# NOAA JPSS Science Team Meeting

## Trace gas session

Antonia Gambacorta and Monika Kopacz

Co-conveners

August 18, 2017

**Auditorium: Trace Gases**

| Time | Presentations / Topics | Speaker | Affiliation |
|---|---|---|---|
| 0830 - 0900 | ***Night Vision: Illuminating the Capabilities of the VIIRS Day/Night Band*** ***Auditorium*** | Curtis Seaman | CIRA |
| 0915 - 1700 | ***Trace Gases*** ***Chairs: Antonia Gambacorta and Monika Kopacz*** ***Auditorium*** | | |
| 0915 - 0930 | *Opening Remarks* | Antonia Gambacorta; Monika Kopacz | STC;CPO |
| 0930 - 0950 | *Status of the NUCAPS Full Spectral Resolution trace gas products* | Antonia Gambacorta | SGT |
| 0950 - 1010 | *Status of NUCAPS Full Spectral Resolution Trace Gas EDR Validation* | Nick Nalli | IMSG |
| 1010 - 1030 | *Forward Model Improvements: Present and Future* | Larrabee Strow | UMBC |
| 1030 - 1100 | ***Break*** | | |
| 1100 - 1120 | *What are NUCAPS trace gas retrievals good for?* | Nadia Smith | |
| 1120 - 1140 | *Evaluating NUCAPS CH4 and CO* | Greg Frost | NOAA/ESRL |
| 1140 - 1200 | *Recent Improvements in NUCAPS CH4 retrievals using CrIS FSR data* | Xiaozhen Xiong | |
| 1200 - 1330 | ***Lunch*** | | |
| 1330 - 1350 | *Using Ammonia Retrievals from the Cross-track Infrared Sounder to Improve Emission Inventories and Models.* | Matt Alvarado | AER, Inc. |
| 1350 - 1410 | *Increased atmospheric ammonia over the worldâ€™s major agricultural areas detected from space* | Juying Warner | UMD |
| 1410 - 1430 | *Multi-species, Multi-Spectral, Multi-Satellite retrievals of trace gases* | Vivienne Payne | JPL |
| 1430 - 1450 | *Full-chemistry Vog Forecasting over Hawaii* | Youhua Tang | ARL |
| 1450 - 1500 | ***Break*** | | |
| 1500 - 1520 | *Smithsonian Astrophysical Observatory OMPS Nadir Mapper formaldehyde retrievals* | Gonzalo Gonzalez Abad | Harvard |
| 1520 - 1540 | *Monitoring Atmospheric NO2 and SO2 from Space: Half a Decade of Suomi NPP OMPS Global Observation* | Kai Yang | NASA |
| 1540 - 1600 | *Development of Multi-sensor JPSS SO2 Products for Volcanic Cloud Monitoring* | Mike Pavolonis | STAR |
| 1600 - 1610 | *Closing Remarks* | Monika Kopacz; Antonia Gambacorta | CPO; STC |

# NOAA (OAR/CPO/AC4) effort so far

- **2013**: FY13 FFO funded ammonia product development and validation
- **2014**: FY14 FFO funded further development of ammonia product; CrIS workshop gathers potential (research) users
- **2015**: FY15 FFO funded ammonia product application in GFDL Earth System Model; CrIS workshop report released
- **2016-17**: FY16 FFO funded CrIS/OMPS ozone product development
- **2017**: FY18 FFO solicits for new (BVOC) product development – 5 relevant proposals

How did we contribute? Mostly through FFO…

# More progress: CrIS workshop recommendations (2015)

Scientific community uses TIR satellite observation, so far provided by NASA and EUMETSAT from **MOPITT, TES, AIRS and IASI**. All are past expiration and there are no plans to replace them.

**Recommendation 1: Need data**

- Provide calibrated radiances Level 1b data at full spectral resolution.

**Recommendation 2: Special needs for atmospheric chemistry**

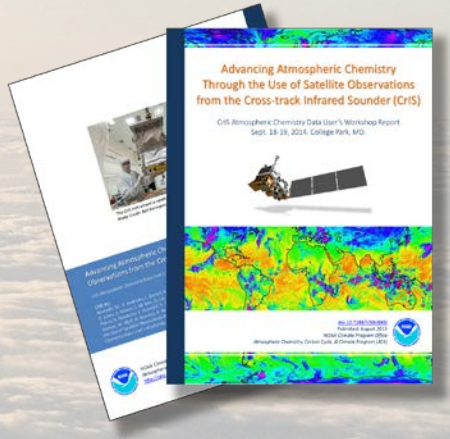
A. Provide reduced file size (like TES "lite) with retrievals for individual trace gases and their observation operators at a reduced vertical resolution.
B. Provide essential information: a priori, averaging kernels, estimated retrieval error.
C. Allow rapid multi-file download from CLASS

