

# Joint Research Centre (JRC)

The European Commission's in-house science service



## JRC views on the establishment of the European Open Science Cloud

Panayotis Christidis, JRC Big Data Lead Scientist

**The European Open Science Cloud: Open Day Event**  
*EMBL, Heidelberg, 20 January 2016*

# JRC's Mission and Role

**... is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.**

## **Direct research:**

**JRC is the European Commission's in-house science service and the only DG executing direct research; providing science advice to EU policy.**

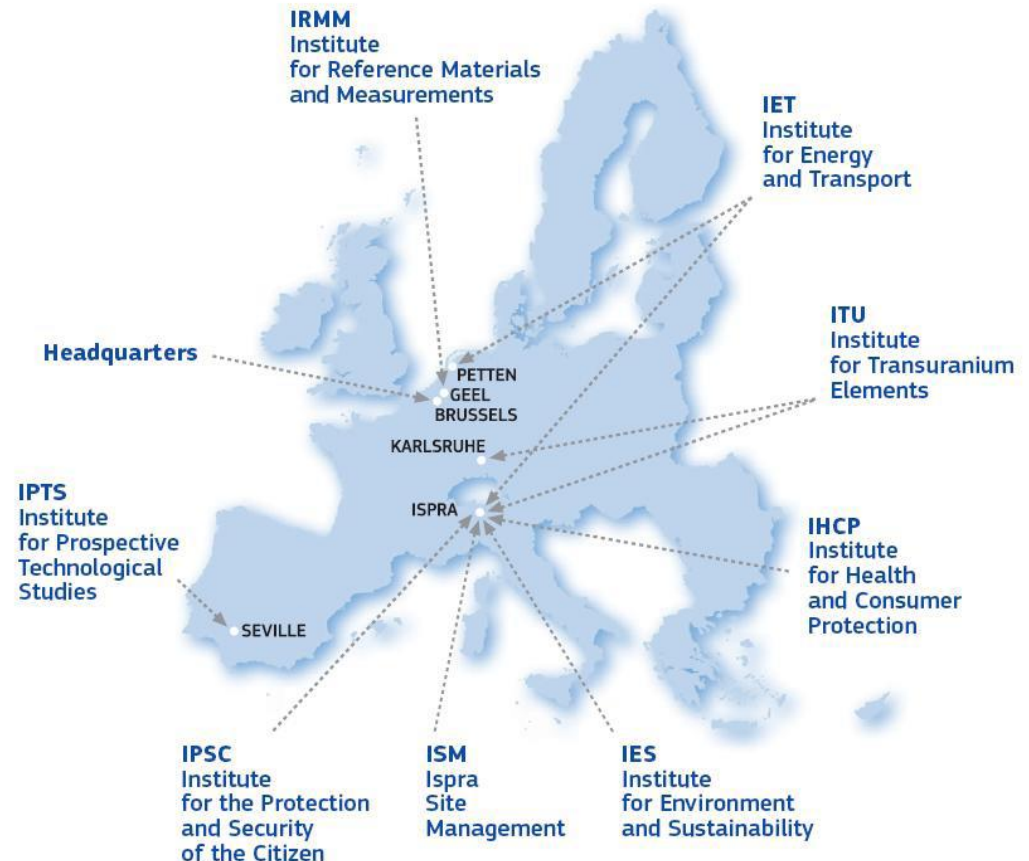


***Serving society, stimulating innovation, supporting legislation***

## Quick Facts:

Established 1957

- 7 institutes in 5 countries
- 3055 scientific, technical and administrative personnel
- 1 370 contributions to EU Policy
- 689 peer-reviewed scientific publications in 2014
- Budget: €375 million annually, plus €73 million earned income



JRC's structure

# Key priorities

- **Economic and Monetary Union (EMU)**
- **Internal market: growth, jobs and innovation**
- **Low-carbon economy and resource efficiency (environment, climate change, energy, transport)**
- **Agriculture and global food security**
- **Public health, safety and security**
- **Nuclear safety and security**

*Providing the needed scientific support to the Europe 2020 policy priorities.*



# Main lines working with **Big Data**

- **Remote sensing / Copernicus**
- **Environmental monitoring**
- **Geospatial information**
- **Transport activity**
- **Internet activity**
- **Emergency management systems**
- **Economic indicators, financial transactions, trade**
- **Patents, publications, innovation measurements**
- **Bioinformatics**
- **Modelling**
- **Experimental results and standards**

