Big Data Integrator Platform and Prototype Solutions

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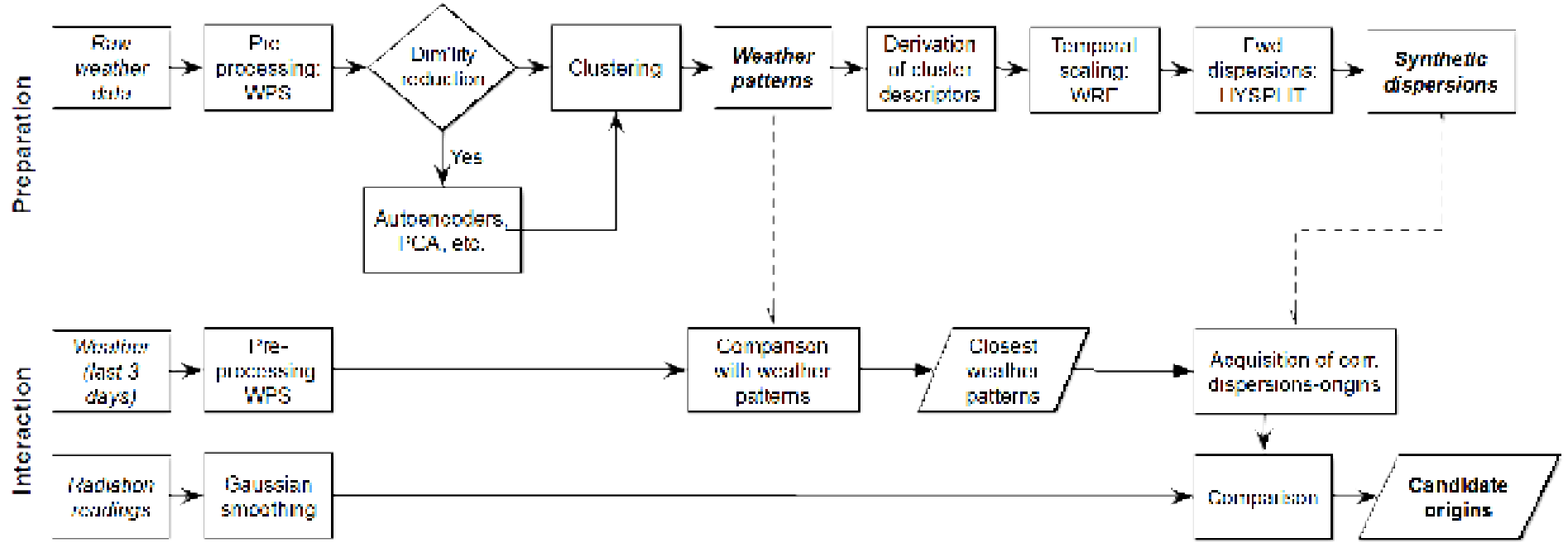
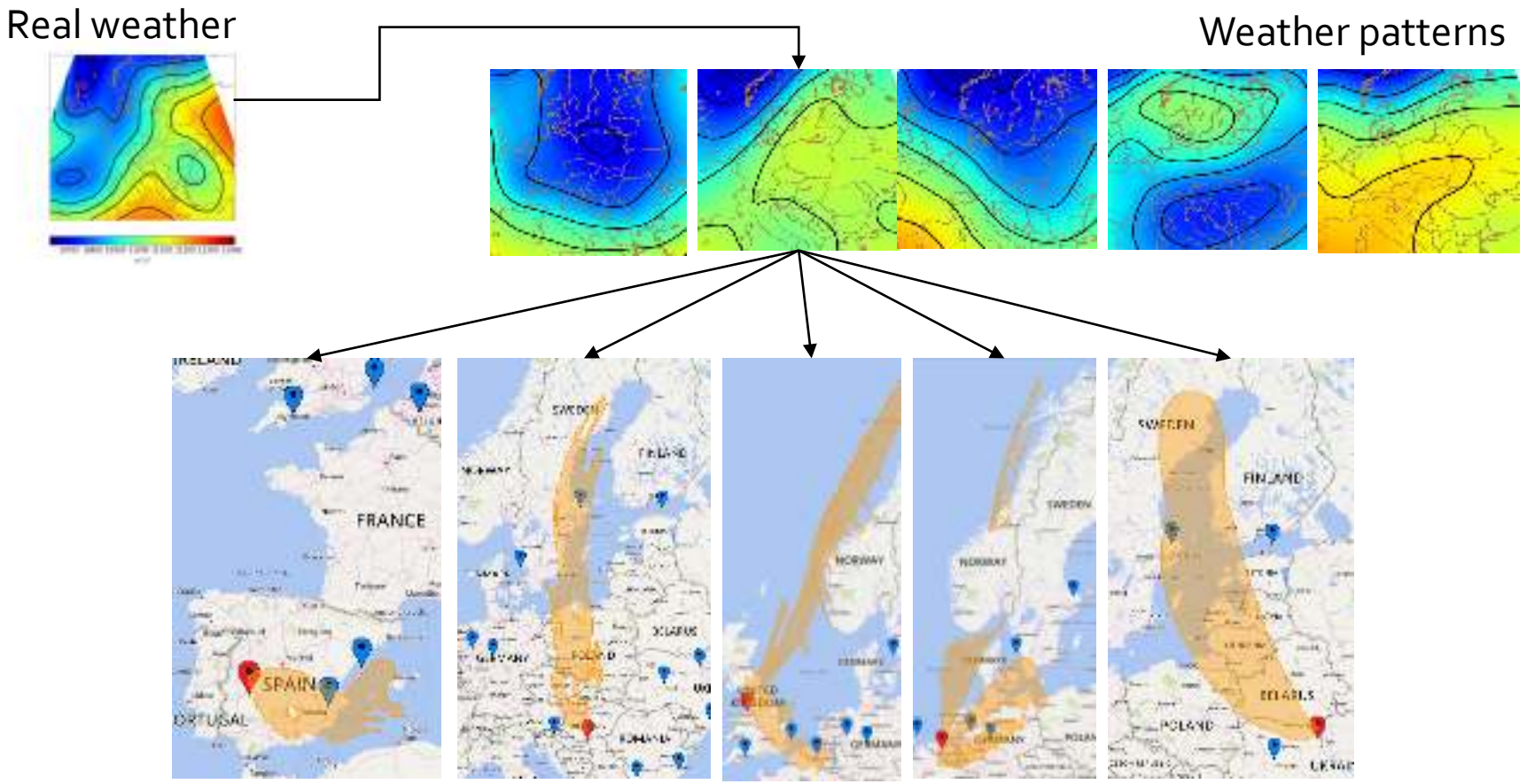
Methodology



