Zintegrowany System Przetwarzania Danych Oceanograficznych

Oceanographic Data Center of IO PAN

Integrated Ocean Data and Information Management System

Oceanographic Data Center of IO PAN

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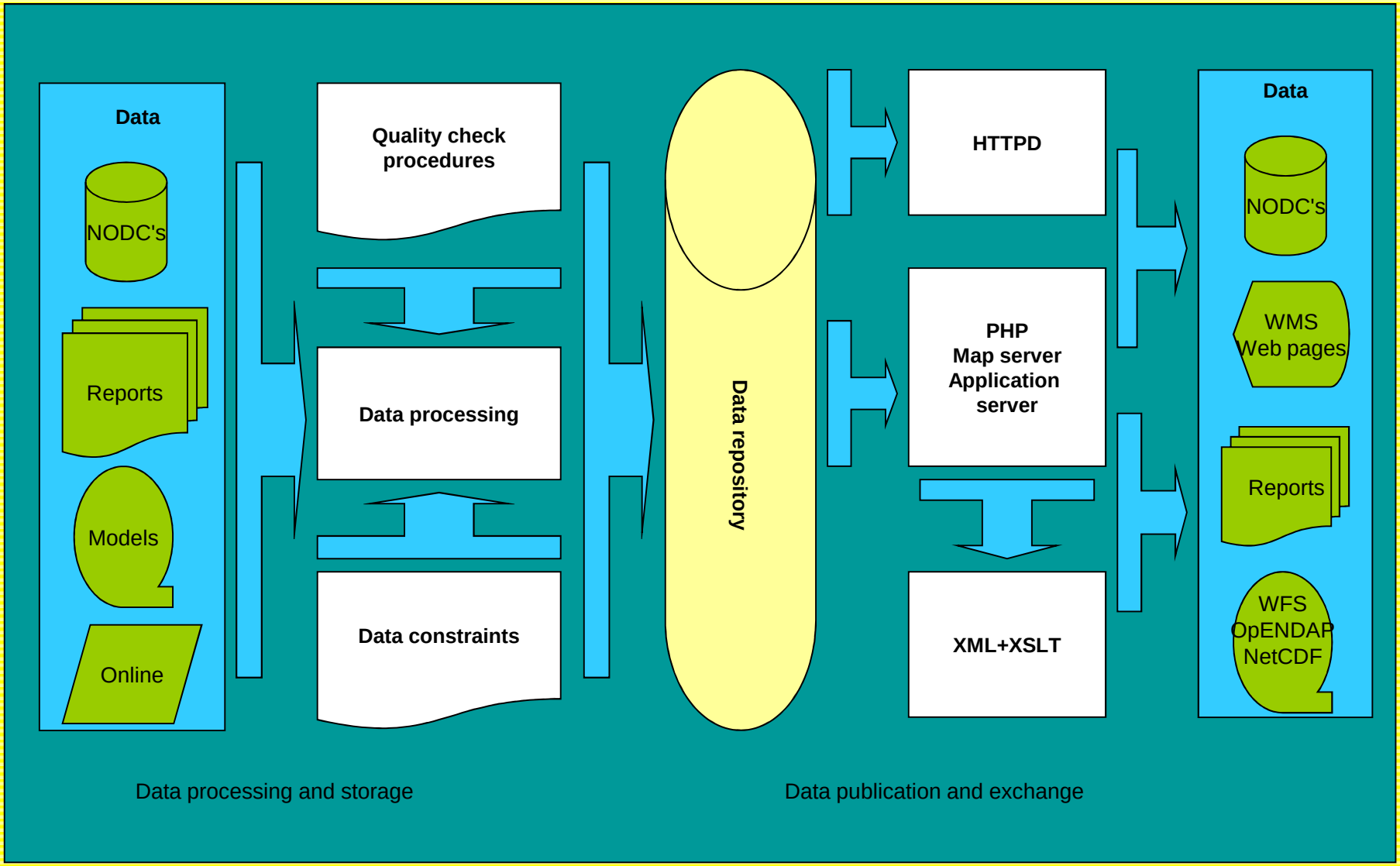
Oceanographic data at IO PAN

Extensive archives of information

Institute of Oceanology (IO PAN) maintains data gathered during research activities performed for more than 50 years. These data, originating from different sources are being processed according to common practice elaborated through generations of oceanographers, however there appears to be a very strong demand for standardization of procedures, especially while facing problems regarding cooperation in data exchange

Oceanographic data at IO PAN



Development of ODC

Project goals

- to build ocean data repository with data management and processing system ensuring data availability, increasing data accessibilty providing catalogue services and reducing risk of data degradation and data loss
- to deploy management system for research and development projects and works performed by Institute according to standards and identified processes
- to deploy management system for resources used and people engaged in research and administrative processes optimizing human work, accessibility and utilization of the resources;
- to develop eLearning platform and data visualisation services providing tools for teachers and trainers at different levels of education

Development of ODC

Project goals

- to deliver platform for data and information delivery services;
- to build organizational and technological infrastructure (ensuring development, management and coordination of national and international projects from the marine research domain);
- to provide data, information and metainformation for marine research institutes and coastal, environment and marine management organizations, industrial R&D organizations active in shelf, coastal land and river estuaries areas, involved in exploitation of marine environment, national and international scientific institutions, administration and authorities at local, regional and national level
- to increase possibility of hosting data and services at high quality level

