

CESMA

Master di II livello in
Customer Experience, Statistics,
Machine learning & Artificial intelligence

IX EDIZIONE

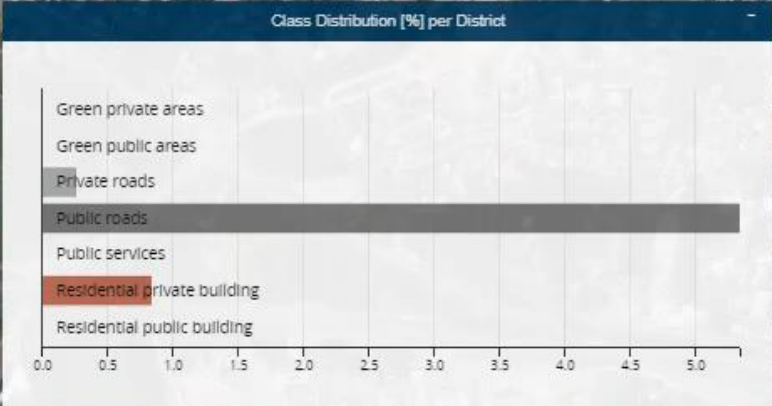
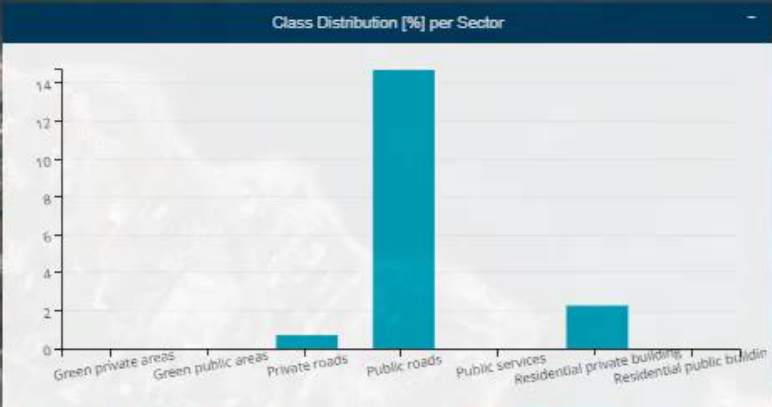
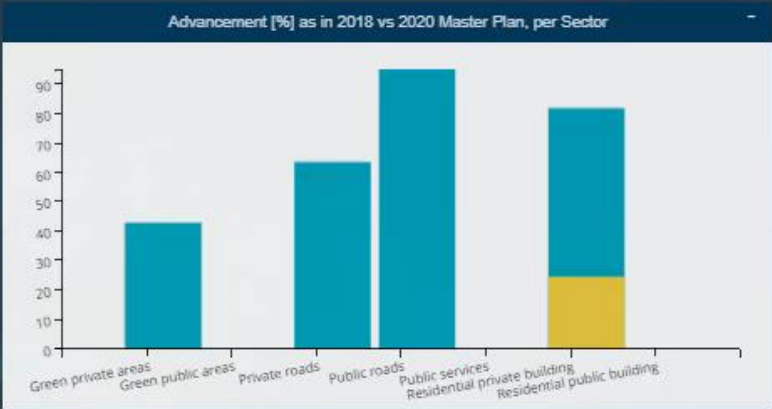
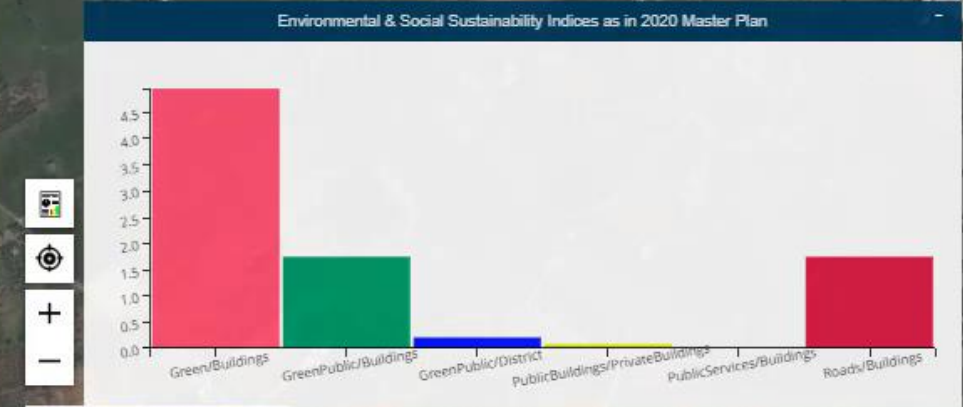
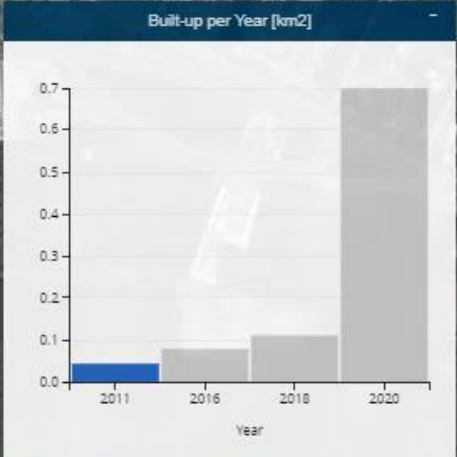
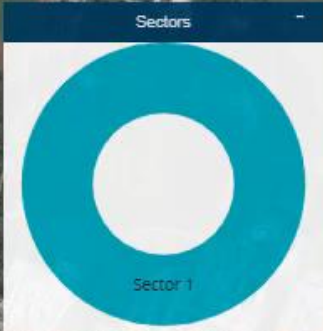
OPEN DAY

