ISO Metadata in netCDF/HDF Questions and Answers

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Can ISO metadata content be represented as groups and attributes in a netCDF-4 extended model file?

An XSLT transform for translating ISO metadata into NcML has been created and tested with many ISO 19115, ISO 10115-2, and ISO 19115-1 records. All of the content from those records has been successfully translated into NcML, so the current answer to this is yes.

Action: Continue testing this hypothesis by providing ISO metadata examples to The HDF Group for testing. We will return NcML records with that content for examination by the participants and address problems that are revealed in these tests.

What are the xPaths to metadata elements required by CF-Compliant tools in this NcML representation?

In order to answer this question we need a list of metadata elements that are required by CF-Compliant tools. An initial list is included in the NcML created by ncISO in a group named CFMetadata (shown below). We need to know the other metadata elements required by CF-compliant applications.

```
<group name="CFMetadata">
    <attribute name="geospatial_lon_min" value="-68.0" type="float"/>
    <attribute name="geospatial_lat_min" value="16.0" type="float"/>
    <attribute name="geospatial_lon_max" value="-64.0" type="float"/>
    <attribute name="geospatial_lat_max" value="20.0" type="float"/>
    <attribute name="geospatial_lon_units" value="degrees_east"/>
    <attribute name="geospatial_lat_units" value="degrees_north"/>
    <attribute name="geospatial_lon_resolution" value="8.33E-4"/>
    <attribute name="geospatial_lat_resolution" value="8.33E-4"/>
</group>
```

Action: CF-compliant application developers provide a list of required elements to The HDF Group. We return netCDF/HDF xPaths for CF-compliant metadata elements for review.

Can ISO-compliant metadata records be constructed from appropriate NcML?

An XSLT transform for translating NCML into ISO metadata has been created and tested with many ISO 19115, ISO 10115-2, and ISO 19115-1 records. All of the content from those records

has been successfully translated from NcML into well-formed and compliant ISO records, so the current answer to this is yes.

Action: Continue testing this hypothesis using the ISO samples provided by translating the NcML back into ISO and providing the results to the participants for review.

Are there other alternatives to storing ISO-compliant metadata in netCDF files?
Ethan Davis proposed an approach using nested compound datasets in attributes in netCDF files.
[Report Out: Ethan] This was a question rather than a proposal.

Action: Evaluate this alternative.
[Report Out: Ethan] ACTION: Develop a proposal for storing some set of

Can ISO-Compliant metadata be added to CF-Compliant files without disrupting access with CF-Compliant tools?
This is currently an open question and we need input from group members that are familiar with approaches used in CF-compliant applications. Our hope is that CF-compliant tools would not be affected by extra groups in the files.

Action: Provide CF-Compliant data files to The HDF Group for testing. Proposed test plan: 1) extract ISO-compliant metadata from these files, 2) convert that metadata to a group/attribute structure in NcML, 3) add that group at the root level in the CF-compliant data file, 4) test access with tools.

Action: Make a list of CF-compliant tools that we should test using the proposed plan.

Report Out - Additional Questions/Actions

Q: Should ISO metadata be included in netCDF files? If so, how much?
- What do data producers think?
- What do data users think?
- What do data archivists think?

Q: Should ISO metadata be included in the CF standard? If so, how much?
Q: How much of ISO metadata should be included in CF standard?
- Limited amount
- All ISO metadata
Q: Should CF have a way to reference an external (non-netCDF?) metadata file?

ACTION: Discuss the above questions if and how much discovery metadata should be included in CF

Steve: If metadata isn't woven into nc-CF structure, it will/may duplicate information already stored in CF metadata/data.

What are the Goals of containing ISO metadata in CF

de-coupled