Development of ODC

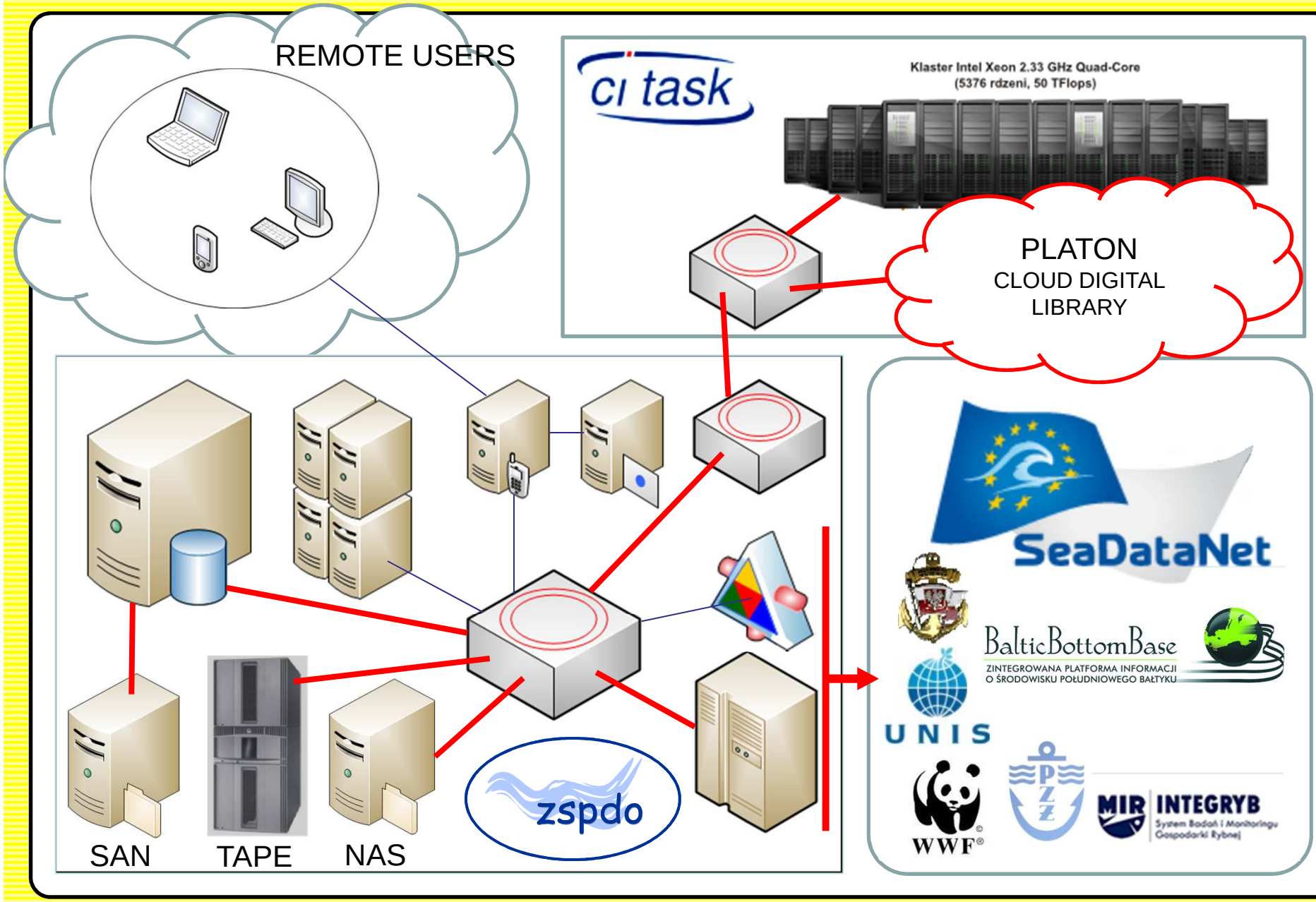
Project goals

facilitating oceanographic data management processes considering their complexity, their heterogenouos nature and demand of interoperability preserved for external systems.

