GSICS Collocated Data Sets

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Purpose of the Presentation

- Define the inter-calibration process
- Identify data needed to perform the analysis
- Describe the analysis performed with the data
- Identify tools needed to do analysis
- Scope the results to be shared

- Proposed formats for packaging these data sets for deployment onto the GSICS Data Management Server.
- Use these formats as recommendations for discussion towards a consensus on what source data format to use.

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Defining the inter-calibration process

- Get the Data
- Read the Data
- Collocate the Data
- Transform the Data to allow comparisons
- Compare the Data
- Analyse results
- Develop methods to correct biases in data
- Report the findings

Data needed to perform the analysis

- Collocation data:
  - Orbital predictions
  - Specification of collocation criteria (time, space,…)
  - Date/Time & Positions for target collocations

- For each pixel of the datasets:
  - Pixel index (scan line/element, orbit/granule, etc…)
  - Radiances in all channels to be used
  - Quality flags
  - Either the following values or formulae to calculate:
    - Date/Time
    - Position (Latitude, Longitude)
    - View geometry at surface (azimuth, elevation)
    - Solar geometry at surface (azimuth, elevation) (only 1 of each pair)

Analysis performed with the data

- The inter-calibration analysis:
  - Collocating observations
  - Transforming them to common observation-space
  - Defining uncertainty on observations
  - Comparing them
  - Compiling time series
  - Calculating statistics
  - Interpreting results
  - Reporting findings

- As described in previous presentation

What else is needed to do all this?

- Tools to calculate collocations
- The satellite data! (described above)
- Tools to read radiometer data
- Tools to transform data
  e.g. Spectral convolution, patching, etc.
- Documentation describing data formats
- Structure for results to be uploaded
- Method to alert/distribute results

What are the results?

- Collocation algorithms
- Spectral correction algorithms
- Channel radiance differences
  - Mean values & uncertainties
  - For every collocated pixel
  - Overpass average
  - Time series statistics
- Re-calibration algorithms
- Reports

Recommendations for Source Data Format.

- The source data format shall be concise and compact for transfer over the Internet.
- A self describing format shall be used to remove the need for accompanying meta-data information.
- Ideally the format shall be an established format used in the Meteorological and Space community.
- Tools available to support the analysis and processing of this format should be a factor for its selection.

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Proposed Source Data Set Format Candidate

- The NetCDF (Network Common Data Form) format fulfils the proposed recommendations for the source data set format.
- Benefits of using NetCDF are:
  - Portable, Accessible, Maintainable.
  - Incorporation of metadata with the data, reducing possibilities for misinterpreting the data.
  - Tools like Unidata's THREDDS Server, IDV and NOAA's ncBrowse are available for interrogating and visualising this format.

Proposed Source Data Set Format Candidate Continued.

- Limitations of the NetCDF Format.
  - Relative to other formats like BUFR, NetCDF data sets are larger when representing the same data.
  - Max. 2 gigabytes of data can be stored in a single NetCDF file.
  - Limited data structures within the format.
  - There are currently no official conventions that the NetCDF format adheres to for metadata definition.

