NASA Goddard Giovanni Support for YOTC

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Overview of YOTC

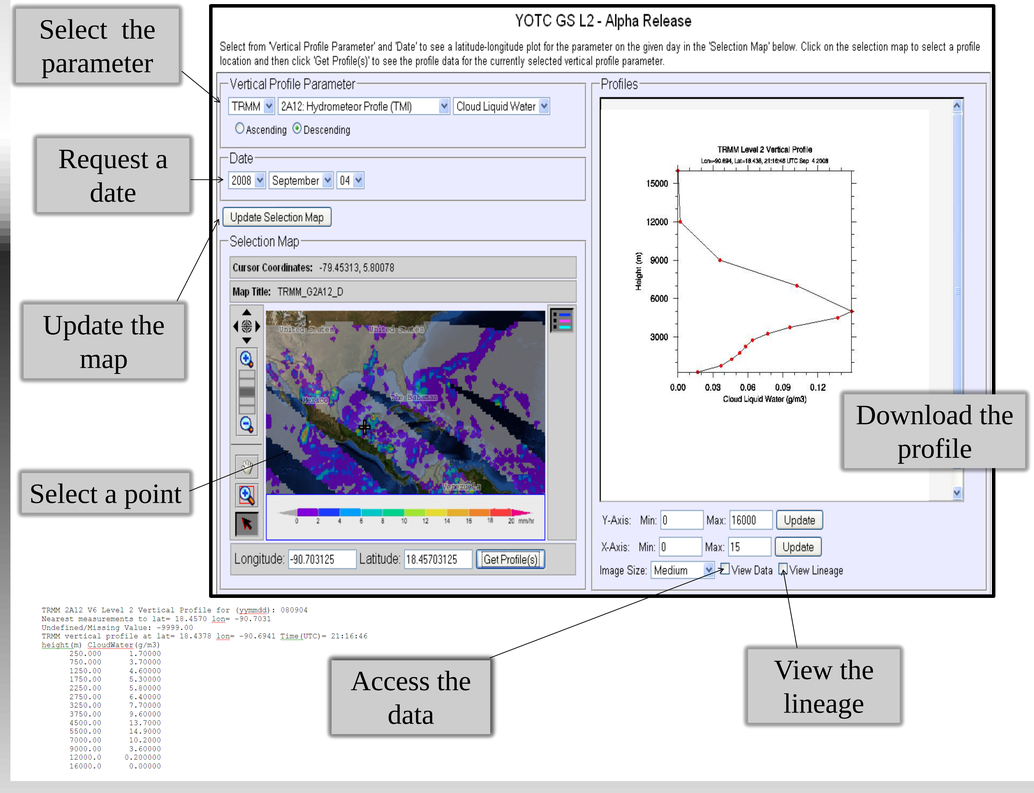
The fundamental challenges to overcoming our shortcomings in understanding and modeling/predicting tropical convection have been two fold: I) the need to represent the broad range of scales applicable to the tropical organization problem (i.e. cumulus to planetary), and II) the lack of observations that adequately and simultaneously characterize this broad range of scales and that also provide three-dimensional information on thermodynamic, radiative and dynamical interactions, including cloud microphysical processes. In regards to the second challenge, it should be stressed that this problem will not be solved through the production and examination of one or a few high quality long-term records of fundamental quantities (e.g., SST, water vapor, cloud fraction). Rather, an alternative and more comprehensive paradigm is needed, one that integrates the multitude of applicable resources and measures of tropical convection in a manner that that can be better utilized by the diagnostic, modeling and forecasting communities to more completely and coherently focus on the problem.

Because the goal of YOTC involves examining a scientifically complex, multi-scale “process”, rather than documenting the characteristics of a single parameter (e.g., SST, cloud cover), YOTC has an IOP perspective that targets a period, May 2008 – April 2010, long enough to encompass many cases of tropical convection activity in many of its most challenging yet influential forms. This includes mesoscale and synoptic variability, easterly waves and hurricanes, convectively coupled waves, the MJO and the culmination of these in terms of the monsoon, their interactions with the extra-tropics, and mean characteristics such as tropical-to-subtropical transitions. The YOTC time period and length are driven in part by the following: 1) keeping the multi-sensor/multi-platform and model-analyses data sets and associated infrastructure manageable, 2) facilitating a focused effort by the research and operational communities on a specific scientific problem, and 3) capitalizing on the recent key additions to the armada of satellites (e.g., CloudSat and CALIPSO).