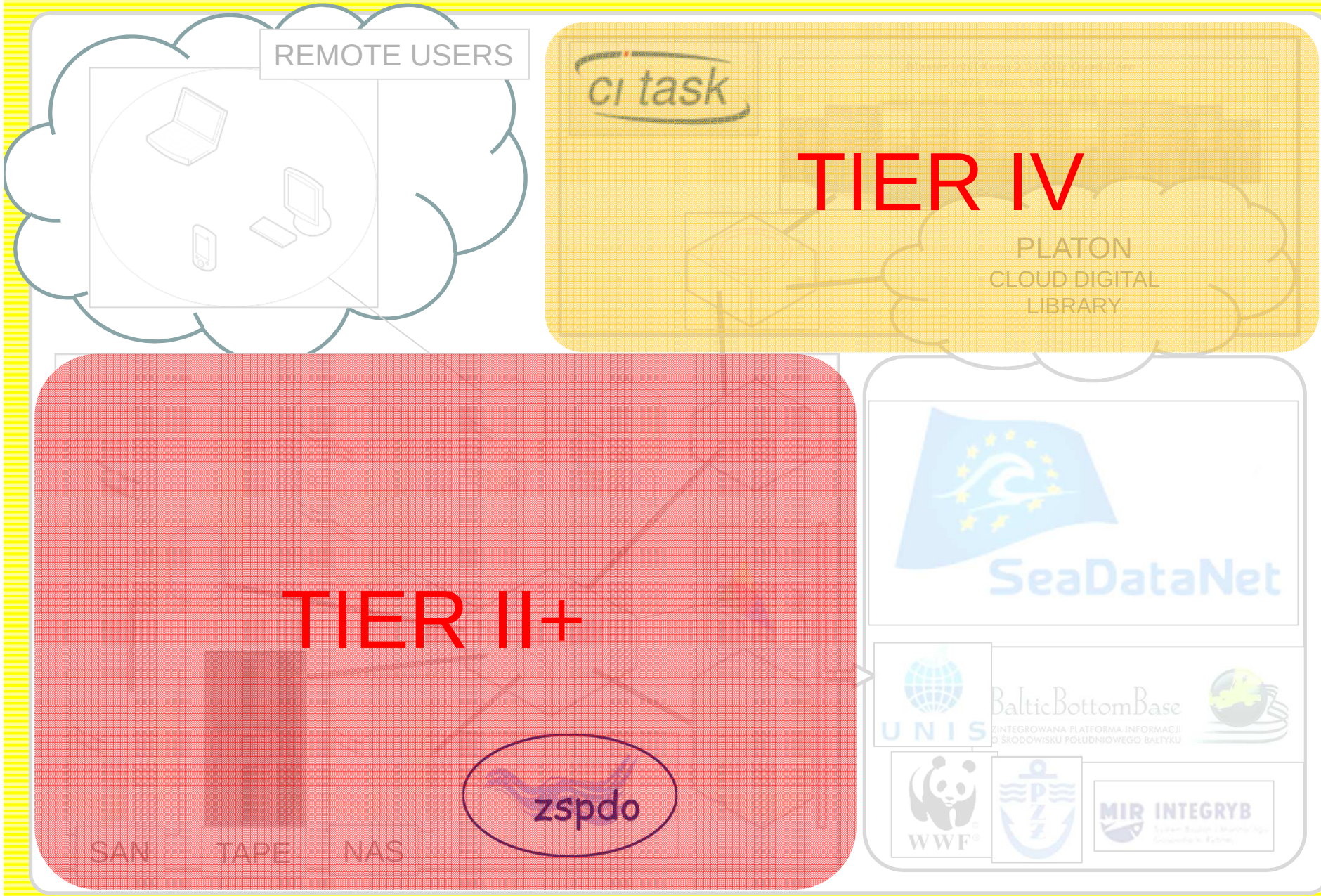
General principle

ZSPDO enables users to define their own formats of raw data and mapping from native formats to vocabulary parameter and metadata definitions, and store them in the data mart for further processing

Data Center Infrastructure



Data Center Infrastructure : TIA 942 standard



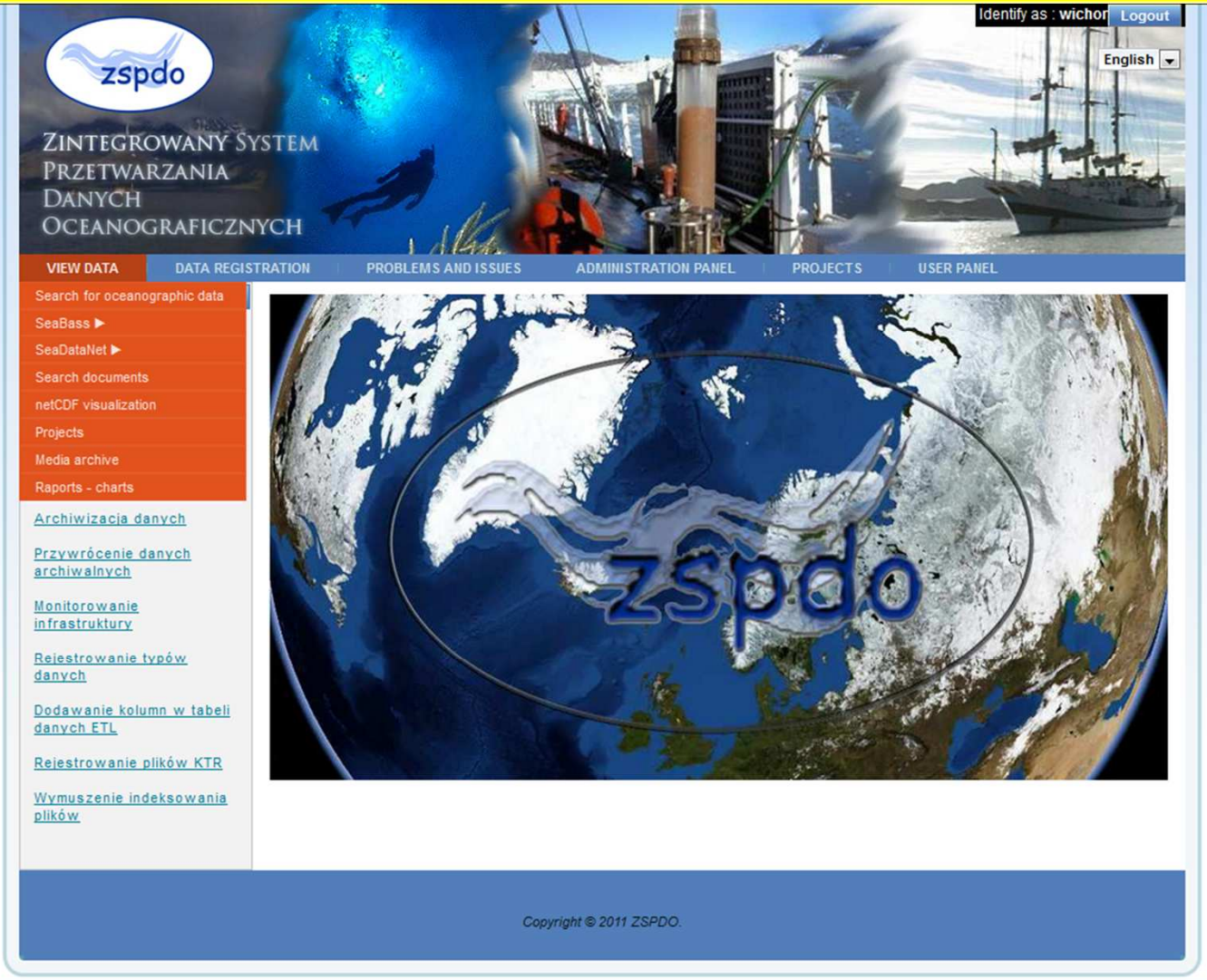
Data Center Infrastructure : ZSPDO Portal

INNOWACYJNA GOSPODARKA
NARODOWA STRATEGIA SPÓJNOŚCI

UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ
ROZWOJU REGIONALNEGO

Project co-financed by the European Union through the European Regional Development Fund

