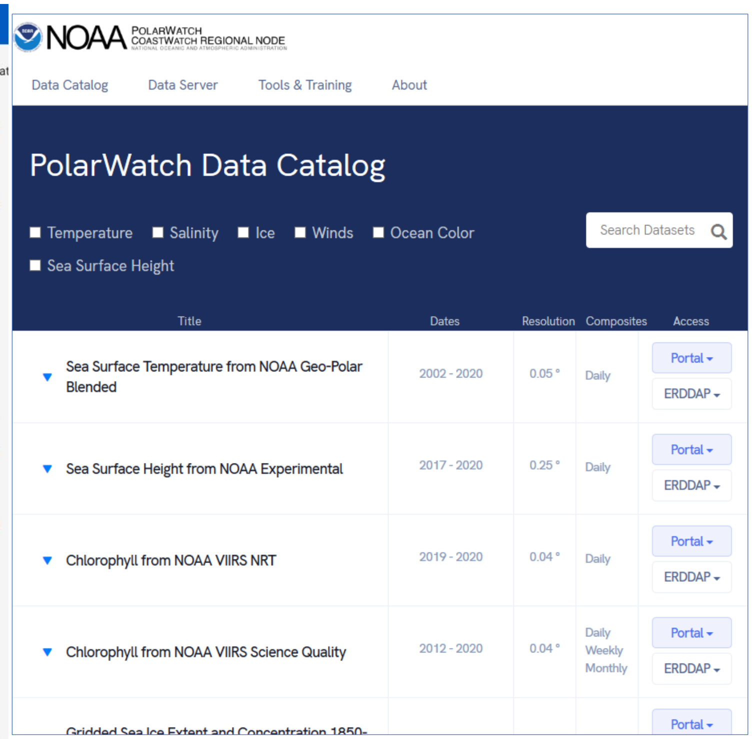
Products and Applications

NOAA PolarWatch Data Catalog Improved and Expanded: As part of the support to the NOAA/NASA Ocean Surface Topography Science Team (OSTST), CISESS Scientist Sinéad Farrell has been developing datasets for the latest node of NOAA CoastWatch/OceanWatch program: NOAA PolarWatch. PolarWatch enables data discovery, easy access, and broader usage of high-latitude satellite data products, especially those developed by NOAA/NESDIS/STAR/SOCD. It delivers multi-sensor physical and biological ocean remote sensing data in support of broad applications in the Arctic and Southern Oceans. In August, the PolarWatch website was updated to offer a new catalog view that makes it easier to compare datasets and provides streamlined access to the data.

OLD CATALOG



NEW CATALOG

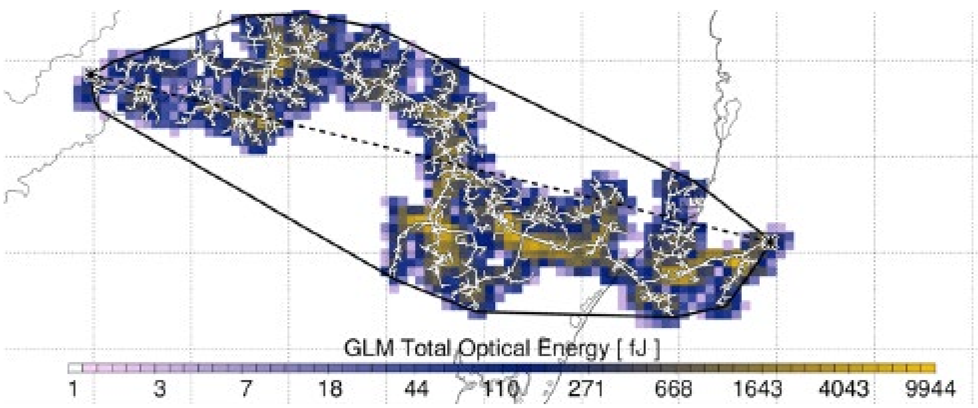


There are now over 100 datasets, including satellite data, model output, and in situ measurements from field sensors. The newest satellite datasets are from the NOAA-16 Visible/Infrared Imager Radiometer Suite (VIIRS): Daily sea ice surface temperature, concentration and thickness are now available for the Arctic and Antarctic at 0.795 km resolution. See https://polarwatch.noaa.gov/ for more information.

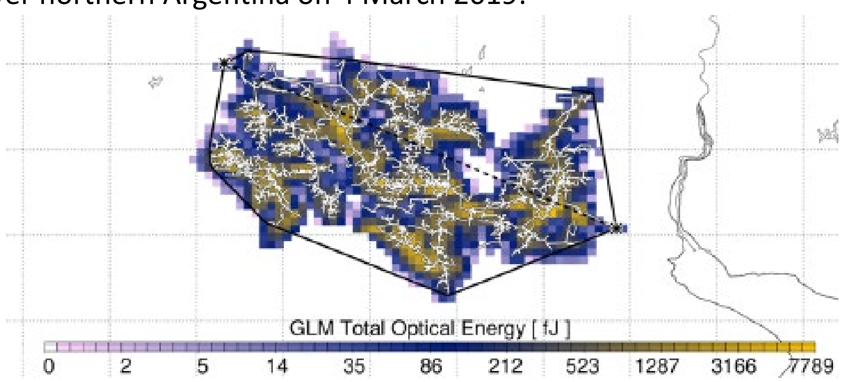
(*POC: Sinéad Farrell, sinead.farrell@noaa.gov , Funding: Jason & OSTST)*