## Big Data in the JRC (today)

- **Big Data is already here for most scientific areas**
- **Higher volumes & velocities raise infrastructure needs (manageable)**
- **Cross-sectoral collaborations show possibility to use variety in data**
- **Adopting new tools (machine learning, data mining, etc.)**
- **In the process of incorporating "new" data sources into our work (separating value from noise)**
- **Improving visualisation tools, policy relevant**

# Big Data in the JRC (goal for 2020)

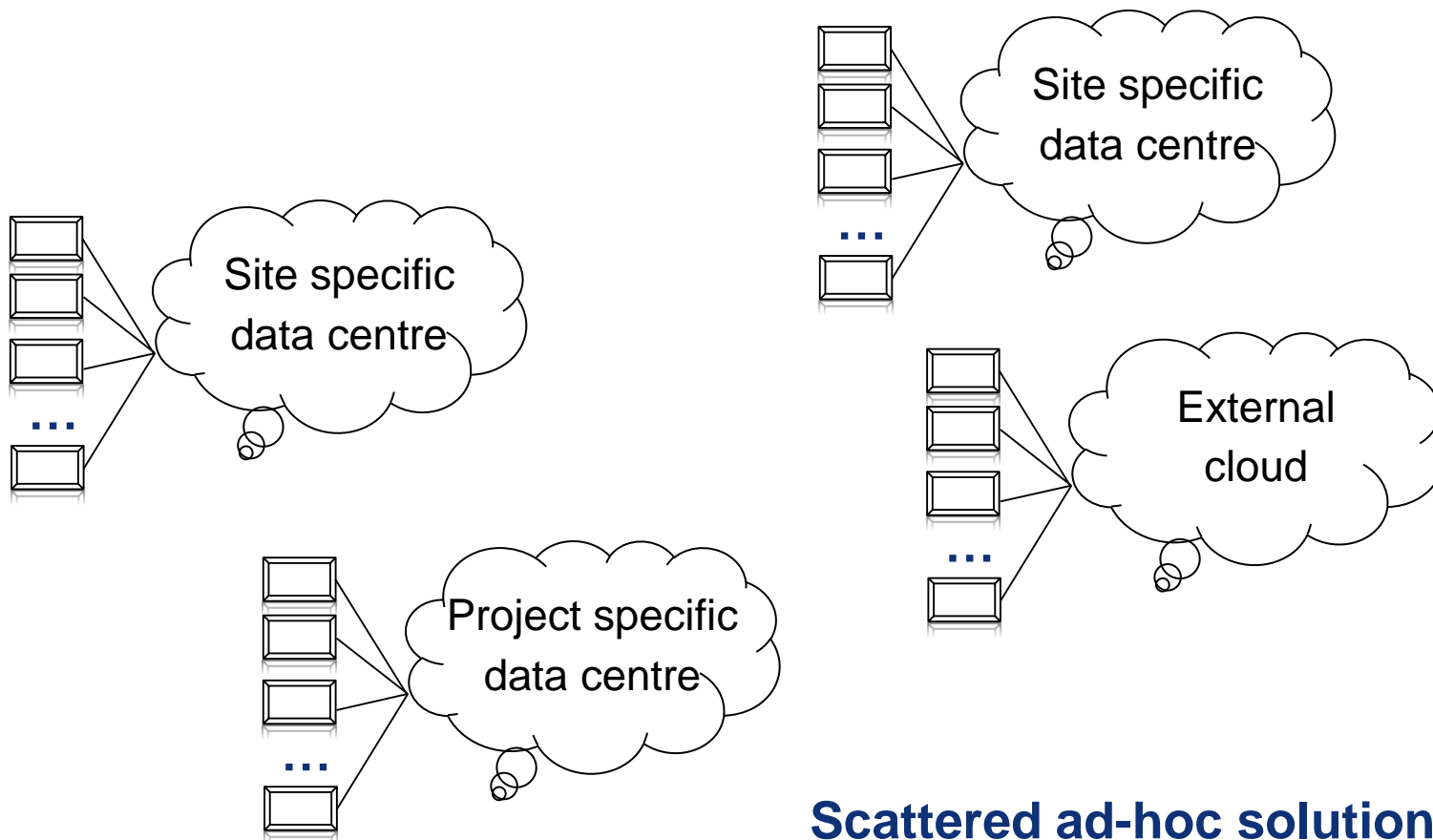
- **Vibrant Big Data community in JRC**
- **5x current computing capacity, bandwidth, storage**
- **Extensive cross-sectoral collaborations**
- **Combine conventional with "new" data sources**
- **Integrated data products for policy makers and public**