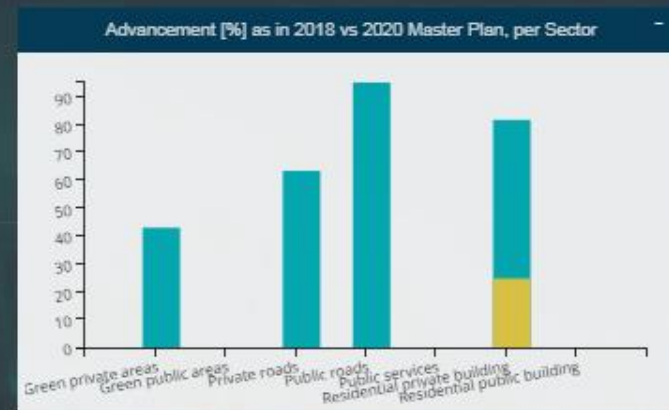
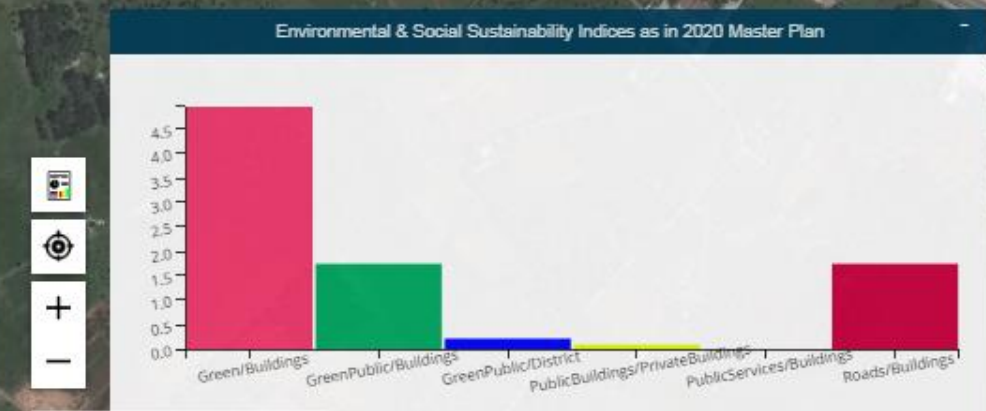
26 novembre 9:00 – 12:00

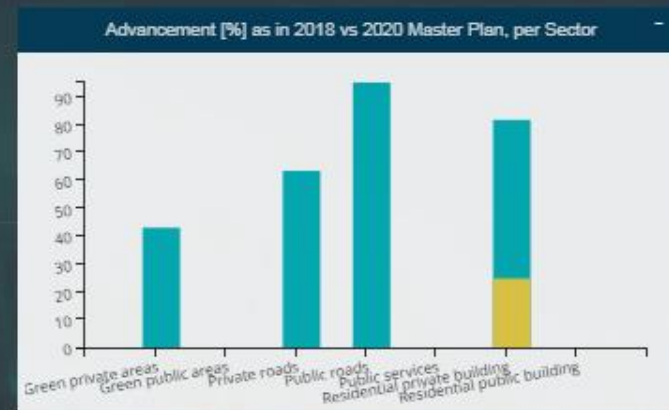
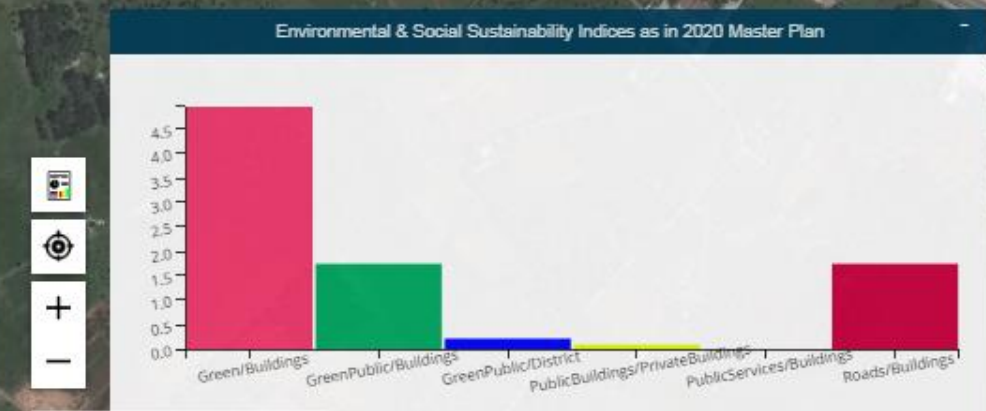
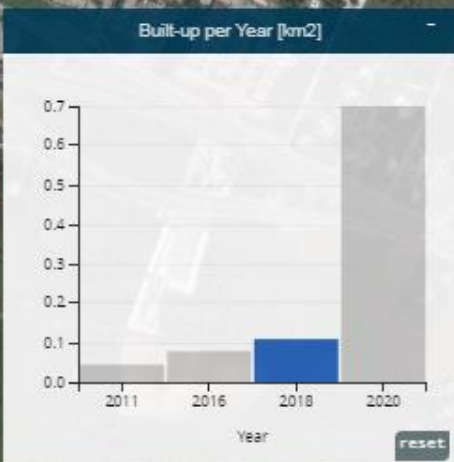
Aula Magna
Facoltà di Economia

