Weekly Report

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

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Prepared by: RAMMB/CIRA contributors
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Products and Applications

CIRA's aviation website with a new CONUS domain: The CIRA Cloud team updated the experimental aviation website with the addition of the GOES-16 ABI CONUS data. The experimental Cloud Vertical Cross-section product is based on 3D gridded satellite cloud data derived from the Enterprise Cloud Products (cloud top/base and phase), including supplementary data such as temperature data (NUCAPS or NWP model), PIREPs (icing and turbulence), and terrain information. The products have been developed with JPSS VIIRS data for Alaska users, and are now extended to CONUS with ABI. Two separate domains are currently available on the website (Alaska with VIIRS and CONUS with ABI), and users can create custom cloud cross-sections by selecting their own flight paths. (POC: Y.J. Noh, J. Haynes, B. Daub, M. Niznick, CIRA, Yoo-Jeong.Noh@colostate.edu, 970-491-8907; Funding: JPSS and GOES-R)

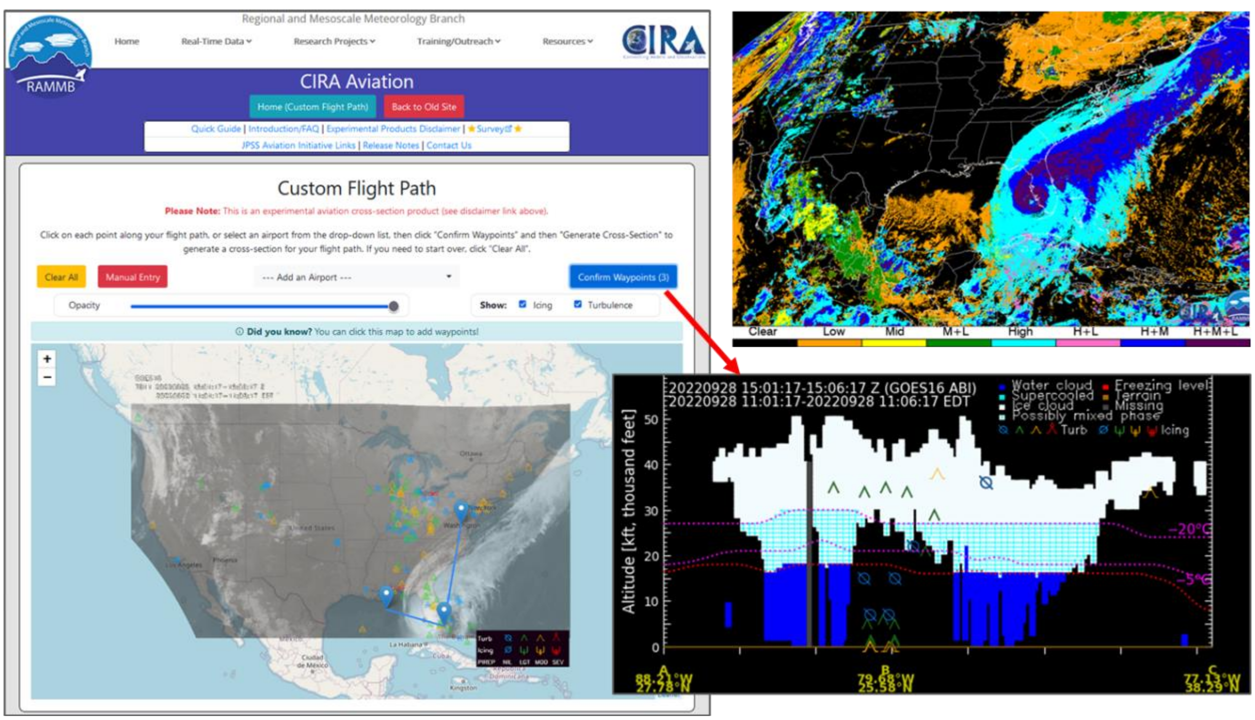

Figure: CIRA's experimental aviation website (https://aviation.cira.colostate.edu/) for custom cloud vertical cross-sections with a new CONUS domain using GOES-16 ABI data. A cloud vertical *cross-section along a sample path of New Orleans-Miami-Washington D.C. through Hurricane Ian is shown with Cloud Layers available in CIRA's SLIDER (1501 UTC 28 Sep 2022).*