Data Center Infrastructure : Data browsing

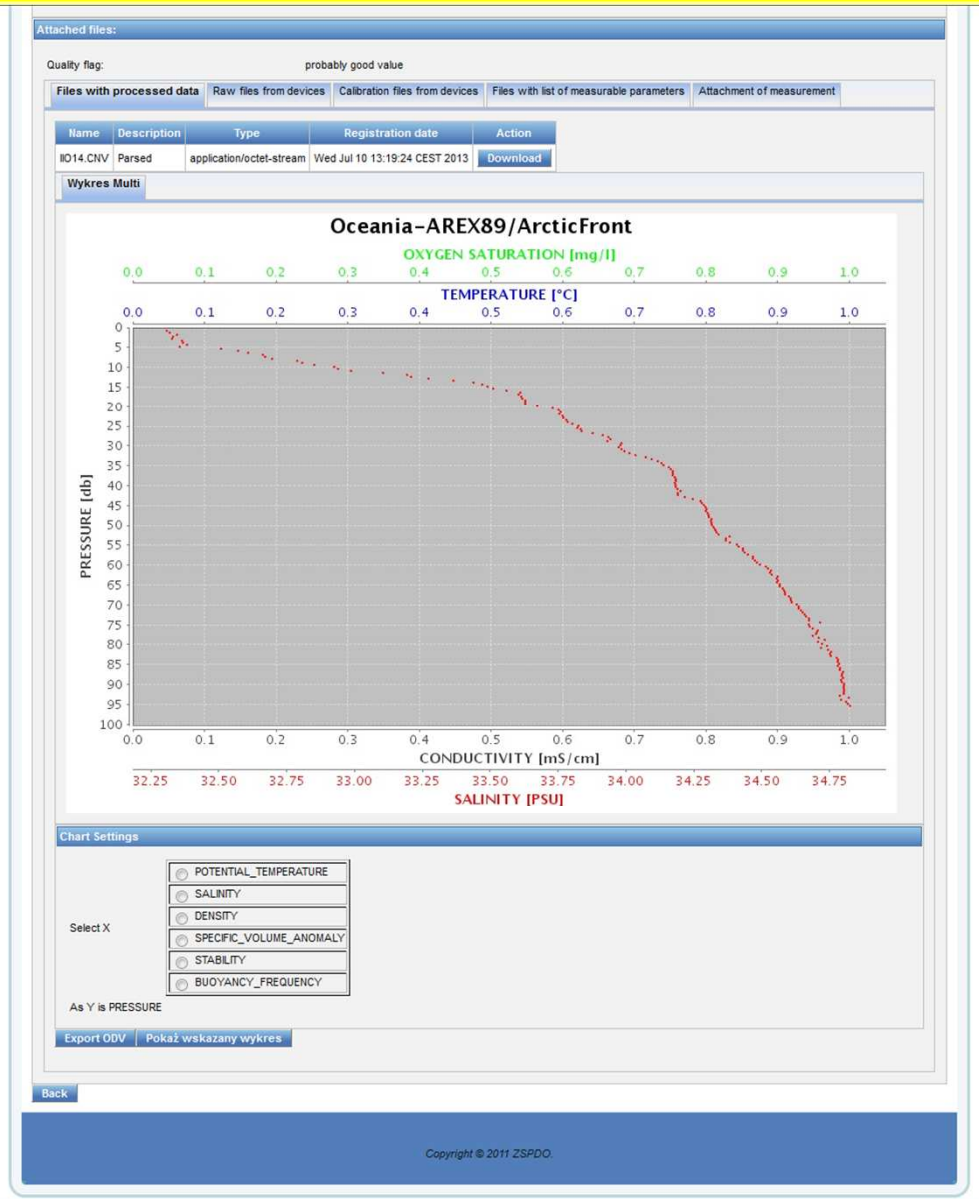


Development of ODC: Data browsing

Development of ODC: Data sets collection

Development of ODC: Data set details

Development of ODC: Data set details

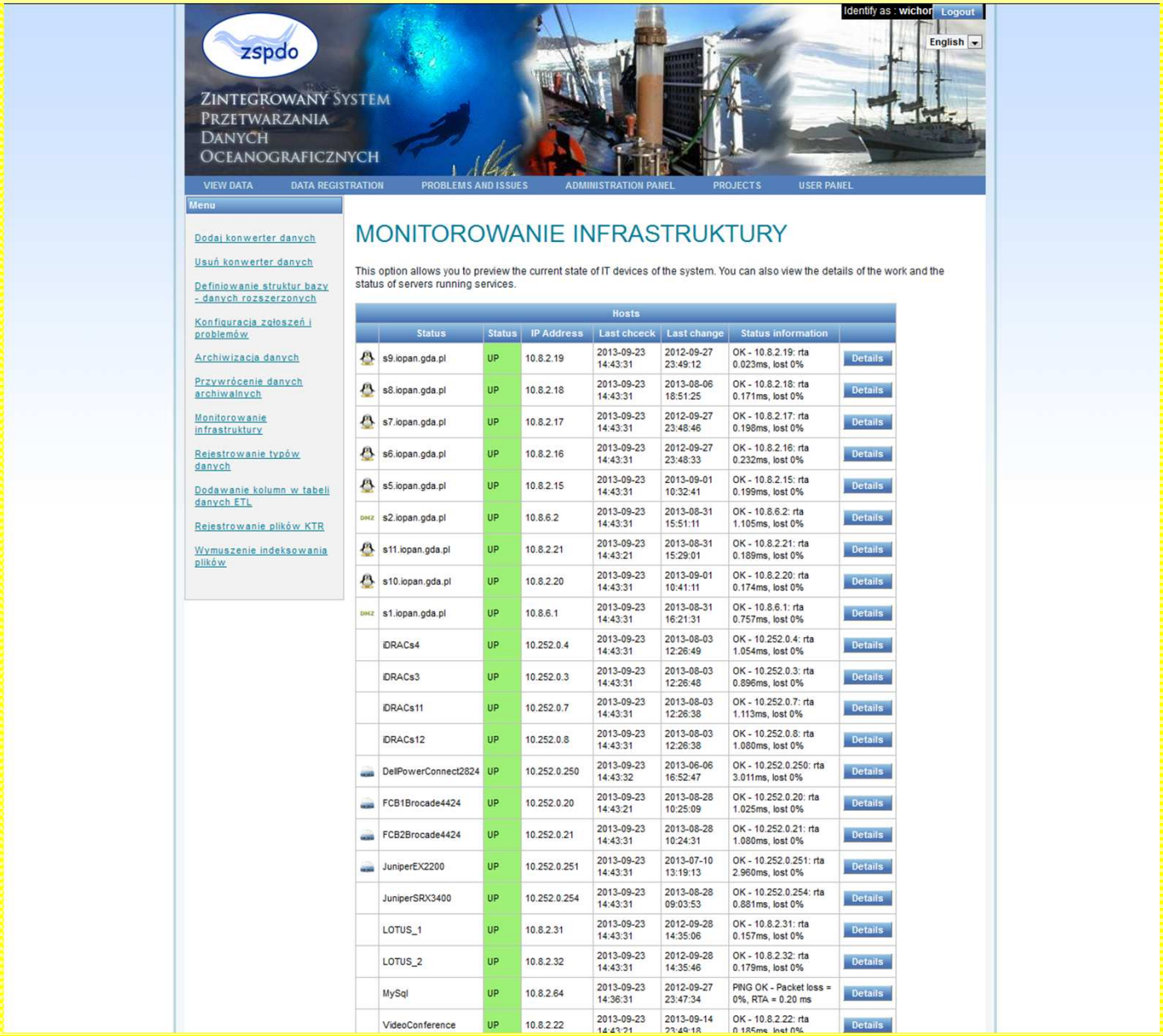


Development of ODC: Vocabulary browsing

Nazwa	Pełna nazwa	Url	Definicja
NVS mappings	NERC Vocabulary Server mappings index	http://vocab.ndg.nerc.ac.uk /list/C970/401	A catalogue of the mappings between vocabularies held in the NERC Vocabulary Server.
Geo-Seas skewness descriptors	Geo-Seas sediment grain-size skewness descriptors	http://vocab.ndg.nerc.ac.uk /list/GS50/1	Terms used to describe sediment grain-size skewness coefficients in the Geo-Seas project
Biological entity names	BODC parameter semantic model biological entity names	http://vocab.ndg.nerc.ac.uk /list/S250/29	Terms used to describe biological entities (organisms or parts thereof) in the BODC Parameter Usage Vocabulary
MEDATLAS Parameter Usage Vocabulary	MEDATLAS Parameter Usage Vocabulary	http://vocab.ndg.nerc.ac.uk /list/P09/40	MEDATLAS Parameter Usage Vocabulary
SeaDataNet data access	SeaDataNet data access mechanisms	http://vocab.ndg.nerc.ac.uk /list/L071/2	Terms for mechanisms by which data objects described by SeaDataNet Central Data Index (CDI) records may be obtained before SeaDataNet is fully implemented.
SeaDataNet APG	SeaDataNet Agreed Parameter Groups	http://vocab.ndg.nerc.ac.uk /list/P031/21	Terms agreed within the EU SeaDataNet community to describe coarse-grained groupings of related measurement phenomena.
CSR units	SeaDataNet Cruise Summary Report quantification units	http://vocab.ndg.nerc.ac.uk /list/L181/1	Terms used as units in the quantification of what was collected or measured in a Cruise Summary Report (ROSCOP) record.
SeaDataNet device categories	SeaDataNet device categories	http://vocab.ndg.nerc.ac.uk /list/L05/33	SeaDataNet device categories