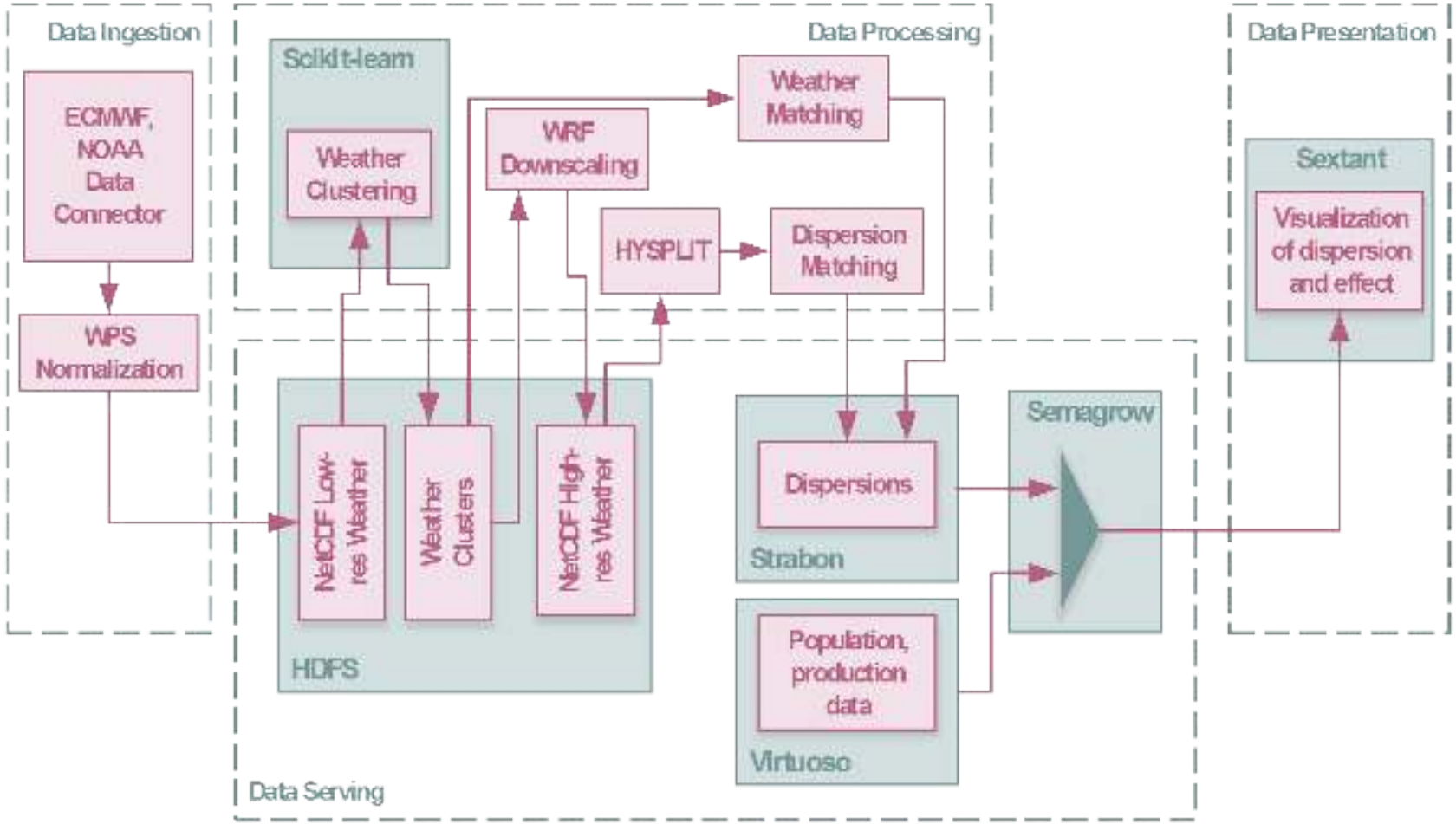
- Emphasis on *responsiveness*
- Emphasis on *reusable data products* (weather patterns & synthetic dispersions)
- Generalisable methodology