Osservazione della terra, Big Data e Intelligenza artificiale

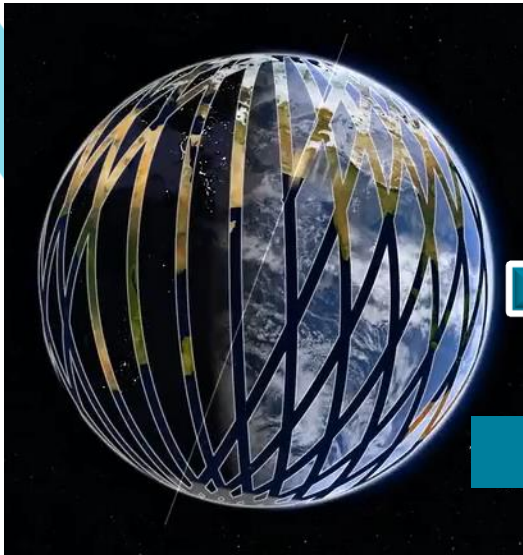
Massimo Zotti – Planetek Italia







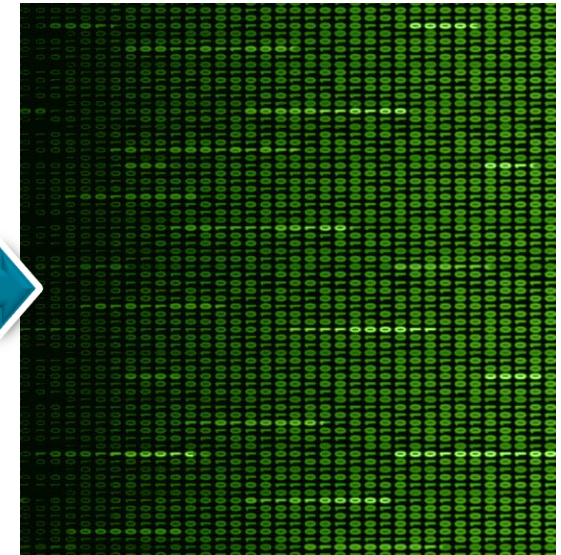
From satellite data flows to Geospatial Analytics



