

# SCM-09

Sustained production of the  
International Satellite Cloud Climatology Project (ISCCP)  
cloud products

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# Outline

Project Status at start of Phase II

Phase II

- Key findings, advances, developments

- Difficulties and challenges

Project status at end of Phase II

The future of SCOPE-CM and ISCCP

# Project Status at start of Phase II

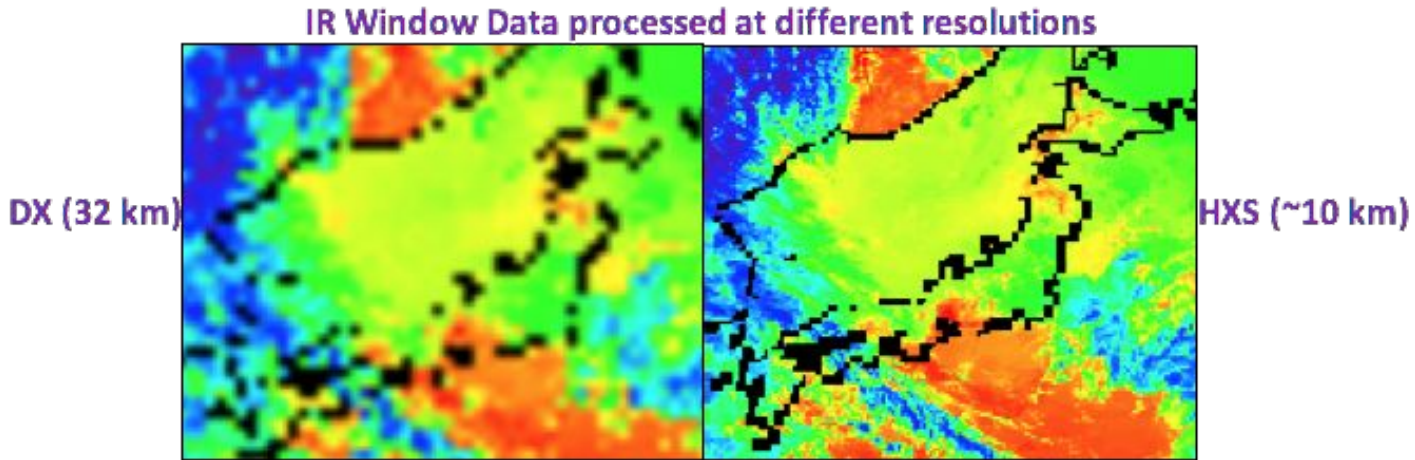
- ISCCP D was static - PoR: 1983-2009
- Other cloud datasets were being produced
  - but with different capabilities than ISCCP ... and often, shorter periods of record.
- Cloud intercomparisons (Stubenrauch 2012)
  - Clouds products had large agreement for most cloud conditions
  - Products disagreed over snow covered regions, deserts, cirrus, etc.
  - Some artifacts in ISCCP apparent
- Planned: Transition ISCCP from research (*NASA and CCNY*) to operations (*NOAA*)
  - work had begun at NASA to port code and data
  - little had been transferred or tested at start of Phase II

# Phase II: Key findings, advances, developments

- Agencies (JMA, EUMETSAT, NOAA) provide B1 for new satellites
  - Himawari, MSG, GOES-R
- Maturity upgrades to the ISCCP code
  - netCDF, metadata support, CF compliance,
  - Configuration management and code version control
  - parallel processing for cluster compute environment
- Transfer of processing from NASA/GISS and CCNY to NOAA/NCEI
- Developed expertise to produce, debug and improve ISCCP practices.
  - Produced ISCCP H to replace entire legacy archive: July 1983 - Dec. 2009
  - Extended ISCCP H record: Jan. 2010 - June 2015
  - Currently Extending ISCCP to 2018

# ISCCP Reprocessing: Improvements

- **New satellite data inputs**
  - Full resolution AVHRR GAC data (32 km → 4 km)
  - ISCCP B1 data (30 km → 10 km)
- **New ancillary data**
  - Improved Snow, Ozone, Aerosol, and Temp/Humidity profiles
- **New resolution**
  - Higher resolution products (2.5 deg → 1 deg)
- **New products**
  - ISCCP HXG - 10 km global merged product (radiances, cloud flag, cloud parameters)
- **New Format**
  - NetCDF



# Difficulties and challenges and successes

- Large code base (Fortran: 30 000+ LOC, Perl: 10 000+ LOC, ...)
  - Learned the ISCCP processing system
  - Ancillary data preparation, Satellite Data QC, Calibration steps, Cloud product steps, etc.
- Storage, processing and archive of data
  - Input data - 20 TB
  - Output data - 40+ TB
- Modifications needed to extend ISCCP beyond 2009
  - As delivered, ISCCP code ran processing through 2009
  - Incorporated new satellites - Himawari 8, Metop A, GOES-16/17, ...
  - Adjustments and improvements to ISCCP calibration process
- Resources
  - NCEI team only work part time on ISCCP - totals about 1.1 Full Time Employees
    - Will be difficult to maintain production as satellites change or to reprocessing to improve
  - Other agencies require resources when data streams change

# Project status at end of Phase II

- Products complete for July 1983 through June 2015 (33 years full years)
- NCEI ISCCP page supports data and access
  - <https://www.ncdc.noaa.gov/isccp>
- Announcements made through Google [ISCCP News Forum](#)
- User support through Google [ISCCP Q&A Forum](#)
- Dataset described in [Earth Systems Science Data](#)
- Currently working on ...
  - extending through 2018 as an ICDR (interim CDR)
  - extending back to Jan. 1982
  - developing plan for VIIRS
  - collaboration with GSICS partners
  - *BAMS* article in the works
- Plans to reprocess to reduce artifacts and improve long term stability

# The future of SCOPE-CM and ISCCP

## SCOPE-CM issues

*Operational sustainment of legacy product*

1982 - forward

### Routine production

- Ensure continued support from international partners
  - New partners?
- Ensure routine updates of products
- Ensure resources are available for production
- Geostationary coverage

### Maintenance - Sustainment

- Reprocessing (*that's what CDRs do*)
- Incorporate new satellite data
  - VIIRS, Meteosat 3<sup>rd</sup> Gen., etc.
- Incorporate GSICS and other calibration info.
- Access to global geostationary satellites not currently part of ISCCP

## ISCCP-Next Gen. issues

*Development and production using next gen instruments*

*coming soon?*

Likely a GDAP development

- Optimal temporal/spatial resolutions? Channels?
- Should we incorporate operational cloud products?
- How to store voluminous datasets?
- Long-term homogeneity vs. short-term improved instruments/algorithms?