IUGONET

Inter-university Upper atmosphere Global Observation NETwork

Metadata DB for Upper Atmosphere

Metadata Database for Geoscience by using DSpace

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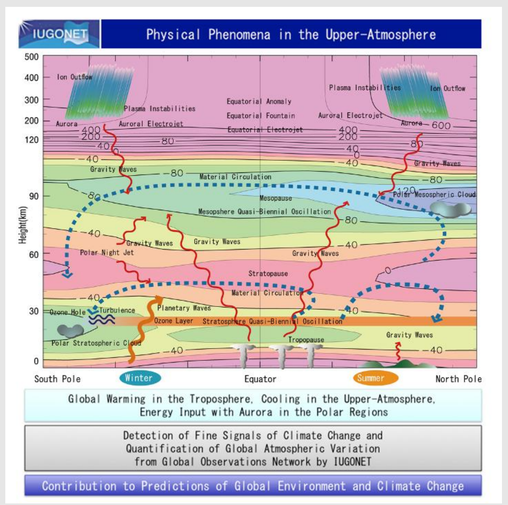
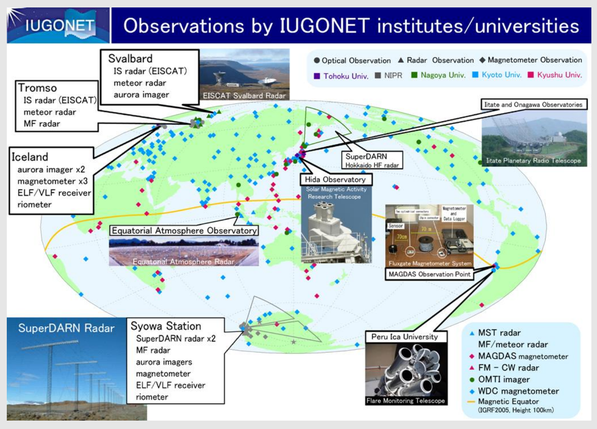
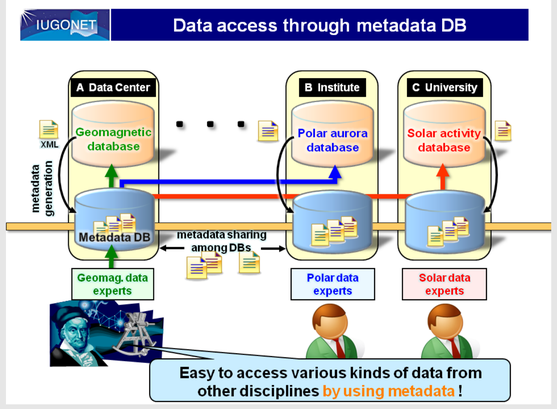
Issues for investigating upper atmosphere

The integration analysis by using various kinds of observational data is necessity for investigating the mechanism of long-term variations in the upper atmosphere. However, there are no way to cross-search their DBs which are distributed over many research institutes in Japan.

For resolving this inconvenience, we build the metadata DB in order to search their metadata.



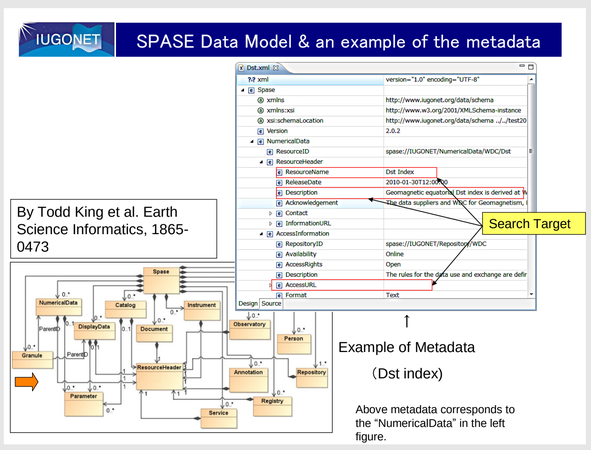




Metadata Format

We designed the **IUGONET common metadata format** [1] which is based on the **SPASE Data Model** [2][3][4]. Basically the metadata includes URL of observational data, start & end time of observation, spatial coverage of observation and so forth.

