Questions & Answer Session 1

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Amita Mehta (amita.v.mehta@nasa.gov)

Question 1: Which methodology do you use to estimate the "Cost in Billions of dollars"?
Answer 1: The estimates shown here are from NOAA. NASA does not make estimates of costs - but other agencies such as NOAA and FEMA, and global organizations such as the red cross, have teams and empirical procedures for damage estimates.

Question 2: On slide 22: what is rip current?
Answer 2: It is the current that is narrow but flows away from the shore to the ocean. Rip currents can occur any time but can be particularly strong during high storm surge events associated with hurricane winds. If you go to the NOAA website where they describe a rip current: https://oceanservice.noaa.gov/facts/ripcurrent.html

Question 3: Please tell us about spatial temporal pressure conditions when a cyclone propagates to land.
Answer 3: NASA GEOS-5 data would help monitor spatial and temporal pressure conditions when a cyclone propagates to land. You can check sea level pressure (SLP) at https://fluid.nccs.nasa.gov/weather/wxmaps/. You can see real time and hourly forecasts of SLP. You can view the animation as we did in the webinar.

Today we mostly saw this visually, but you can also download all the data digitally. Some of that we will see next week. You can download the data and work with GIS or other tools to do analysis right when the storm is in your area, at one location.

Question 4: Can we quantify the damage before the storm hits? How far in advance?
Answer 4: That really requires historical data of past storms -- intensity, size, precipitation, flooding, along with damage data associated with the storms. With that you can derive an empirical or probabilistic relationship between storm parameters and damage. But you will not be able to say that just from one storm's data, you do need past data to determine what kind of impact to expect.

Question 5: Does the CYGNSS satellite provide wind data?

Answer 5: Some information will be available next week. Yes, CYGNSS provides ocean surface wind speed at 0.2x0.2 degree resolution, between 40S to 40N latitudes. The data are available daily from March 18, 2017 to present. The data are available via ftp. Please see https://podaac.jpl.nasa.gov/dataset/CYGNSS_L3_V2.0 for more information.

Question 6: What software is available to process and visualize gpm and trmm data?
Answer 6: Giovanni (https://giovanni.gsfc.nasa.gov/giovanni/) can be used to analyze TRMM and GPM data, you can spatially and temporally subset the data, analyze, and visualize maps, time series, and histograms. You can also download the data in NetCDF or HDF formats via https://pmm.nasa.gov/data-access/downloads/gpm. You can then use other software (Matlab, IDL, Python, GIS) to read and analyze these data.

Question 7: Where I can get free, high resolution (1-10 meter) elevation data and historical world precipitation and temperature data? If anyone knows, please share.
Answer 7: High resolution elevation data - 1-10 m data - may not be available globally. In the U.S. National Elevation Data are available at 10 m (https://lta.cr.usgs.gov/NED). Regionally over the U.S., there are elevation data based on airborne lidar (https://viewer.nationalmap.gov/basic/).

Historically world precip and temperature data - they're available from multiple sites. Based on remote sensing for about 20 years you can find NASA data. TRMM is since 1998 and GPM will continue - so you'll have at least 20 years of data. You can look at global precipitation climatological (GPGC) is a long term dataset https://precip.gsfc.nasa.gov/. In addition temperature data can be found from MERRA reanalysis and MERRA-2 (https://gmao.gsfc.nasa.gov/reanalysis/MERRA-2/data_access/) since 1980.

Also, precipitation and temperature data based on surface measurements can found from Climate Research Unit T (http://www.cru.uea.ac.uk/data). These data are only are over land.

Question 8: How are these tools able to assist us in predictive analysis? The examples are using a historical model.
Answer 8: If you go to GEOS-5 you can see forecasts for current storms - for Flamboyan, you can go to the GEOS-5 and see a forecast for that. You will be able to use all the tools exactly the same way in NRT. For tracking a storm and associated

precipitation you can use Worldview - this is for monitoring in near real time, not for prediction. But the GEOS-5 model does have predictive capability.

Question 9: How can I look for a specific place in NASA Worldview by name or coordinate without the need to zoom in?
Answer 9: If you go to Worldview, once you move your cursor on the screen, you'll be able to see the lat/lon but to see a specific place, you will have to zoom in.

Question 10: What are prospects for future storm pattern identification?
Answer 10: This is not a simple question - so, what we're talking about is short-term forecasts from GEOS-5 that can tell you what's happening now. Future storm patterns is something that requires climate modeling and that topic is beyond the scope of this webinar.

Question 11: Do you have a model for estimating the damages?
Answer 11: No, we don't have one. Someone on the chat mentioned that you can use the Hazus program to estimate damages in the U.S. https://www.fema.gov/hazus.

Question 12: What are some of the natural methods that can be used in remote locations that have less facilitates during a cyclone?
Answer 12: That's a real challenge - all this information is available if you have access to a computer, internet, electricity. If you're in a remote location, the way it works right now - particularly in developing countries - is that the government, local authorities, or NGOs working in disaster management would be receiving this information and disseminating it and providing it to people in remote locations. A lot of destruction and damage still goes on because in remote or interior areas people don't get the information in time.

Question 13: One of the biggest problems in our county is damage from trees. Which remote sensing data source is best for showing health of vegetation?
Answer 13: Landsat is basically the answer - it helps in looking at vegetation health. For large scale area you can see from MODIS and next week we'll have an example where you can see in imagery before/after storms how trees are damaged or destroyed.

Question 14: what mobile app will be recommended to to get the real time best information on weather with average or poor internet frequencies?

Answer 14: If you're in a remote area and have no internet, a mobile answer is a good fit. That's what you should be looking at. For now, we don't have a single app we can recommend, but we can find out more information. You can visit http://portal.gdacs.org/Expert-working-groups/Mobile-technology/iGDACS to get information about a GDACS smartphone app that not only provides alerts to users but allows users to provide feedback, information, and pictures.