ESA Climate Change Initiative Phase-II

Sea Surface Temperature (SST)

www.esa-sst-cci.org

Proposal for increased flexibility in GDS 2 for climate SST datasets

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ESA SST CCI outputs

- L2/L3 SST as observed + correction to different depths:
  - Skin
  - Sub-skin
  - 20 cm
- Diurnal adjustment:
  - SST at satellite overpass
  - SST at standard overpass (e.g. 1030 LECT)
  - SST at standard time of day (e.g. 10:30 am / pm local time)
  - Daily UTC average
- Uncertainty estimates:
  - Uncorrelated
  - Synoptically correlated
  - Large Scale
  - Adjustment (depth and diurnal)
  - Total

Use of depth as dimension

- Plan to add depth as a dimension for CCI experimental fields
- sea_water_temperature(time, lat, lon, depth)
- Fewer additional variables
- Possibility of better compression
  - at cost of read performance for some access patterns
- Put primary / recommended SST in standard variable
  - sea_surface_temperature(time, lat, lon)

GDS 2.0 limitation

- Experimental fields can use up to 32 bytes per pixel (6 for L4)
  - Could have more than 32 fields if we include everything!
- In SST-CCI Phase 1
  - Considered putting extra fields in separate file
  - Too complex – need to read multiple files if only one file has lat/lon etc.
  - Too big if lat/lon stored in every file
- In SST-CCI Phase 2
  - Will use a single output file
  - May exceed 32 bytes per pixel experimental fields
- Is 32 bytes / pixel limit driven by file size considerations?
- SST-CCI uses netCDF4 with compression
  - Use of chunking, shuffle mean experimental CCI fields compress very well

Summary

- depth as a dimension?
- Can we lift the 32 bytes / pixel for experimental fields
  - If not in core GDS, then as a “climate” extension?