GeoColor from the Advanced Meteorological Imager (AMI): The Korea Meteorological Administration (KMA) launched the Advanced Meteorological Imager (AMI) onboard Geo-KOMPSAT-2A (GK2A) on 18 December 2018. AMI is similar to the Advanced Baseline Imager (ABI) onboard the GOES-R series satellites, except that it has a 0.51 µm "green" band and lacks the 2.25 µm "cloud particle size" band. As a result of discussions between CIRA and KMA at the AMS Collective Madison Meeting in August, CIRA is now able to acquire AMI data in near-realtime. As a first step toward providing AMI imagery products on CIRA's SLIDER website (https://rammb-slider.cira.colostate.edu), the very first GeoColor image has been produced (see Fig. 1 below). This GeoColor image utilizes the Hybrid Green approach that was first implemented on imagery from the Advanced Himawari Imager (AHI) onboard Himawari-8 to correct for the fact that the 0.51 µm band is offset from the peak reflectance signature of chlorophyll at 0.55 µm (Miller et al. *BAMS* 2016). A comparison between CIRA's GeoColor product and KMA's "AI True Color" product for the AMI "Local Area" sector is shown in Fig. 2 below. CIRA is working with KMA to improve the appearance of KMA's True Color imagery and the SLIDER Team is working to add imagery from all the AMI bands as well as popular RGB products to SLIDER. (POC: C. Seaman, Y.-J. Noh, S. Miller, and N. Tourville, CIRA, 970-491-8448, Curtis.Seaman@colostate.edu; Yoo-Jeong.Noh@colostate.edu)