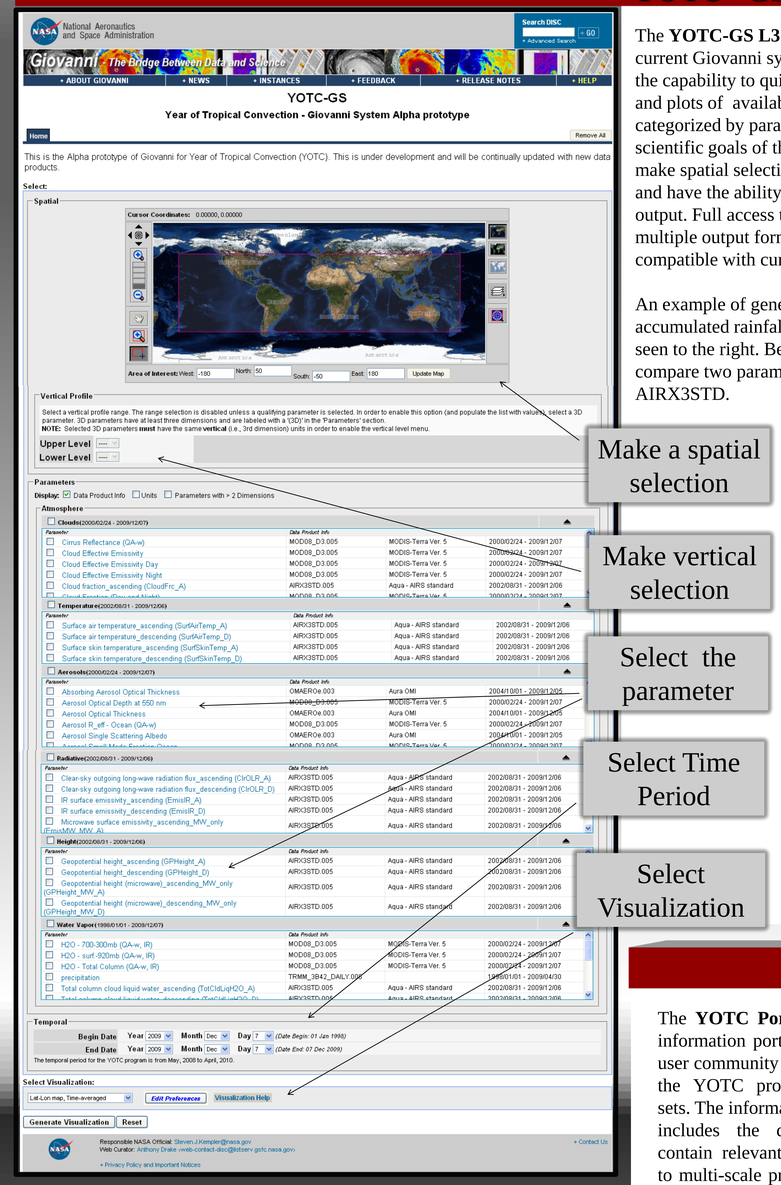
The proposed dissemination framework for the YOTC satellite data archive is based on the Giovanni system. Giovanni is a web-based application developed by the NASA Goddard Earth Science (GES) Data and Information Service Center (DISC) that provides a simple and intuitive way to visualize, analyze, and access/download vast amounts of Earth science remote sensing data. For a more complete description, see http://disc.sci.gsfc.nasa.gov/giovanni/. A prototype YOTC Giovanni System (hereafter YOTC-GS) is in the process of being developed. YOTC-GS will provide access to level 2 (i.e. swath level data) and/or level 3 (i.e. gridded/mapped data) forms of satellite data, the choice – or both – depending on what is appropriate and relevant. The former is needed and better suited for detailed process examination, exploiting the highest temporal-spatial resolutions available and comparison to regional cloud-system resolving model / cloud resolving model (CSRM/CRM) model output. The latter is needed and more well suited for examination of phenomena, conditions and processes on large to global scales, and for comparisons to global model analyses, prediction and simulation output. The prototype interface can be access through the YOTC Portal at the GES DISC (http://disc.sci.gsfc.nasa.gov/yotc)

