

# An Integrated Web-based Visualization System for Monitoring and Validation of the Products from Hyper-spectral Instruments



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## Introduction

As a hub for the hyper-spectral sounding activities, NOAA NESDIS STAR is producing more and more high quality products from advanced infrared sounders and microwave sensors. A very important part of the data processing is the monitoring of the instruments performance and the quality of the products. NOAA NESDIS STAR has developed a website for displaying and monitoring various types of hyper-spectral products, including radiances, retrieved geophysical parameters, as well as the trace gas products. The website allows us to bring the look and feel of the hyper-spectral observations to the users; continuous monitoring of the hyper-spectral instruments, such as AIRS, IASI, and CrIS; and support of the verification and validation efforts of the sounding products from the different satellite platforms.



## Sounding Products:

Core Products	Trace Gas & Research Products
Infrared Radiances	Ozone Profiles
Cloud Cleared Radiances	CO
Atmospheric Temperature Profiles	CH <sub>4</sub>
Atmospheric Moisture Profiles	CO <sub>2</sub>
Cloud Top Temperature, Pressure	SO <sub>2</sub> , HNO <sub>3</sub> , N <sub>2</sub> O
Surface Temperature, Emissivity, ...	Atmospheric Instabilities, ...

and more to come...

Main functions of the website include:

- Alarms (SO<sub>2</sub>/volcanic eruptions)
- Quality Assurance
- Validation of products
- Error Assessment

Data Sets:

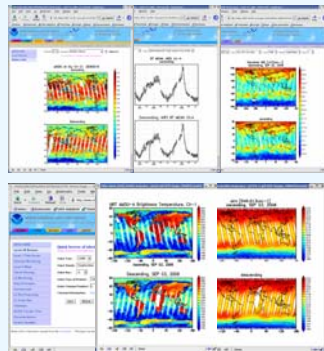
Global Grids: Daily Monitoring

- 0.5 deg lon x 2 deg lat (Daily Monitoring)
- 3 deg lon x 3 deg lat (Reprocessing capability)

Near Real Time:

Granule based monitoring

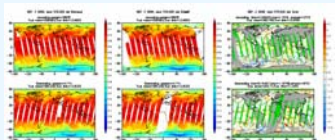
## Core Products



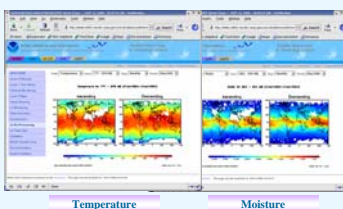
**Radiance Products** can be displayed for selected instruments (AIRS, AIRS co-located MODIS, IASI, AMSU...), date, and channels. The performance of the instruments are also monitored using the Principal Component Analysis (PCA) technique.



**Retrieval Products:** Retrieved temperature (from regression and physical retrieval) can be displayed, comparisons with ECMWF data are also available.



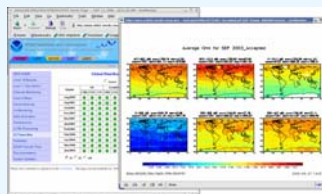
**Reprocessed retrieval products** using the best and latest algorithms are also available.



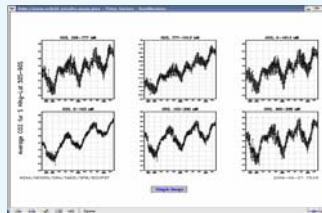
## Trace Gas Products

**Trace Gas products** can be browsed as a function of geography, time... Variations with time and geography are also being monitored.

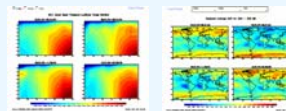
Monthly Average for different layers



CO<sub>2</sub>: Time Series

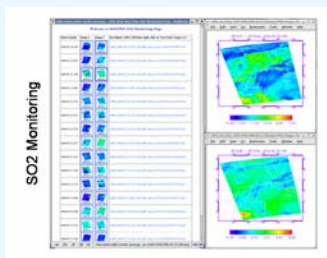


Trace Gas: Transport      Trace Gas: Seasonal Average



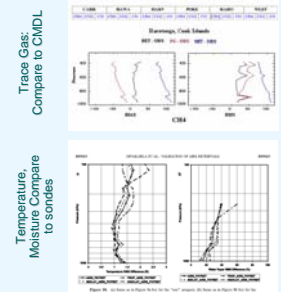
## SO<sub>2</sub> Monitoring

- Developing the capability to provide near-real time SO<sub>2</sub> detection
- Email message sent out automatically to the users when the possible so<sub>2</sub> signals detected
- Granule plots and data are available from the website.



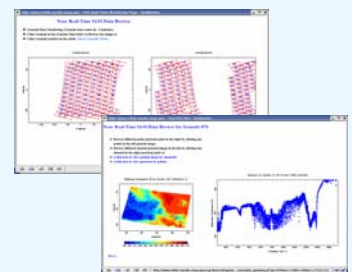
## Products Validation

- Validation of products versus operational sonde networks
- Temperature
- Humidity
- Ozone
- Validation and Evaluation of Trace Gas Products



## Near Real Time capabilities:

- View the most recent IASI data that has been processed.
- Select the granule that is interesting
- Click on any spot will bring up the full spectra
- Click on interesting spectrum brings up the corresponding granule map
- Similar features are under development for level 2 products and match-ups



**For more information about the NRT processing system:** please see poster

"Distribution of Hyperspectral Radiances to Numerical Weather Prediction Centers" (Walter Wolf et al.)

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<http://www.orbit.nesdis.noaa.gov/smcd/spb/iosspdt/testd1/iosspdt.php>