# Fusion of Hurricane Models and Observations:
Developing the Technology to Improve the Forecasts
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Objective

- Extend the capabilities of JPL Tropical Cyclone Information System (TCIS) to provide technology for the fusion of observations and operational model simulations to help improve the understanding and forecasting of hurricane processes. Specifically:
  - Develop processing techniques to enable multi-source data fusion across hurricane forecast models, satellite data, and in situ sensor measurements.
  - Develop tools to manage the validation and assessment of model comparisons to more easily evaluate the performance of different numerical models.
  - Develop interactive visualization techniques to enable analysis of highly complex systems.
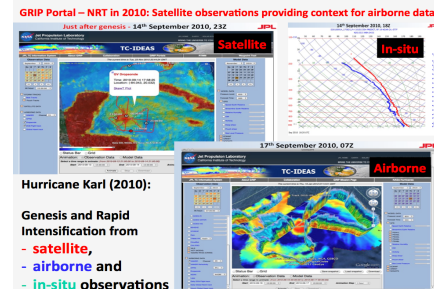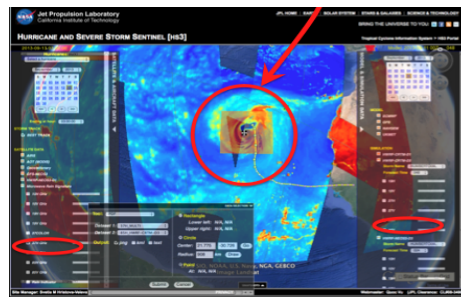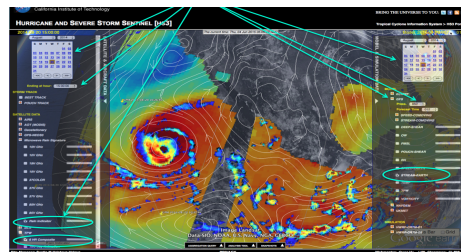
The JPL Tropical Cyclone Information System:
- Brings models and observations into a common analysis system
- Develops on-line analysis tools
- Provides interactive visualization of complex storm systems

Accomplishments

- Supported the objectives of the multi-agency Hurricane Forecast Improvement Project (HFIP), via close collaboration with NOAA (EMC and AOML/HRD), by developing an interactive near-real-time portal to enable timely delivery, utilization, and analysis of satellite and model data to help increase the understanding of hurricane processes and the accuracy of their forecasts.

- Operated the interactive portal during 2014-2016 in support of NASA's HS3 field campaign - and again in 2015 to facilitate collaboration with NOAA's NHC and HRD - in the use of hurricane observations for improved understanding of the large-scale and storm-scale processes associated with hurricane genesis, track, and intensity change.

- Demonstrated TCIS analysis tools during the 2015 hurricane season to discover potential predictive capabilities for hurricane rapid intensification by relating the evolution of 2D precipitation structure to near-surface wind fields (from near-simultaneous satellite observations) to hurricane intensity changes. StormCenter geocollaborate tool enabled multi-user interactions during operational use.

- Infused into the NASA Earth Observing System Simulator Suite (NEOS3) tool.

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TRL$_{in}$ = 3   TRL$_{out}$ = 6

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