Satellite Data



Automatic Selection & Download
Automatic Processing

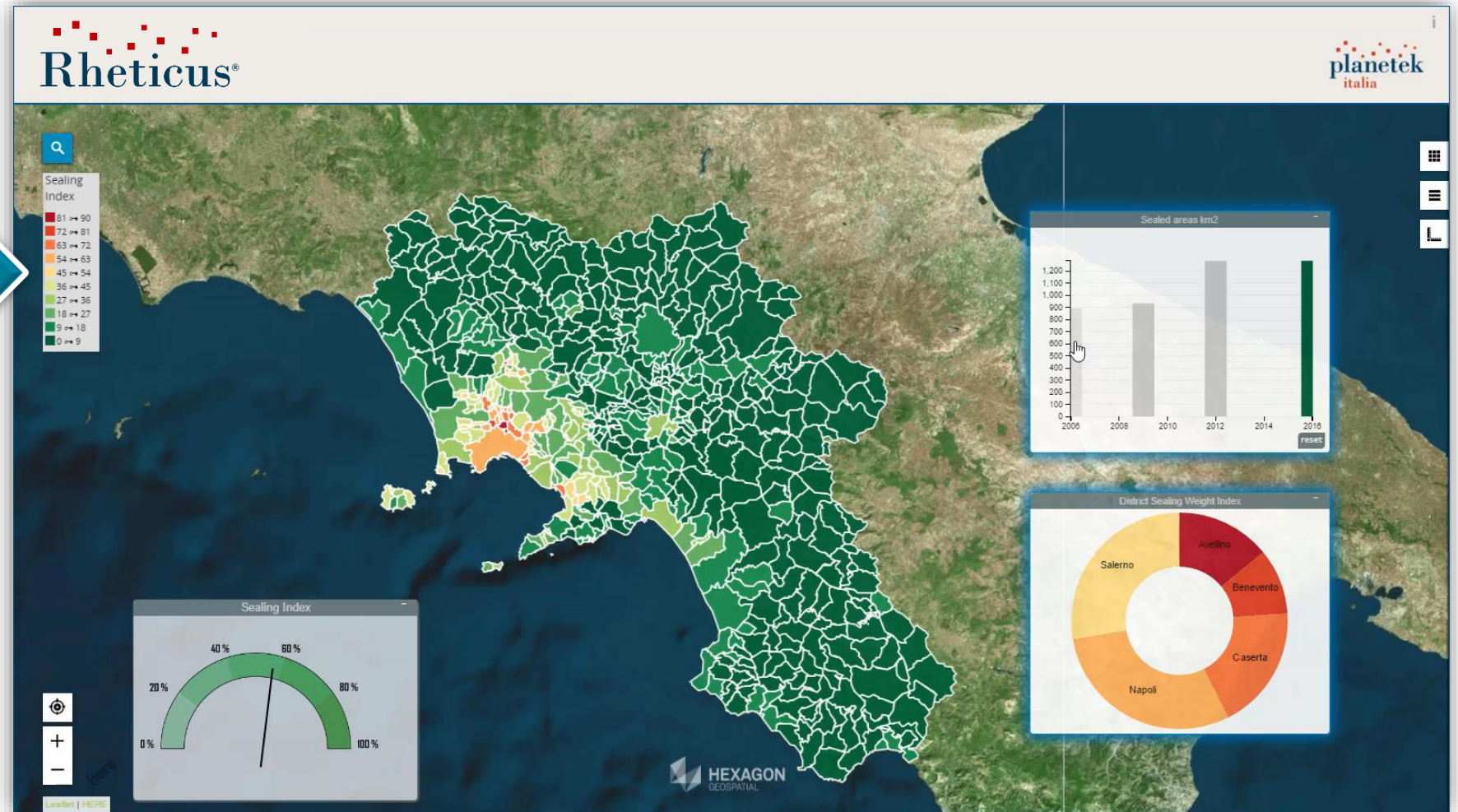


Continuous flow of
information

From satellite data flows to Geospatial Analytics