Data-Driven Source Estimation



Big Data Architecture

- Modular
- Extensible
- Maintainable
- Cloud-ready & elastic
- Documented
- Sustainable



BIG DATA EUROPE
Empowering Communities with Data Technologies

The Big Data Europe Project

- Coordination & Support Action
  - Horizon 2020
  - January 2015 – December 2017
- Provide support mechanisms impacting all major aspects of a data value chain
- Societal Challenges

Large Scale Data Tools & Technologies

- Visualization
  - Sextant
- Processing and analytics
  - Sansa, Spark, Flink, Hadoop, Hive
- Data access & data integration
  - SemaGrow, Strabon, Kafka
- Large scale storage
  - HDFS, Virtuoso, Solr, Cassandra, PostgreSQL

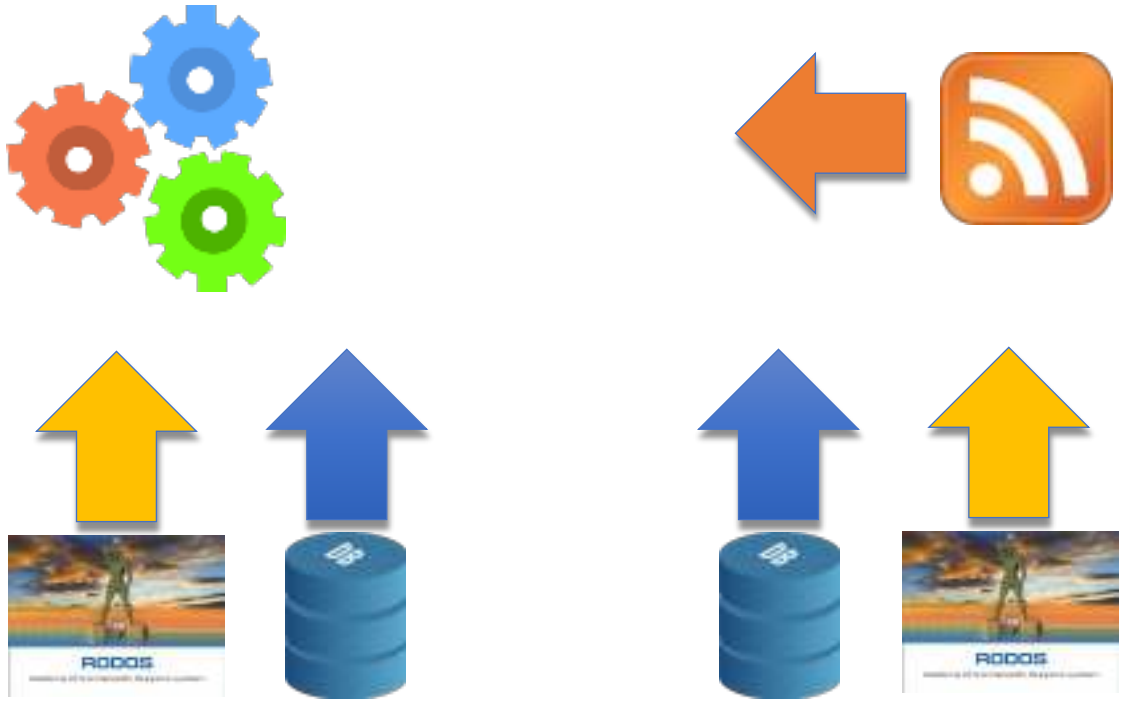
Identified Priorities*

- Priority : EURADOS – NERIS – MELODI – ALLIANCE
  - Improved modelling for internal doses after accidental situations based on environmental monitoring data and personal monitoring data
- Priority : EURADOS – NERIS
  - Improving monitoring by lay people, drones and a European wide harmonization of such tools and methods can be considered as overlapping open topics in both gap analyses, excluding the work to be done in Shamisen-sings
- ALLIANCE – NERIS Key Common Gaps
  - Advanced methods for data treatments to cope with the large amount of data available

* Key Gaps in Radiation Protection Research, MELODI, EURADOS, NERIS, ALLIANCE, EURAMED, Open Information and Networking Day of the European Radiation Protection Research Platforms MELODI, EURADOS, NERIS, ALLIANCE and EURAMED, 20 February 2018, Munich, Germany