The additional elements of our own to the SPASE format are,

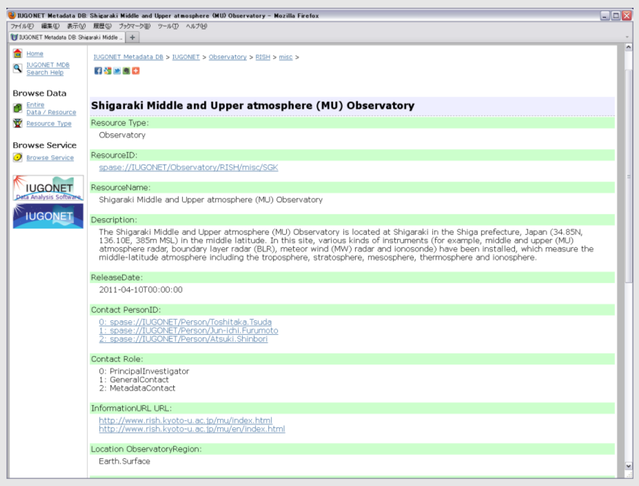


1. element for describing the analogue data,
2. element for describing the longitude and latitude which observation covers,
3. element for describing the coordinate system for Solar images.

Metadata DB System & customizing points

We adopted DSpace 1.7.0 as our metadata DB system because there are so many case examples in Japanese academic information repositories.

462,486 records were stored in the DB currently.



retrieve

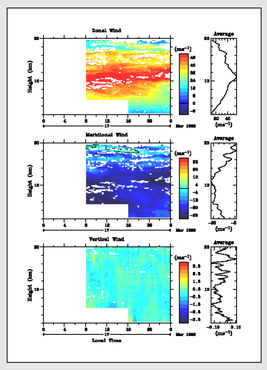


Fig. Access information in the Metadata points the observational data.

[Customizing point #1]

•Customization to handle the IUGONET common metadata format instead of Dublin Core metadata format.

1. Complete shape metadata is stored as 'content' of DSpace.
2. Some search targets are chosen from the metadata (qualifier is created like right figure.)

IUGONET Example of the records in the metadatafieldregistry table

metadata_field_id	metadata_schema_id	element	qualifier
177	2	NumericalData	AccessInformation Format
147	2	Granule	SourceURL

```
<Spase>
 <NumericalData>
  <AccessInformation>
   <Format/>
  </AccessInformation>
 </NumericalData>
</Spase>
```

```
<Spase>
 <Granule>
  <Source>
   <URL/>
  </Source>
 </Granule>
</Spase>
```

[Customizing point #2]

•Implementation of the range search for Time and Space.

Below is an example for time range search.

(start_time: [from_time TO to_time] OR end_time: [from_time TO to_time])
OR
(start_time:[00000101000000 TO from_time] AND end_time:[to_time TO 99991231235959])

, where start_time/end_time means the start/end time of the observation respectively. From_time/to_time is given by the search query.

Conclusion

- We adopted DSpace to the metadata DB for Geoscience.
- We Customized DSpace to handle the IUGONET common metadata format instead of Dublin Core metadata format.
- We implemented the range search for Time and Space.

Finally, we opened our beta version of the Metadata DB for Geoscience to the public.
http://search.iugonet.org/iugonet/

References

[1] Metadata format utilized for the IUGONET metadata database, Tomoaki HORI et al., MGI015-02 , JpGU 2010

[2] SPASE 2.0: a standard data model for space physics, Todd King, James Thieman and D. Aaron Roberts, Earth Science Informatics, 1865-0473

[3] SPASE and the Heliophysics Virtual Observatories, J. R. Thieman, D. A. Roberts, T. A. King, C. C. Harvey, C. H. Perry and P. J. Richards, Data Science Journal, No. 0, Vol. 9(2010).

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