Continuous flow of
information



The data deluge

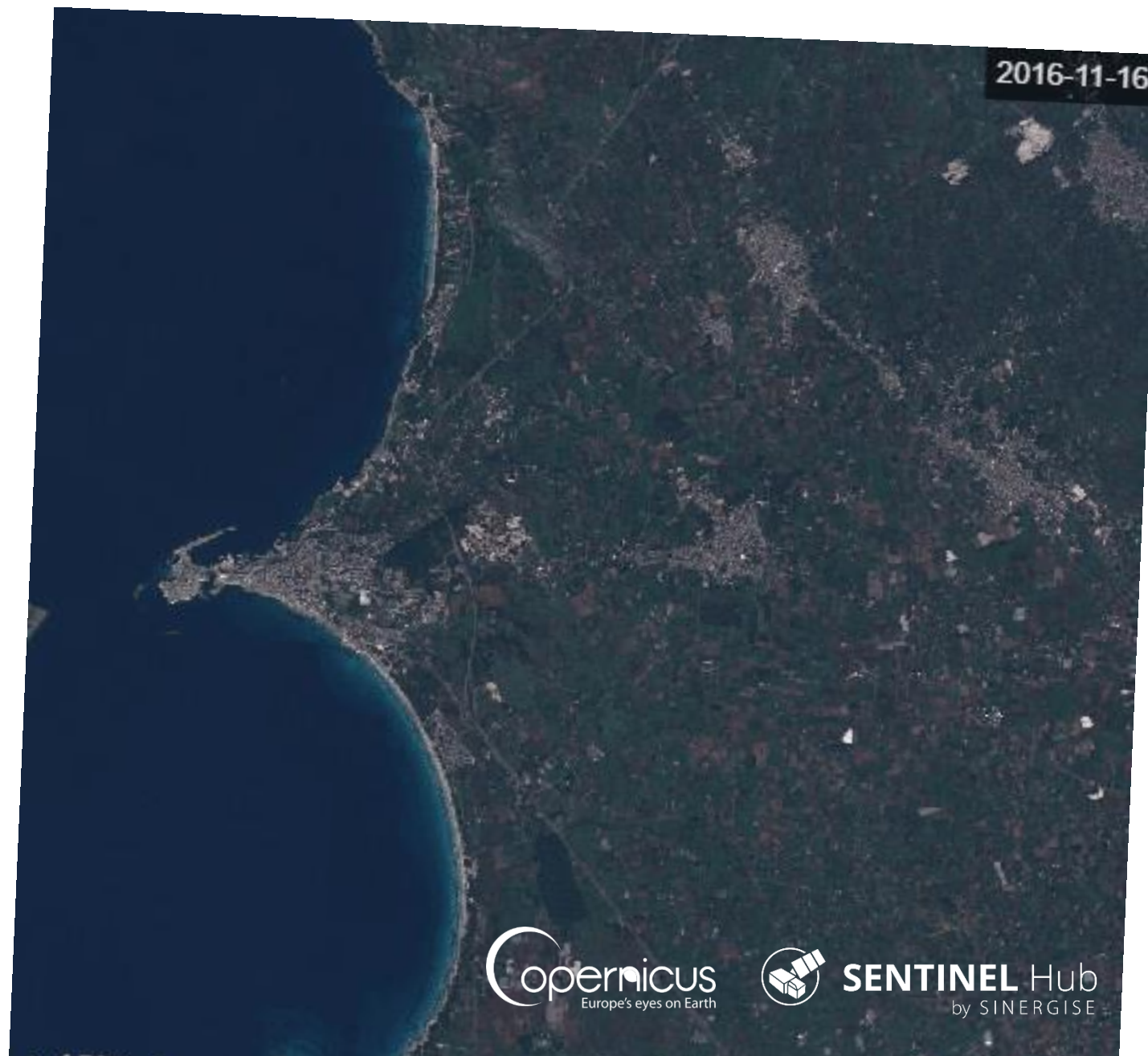
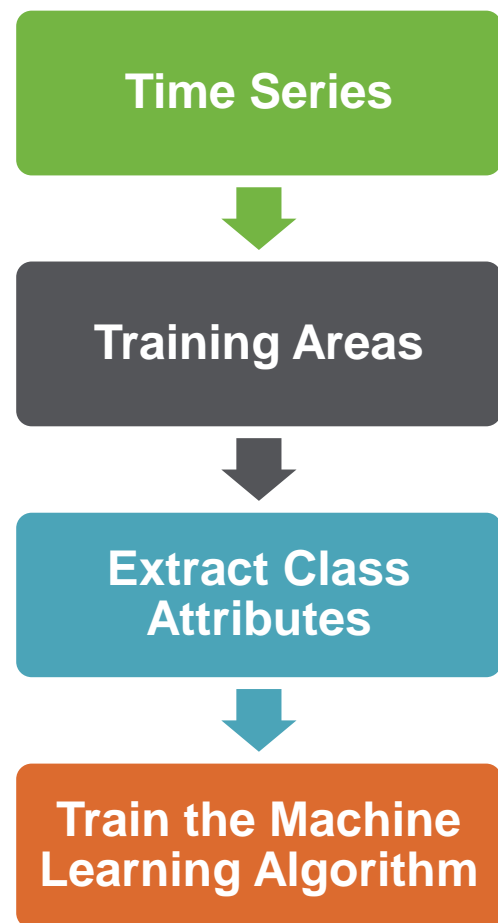
«Data themselves are meaningless, if you don't have the capacity to analyze them»