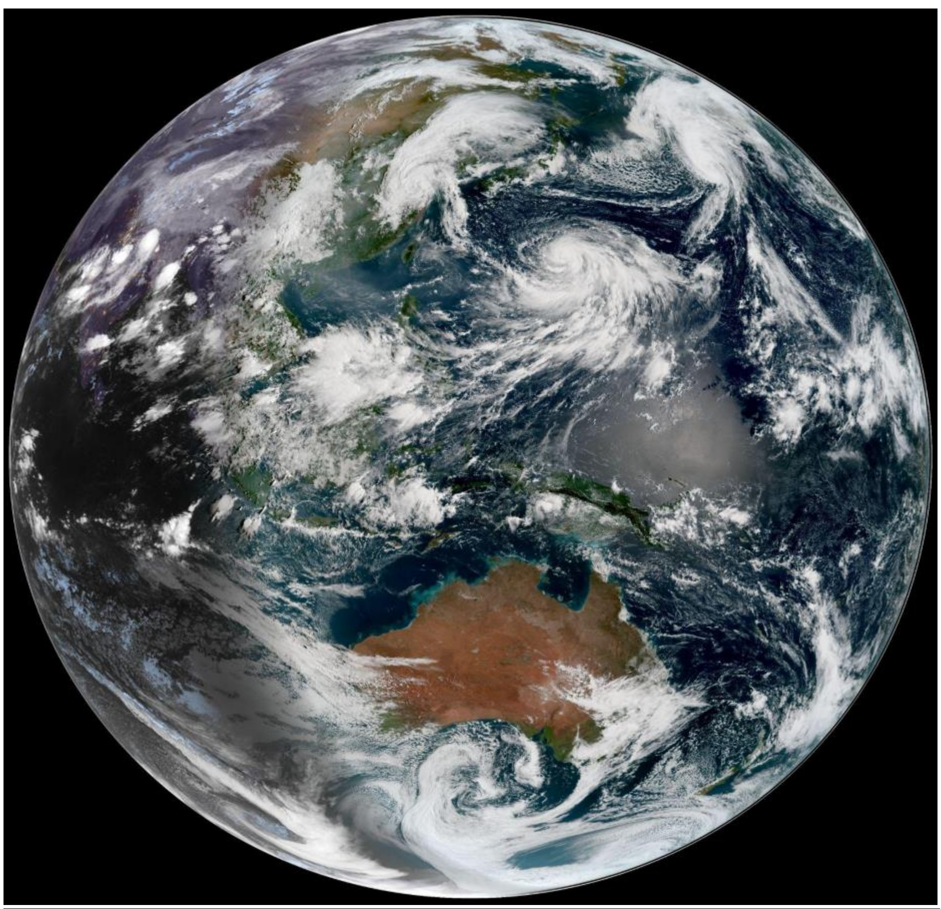

Figure 1. Full Disk AMI GeoColor image from GK2A (0000 UTC, 15 September 2022).

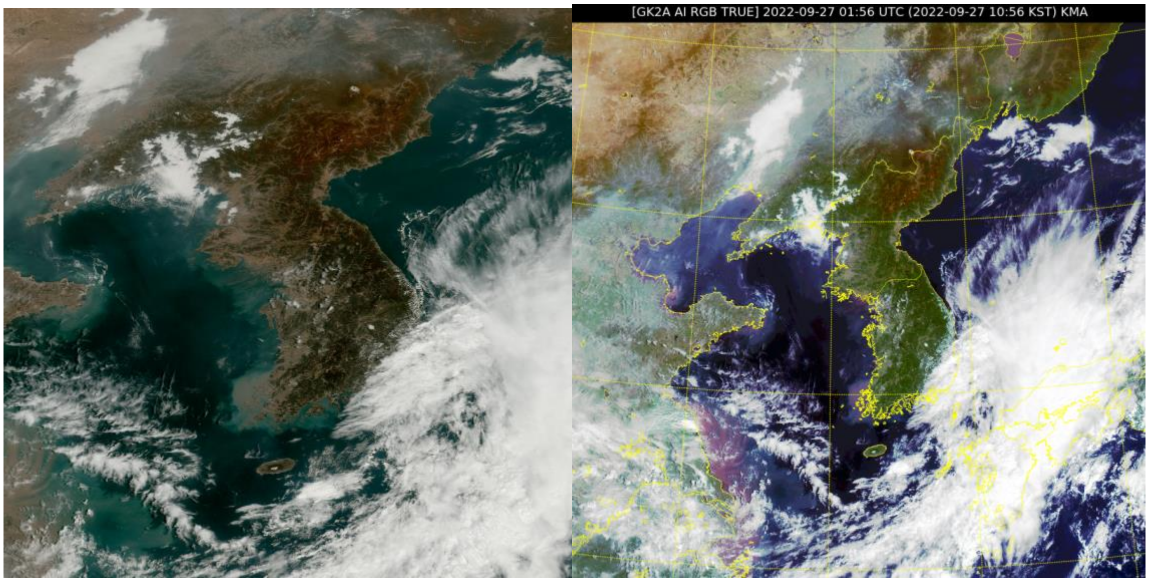

Figure 2. CIRA GeoColor (left) and KMA AI True Color RGB (right) from the GK2A/AMI Local Area sector (01:56 UTC, 27 September 2022). Note the GeoColor image is in the native satellite projection, while the KMA image has been remapped.

Hurricane Intensity and Structure Algorithm (HISA) Code provided to STAR ASSISTT. Galina Chirokova, Mark DeMaria, and Robert DeMaria provided the updated CIRA Hurricane Intensity and Structure Algorithm (HISA) Code to the STAR ASSISTT Team. The updated version works with data from four satellites, including ATMS data from SNPP and NOAA-20 and high-resolution AMSU data from MetOp-B and MetOp-C. The updated code also contains multiple other additions and bug fixes. This project is part of the large DACS project coordinated by John Knaff. (POC: G. Chirokova, Galina.Chirokova@rams.colostate.edu. Funding: DACS)