SeaDataNet Geospatial Feature Types	SeaDataNet Geospatial Feature Types	http://vocab.ndg.nerc.ac.uk /list/L021/1	SeaDataNet profile of ISO MD_GeometricObjectTypeCodeTerms code list. Known in SEA-SEARCH as 'Library 2' or cdi_measurement_codes.
SeaDataNet Contact Roles	SeaDataNet Contact Roles	http://vocab.ndg.nerc.ac.uk /list/C865/4	Terms used to define the responsibilities for a contact (person or organisation) either within the SeaDataNet project or for the datasets described by SeaDataNet metadata.
MD_DatatypeCode	MD_DatatypeCode	http://vocab.ndg.nerc.ac.uk /list/G120/1	Datatype of element or entity
MD_DimensionNameTypeCode	MD_DimensionNameTypeCode	http://vocab.ndg.nerc.ac.uk /list/G130/1	Name of the dimension
SeaVoX Platform Categories	SeaVoX Platform Categories	http://vocab.ndg.nerc.ac.uk /list/L06/9	SeaVoX Platform Categories
MD_CharacterSetCode	MD_CharacterSetCode	http://vocab.ndg.nerc.ac.uk /list/G090/1	Name of the character coding standard used in the resource
SeaDataNet PDV deprecates	SeaDataNet Parameter Discovery Vocabulary deprecates	http://vocab.ndg.nerc.ac.uk /list/P022/75	Deprecated terms describing fine-grained related groups of measured phenomena designed to be used in dataset discovery interfaces.
SeaDataNet Disciplines	SeaDataNet Parameter Disciplines	http://vocab.ndg.nerc.ac.uk /list/P081/3	Terms used to classify SeaDataNet Agreed Parameter Groups to provide topic/theme level terms in a hierarchical parameter discovery interface
IHB Sea Areas	International Hydrographic Bureau (1953) sea areas	http://vocab.ndg.nerc.ac.uk /list/C161/8	Terms used for sea areas from International Hydrographic Bureau, Limits of Oceans and Seas (Special Publication No. 23), 3rd edition 1953.
POGO ships	Partnership for Observation of the Global Ocean ships of interest	http://vocab.ndg.nerc.ac.uk /list/P173/1	Research vessels deemed to be of interest to POGO. 'Of interest' is defined as active ocean-going research vessels greater than 60m in length

