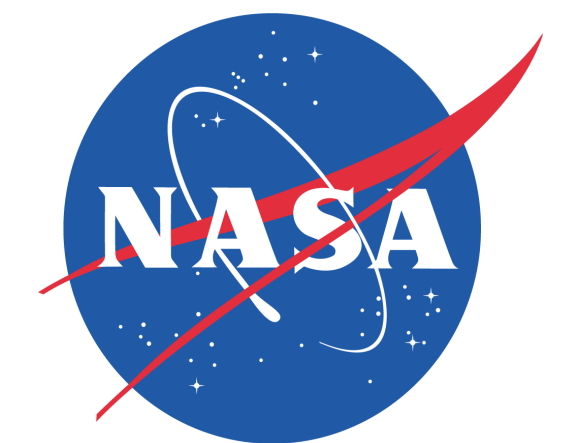


Deriving Earth Science Data Analytics Requirements



Goal oriented Earth Science Data Analytics (ESDA)

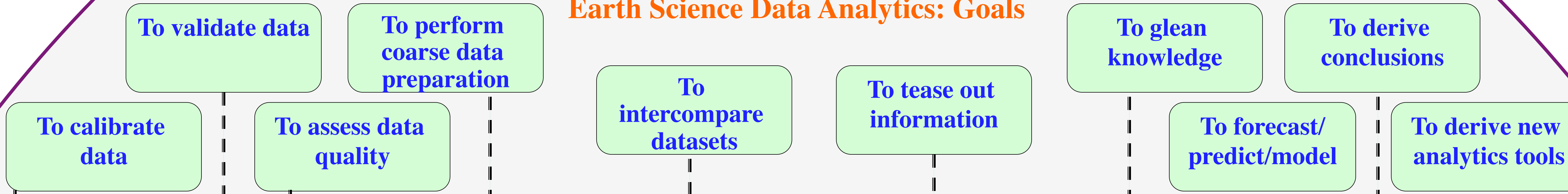
reveal requirements for needed data
analytics tools/techniques

Earth Science Data Analytics: Definition

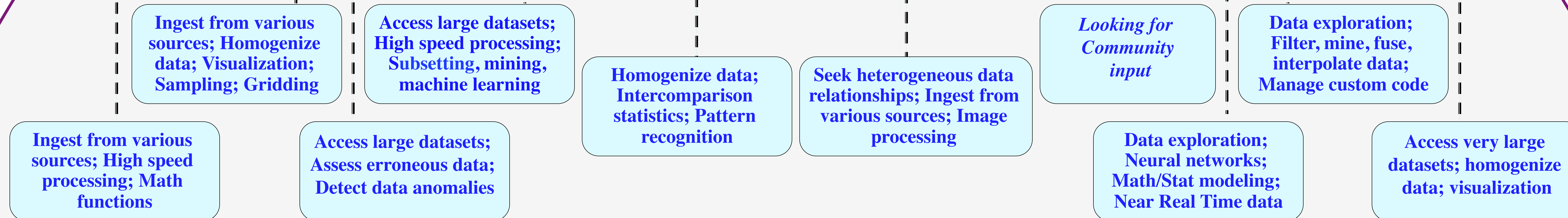
The process of examining, preparing, reducing, and analyzing large amounts of spatial (multi-dimensional), temporal, or spectral data using a variety of data types to uncover patterns, correlations and other information, to better understand our Earth.