Publications

GOES-16 GLM Verifies Record-Setting Lightning: CISESS Scientist Eric Bruning (TTU), who works on the "Optimizing Geostationary Lightning Mapper Use in AWIPS" task funded by OWAQ and led by SCSB's Scott Rudlosky, has co-authored a new article in the August 28th issue of *Geophysical Research Letter* with two former CISESS Scientists: Michael Peterson and Rachel Albrecht. This article provides the documentation for two lightning megaflash records. The world's greatest extent for an individual lightning flash is a single flash that covered a horizontal distance of 709 km across parts of southern Brazil on 31 October 2018:



The greatest duration for a single lightning flash is 16.73 s from a flash that developed continuously over northern Argentina on 4 March 2019:

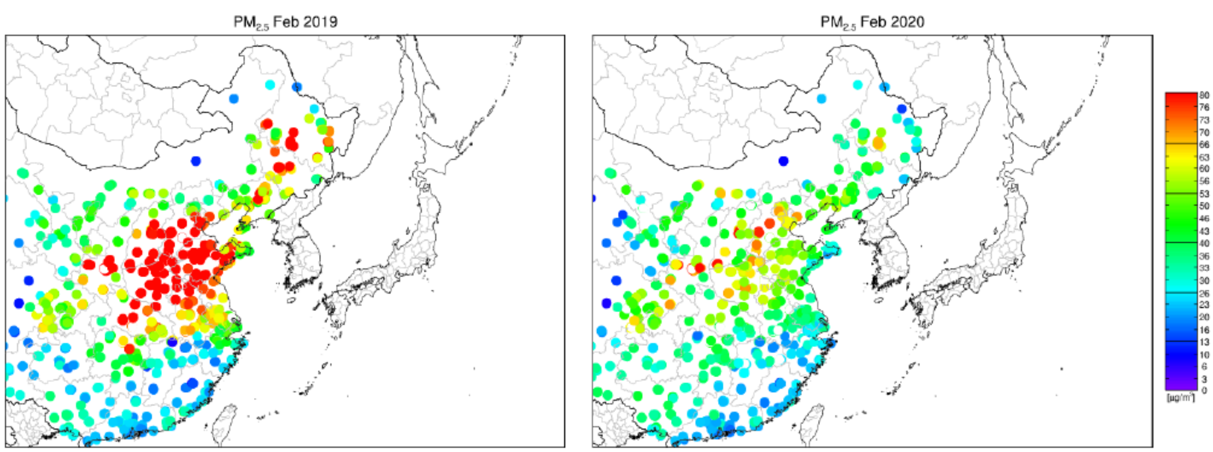


These records were certified by the World Meteorological Organization (WHO) based on analysis of data from the GOES-16 Geostationary Lightning Mapper (GLM). Both these records are more than double the prior records, which relied only on ground-based Lightning Mapping Arrays, proving the importance of space-based lightning measurements.

Peterson, M. J., Lang, T. J., **Bruning, E. C**., Albrecht, R.,Blakeslee, R. J., Lyons, W. A., Stéphane Pédeboy, William Rison, Yijun Zhang, Manola Brunet, and Randall S. Cerveny, 2020:. New World Meteorological Organization certified megaflash lightning extremes for Flash distance (709 km) and duration (16.73 s) recorded from space. *Geophys. Res. Lett*., **47**, e2020GL088888, https://doi.org/10.1029/2020GL088888.

(POC: Eric Bruning, eric.bruning@ttu.edu, Funding: OWAQ/WPO).

Can We Assess Post-COVID-19 Economic Activity using Air Pollution Data? CISESS Scientist Hyun Cheol Kim (OAR/ARL) is working with NOAA, Georgia EPA, and South Korean scientists to determine if they can use surface pollution measures in China to gauge its economic recovery from the COVID-19 pandemic. The researchers examined pollution data from 2017 to the current year to identify annual variability in pollution, caused by social events such as the Lunar New Year as well as year-to-year meteorological differences. Kim found that the reduction in nitrogen dioxide (NO_2) values was deeper and longer than in prior years but they started to recover after February 15. Fine particulates ($PM_{2.5}$) dropped 30% and had not yet returned to normal values by the end of March. The figure below shows the monthly mean $PM_{2.5}$) for February 2019 (left) and February 2020 (right) with red indicating the highest levels.



Sulfur dioxide (SO_2) was not significantly affected by the pandemic. This may be evidence that different economic sectors are recovering at different rate, led by the transportation sector (source of most NO_2) and lagging in the agricultural sector (a source of $PM_{2.5}$). However, measurements of single pollutants are insufficient to draw conclusions on the overall economic recovery. This article opened for discussion at *Atmospheric Chemistry and Physics Discussions* on August 17th: https://doi.org/10.5194/acp-2020-821.

Kim, Hyun Cheol, Soontae Kim, Mark Cohen, Changhan Bae, Dasom Lee, Rick Saylor, Minah Bae, Eunhye Kim, Byeong-Uk Kim, Jin-Ho Yoon, and Ariel Stein, 2020: Quantitative assessment of changes in surface particulate matter concentrations over China during the COVID-19 pandemic and their implications for Chinese economic activity, *Atmos. Chem. Phys. Discuss.*, https://doi.org/10.5194/acp-2020-821 (under review).

(Hyun Cheol Kim, hyun.kim@noaa.gov, Funding: ARL)

Awards and Recognition

Training and Education

Media and Outreach

Other