Data Center Infrastructure : Help desk management

Data Center Infrastructure : Infrastructure monitoring



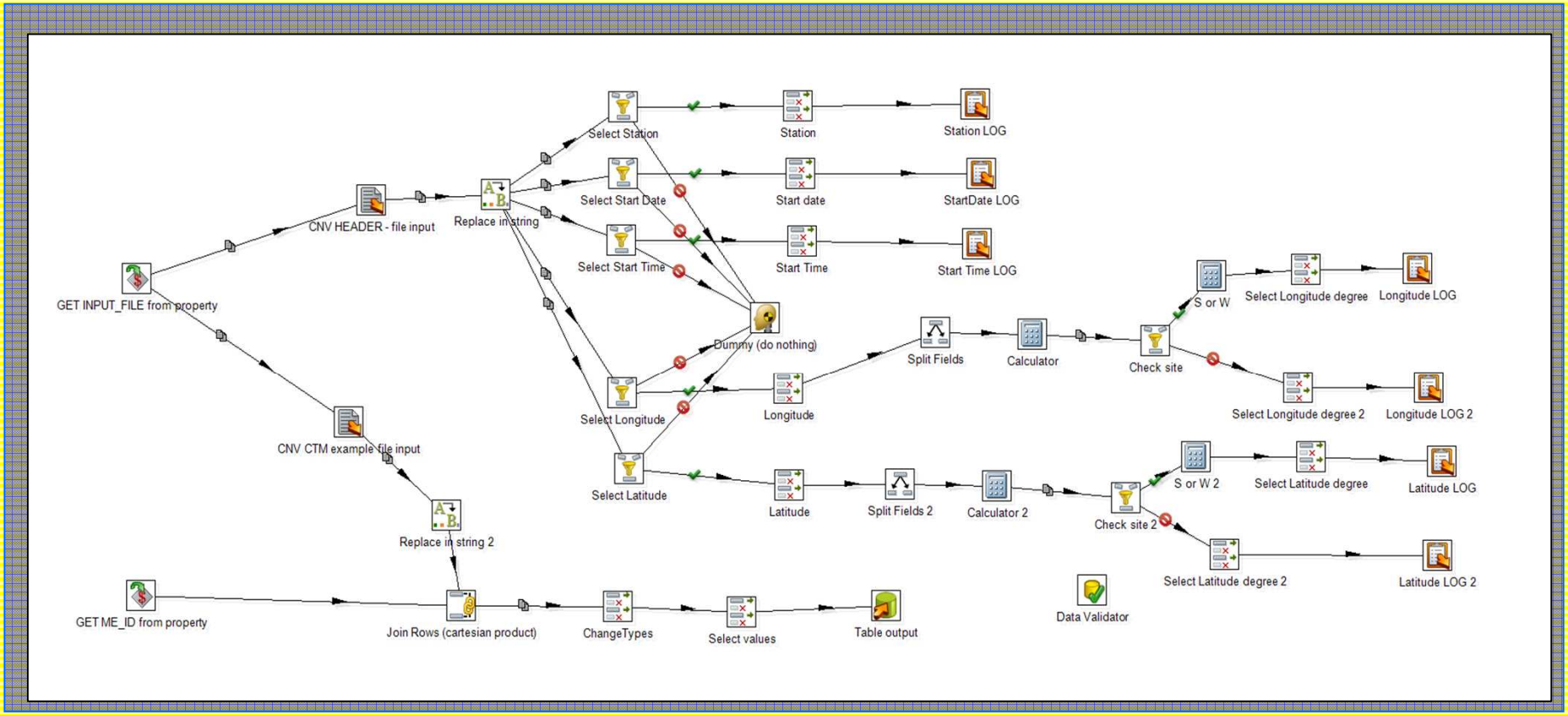
Data Center Infrastructure : Data transformation

```
* Seabird SBE 49 Raw Data File:
* Number of Bytes Per Scan = 6
* System UpLoad Time = Wed Mar 0
* Ship:       Oceania
* Cruise:     Stolpe Channel 2003
* Station:    1rs
* Latitude:   N54 50.707
* Longitude:  E19 18.278
* Bottom:     110
# nquan = 7
# nvalues = 210
# units = metric
# name 0 = pr: pressure [decibar
# name 1 = t0: temperature [deg
# name 2 = sal00: salinity, PSS-
# name 3 = sigma-t00: density, s
# name 4 = sva: specific volume
# name 5 = flag:  0.000e+00
# name 6 = nbin: number of scans
# span 0 = 1.000, 105.500
# span 1 = 2.4134, 8.3162
# span 2 = 7.3739, 13.4070
# span 3 = 5.8815, 10.3359
# span 4 = 1709.57, 2148.93
# span 5 = 0.000e+00, 0.000e+00
# span 6 = 13.0000, 201.0000
# interval = decibars: 0.5
# start_time = Wed Mar 07 2007 1
........
# derive_date = Mar 20 2007 09:1
# derive_in = 1RS000.CNV GUILDLI
# strip_date = Mar 20 2007 09:10
# strip_in = 1RS000.CNV
# file_type = ascii
*END*
      1.000      2.5273      7.375
      1.500      2.5464      7.376
      2.000      2.5096      7.375
      2.500      2.4939      7.375
```

```
<?xml version="1.0"?>
- <transformation>
  - <info>
      <name>Transformation IOPAN test</name>
      <description/>
      <extended_description/>
      <trans_version/>
      <trans_type>Normal</trans_type>
      <trans_status>0</trans_status>
      <directory>/</directory>
    - <parameters>
      - <parameter>
          <name>INPUT_FILE</name>
          <default_value>default</default_value>
          <description>DATA IN</description>
        </parameter>
      - <parameter>
          <name>MEASUREMENTEVENT_ID_PROPERTY</name>
          <default_value>default</default_value>
          <description>Measurement_ID</description>
        </parameter>
      </parameters>
    + <log>
    + <maxdate>
      <size_rowset>10000</size_rowset>
      <sleep_time_empty>50</sleep_time_empty>
      <sleep_time_full>50</sleep_time_full>
      <unique_connections>N</unique_connections>
      <feedback_shown>Y</feedback_shown>
      <feedback_size>50000</feedback_size>
      <using_thread_priorities>Y</using_thread_priorities>
      <shared_objects_file/>
      <capture_step_performance>N</capture_step_performance>
      <step_performance_capturing_delay>1000</step_performance_capturing_delay>
      <step_performance_capturing_size_limit>100</step_performance_capturing_size_limit>
      <dependencies> </dependencies>
      <partitionschemas> </partitionschemas>
      <slaveservers> </slaveservers>
      <clusterschemas> </clusterschemas>
      <created_user>-</created_user>
      <created_date>2013/07/31 09:20:29.637</created_date>
      <modified_user>-</modified_user>
      <modified_date>2013/09/05 10:53:42.204</modified_date>
  </info>
  <notepads> </notepads>
+ <connection>
+ <connection>
+ <connection>
+ <connection>
- <order>
  - <hop>
      <from>GET INPUT_FILE from property</from>
      <to>CNV BODY file input</to>
      <enabled>Y</enabled>
    </hop>
  - <hop>
      <from>GET INPUT_FILE from property</from>
      <to>CNV HEADER - file input</to>
      <enabled>Y</enabled>
    </hop>
  - <hop>
      <from>CNV HEADER - file input</from>
      <to>Replace in string</to>
```