# The challenges for the JRC

- **Move to an institution-level Big Data strategy/ culture:**  
Big Data applications are no longer only pilot or laboratory experiments. Real world applications require a higher level of scalability, reliability, security and system resilience.
- **Development of real-time applications:**  
The policy relevance of science-based evidence increases significantly the less time lag exists. Providing real (or near real) time information based on Big Data would be a natural evolution of the current JRC activities.
- **User and stakeholder involvement:**  
The Big Data based products of the JRC should allow users and stakeholders the opportunity explore the underlying data and perform their own analysis, even if they are not domain or Big Data experts



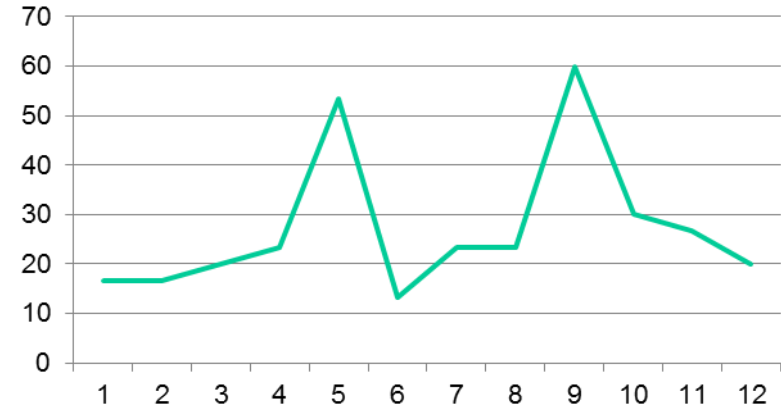
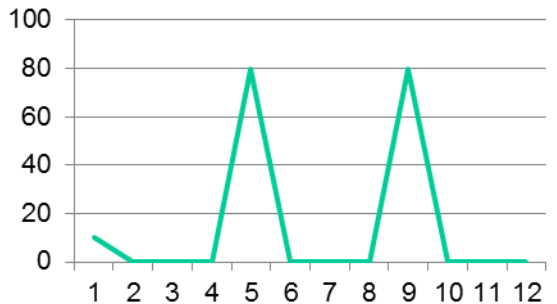
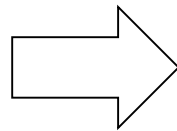
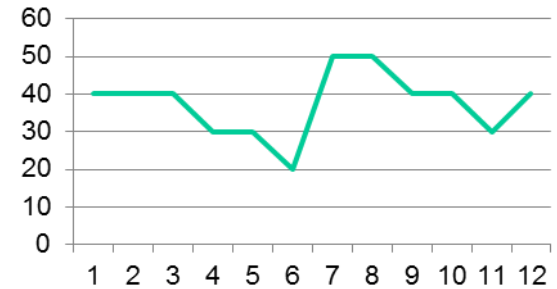
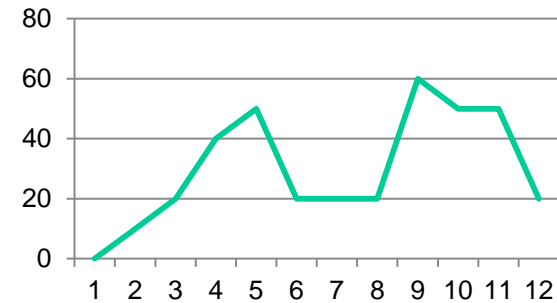
# JRC in the cloud (today)