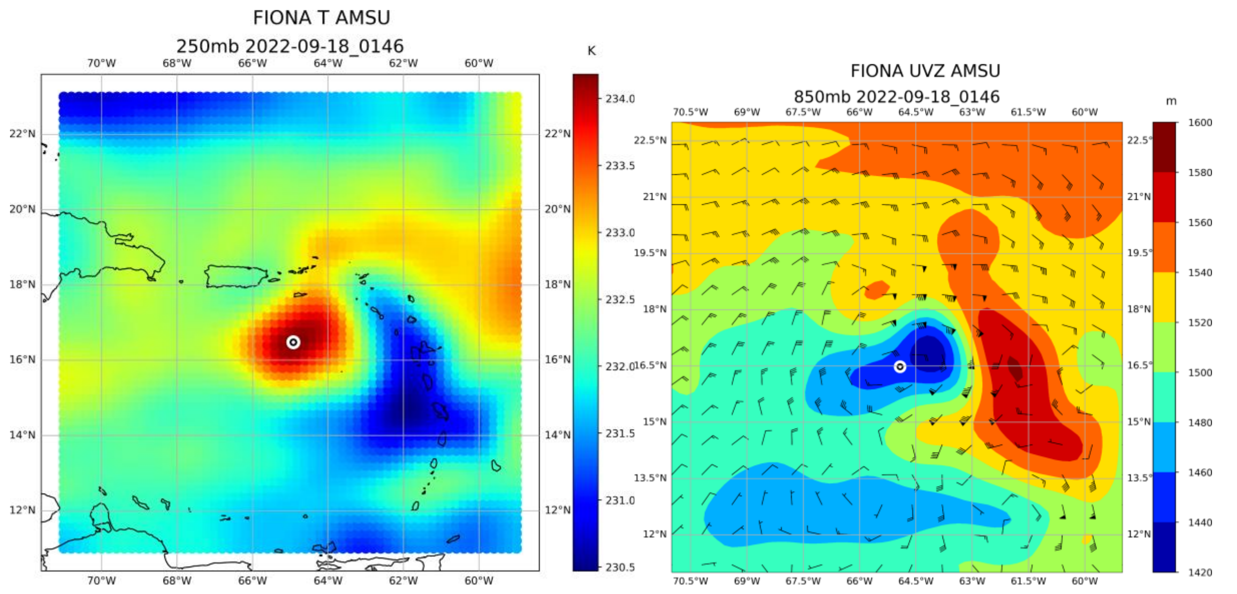

Figure. HISA output plots for Hurricane Fiona with MetOp-C input data. Left: 250 hPa temperature; Right: 850 hPa geopotential height and wind field.

Awards and Recognition

Publications (Citation: followed by a short **Summary:** (Why & so what)**, & detailed summary):**

Blog Posts and Social Media

Media Coverage of Hurricane Ian: Dakota Smith created a number of animations that were used by multiple media organizations to cover Hurricane Ian. Included in these animations were GLM and GeoColor imagery of Hurricane Ian. All of the media examples below contain animations that were downloaded from the newly-created Satellite Library. (POC: D. Smith, CIRA, dakota.smith@colostate.edu) Funding: GOES-R.

The New York Times: "A satellite view shows Ian swirling and flickering with lightning"
https://www.nytimes.com/live/2022/09/27/us/hurricane-ian-florida-news#a-satellite-view-shows-ian-swirling-and-flickering-with-lightning

BBC News: "Satellite images show lightning strikes surrounding Hurricane Ian over Cuba"
https://www.bbc.com/news/av/world-us-canada-63053697

ABC News: "Satellite images show lightning-packed Hurricane Ian"
https://abcnews.go.com/US/video/satellite-images-show-lightning-packed-hurricane-ian-90613479

CNN: "Stunning timelapse shows Hurricane Ian formation from space" https://www.cnn.com/videos/weather/2022/09/28/satellite-images-hurricane-ian-lon-orig-tp.cnn

The Daily Telegraph: "Satellite Shows Lightning Flashes as Hurricane Ian Churns Near Cuba" https://www.dailytelegraph.com.au/news/national/satellite-shows-lightning-flashes-as-hurricane-ian-churns-near-cuba/video/f5b6caa7cb63fc7ebb7bfba88a2be190

USA Today: "Satellite shows lightning flashes as Hurricane Ian churns near Cuba" https://www.usatoday.com/videos/news/weather/2022/09/27/satellite-shows-lightning-flashes-hurricane-ian-churns-near-cuba/10443077002/