«Big Data make old methods inefficient and obsolete, allowing us to own an unprecedented amount of data which is far greater than we can manage»

Source: *Boschi-Gambit*: <https://www.che-fare.com/panopticon-big-data/>



Machine learning and Time Series



Classification

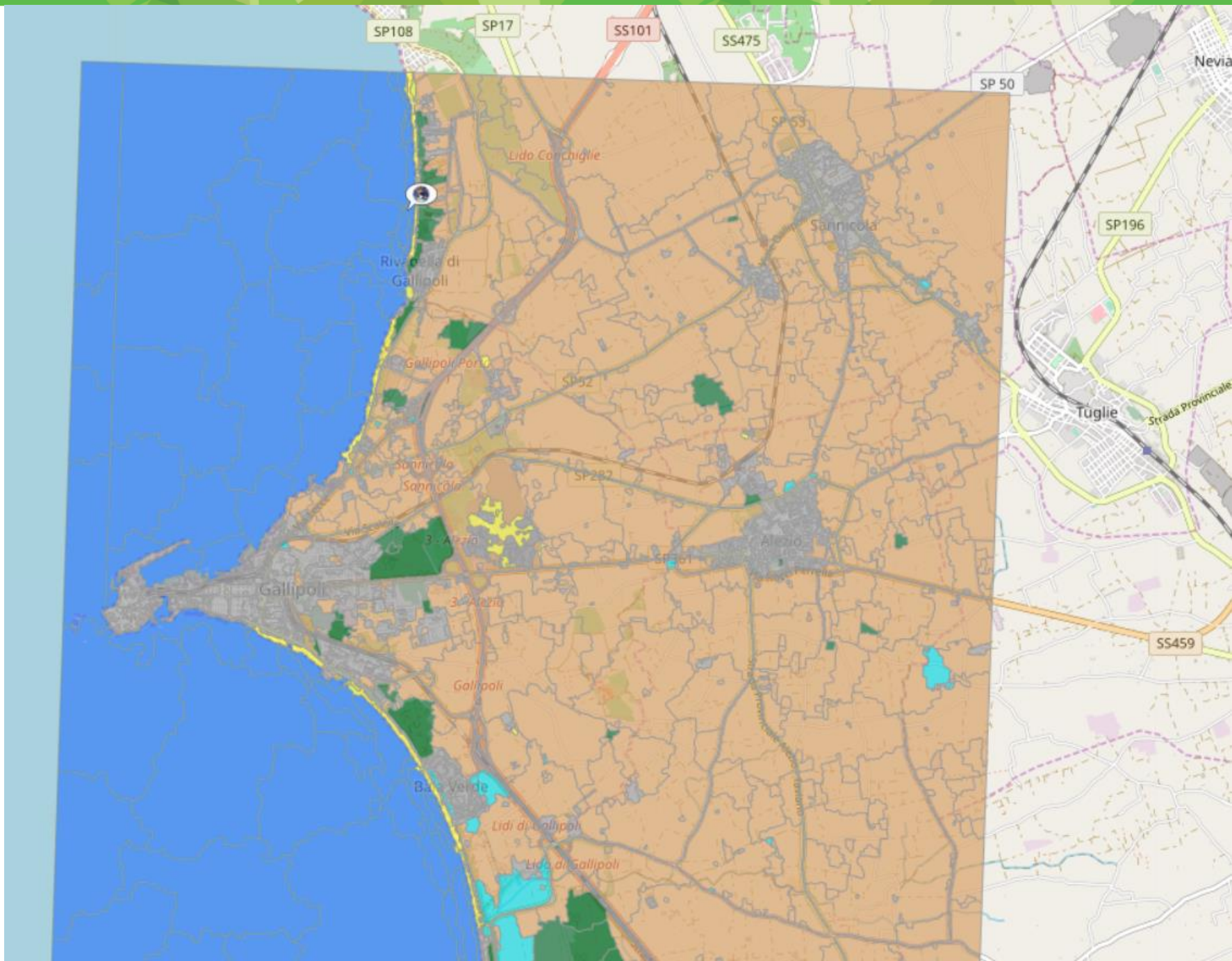
Time
Series



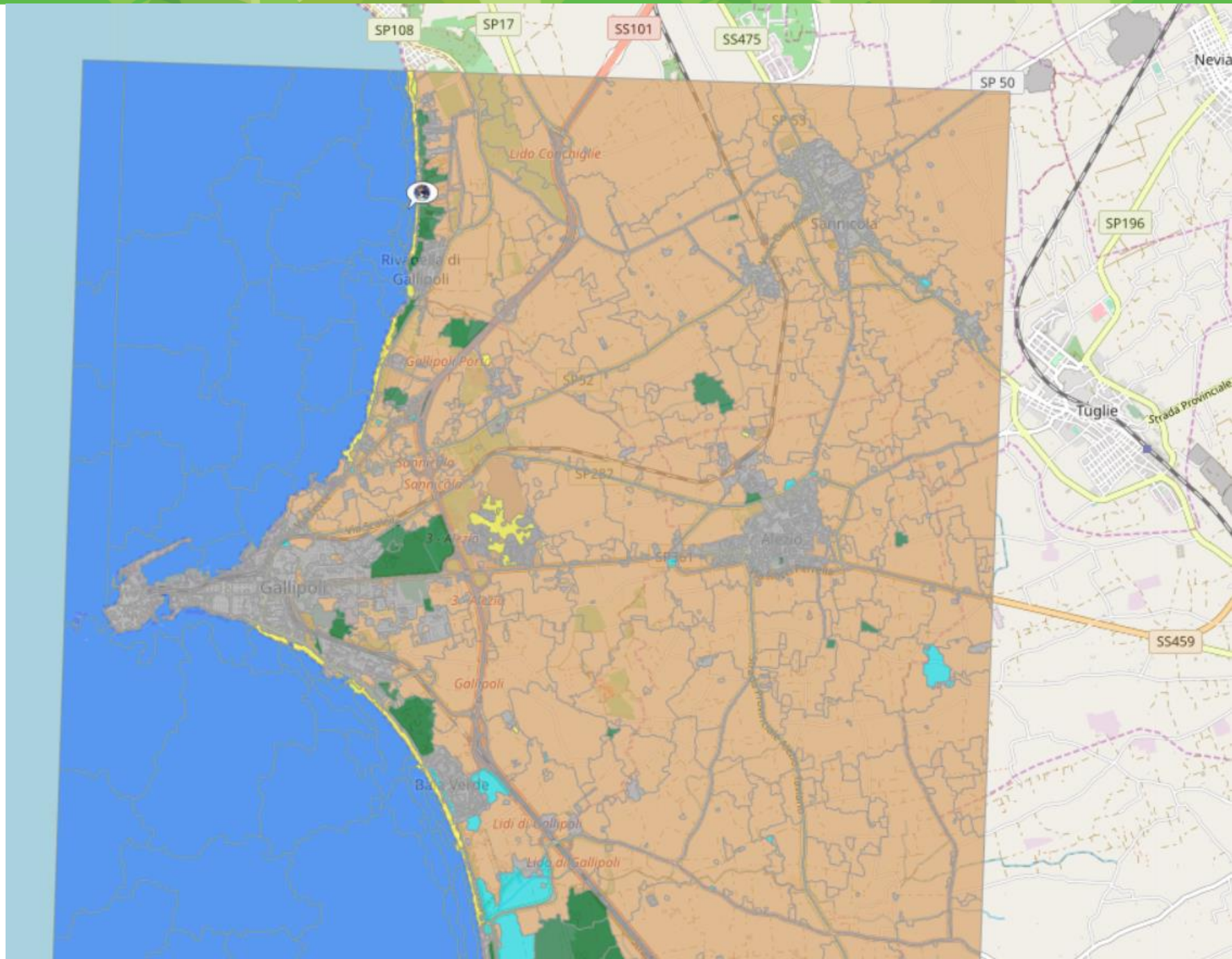
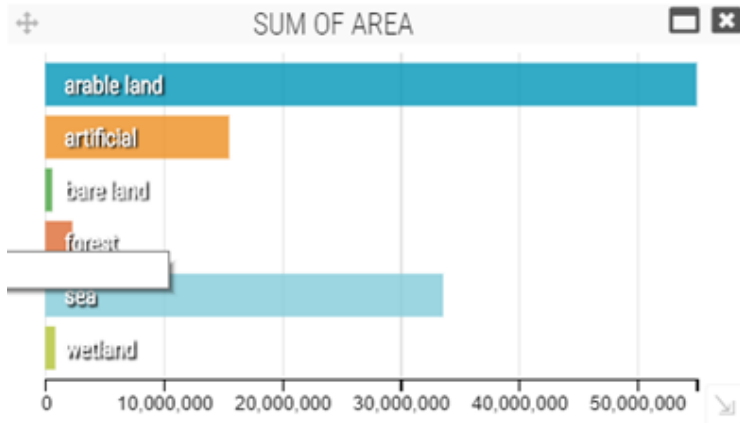
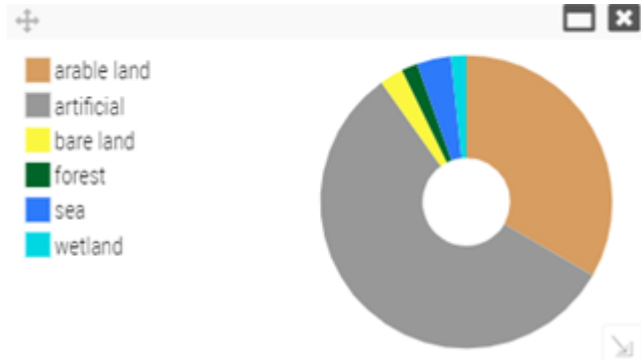
Trained
Machine