**Scattered ad-hoc solutions**

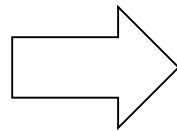
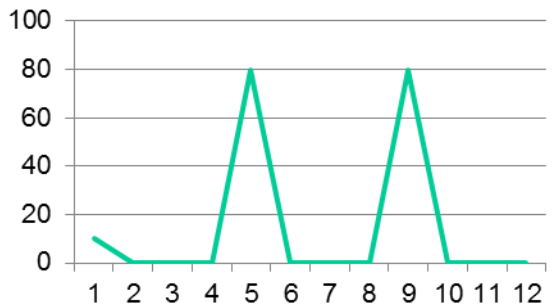
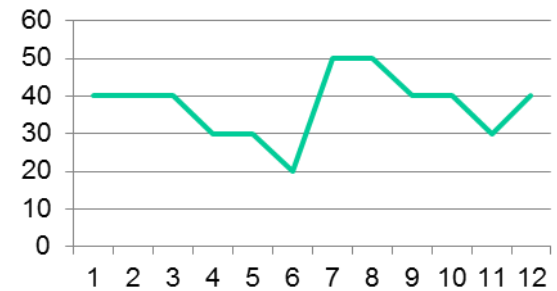
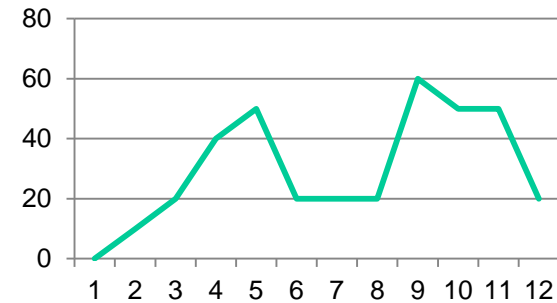
# How to improve efficiency