YOTC –GS L2

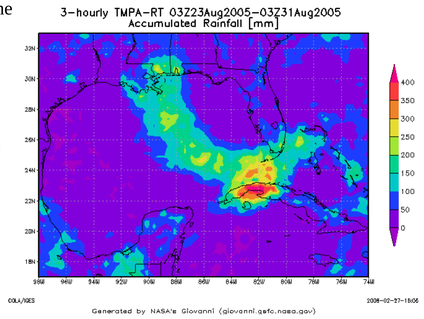
The **YOTC-GS L2** is a web application currently in alpha development and demonstrates the new Giovanni system. The interface currently focuses on Level 2 data and provides users with a way to quickly view vertical profiles for a given point location. AIRS and TRMM level 2 data can be extracted from a single point location after a point of interest is selected from a spatial map produced from similar data. More data is expected to be added to this interface as development continues.



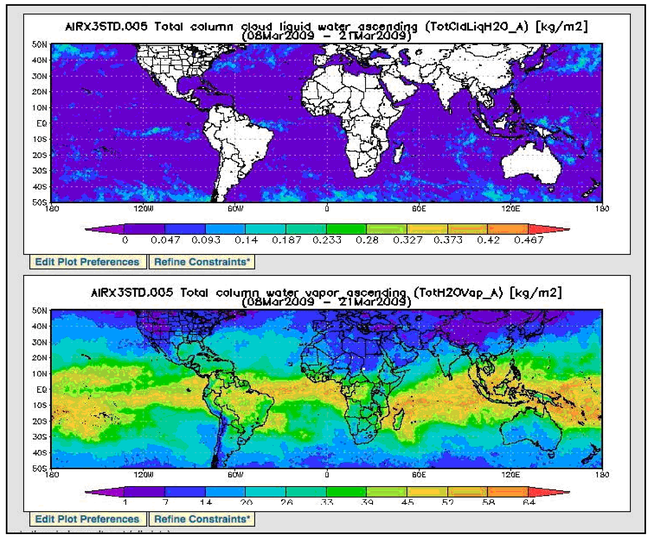
YOTC –GS L3



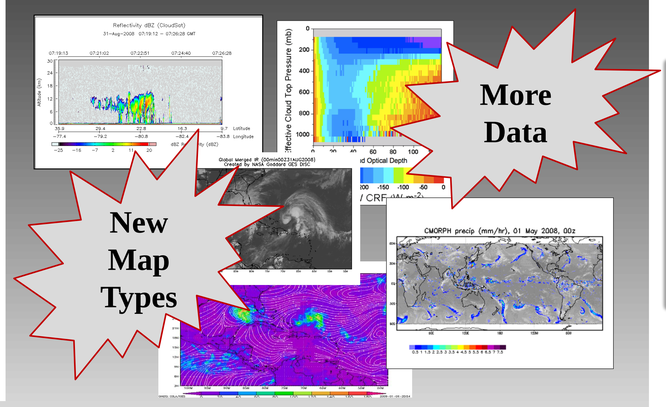
The **YOTC-GS L3** is a web application utilizing the current Giovanni system that provides users with the capability to quickly and easily generate maps and plots of available level 3 data. The data is categorized by parameters and is based on the scientific goals of the YOTC program. Users can make spatial selections from a high resolution map and have the ability to fine tune the generated output. Full access to the data is also available in multiple output formats to make the data more compatible with current software tools.



An example of generated output of TRMM accumulated rainfall from the 3B42 product can be seen to the right. Below is an example of a way to compare two parameters from the AIRS L3 product AIRX3STD.



What’s To Come



YOTC Portal

The **YOTC Portal** is a web-based information portal that provides the user community with information on the YOTC program satellite data sets. The information provided includes the data products that contain relevant parameters related to multi-scale processes and how to visualize and access this data. The information portal also provides access to data documentation and links to the original data archives.

Information Includes:
- Documentation
- Data Visualization
- Data Access
- Dataset Information
- Applications
- Science Focus