Key topic 3: Data Assimilation**

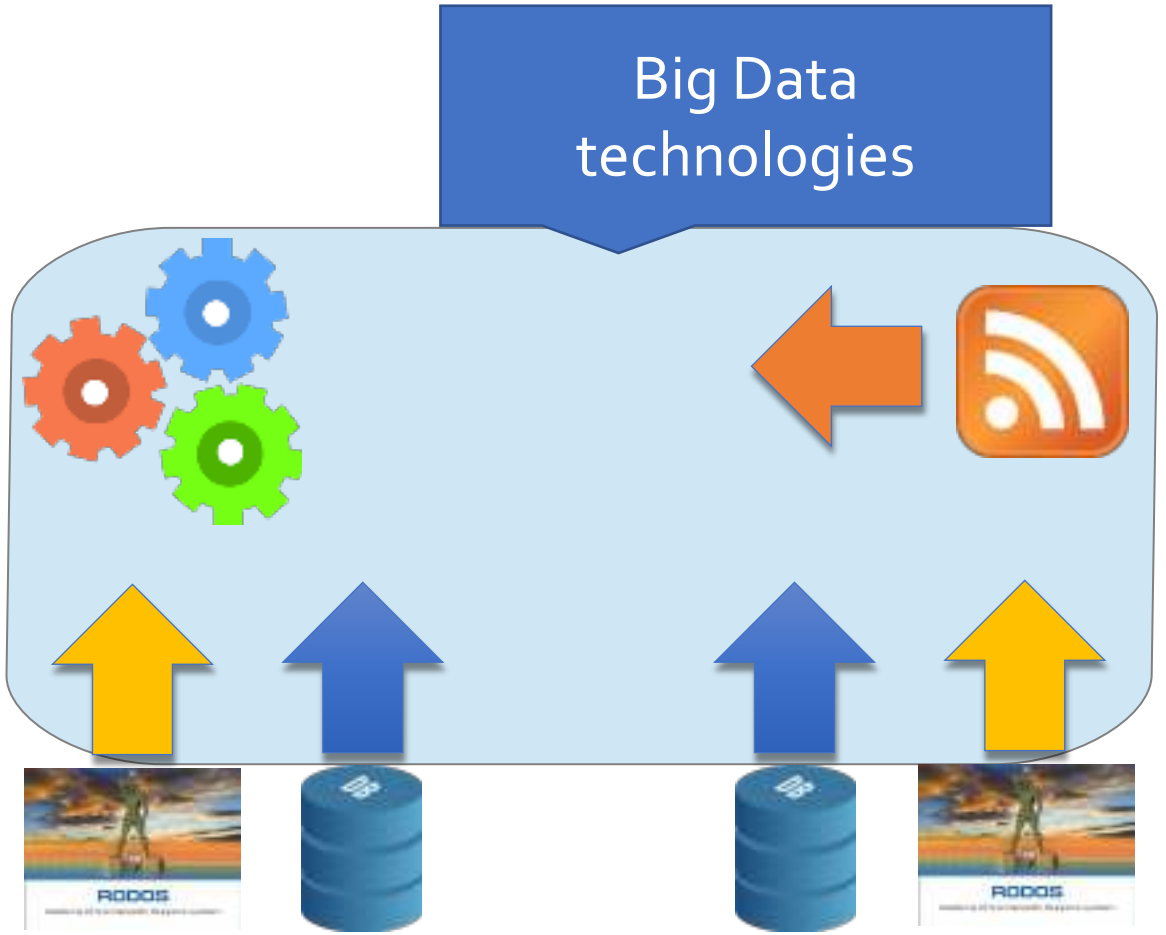
- Improved source term estimation
  - Data assimilation techniques
- Big Data, Data Fusion
  - Methods and tools to analyze the huge amount of calculations performed for preparedness in terms of usability in a real event



** GAP ANALYSIS NERIS, Version December 22, 2017

Key topic 3** : An Approach

- Big Data technologies to retrieve data from a collection of storages, e.g.,
  - Meteorological data
  - Emergency Response calculation outputs
  - Measurements
- Big Data technologies to provide transparent data integration
- Big Data technologies to handle stream processing



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Resources

- https://www.big-data-europe.eu
- S. Auer et. al., "The BigDataEurope platform - supporting the variety dimension of big data," *ICWE 2017, LNCS*, vol. 10360, 2017
- I. A. Klampanos, A. Davvetas, S. Andronopoulos, C. Pappas, A. Ikonomopoulos and V. Karkaletsis, "Autoencoder-driven weather clustering for source estimation during nuclear events," *Environmental Modelling & Software*, vol. 102, 2018
- A. Davvetas, I. A. Klampanos, S. Andronopoulos, G. Mouchakis, S. Konstantopoulos, A. Ikonomopoulos and V. Karkaletsis, "Big data processing and semantic web technologies for decision making in hazardous substance dispersion emergencies" in *CEUR Workshop Proceedings - ISWC 2017 Posters & Demonstrations and Industry Tracks*, vol. 1963, 2017
- S. Andronopoulos, I. A. Klampanos, A. Davvetas, C. Pappas, A. Ikonomopoulos and V. Karkaletsis, "Towards inverse source term estimation using Big Data Technologies", *3rd NERIS Workshop*, 2017