Critical Success Factors of the ReefTEMPS sensors-oriented environmental information system for a real operationality
Component of the French Seashore and Coastal Research Infrastructure

ReefTEMPS
Network of coastal oceanic sensors since 1953

3 research teams

4 data management sub-networks

- Global ReefTEMPS pacific zone
- Institute of Research for Sustainable Development
- University of South Pacific
- South Pacific Community
- University of New Caledonia
More than 60 years of data collection

- Temperature, sea pressure, salinity, wave, turbidity, conductivity
- Global warming, Lagoon water circulation, Tsunamis, Coral bleaching, Algae proliferation, decision manager
72 sensors in activity
±70 data imports per year
+5 M measurements per year (exponential growth)

Live
60s / 30mins acquisition rates

Data cycle

- NetCDF following Climate and Forecast (CF) Convention and OceanSites Data Format Reference
- Data qualification includes manual and automatic controls
Findable
- Ensure data continuity in a virtual warehouse or data center logic
- Diffuse data in catalogs

Accessible
- Make data accessible and validated to the community

Interoperable
- Be interoperable and provide data to data warehouses
- France: CORIOLIS
- Europe: SeaDataNet
- South Pacific region, International: SOPAC, PI-GOOS, IMOS

Reusable
- Produce and disseminate maps and indicators
- Clear and accessible data usage licence

Data dissemination
- NetCDF, WMS, WFS, SOS, CSW, CSV, raw images access formats availables
- Compliance with FAIR data practices
AODN portal is the Australian Ocean Data Network

Information system design v.1 - 2010

> AODN portal is the Australian Ocean Data Network

> Standards and Open sources software deployed as a Server/Client architecture
SOS v.1

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SOS v.1 - GetObservation

SOS Server limitation of the request set to 1 year

Pressure measurements frequency up to every 60s

Requesting one year returns more than 500,000 entries

XML file generated size is in hundreds of Mo

Download reaching 10mins
Strength & Weakness SOS v.1

**Strength**
- ✓ Findable
  - ➔ Well referenced
- ✓ Accessible
  - ➔ Data easy to get

**Weakness**
- ↘ Interoperable
- x SOS mapping
- ↘ Reusable
- x Response time

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Architecture made as services consumed by ReefTEMPS data portal

> SEANOE is a publisher of scientific data in the field of marine sciences. It is managed by the ODATIS data center of France’s Earth System research
Data Discovery

SOS API

OGC Services

Dataset DOI, Archive download (SEANOE) & License

Metadata Norm CF & OceanSites & RSS news

Open DATA Download and dynamic access

http://reeftemps.science

Dataset

Mi-00CO201_TEMP_DA_TR

Station COK Manihi Atoll 01

Properties:
- Type: Temperature
- Field: Sea Temperatures

Graphe de données de la station sur la dernière année de mesure:

ReefTemps daily data for COK Manihi Atoll 01

Télécharger les données

Vous êtes connecté le 25/01/2015.

Options de téléchargement:
- Open DATA
- Metadata Norm CF
- OceanSites RSS
- License
- Fichier graphique

CITATIONS:

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Critical success factors #1

- SOS v1 was too permissive
- Offering as physical parameter instead of platform prevented us from using 52North client solution
- SOS v2 is more explicit
Critical success factors #2

REST API

- XML generation is too expensive
- XML download is too heavy
- JSON is a better data exchange format.
- XML is a better document exchange format.
- REST is easy of implementation
- JSON is easy to read
Ad hoc database is to be kept

SQL Join are heavy with volumetry

SQL Views are the same

Materialized views are an option

Duplication of data in dedicated SOS schema is fast
Critical success factors #4

- No user identification required
- No delay due to id validation
- No permission to ask
- Users will get used to using a DOI for data used in publication
- Seamless interface

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Critical success factors #5

MANY WAYS TO ACCESS THE DATA

- Oceanograph physicists can use NetCDF
- Sensor Information systems can use SOS
- Ecologists (among others) can understand CSV
- Catalogs can browse CSV
- Geo Catalogs can browse GIS
- People can have a quick look at the data on images
- Remote systems can listen to data publications updates
- As in marketing strategy, the implementation of services competing with SOS leads to an increase in the attractiveness and use of SOS

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Conclusion

More usages / visits / citations

More datas and types of data
Future

- From timeseries to series
- NoSQL?
- Big Data?

Integration of profile data is ready to go
Document oriented = direct insertion of netcdf files?
Handling exponential growth of data

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THANK YOU!

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