Kaluga Conference 2014

Data Management and Long Term Archiving of Remote Sensing and In-situ Data at DFD - Status and Trends

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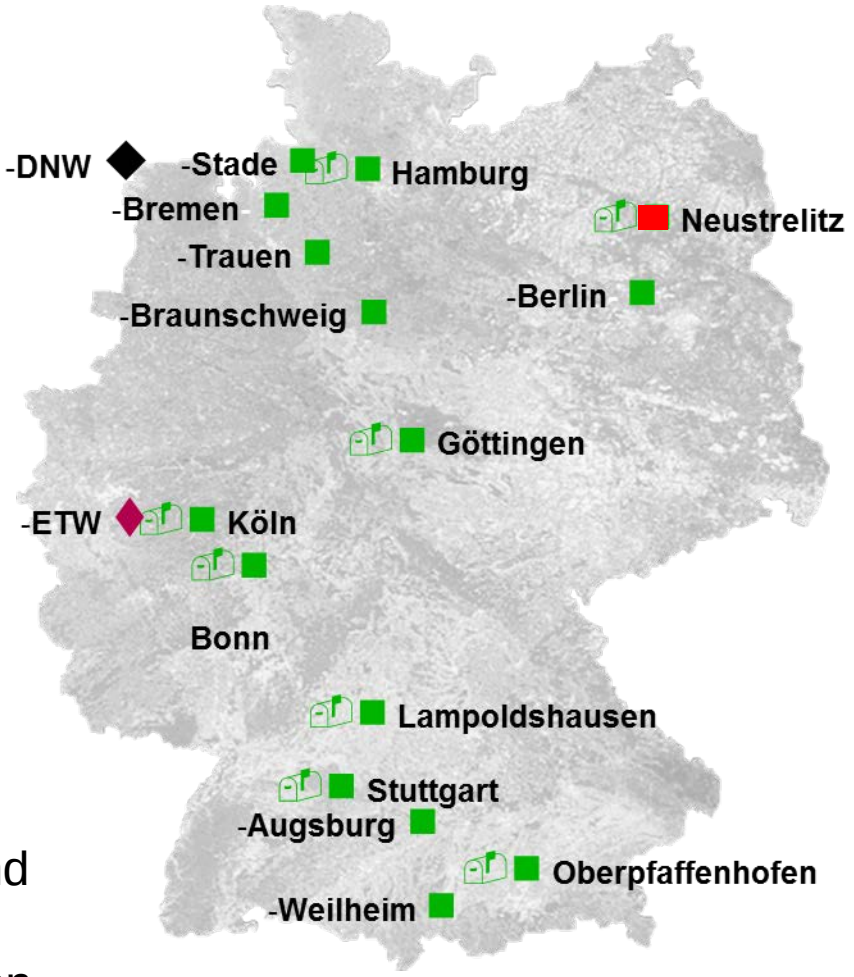
- DLR- an overview
- More data → Much more data
  - Mission of the past - MIR/ PRIRODA
  - TerraSar-X / Tandem-X
  - European space initiatives / ~projects
- Data Management and Long-Term Archiving
- Outlook

DLR- an overview

- Research Institution
  - Aeronautics
  - Space Research and Technology
  - Transport
  - Energy



- Space Agency
- Project Management Agency

- Approx. 8000 employees across 33 institutes and facilities at 16 sites.
- Offices in Brussels, Paris, Tokyo and Washington.

More data - Much more data

Mission of the past - MIR/ PRIRODA

- German- Russian project MOMS-2P (Modular Optoelectronic Multispectral Stereo-Scanner) on board of the orbital space station MIR (PRIRODA module)
  - 18m resolution: 4 Multispectral channels, 2 Stereo PAN
  - 6m resolution: 1 Pan nadir
- MOMS-2P images up to a latitude of 51°(e.g. Europe)
- operation of the camera **1996 to1999**
- 152 data takes, processing up to L1B,
  1 TB of mission data – 4 years

- Duration from ordering till acquisition and delivery:
  sometimes more than ½ year

- TerraSAR-X – First German SAR Satellite

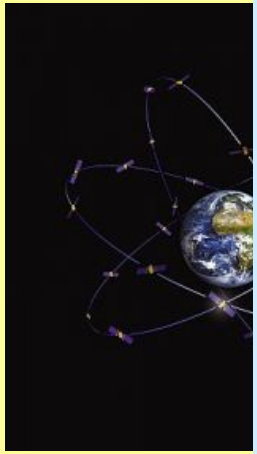
- Launch: 15. Juni 2007
- 1st picture: 19. Juni 2007
- Orbit: 514 km

