Long Term Data Preservation: status of activities and future ESA programme

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Outline

- Long Term Data Preservation: the need and challenges
- Cooperation activities in Europe
- ESA LTDP Programme
- Conclusions
We have now reached about 20 years of continuous measurements from space for many geophysical parameters (even 30 years for some parameters)

→ Earth Observation data are becoming an essential tool for Earth Science

→ Long term series of data needed for several applications in different Earth Science domains
The preservation of EO data (the “bytes”) is useless without the preservation of the knowledge associated with the data (e.g. the “quality”).
A recent example of unexpected result with the 20 years data archive

“Monitoring the South Atlantic Anomaly using ATSR instrument series”, S. Casadio & O. Arino

[paper published in COSPAR Advance in Space Research]
Earth Observation archives data volume expected trend

The plans of new ESA missions indicates 5-10 times more data to be archived (Level 0) in next 10-15 years.
• Preservation of EO data but also of all associated information (documentation, CAL/VAL databases, algorithms, etc).
• Completeness and coherency among all elements to be preserved to ensure present and future exploitability.
• Data Quality, Context and Provenance (documented).
• Maintenance of capabilities to (re-)generate data products.
• Harmonized data and information accessibility.
• Coordinated and coherent approach in Europe.

Preservation has to be addressed in all phases of a mission starting from its design.

Incremental approach for past and current missions, systematic planning and approach for future missions.
• Long Term Data Preservation: the need and challenges

• Cooperation activities in Europe

• ESA LTDP Programme

• Conclusions
• ESA is coordinating the LTDP cooperation activities in the Earth Observation domain with European partners through the LTDP WG formed within the Ground Segment Coordination Body (GSCB).

• Implemented the basic rules of the European LTDP Framework in Earth Observation: “LTDP Common Guidelines and Preserved Data Set Content”
  ✓ Reflecting the consensus of the European EO Data providers.
  ✓ Reviewed at GEO, CEOS and with NASA.
  ✓ Being reviewed with QA4EO.

New Issues available by end of June 2012
European LTDP Framework coordination: LTDP Working Group (2)

- Defined the initial data set to be preserved, including the related glossary.

- Started several technical activities:
  - LTDP User Requirements Study (FIRST)
  - Archive Technology Study (LAST)
  - LTDP Initiatives and Standards Survey
  - LTDP/QA4EO Study
  - LTDP Architecture Definition Project

- Guaranteed the information flow through workshops, web sites, participation to conferences and LTDP related events.

**Cooperation amongst European space actors is essential to preserve all needed EO data for the future**
International EO LTDP Context

- ESA membership
- Participation to several projects
- LTDP Component
- Standards (e.g., OAIS)
- WGISS
- European Commission
- scidip-es
- GEO

European EO LTDP Framework
• Institutional web site:
  ✓ http://earth.esa.int/gscb/ltdp/
  ✓ Contains basic LTDP documents (e.g. Guidelines).
  ✓ LTDP events and related material (e.g. Workshops).

• Technical Web Site:
  ✓ http://ltdpts.eo.esa.int/
  ✓ Contains technical documentation and results of LTDP Cooperation activities.
  ✓ Forum for technical discussions.
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• Conclusions
Approved at ESA CMIN 2008 for a period of 3 years in order to:

1. Prevent ESA and ESA managed TPM EO data loss and enhance accessibility
   → **Implementation most urgent actions**

2. Start the implementation of the LTDP infrastructure needed for data and associated information management
   → **Evolution activities**

Both in support of the most urgent needs (e.g. CCI)

3. Identify the minimum “dataset content” to be preserved and define the LTDP architecture for efficient preservation and accessibility of the ESA EO data and associated information in the long term
   → **Analysis and studies**

4. Define & reinforce a common approach for LTDP in Europe
   → **European LTDP framework coordination**

5. Prepare the LTDP Programme proposal for the period beyond 2012.
   → **LTDP programme preparation**
ESA EO LTDP Preliminary Programme 2009-2012 Work Plan

LTDP Workplan 2009-2012

Analysis & Studies
- Consolidate user requirements
- Define data set to be archived beyond telemetry
- Evaluate impact of latest technologies
- Analyse & coordinate with other international LTDP projects (e.g. funded by EC)

Implementation (ESA archives)
- Knowledge preservation beyond data archiving
- Integrity of archived data
- Data access and security
- Interoperability and standardization
- Archives exploitation

European LTDP Framework Coordination
- Complete, maintain & evolve the LTDP
  - Common Guidelines (involving CEOS/GEO)
- Create a European collaborative technical framework

LTDP Programme Preparation
- Technical Content (activities for period 2012 onwards)
  - ESA archives
  - European LTDP Framework
  - Cost
  - Funding options
  - Schedule

Analysis and Studies
Implementation activities
Evolution activities
• Covering the period beyond 2013, will be submitted to ESA Ministerial Council in Nov 2012 within ESA mandatory activities.

• Objective to guarantee long term preservation, access and exploitation of data, and associated knowledge, archived at ESA facilities and generated by ESA and ESA-managed Third Party missions in ALL fields of space Science
  ✓ Implemented in cooperation among Earth Observation, Science and Human Spaceflight ESA directorates.

• It will ensure the consolidation, preservation and accessibility of ESA data records and associated knowledge for any future use.

• Covering preservation and data access for EO missions starting five years after end of life (e.g. ERS-1 immediately, ERS-2 from 2016).
• It will enable and support ESA’s and European Exploitation Programmes and activities requiring long term data series (e.g. Climate Change Initiative) or the utilization of old data holdings in the long term (e.g. in astronomy for change detection in stars, pre-ISS missions in Life & Physical Sciences) and to support new missions.

- Implemented in coordination with other space science data owners in Europe aiming at coherently preserve all European space data and associated information.
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• Conclusions
• Needs and challenges related to LTDP of EO data are well identified
• Cooperation in Europe in the EO LTDP domain is producing remarkable results
• EO LTDP Preliminary Programme is allowing the:
  ✓ Implementation of essential activities at ESA facilities for data loss prevention.
  ✓ Coordination of LTDP activities, with the involvement of all European data owners and archive holders, and LTDP basic principles consolidation and promotion.
• ESA LTDP programme for the period 2013-2017 will:
  ✓ Ensure preservation of all ESA Science data with a common approach across the Agency and with Member States.
  ✓ Provide new opportunities for European Users, Operators and Value Adders.
  ✓ Significantly contribute to the future of science (and in particular Earth Science).
LTDP WG thanks you!

Any question?

“Valorise the past for future needs”

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