Newsweek: "Hurricane Ian Video Shows Spectacular Lightning Swarm Around Eye of Storm" https://www.newsweek.com/hurricane-ian-video-lightning-swarm-eye-storm-1747034

METRO: "Satellite images show lightning crackling near the eye of Hurricane Ian as storm approaches Florida" https://metro.co.uk/2022/09/28/hurricane-ian-lightning-crackles-near-eye-of-storm-as-it-nears-florida-17468933/

INSIDER: "Satellite visuals show lightning crackling around the eye of Hurricane Ian as it sweeps over the Gulf of Mexico toward Florida" https://www.insider.com/satellite-images-lightning-crackling-around-eye-hurricane-ian-2022-9

Fox News: "NOAA's GOES-16 satellite shows size of Hurricane Ian" https://www.foxweather.com/watch/play-5ee9e1f80000e7b

Miami Herald: "Extraordinary amount of lightning surrounds Hurricane Ian's eye" https://www.miamiherald.com/news/weather/hurricane/article266526996.html

***New York Times* interviews for Hurricane Ian:** Chris Slocum (STAR/CoRP/RAMMB) spoke with *The New York Times* reporter Elena Shao about how hurricane structure and intensity influence local impacts at landfall, and specifically the risks and hazards to Florida from Hurricane Ian. In the articles entitled "Here's why Hurricane Ian is sucking water out of Tampa Bay" and "Ian Bludgeons Southwest Florida With Devastating Winds and Storm Surge", Chris explains why wind direction can blow water out of Tampa Bay. In a follow-up interview, C. Slocum discussed the ingredients and mechanisms of rapid intensification for "Ian joins a string of 'rapid intensification' hurricanes." (POC: Chris Slocum, STAR, Christopher.Slocum@noaa.gov, 970-491-2409; Funding: PRDA)

CBS Denver: Chris Slocum, Dan Bikos, and Jack Dostalek discussed and highlighted tools RAMMB/CIRA use to monitor and understand tropical cyclones like Hurricane Ian with CBS 4 Denver (KCNC-TV) during their visit to the CIRA daily weather briefing. The group commented on hazards being seen in Hurricane Ian's Florida landfall and the potential for additional impacts as Ian impacts the Eastern Seaboard after passing over Florida. Chris Slocum answered questions about CIRA's role in improving tropical cyclone forecasts. (POC: Chris Slocum, STAR, Christopher.Slocum@noaa.gov, 970-491-2409; Funding: PRDA, GOES-R, JPSS)

New Satellite Liaison Blog Post: Bill Line published a blog post titled “Hurricane Ian”. The post showcases ABI and VIIRS Imagery of Hurricane Ian, and highlights a few NWS uses of satellite data during the event. See Figure below. The link to the post can be found here. (POC: B. Line, CoRP/RAMMB, bill.line@noaa.gov) Funding: PDRA

