

## Weekly Report

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

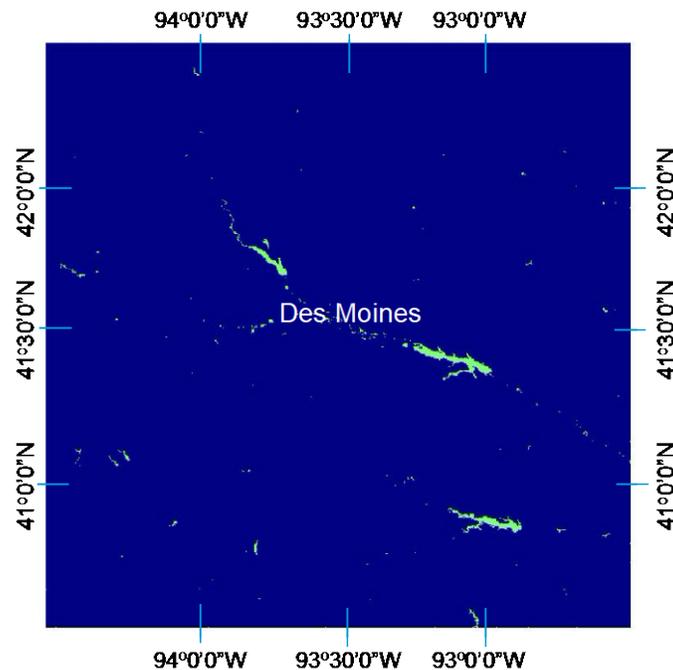
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Submitted by: Ralph Ferraro  
Prepared by: Debra Baker  
Date of Submission: 12/18/2020

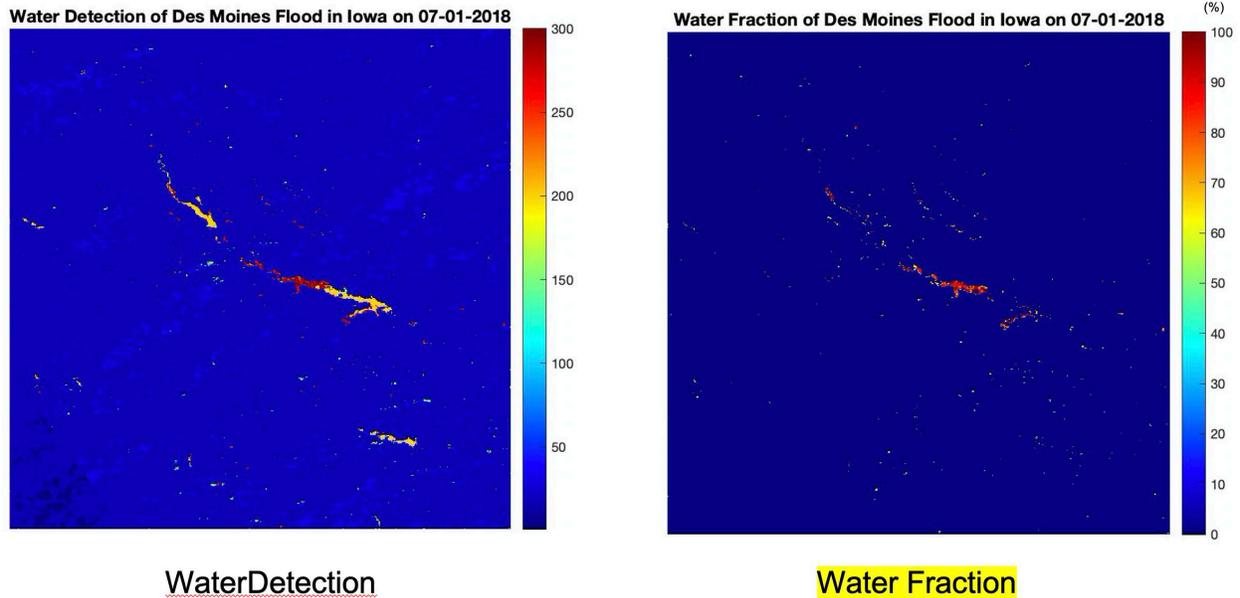
### Products and Applications

#### **Accelerated Exploitation of Satellite Observations to Improve Flood and Inundation**

**Monitoring and Forecasts:** CISESS Scientist Qingyuan Zhang has developed Matlab software to produce daily VIIRS water fraction products with JPSS-VIIRS and NPP-VIIRS images. Zhang has produced the daily VIIRS water fraction products for the Des Moines flood event in Iowa from 6/26/2018 to 7/10/2018. Figure 1 shows the event study area. Figure 2 displays “Water Detection” and water fraction maps of the study area for this flood event on 7/1/2018. Two formats of the water fraction products are available: ASCII and Geotiff. The VIIRS products for the Des Moines flood event in 2018 have been delivered to the Florida Institute of Technology (FIT) validation team.



