**Tropical Cyclone Information System (TCIS)**

The JPL Tropical Cyclone Information System (TCIS) is a tool for hurricane research, and model evaluation. It integrates model forecast of geophysical variables with satellite and airborne observations from a variety of instruments and platforms.

**Satellite observations** (TCIS) can help through:
1. Validation/Improvement of hurricane models
2. Advanced data assimilation of satellite observations inside the hurricane core.

**Some outstanding questions**

1. Is the representation of the precipitation structure correct?
2. Is the environment captured well?
3. Is the interaction between the storm and its environment realistic?
4. Is the storm scale and asymmetry reflected properly?
5. Is the precipitation observed accurately?
6. Is the storm scale and asymmetry reflected properly?

**Research using (TCIS-DA)**

- Satellite depictions of hurricanes over the globe
- Multi-instrument observations pertaining to:
  i) the storm structure
  ii) the air-sea interactions
  iii) the larger-scale environment
- 11-year record (2000-2010)
- Offers digital data and imagery
- Unique source to develop robust statistics for:
  - hurricane research
  - algorithm development

**COMING UP - Fusion of Models and Observations**

- Now: integrating hurricane model forecasts with satellite and airborne observations from a variety of instruments and platforms
- Next: Analysis tools to allow interrogation of a large number of atmospheric and ocean variables
  - To evaluate and improve models
  - To better understand the large-scale and storm-scale processes and their interaction

**TCIS-Interactive Portals in NRT**


- Integrates model forecasts of geophysical variables with satellite and airborne observations from a variety of instruments and platforms, providing good spatial and temporal context for the high-resolution, but limited in space and time, airborne observations.
- Essential knowledge for the experiment design, flight planning, and a very rich information source in the analysis stage of the experiment.
- Allows interrogation of a large number of atmospheric and ocean variables to better understand the large-scale and storm-scale processes associated with hurricane genesis, track and intensity changes.


- Hurricane Sandy
  - Does not have data from 2000
  - Historical data from 1987 to 2010
  - From AMSR-E and WindSat
  - Best Track data from 1970
  - Joint PDFs of 85 GHz and 19 GHz
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**Hurricane Katrina**

- Satellite data from 2005
- Historical data from 1987 to 2010
- From AMSR-E and WindSat
- Best Track data from 1970
- Joint PDFs of 85 GHz and 19 GHz

**Research using (TCIS-DA)**

- The statistical relationship between the 10 Gt (1 m) and 30 Gt (3 m) cyclone track data is well presented information on the vertical structure of the storm.
- The vertical branch indicates too much scattering.

**Data**:

- Satellite and airborne observations from a variety of instruments and platforms.

**Satellite and airborne observations** from a variety of instruments and platforms.