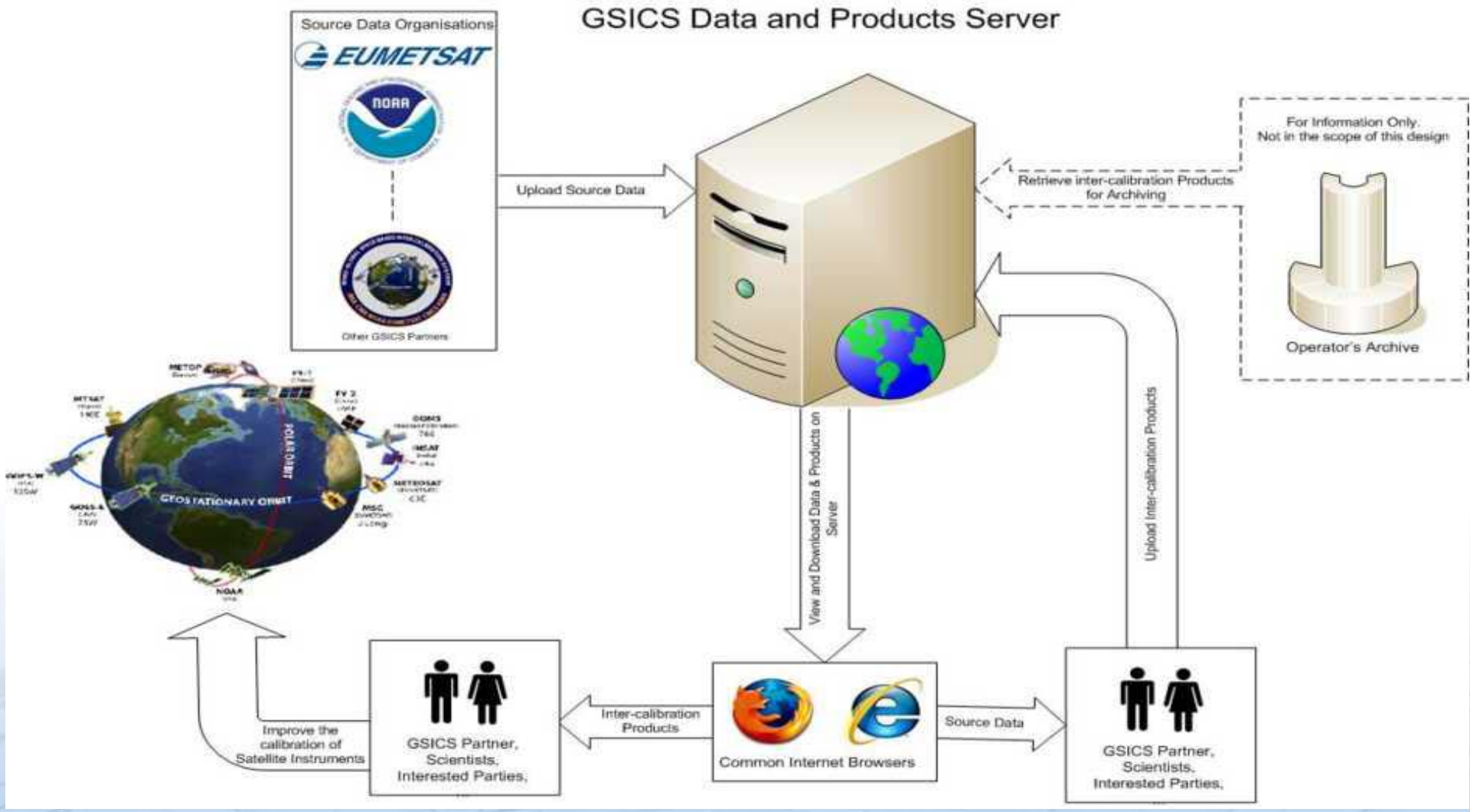
Who is Using NetCDF ?

- US Meteorological and Space Organisations.
- EUMETSAT.
- European Centre for Medium-Range Weather Forecasts (ECMWF).
- European Satellite Application Facilities (SAF).

The approach taken to create EUMETSAT's Source Data Format.

- Extract from the source data the data fields needed to perform the comparisons.
- Structure these fields into the selected source data format.
- Present this source data format to users and NetCDF experts for comment. Feedback is taken to evolve the format.
- Present these formats here for discussion with the goal of coming to a consensus on whether the source data format fulfil the data management needs of GSICS.

Generic view of the Data Management Server



End of Presentation

- Handout showing an example MSG SEVIRI NetCDF Radiance Product.
- Handout showing an example EPS IASI NetCDF Radiance Product.
- Questions