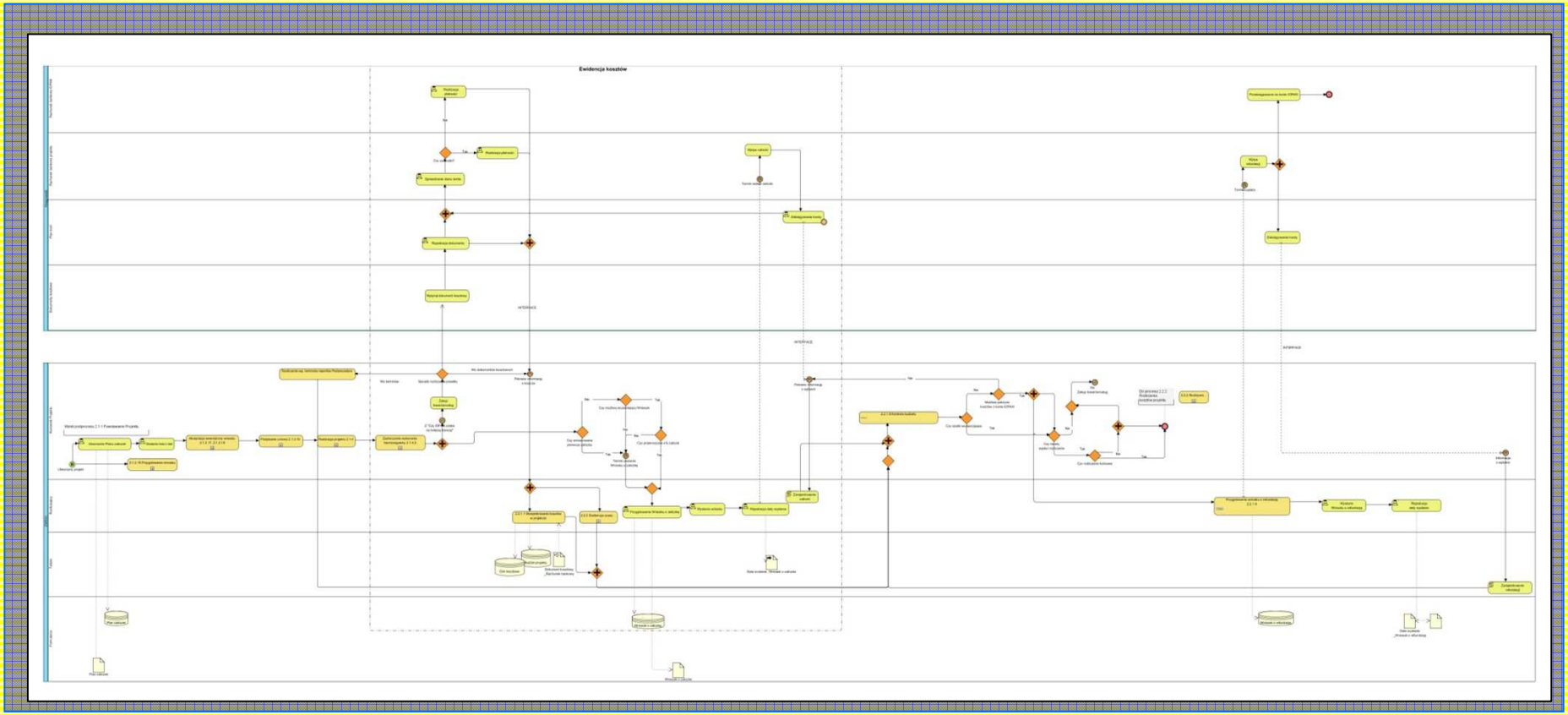
Data Center Infrastructure : Pentaho Business Analytics

- Data access and ETL
- Data discovery and analysis (OLAP engine)
- Data mining



Data Center Infrastructure: Process management

- Processes are defined using BPMN v.2
- Visual Paradigm/Dysant Framework
- Workflow definition by graphical GUI



Data Center Infrastructure: eLearning platform

Lech Kotwicki

Ekosystemy brzegowe

INNOWACYJNA GOSPODARKA

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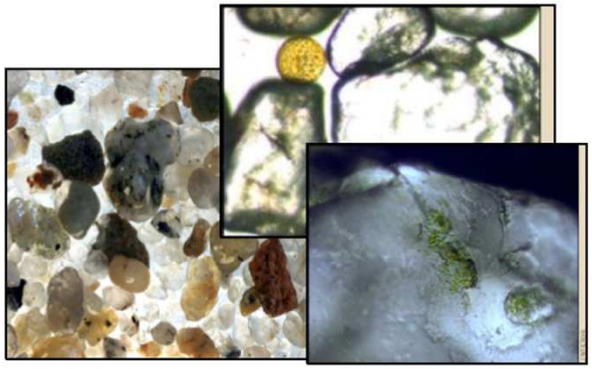
Mieszkańcy naszych rzek

Dolina Wisły to jeden z najcenniejszych ekosystemów europejskich, kluczowy obszar dla niezliczonej liczby gatunków zwierząt- od małych bezkręgowców, po ptaki i ssaki. Te ostanie są na tyle duże, że bez problemu możemy obserwować je na codzień. Ale co z tymi mniejszymi, które nie tylko z premedytacją ukrywają się przed okiem bystrego obserwatora, ale także mogą być na tyle małe, że nawet nie zdajemy sobie sprawy z ich obecności?
Spróbujmy więc przyjrzeć się im bliżej….

