# Unit 2: Tropical Disturbances

## Tools

1. Streamline and isotach analysis

*Introduction to Tropical Meteorology, Sections 9.3.1.2*

<http://www.meted.ucar.edu/tropical/textbook_2nd_edition/navmenu.php?tab=10&page=3.1.2>

This section shows examples for how to identify the location of tropical synoptic weather systems and large scale features such as the ITCZ, troughs, tropical cyclones. The same techniques are applicable for finding other systems such as easterly waves, TUTTs, subtropical storms, cold fronts and shear lines.

1. Satellite image analysis

*Introduction to Tropical Meteorology, Sections 9.3.1.3*

<http://www.meted.ucar.edu/tropical/textbook_2nd_edition/navmenu.php?tab=10&page=3.1.3>

This section presents several satellite image products vital to observing, analyzing, and predicting tropical weather such as visible, cloud drift winds, surface winds, precipitation estimates, and precipitable water.

1. Surface Station Observations

Numerous sites provide plots of surface observations such as:

* Unified Surface Analysis from the US National Weather Service, <http://www.opc.ncep.noaa.gov/index.shtml> (3-14 day archive animation)
* Plymouth State Weather Center, <http://vortex.plymouth.edu/u-make.html>

(Real-time and archive data from 1998-present)

*Introduction to Tropical Meteorology, Sections 9.2.2*

[*http://www.meted.ucar.edu/tropical/textbook\_2nd\_edition/navmenu.php?tab=10&page=2.1.4*](http://www.meted.ucar.edu/tropical/textbook_2nd_edition/navmenu.php?tab=10&page=2.1.4)

This section describes sources of observation error

1. Soundings

* University of Wyoming, <http://weather.uwyo.edu/upperair/sounding.html>

(from 1998 to present)

* NOAA ESRL, <http://esrl.noaa.gov/raobs/>

(from 1994 to present)

1. To prepare for real-time weather discussions, assess potential hotspots by checking the Climate Prediction Center, Global Tropical Hazards Outlook, <http://www.cpc.ncep.noaa.gov/products/precip/CWlink/ghazards/index.php>
2. Statistical forecasts of weekly TC activity are available from MeteoFrance, <http://www.meteo.nc/espro/previcycl/cyclA.php>
3. Meteograms (make your own)

* Plymouth State Weather Center,<http://vortex.plymouth.edu/statlog-u.html> (since 1998)
* University of Wyoming, <http://weather.uwyo.edu/surface/meteorogram/> (two-week archive)
* Air Resources Laboratory, Archive Meteorology (gridded data)

<http://ready.arl.noaa.gov/READYamet.php>

Gridded meteorological data archives for the globe (since Dec 2004). Select locations by interactive map, station ID, or latitude/longitude coordinates and create meteograms, soundings, etc...

1. Photographs of weather phenomena are available from:

* NOAA Education Resources, <http://www.education.noaa.gov/>
* NOAA Photo Library, <http://www.photolib.noaa.gov/>
* UCAR Digital Image Library, <http://www.fin.ucar.edu/ucardil/>
* NASA, Astronaut photography of earth, <http://eol.jsc.nasa.gov/>