Data Preparation **Data Reduction** **Data Analysis**

Earth Science Data Analytics: Goals



Earth Science Data Analytics: Initial Requirements

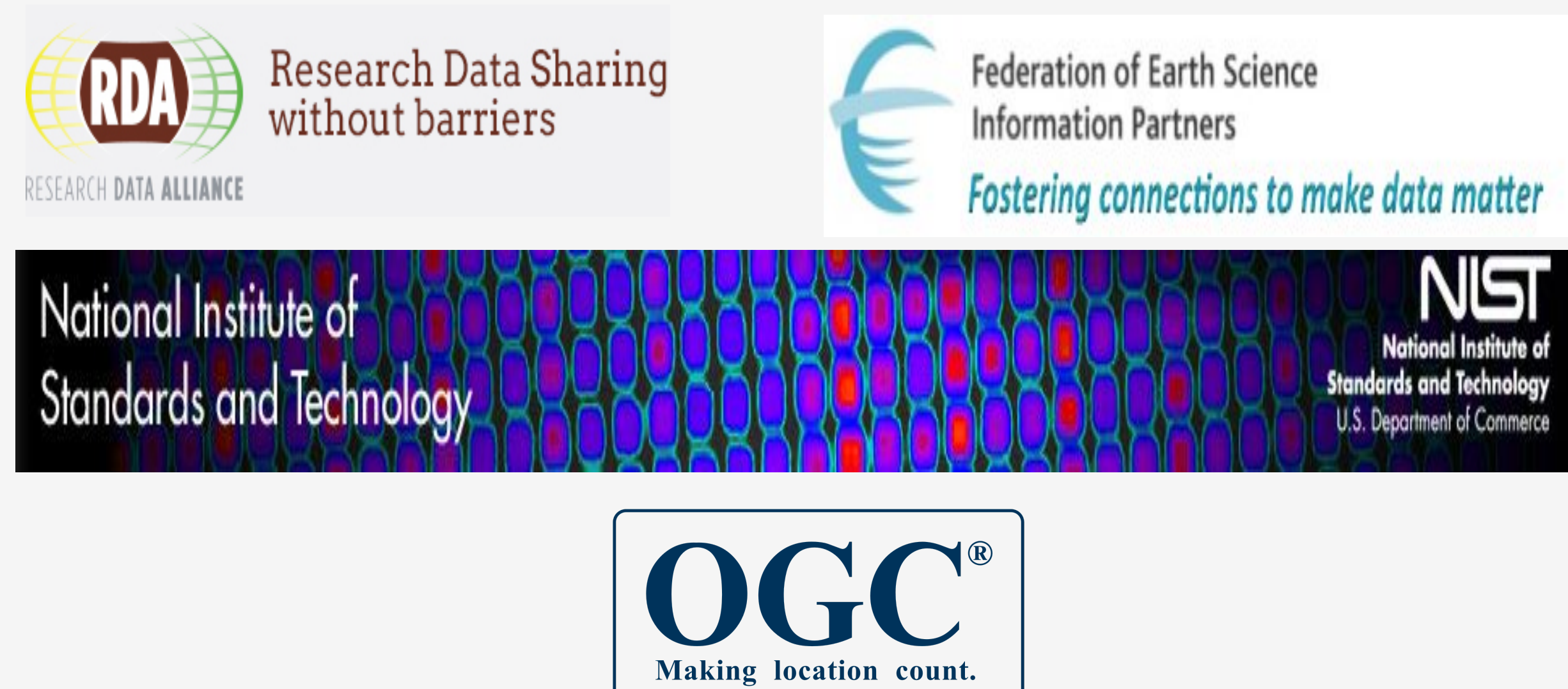


Earth Science Data Analytics: Exemplary Tools, Techniques, Integrated Systems

Types of Analytics	Tools	Techniques	Integrated Systems
<ul style="list-style-type: none"> Data Preparation Data Reduction Data Analysis 	<ul style="list-style-type: none"> R, SAS, Python, Java, C++ SPSS, MATLAB, Minitab CPLEX, GAMS, Gauss Tableau, Spotfire VBA, Excel, MySQL Javascript, Perl, PHP Open Source Databases PIO, NCL, Parallel NetCDF AWS, Cloud Solutions, Hadoop MPI, GIS, ROI-PAC, GDAL 	<ul style="list-style-type: none"> Statistics functions Machine Learning Data Mining Natural Language Processing Linear/Non-linear Regression Logical Regression Time Series Models Clustering Decision Tree Factor Analysis Principal Component Analysis Neural Networks Bayesian Techniques Text Analytics Graph Analytics Visual Analytics Map Reduce 	<ul style="list-style-type: none"> EarthServer (http://www.earthserver.eu) NASA Earth Exchange (https://nex.nasa.gov/nex/) EDEN (http://cda.ornl.gov/projects/eden/#) EARTHDATA (https://earthdata.nasa.gov) Giovanni (http://giovanni.gsfc.nasa.gov/giovanni/)

Compiled from: <http://practicalanalytics.co/predictive-analytics-101/> and <http://cda.ornl.gov/research.shtml>

Earth Science Data Analytics: Enabling Organizations



The good news...