Osad rzeczny to najczęściej mieszanina piasków i mułów. Poszczególne ziarna osadu różnią się kształtem i średnicą, co sprawia, że pomiędzy nimi tworzą się wolne przestrzenie. Te tzw. przestrzenie interstycjalne umożliwiają nie tylko swobodny przepływ wody przez osad, ale także stanowią środowisko życia dla niezliczonej ilości organizmów.

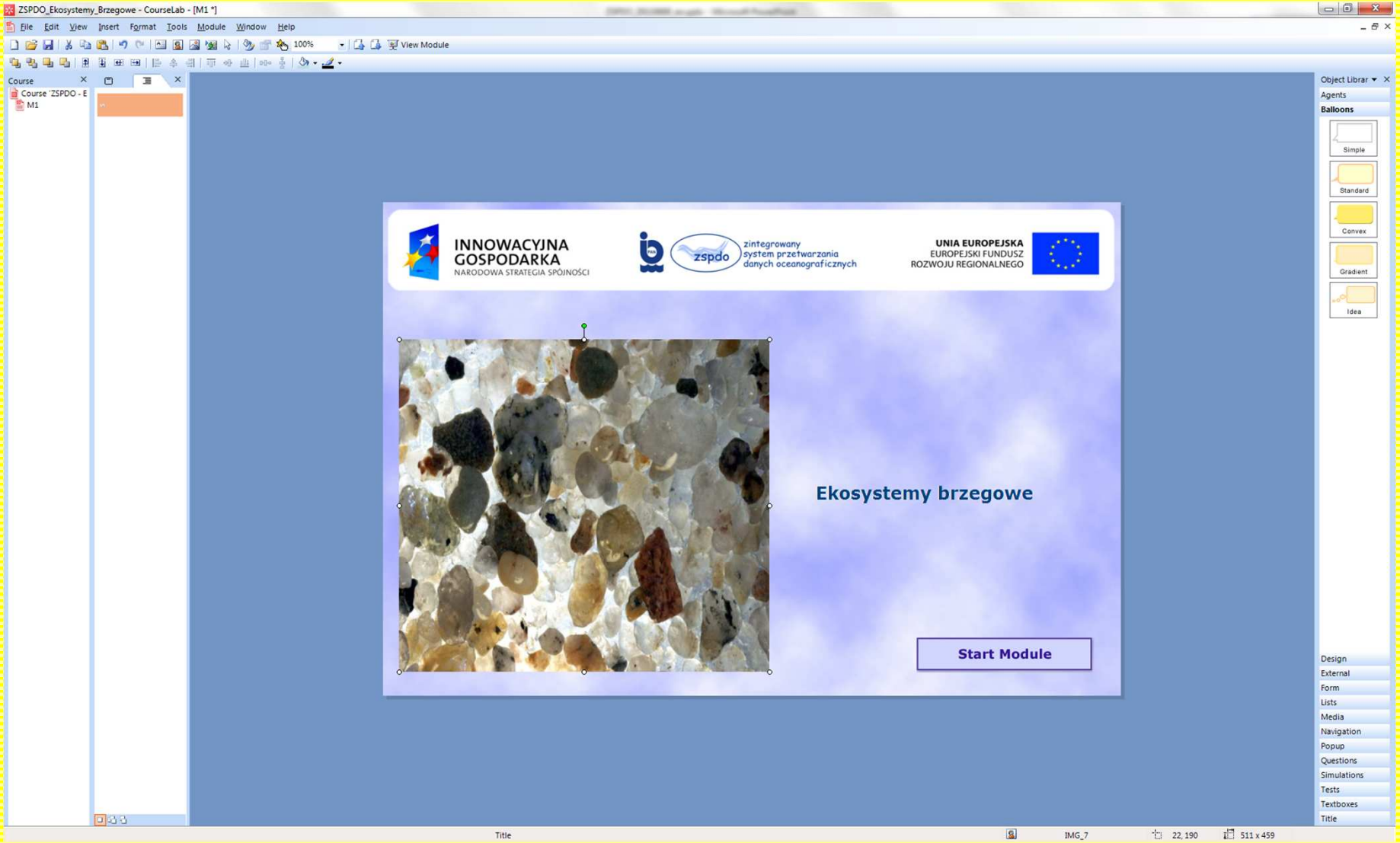


Fot. 1. Kwarcowy piasek wiślany – widoczne przestrzenie pomiędy ziarnami piasku, zyjące tam okrzemki oraz mikroorganizmy porastające zagłębienia w pojedyńczym ziarnie.

Najmniejsze z nich to **MIKROORGANIZMY**, umowna nazwa wielu różnych bakterii, roślin i zwierząt, których rozmiary nie przekraczają 0.05 mm. Najliczniej

INNOWACYJNA GOSPODARKA

Data Center Infrastructure: eLearning platform: authoring tools



Data Center Infrastructure: Videoconferencing platform

- teleconferencing facility
- telepresence
- groupworking
- remote desktop
- multimedia presentations
- session recording
- eAccess

ensures cross-functioning integration with helpdesk, groupware, eAccess and eLearning modules

Conclusions: Benefits for the community

- ensurance of security of agregated information resoruces
- improvement of data exchange with international organisations
- automatisation of metainforamation discovery and publication
- normalization of data and information exchange procedures deploying widely used standards (eg. those developed within SeaDataNet)
- improvement of research project management with developed tools for budget and resources administration
- monitoring of the administration processes and quality management within projects
- improve efficiency of research works providing fast and easy access to data repository

Conclusions

- Growing computation power and storage eqiupment capabilities give oportunity of increasing data volume archived, processed an analysed in data centers. This trend is well known as „big data paradigm” in financial and bussines applications.

- Exploding data volume also lead to demand of new services
eg. mutlidimensional analysis and data visualisation, integrated in unique platform. ZSPDO have been developed to face these identified chalenges and raise operational performance of data processing.

- Growing potential of data management systems and oceanograpic data centers enforce dissemination of knowledge and rise effort of users training

- Interoperability of data centers is key factor of development

THANK YOU!