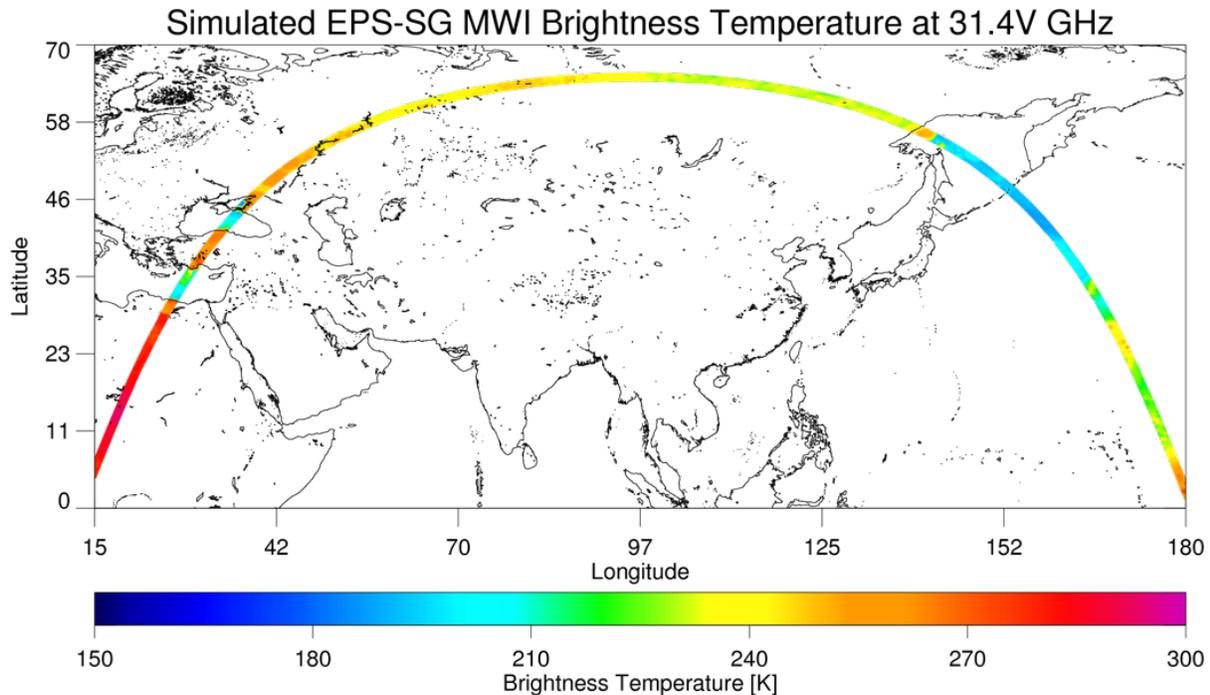
**Figure 1.** Normal 2° by 2° water a map of the 2018 Des Moines flood event in Iowa.



**Figure 2.** VIIRS Retrievals of “WaterDetection” and water fraction of the Des Moines flood event in Iowa on 7/1/2018

(POC: Qingyuan Zhang, [gyzhang@umd.edu](mailto:gyzhang@umd.edu), Funding: NOAA Disaster Supplemental: Improving Forecasting of Hurricanes, Floods, and Wildfires)