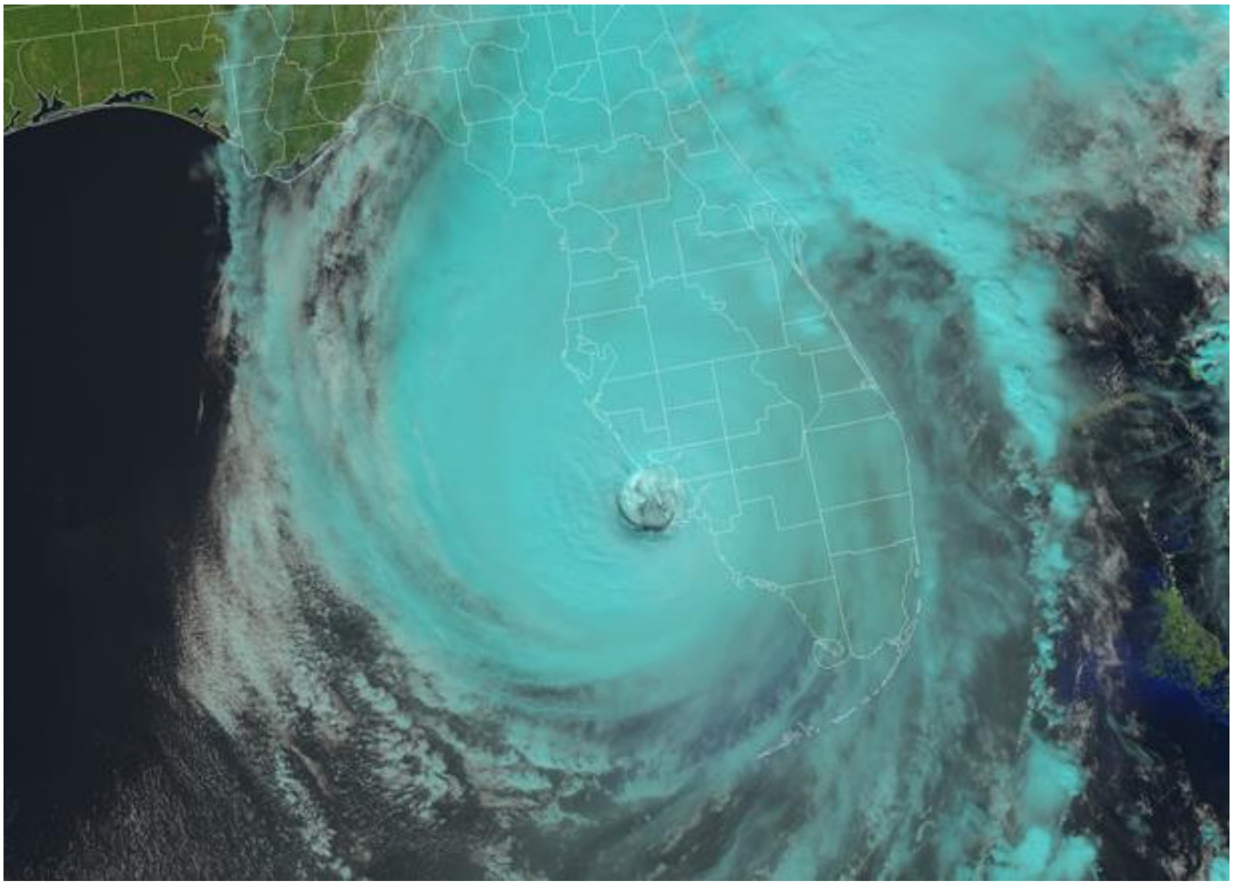

Figure: NOAA-20 VIIRS Natural Color RGB image of Hurricane Ian around the time of landfall.

Travel, Workshops, Conferences, and Meeting Reports

Akansha Singh Bansal presented a poster (virtually) titled "Spatio-Temporal Modeling on Multispectral Satellite Data using Self-Supervised Learning" at Workshop on Transformers for Environmental Science [ESST 2022] in Germany on 23rd September’22.

Akansha Singh Bansal is presenting a flash talk at Satellite Data for Energy Analysis and Policy Conference at the University of Wisconsin-Madison campus on 6-7th October'22.

Training and Education activities

Daily weather discussions highlighted at CSU: Anne Manning, CSU Media team, wrote a quick article highlighting the daily weather discussions held at CIRA, in this case discussing Hurricane Ian (here). Daily public weather discussions have been hosted by CIRA and RAMMB scientists, and CSU students for many years. This provides a focus mechanism for weather issues, inspires new ideas, and trains those new to satellite data interpretation. In the months of August - mid-September the discussion concentrates on tropical weather and tropical cyclones, which relies heavily on remotely sensed data. During the rest of the year discussion topics shift to local and CONUS weather discussions with an emphasis on satellite data use. (POC: John Knaff, (970) 279-1611, John.Knaff@noaa.gov, Funding: PRDA, GOES-R, JPSS).

Future Meetings and Events (dates, meeting/event, location, staff involved)

Other

Manuscript review: D. Hillger reviewed a manuscript submitted to *Atmosphere*. (POC: Don Hillger, CIRA, Don.Hillger@colostate.edu)