Earth Science Data Analytics: Preparing for the Future

Central England NERC Training Alliance **CENTA**

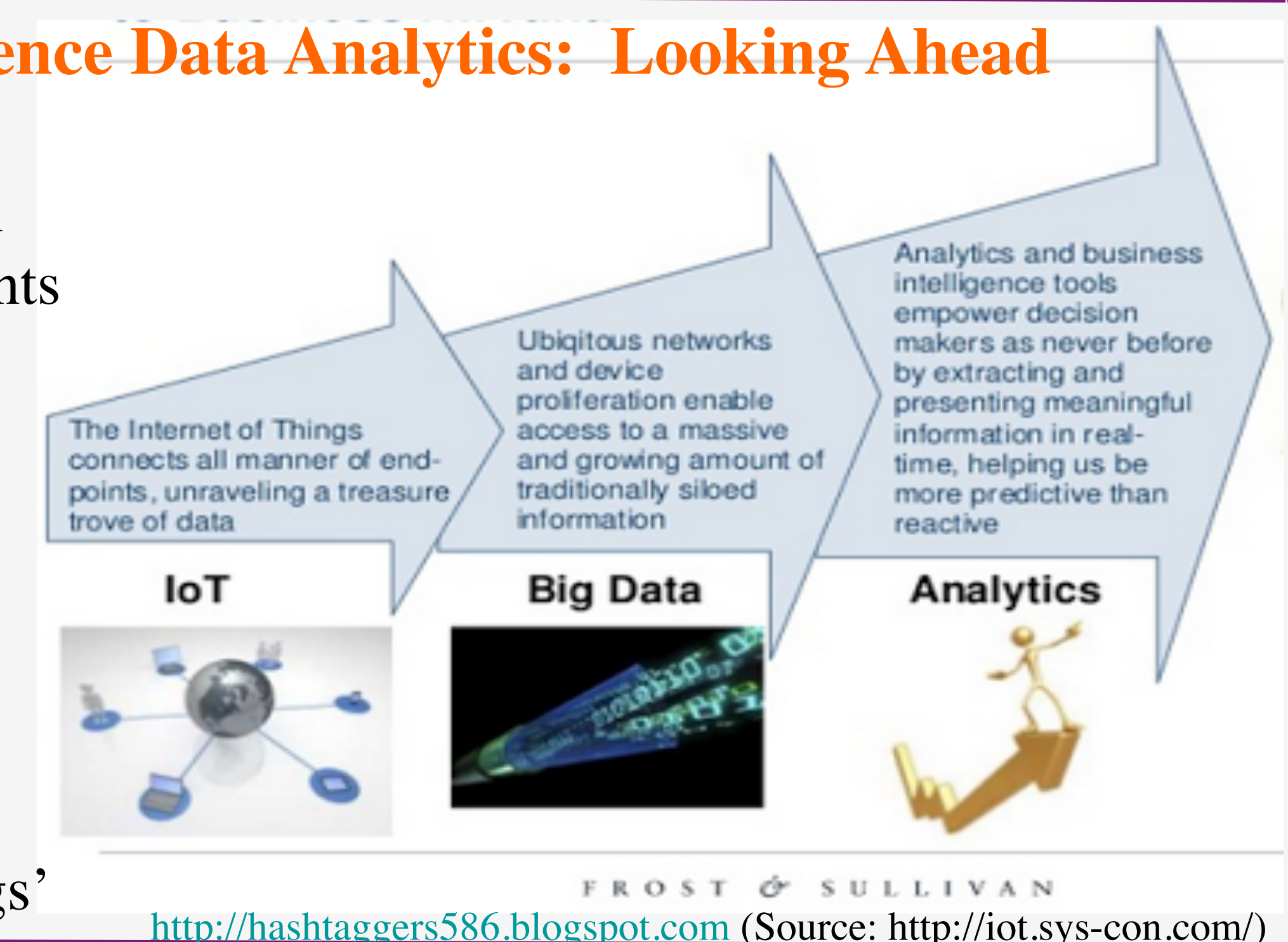
Big data analysis to fuel environmental research at Reading University

2nd Annual Graduate Workshop on Environmental Data Analytics
July 27-31, 2015
Hosted by the National Center for Atmospheric Research in Boulder, CO

... offering degrees in Data Science
... summer school on Big Data Analytics
... online master's degree in data analytics

Earth Science Data Analytics: Looking Ahead

- Complete Gap Analysis between ESDA requirements and current tools/technologies
- Continue to evolve tools/techniques to address growing scope of the 'Internet of Things'



* Thanks to the work of the Earth Science Information Partners (ESIP) Federation, Earth Science Data Analytics (ESDA) Cluster