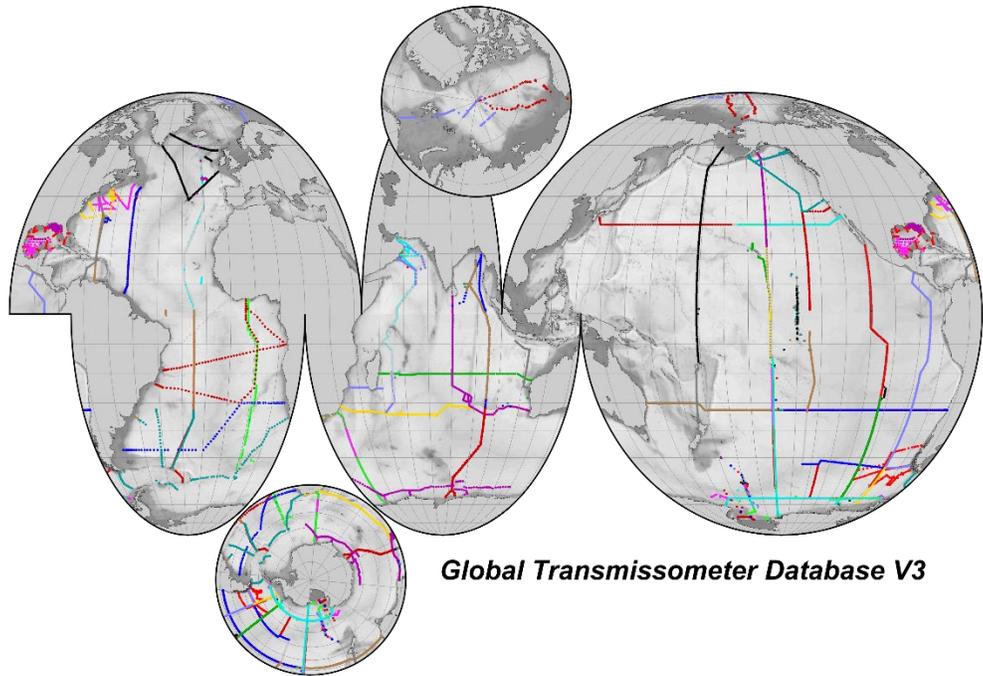
**Proxy Data for EPS-SG for Microwave Imager (MWI) Released:** As part of the effort to prepare for production of EUMETSAT Polar System – Second Generation (EPS-SG) Microwave Imager (MWI) level-2 products, CISSS’s MWI team, led by Veljko Petkovic and Ralph Ferraro, has generated a set of simulated MWI measurements. The MWI instrument will not only expand the global coverage of conical-scanning radiometers, but also introduce the first set of oxygen absorption channels to NOAA operations. Ability to work with simulated observations at the early stage of this project is critical for successful preparation of day-1 EDR retrievals. Simulated brightness temperatures will provide algorithm developers with a unique opportunity to gain a better understanding of how the new oxygen bands information content can improve the quality of the future satellite products. This proxy dataset enables pre-launch retrieval implementation and opens a path forward to setting operational requirements for NOAA’s level-2 EDR output. The figure below depicts simulated brightness temperature at 31.4V GHz MWI channel as they would be seen over a portion of a GPM-DPR orbit.



**Figure:** EUMETSAT-Second Generation Microwave Imager Brightness Temperature at 31.4 GHz vertical polarization. Data are simulated using MWI FOV geometry over a portion of a GPM-DPR orbit (December 31 2014). EPS-SG MWI will fly in 9:30am/pm orbit at 835 km altitude on-board of all three B platforms providing imagery at 26-channels (19 GHz – 183 GHz) over a ~1650 km wide swath.

(POC: Veljko Petkovic, [veljko@umd.edu](mailto:veljko@umd.edu), Funding: METOP-SG)

**New Global Transmissometer Database Released:** CISESS Scientist Alexey Mishonov and his team from Texas A&M University Oceanography Department published a new version of the Global Transmissometer Database. NOAA's extensive collection of transmissometer data has been organized into a coherent database to address numerous questions about the global distribution of particulate matter using an important inherent optical property - beam attenuation ( $c$ ), which can be correlated with the concentration of particulate organic carbon (POC) in surface waters and total particulate matter throughout the water column. It includes 11,684 beam attenuation profiles from 107 cruises. The coverage includes basin-wide transects in the North and South Atlantic, North and South Pacific, Indian, and Southern Oceans, as well as several repeat basin-wide transects on decadal time scales. Transmissometer profiles were uniformly quality controlled, edited, and converted to a common format. Data is freely available for scientific use as a collection from the Ocean Data View (ODV) web site as well as from CCHDO and NCEI archives as a set of independent cruises/profiles. Associated data (temperature, salinity & oxygen) collected on the same cruises are also loaded into this collection.



Gardner, W.D., A.V. Mishonov, M.J. Richardson, 2020. Global Transmissometer Database V3.  
 DOI: 10.13140/RG.2.2.36105.26724,  
<https://odv.awi.de/data/ocean/global-transmissometer-database/>.

(POC: Alexey Mishonov, [alexey.mishonov@noaa.gov](mailto:alexey.mishonov@noaa.gov), Funding: NCEI)

**Workshops, Conferences, and Meetings**

**Atmospheric Electricity Section at the 2020 AGU Fall Meeting:** Daile Zhang, a post-doc associate of CISESS, co-chaired and presented at the 2020 AGU Atmospheric Electricity section (Dec. 8-11, 2020). Daile presented her work of an Evaluation Study of the International Space Station Lightning Imaging Sensor and co-chaired both the eLightning and the oral session of the Thunderstorm Electrification and Lightning Meteorology. She also served as one of the conveners other two sessions. The virtual sessions went successfully with a total of more than 200 attendees.



(POC: Daile Zhang, [dzhang@umd.edu](mailto:dzhang@umd.edu) Funding: GOES-R)