**Recommendation 3: Validation**

A. Coordinate validation with upcoming field campaigns (e.g. FIREX)
B. More frequent ESRL flights to validate trace gases
C. Plan additional field campaigns with retrieval and user communities

**Recommendation 4: Future**

A. Explore the possibility of new species/products
B. Close spectral gap
C. Reduce noise and increase resolution for future instruments



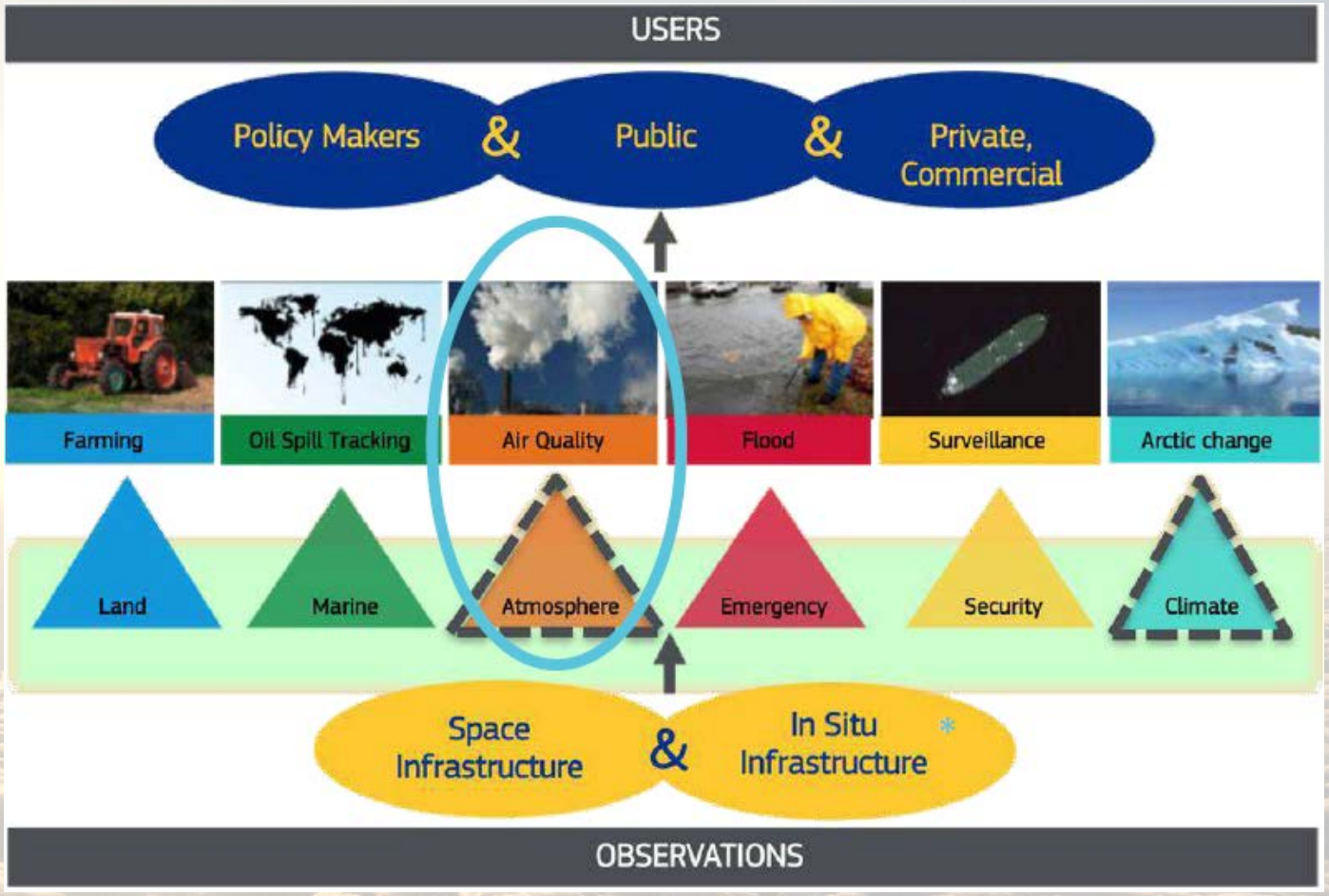

**Most apply to all of JPSS!**

# What are the applications?

- Improved understanding of atmospheric composition
- NOAA Climate/Earth System Model (GFDL) development and validation
- Air quality forecasting
- NGGPS
- Monitoring of air pollution and greenhouse gases

**Priorities??? Workshops needed??**

# Air quality services: Can we keep up with Copernicus?


"The service provides near-real-time analysis and 4-day forecasts, as well as reanalysis, of the **European air quality**, thus enabling a permanent assessment of the air we breathe."

http://atmosphere.copernicus.eu/services/air-quality-atmospheric-composition

*Figure courtesy of Mark Parrington and Vincent-Henri Peuch, ECMWF*

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