- 500 GB per day ~> 200TB per year

- **Tandem-X**
- 5TB per day ->1.5PB per year DEM products

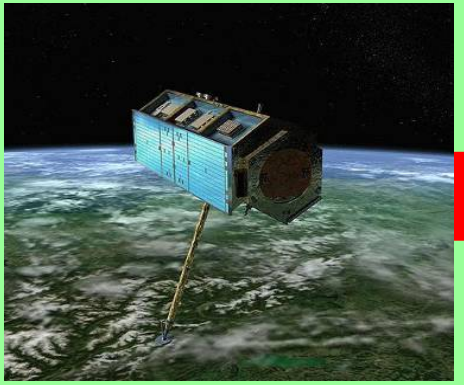
More data - Much more data

European space initiatives / ~projects



Space Situationa

Galileo



Space component

In situ component

opernicus

Services

User

Giga-, Tera-, PetaByte

A4 page(30x60/12 Pkt.)  **4 KByte**

book page (1:1,35)  **5,4 KByte**

1 TByte

250 Mill. A4 **25 km high**

1429 CD‘s

213 DVD‘s

185 Mill. Book pages **370.000 Books (á 500 Sites)**

15 PByte (capacity of D-SDA Neustrelitz)

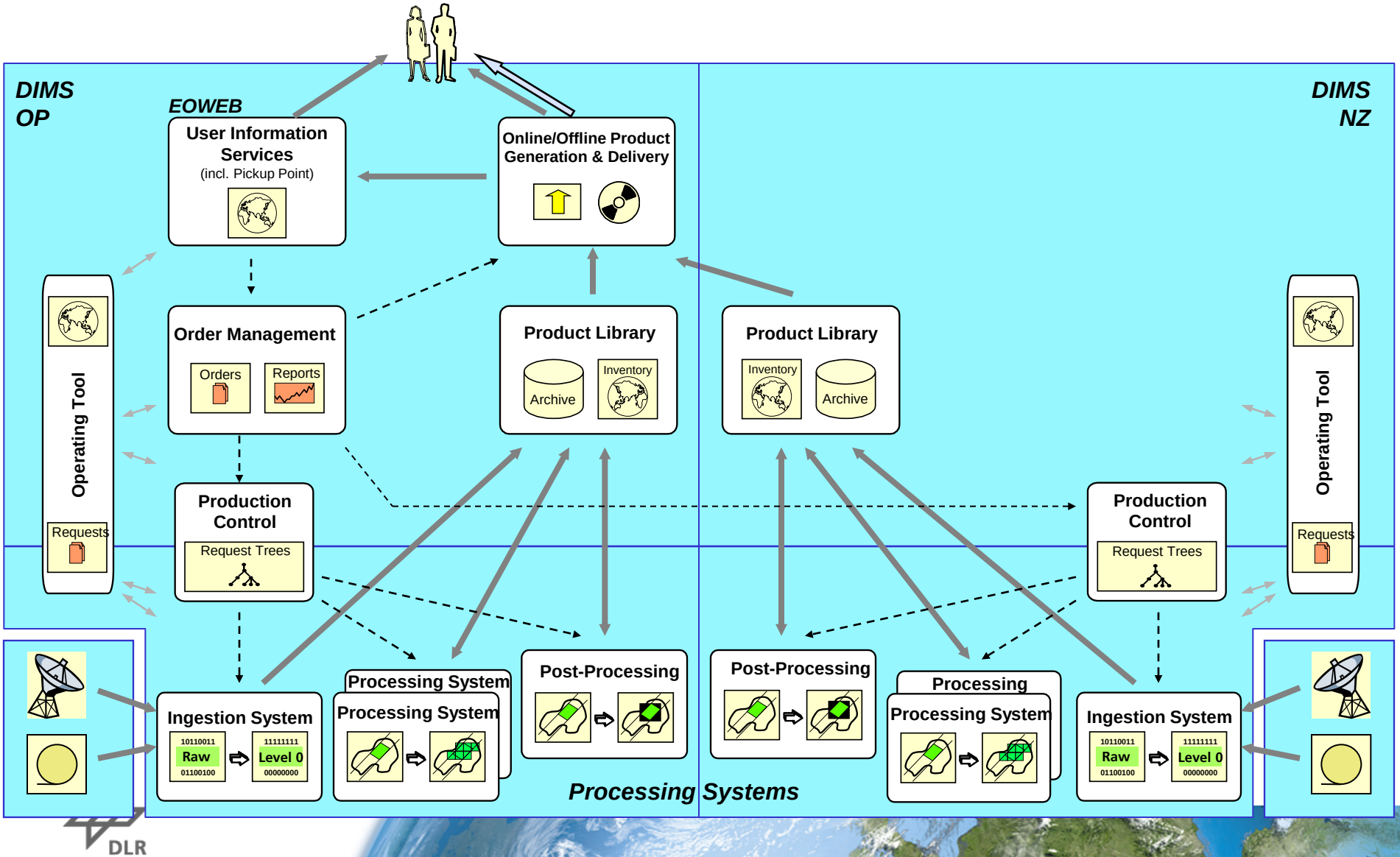
375.000 km ~ Earth-Moon 384.000km

More data - Much more data

Rising

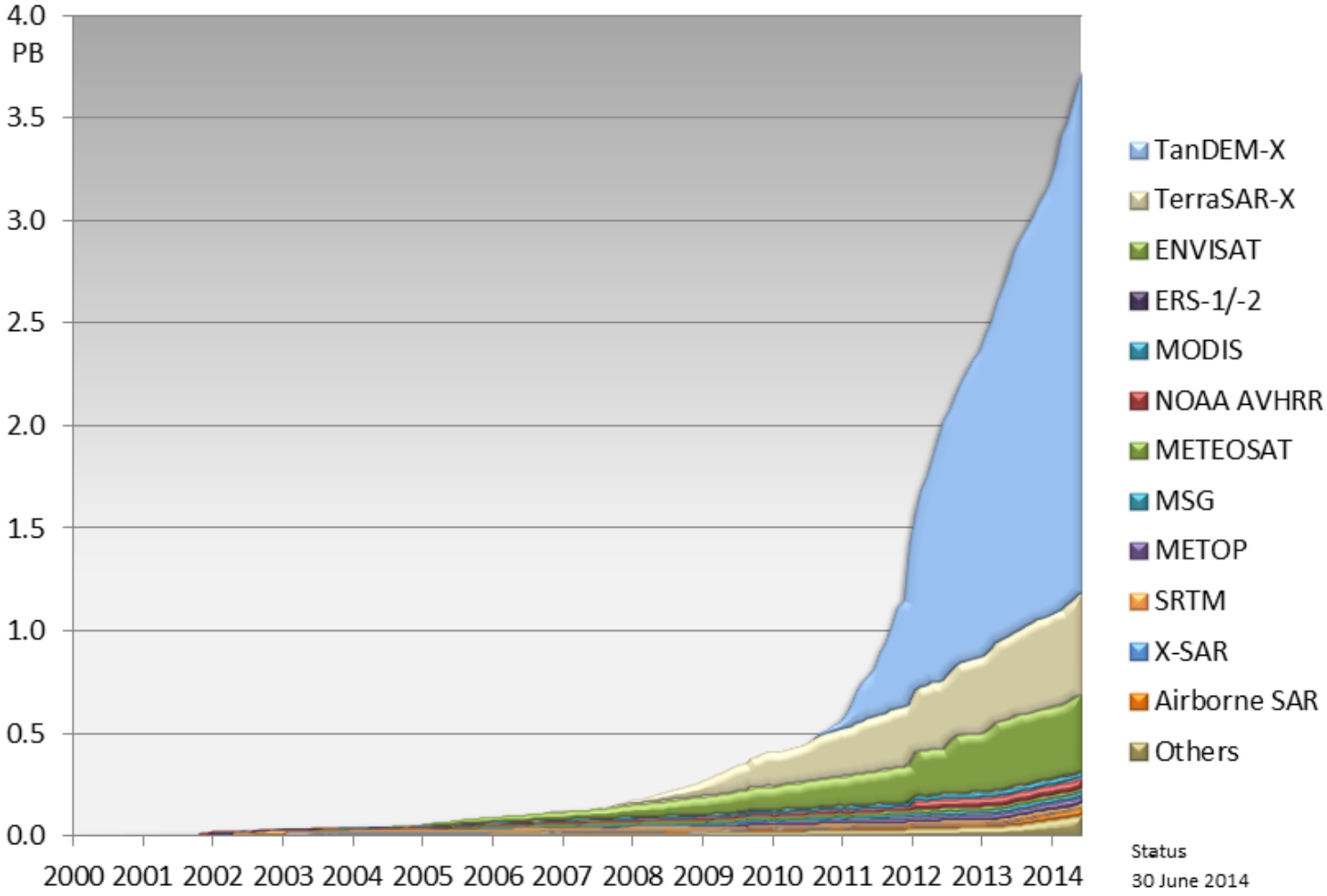
- amount of EO space data
- diversity of EO space data
- Speed of data creation and delivery
- Investment (data management, transfer…) despite falling cost per GB