## 1. Pool JRC resources



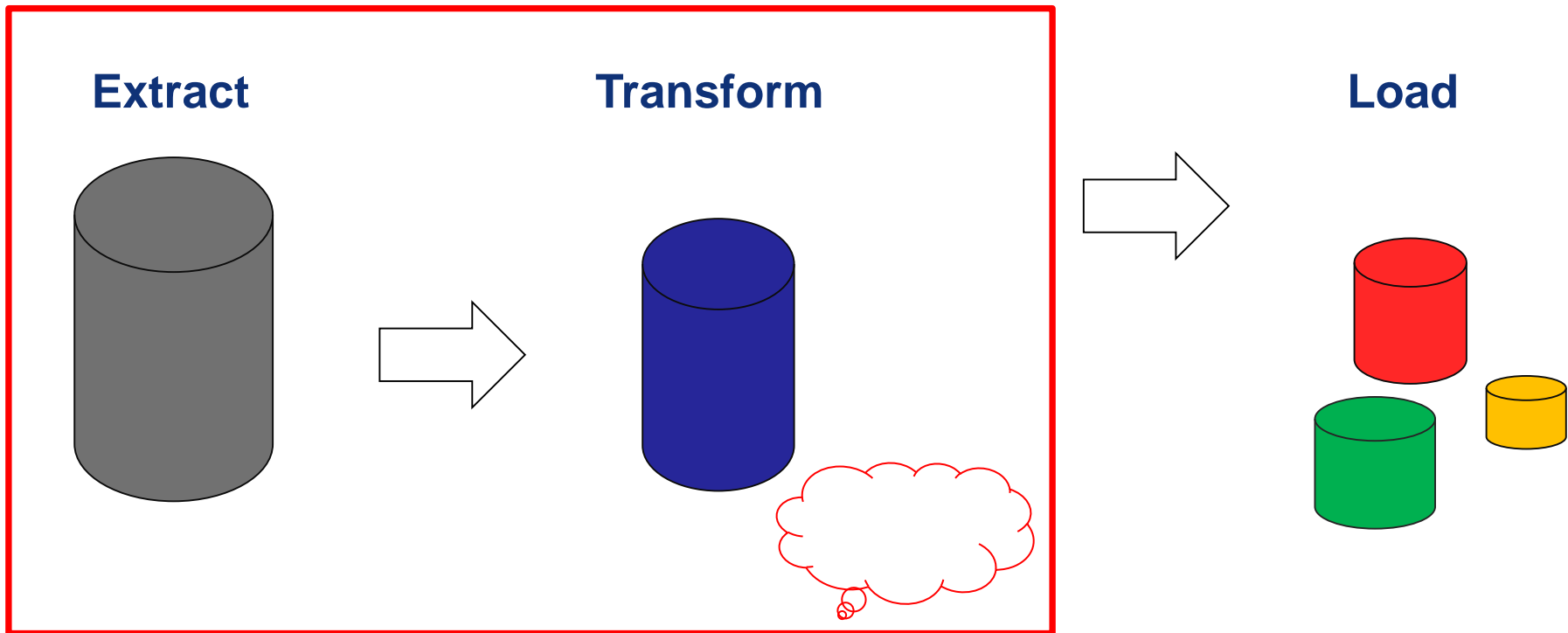
# How to improve efficiency

## 2. Use the cloud for peaks in demand



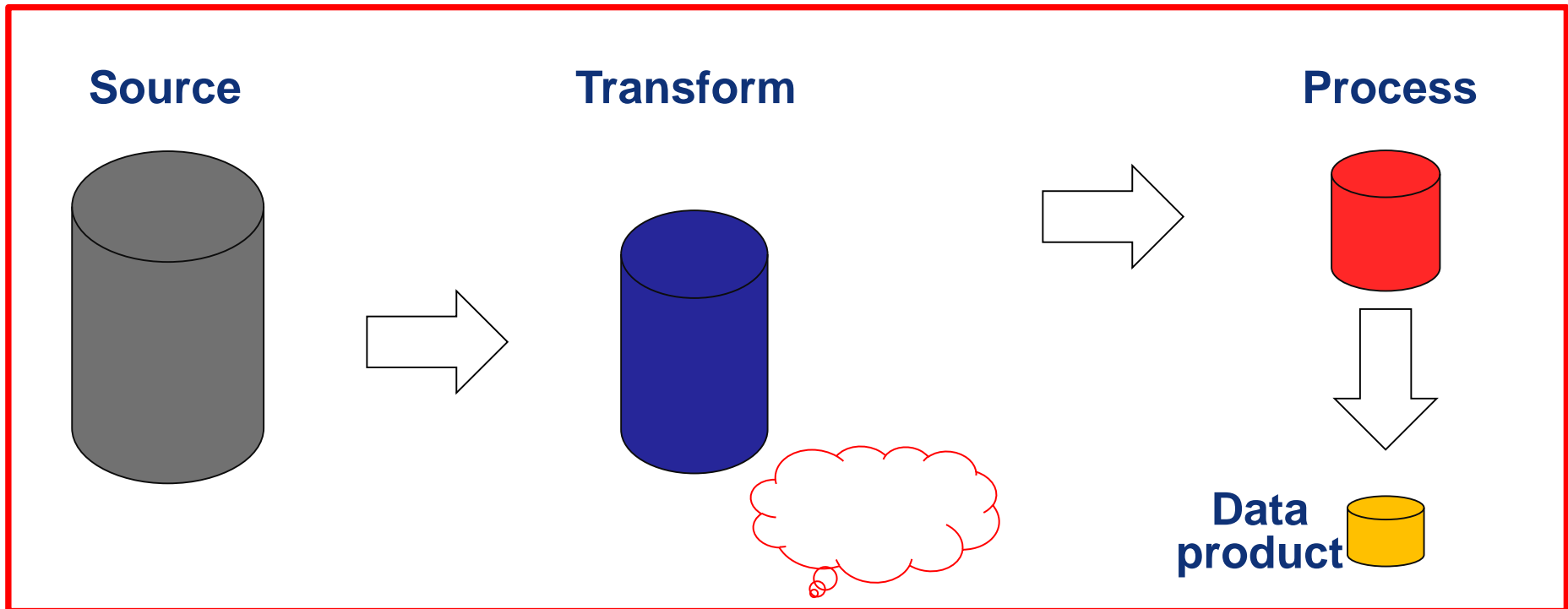
# How to improve efficiency

## 3. ETL- Extract, Transform, Load



# How to improve efficiency

## 4. Move data & data products to cloud



# Benefits of using a cloud

- **Lower investment/ use costs**
- **Flexibility / scalability**
- **Easier access to JRC results by external users**
- **Monitoring of resource use**

# Questions on using a cloud

- **Ownership / governance**
- **Management / interface**
- **Legislation**
- **Security**
- **Procurement / contracting**
- **Monitoring of use charges**

# Benefits of the European Open Science Cloud

- **Lower investment/ use costs**
- **Flexibility / scalability**
- **Easier access to JRC results by external users**
- **Monitoring of resource use**
- **Participation of main JRC partners (ESA, CERN, EMBL, etc.)**
- **EU based (EU legislation)**
- **Natural role for JRC as data provider**
- **JRC collaboration with external organisations**



# Questions on the European Open Science Cloud

- Ownership / governance
- Management / interface
- ~~Legislation~~
- Security
- Procurement / contracting
- Monitoring of use charges
- **Role of JRC infrastructure in EOSC**

# The last slide!

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