International Ocean Colour Science Meeting 2013

Advancing Global Ocean Colour Observations

Splinter 11

Satellite Data File Formats and Tools for Easy Science Exploitation

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Objectives

Delivering consensus recommendations on

data file content and format, meta-data, processing and analysis tools

agreed by a larger community, as represented at the IOCS conference

→ tangible progress & concrete statements

Agenda

14:50 – 15:30	**Data file content and formats (Franz)**
	NASA's perspective on ocean colour data formats and contentions (Sean Bailey, NASA GSFC)
	Sentinel 3 Product Format Overview (Philippe Goryl, ESA)
	Discussion
15:30 – 16:30	**Data processing, analysis and exploitation tools (Brockmann)**
	Processing and validation environment MERMAID and ODESA (Constant Mazeran, ACRI-ST)
	SeaDAS and BEAM user tools (Sean Bailey, NASA & Norman Fomferra, Brockman Consult)
	Discussion
16:30 – 17:05	**Data distribution (Elliot)**
	EUMETSAT's means and plans for distributing ocean colour data (T. Heinemann, EUMETSAT)
	Discussion
17:05 – 17:15	**Review of main messages to be passed to the plenary**

Data file content and formats

- Ocean Biology Processing Group (NASA)
  - EOSDIS data are typically in HDF format (HDF-EOS), other observational and model data in netCDF format
  - Conventions: Climate and Forecasting (CF), ISO and …
  - netCDF4 best of both (HDF4 and netCDF3); improving interoperability
  - OBPG adaption: migration all L2 and above to netCDF4/CF (as closely as possible); SeaDAS7 produces already netCDF4
  - A lot thought put into renovating Level 3 temporal and spatial binning
- Sentinel 3 (ESA)
  - Sentinel SAFE format = package following XDFU specification
    - Meta data in XML
    - Measurement and ancillary data in individual netCDF4 files

Discussion and Recommendations

- netCDF4/CF is considered a good format for ocean colour data
  - OBPG is moving from HDF-EOS to netCDF4/CF
  - Sentinel 3 SAFE includes the measurement data in netCDF4/CF
  - KARI (GOCI) uses HDF5 → netCDF4 is a wrapper around HDF5
- Time series of data products need to be supported by the format. netCDF is doing this
- The CF convention is not fully covering the requirements of ocean colour. Extensions are required
- Geostationary satellite products need further thinking (e.g. no equator crossing time)
- Some operational users (real time/near real time) require a format where satellite data, in-situ and model data can easily be integrated. This is NOT fulfilled by netCDF4

- **The splinter sessions proposes to the plenary to recommend to all Space Agency to adopt netCDF4/CF for their ocean colour data**

Data processing, analysis and exploitation tools

- ODESA and MERMAID
  - ODESA is the environment for developing and validating MERIS L2 algorithms in the ESA ground segment
  - Provision of source code of ground segment processor to community
  - Validation, remote-processing and forum functionality
  - MERMAID = match-up database, quality controled in-situ and MERIS data, fully connected to ODESA
- BEAM and SeaDAS user tools
  - Data processing, analysis and data exploitation tools
  - Open source (GPL); all processors and analysis tools in source code
  - SeaDAS 7 processing power linked with BEAM visualisation and analysis capabilities
  - Large user communities, active forum
  - Multi-sensor support

Discussion and Recommendations

- The availability of ODESA was a great improvement for MERIS

- The existing line of tools, namely SeaDAS, BEAM and ODESA, shall be continued for future sensors
  - Availability of operational processors in source code to the user community
  - Multi-sensor support
  - Data visualisation and analysis tools
  - Easy integration of own processing tools
  - Support to all available ocean colour sensors and data formats
  - Continuous support to the tools in order insure user's developments

- The tools provide a rich set of functionality and there is a risk that they are under-exploited
  - More training courses shall be held and training material shall be generated

Data distribution

- EUMETcast distribution system;
  - redistribution via commercial telecom satellites
  - NRT distribution of Eumetsat and third party data
- Request by ocean colour community to also use the EUMETCast
- Operational requirements
  - High availability, maturity/stability, reliability, reproducable results, monitoring and control functionality, maintainabilty, …
- Ocean colour data on EUMETCAST
  - MODIS/Terra, VIIRS (regional service planned on EUMETCAST Q3/13), MERSI (under negotiation), OCM (under negotiation), OLCI, SGLI (unclear)

Discussion and Recommendations

- Data dissemination tools are critical for the success of a mission.
- Dissemination tools in the Sentinel era need to be adequate for the hughe data volumes.
  - This needs to be considered on the data provider (EUMETSAT, ESA) as well as data user side
- Data dissemination through EUMETCast offers great potential for efficient NRT dissemination
- Beside EUMETCast dissemination, there is a strong requirement for traditional access means such as ftp. This will be also provided by EUMETSAT.
- Concrete, and realistic, user requirements are needed by EUMETSAT. The ocean colour community is asked to provide these to EUMETSAT
  - For example: bandwidth is a cost factor. User requirements are needed and justified