Data Information and Management System



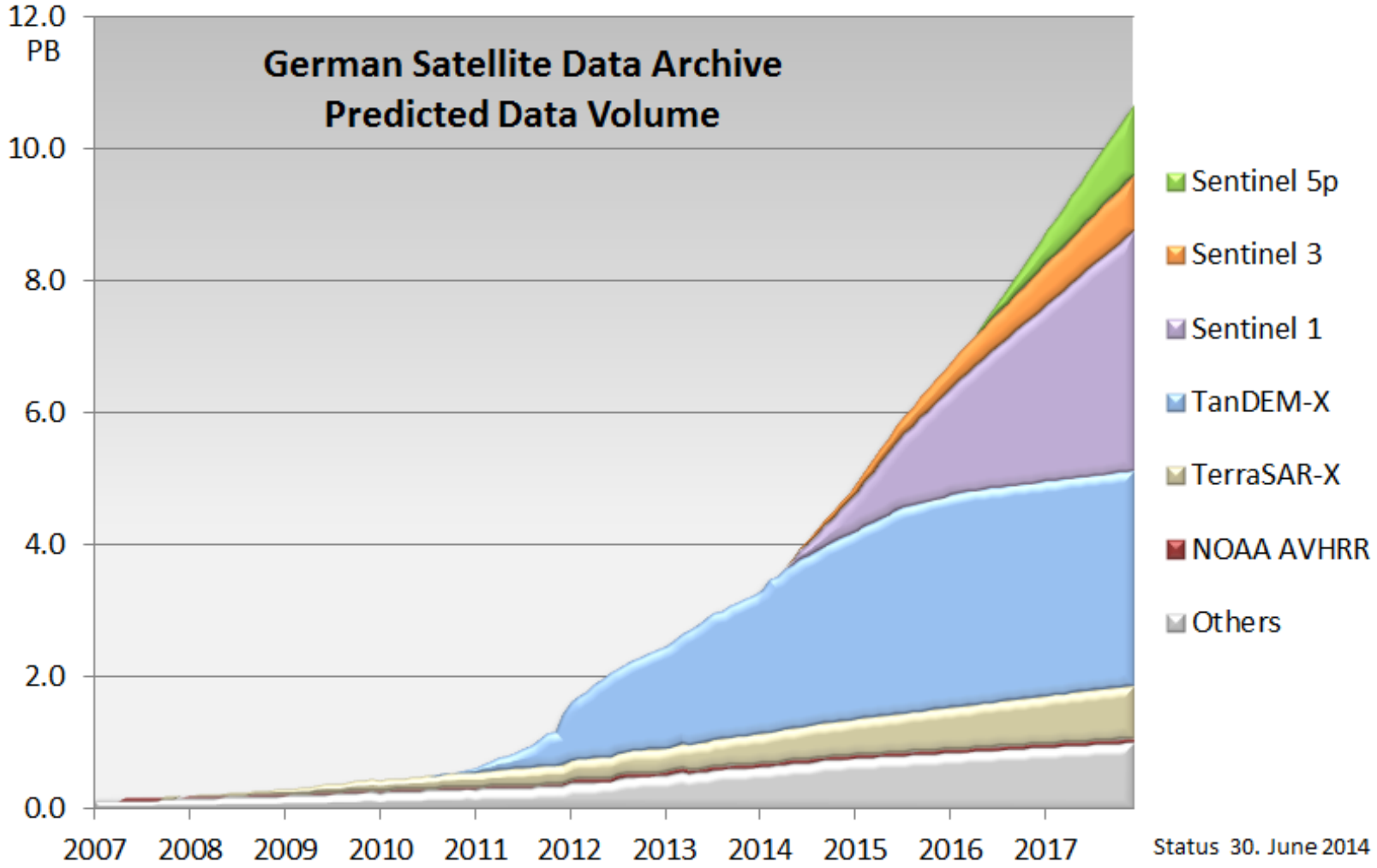
More data - Much more data

D-SDA Archive Volume



More data - Much more data

D-SDA future



Long-Term Archiving

Data Management

- Automatic Tape Libraries (robot systems)
- HSM (Hierarchical Storage Management)
- Faster technologies (effective tape drives, SSD)

LTO-6
2,5 TB

IBM TS 1140
4 TB

STK T 10000 D
8 TB

Reliable Long-Term Archiving

- Quality Monitoring
- parallel use of different (tape) technologies
- active preserving (refreshing, replication, migration, emulation)
- Generation of redundancy information
- Conversion of data formats

Outlook

How improve usability of data

- more complex view of data as pure readability
- also security, trustability, time series, quality of Data and Meta data

Interaction

- Access to digital information from different sources (research, private companies, public offices, etc.)
- For different users (offices, administrations, citizens, etc.)
- For a variety of use cases (research, government, etc.)
- Extension data access: from file-based to service-oriented

Robust Data-and Information-Infrastructure for an International Research Community

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