The integration platform of Roshydromet for data exchange within Russian and international projects

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Introduction

Every day we receive and process great amount of hydrometeorological data. Ocean related data is used in different spheres of human activities. Many organizations handle collection, storage, accumulation, processing, and dissemination of information of regional and global scale.

Various options of registration and formalization of data and metadata
Problem

Re-usage of the information resources within other systems is limited due to - different and incompatible technical implementations, metadata standards, data formats, controlled code lists and vocabularies

Possible solution – custom adapters
- Economically unprofitable - N systems = N adaptors
- Resource-intensive – developers always busy...
- Inexpedient
**Integration platform** – supported technology stack (set of various components) for data discovery (metadata), retrieval (protocols and APIs) and access (services)

**Solution**

- Improved visibility of data and web services
- Metadata always corresponds to data
- Improved interoperability with other data systems

- Officially started in 1998
- Data network launched in 2003
- Received federal status in 2005
- Operational since 2013
- Developed, maintained and supported by Roshydromet
# Integration Platform of Roshydromet

## Information domain within ESIMO

### Marine environment - natural processes

<table>
<thead>
<tr>
<th>Category</th>
<th>Example</th>
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<tbody>
<tr>
<td>Hydrometeorology</td>
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<td>Hydrology</td>
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<td>Water chemistry</td>
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<td>Pollution</td>
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<td>Ice</td>
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<td>Hazardous events</td>
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<td>Biology</td>
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<td>Geology–Geophysics</td>
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<td>Geomorphology</td>
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### Marine-related activities - marine facilities

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<th>Example</th>
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<tr>
<td>Sea ports</td>
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<td>Ships and shipping</td>
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<td>Exploration of bio resources</td>
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<td>Exploration of mineral resources</td>
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<td>Emergency situations</td>
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<td>Shipbuilding</td>
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<td>Ocean science</td>
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<td>Socio-economic conditions</td>
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</table>

- Observations
- Summarizing
- Analysis
- Forecasts
- Data sets
- Spatial Data
- Document sets
- DBMS
- Data file systems
- Applications
- Web-services
- Federal users
- Regional users
- Local users
The integration platform is a set of three major components. It solves interoperability problems between systems by the unification of stylistic and structural representation of heterogeneous information and provides the transmission of data from data source to the delivery system.

Provides:
- Transformation of input data stream to common transport format
- Semi-automatic metadata creation
- Customizable data granularity
- Data delivery and dissemination
Actuality of data and metadata

Standards
ISO-19115, ISO-19139
WMO Core Profile

Parameter vocabulary of Roshydromet

Input formats represented by many types of data

Light Data Provider
virtual access to the Data Provider

Export data
ASCII, NetCDF, JSON, XML
Adaptation for Russian and International projects

- **WMO Information System**: Adaptation of WMO Core Profile metadata and WMO file name convention
- **Ocean Data Portal**: Adaptation of ISO 19139, OGC-services, netCDF4 format
- **GeoITS**: Support of geophysics, high-speed data processing from GTS
- **IITS**: Connection to the State Fund of Roshydromet
Improvements

- Greater performance of data processing
- Broader support of internationally endorsed standards
- Extensible number of machine-2-machine services (REST, SOAP, APIs)
- WMO-compatible naming and dissemination procedures
Perspectives

- NetCDF4 CF-compliant data
- ISO 19115-2 and ISO 19115-3 support
- Implication of LinkedData and Semantic Web technologies
- Use of integration platform within Russian segment of Integrated Arctic Observation System (INTAROS project)
Conclusion

✓ Fusion of data, metadata and services
✓ Several use-cases of the developed integration platform
✓ Scalable environment to support data providers
✓ Reusability of the current solution is cost-efficient and allows to concentrate on task-oriented problems and user needs
✓ Integration platform will become the basis for future projects
Questions?