Classify



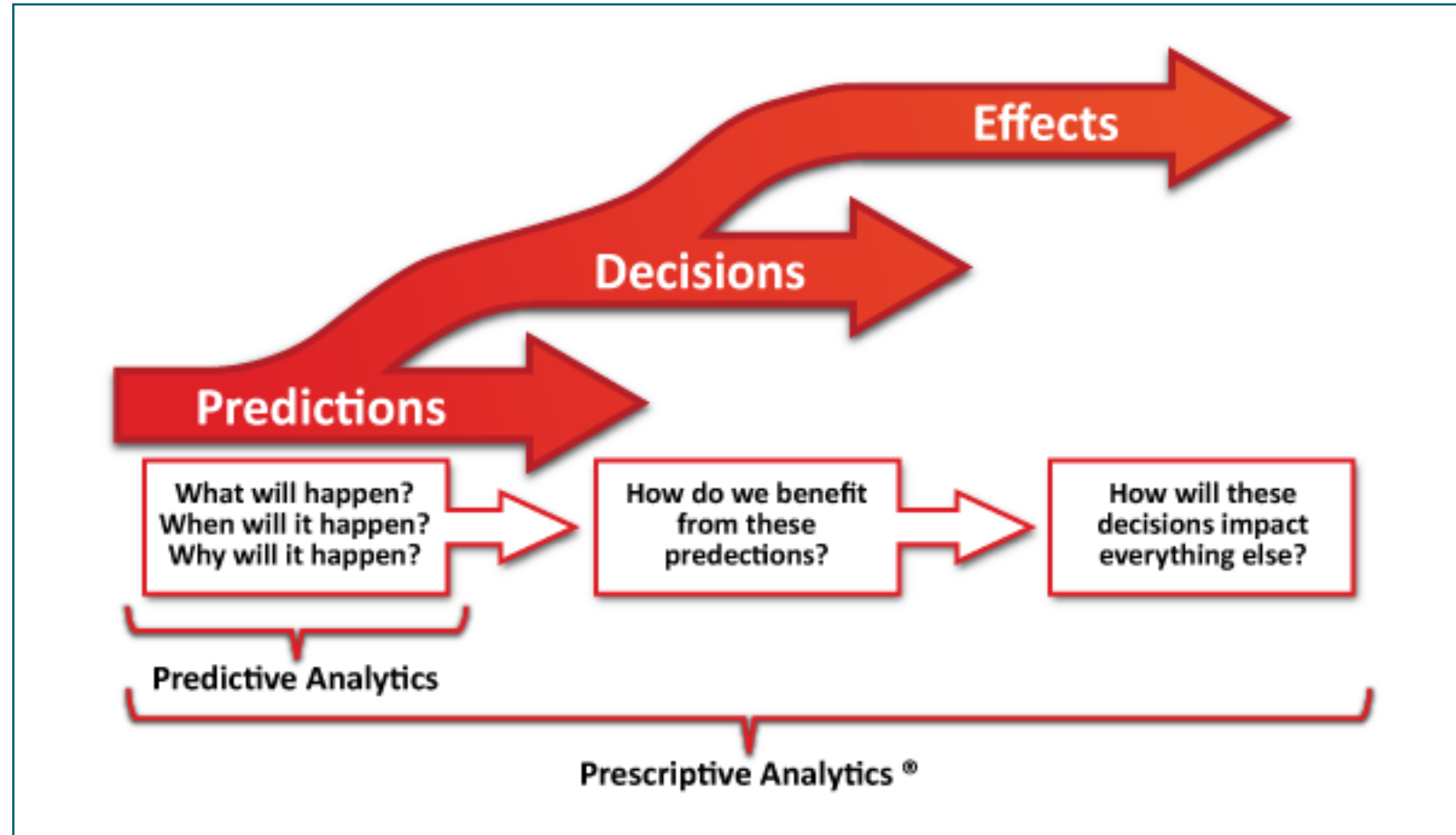
Geo-analytics



The three dimension of EO Analytics

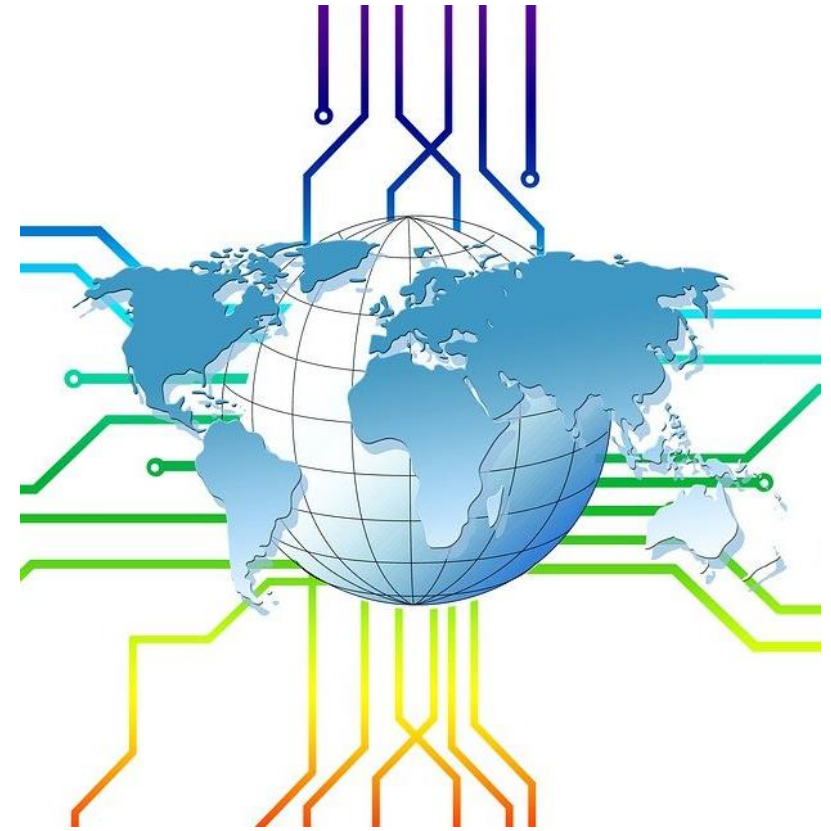
Info@aS :

- Subscription Services
- Actionable Vertical Information
- Big Data Integration
- Globally Scalable (Auto) Services



The Advent of Earth Intelligence

- Innovation in the space sector produced hardware miniaturization, standardization, and reduced launch costs
- The large amount of EO data leverage the transition from Observation to Intelligence
- These data can produce valuable analytics of Environmental, Climatic Economic and financial data



Benefit of EO for Spatial Economy

By using AI and Big Data Algorithms,
Satellites provide:

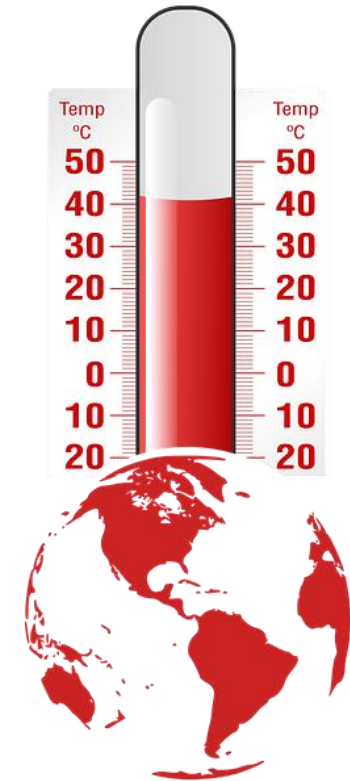
- Neutral and unbiased source of information
- Linked to assets, environmental indicators, business indicators
- Global, frequent, and real-time available
- Empower Gap-Analysis, Impact analysis, other source verification



EO Analytics Examples

Combining Earth observation and remote sensing with AI can transform how risks, opportunities, and impacts are measured for:

- **Insurance**
Climate impact on insurance premium
- **Corporations**
Accounting Environmental Impact
- **International Financial Institutions**
Monitor and evaluate investment impact
- **Food and other commodities**
Short time and long range evaluation



Insurance and Geo Analytics

Sea level rise could drive a doubling of *Average Annual Losses* (AALs) from storm surge for individual properties in coastal area 2030s, and around a 10–20 per cent increase in 1-in-200 year losses.

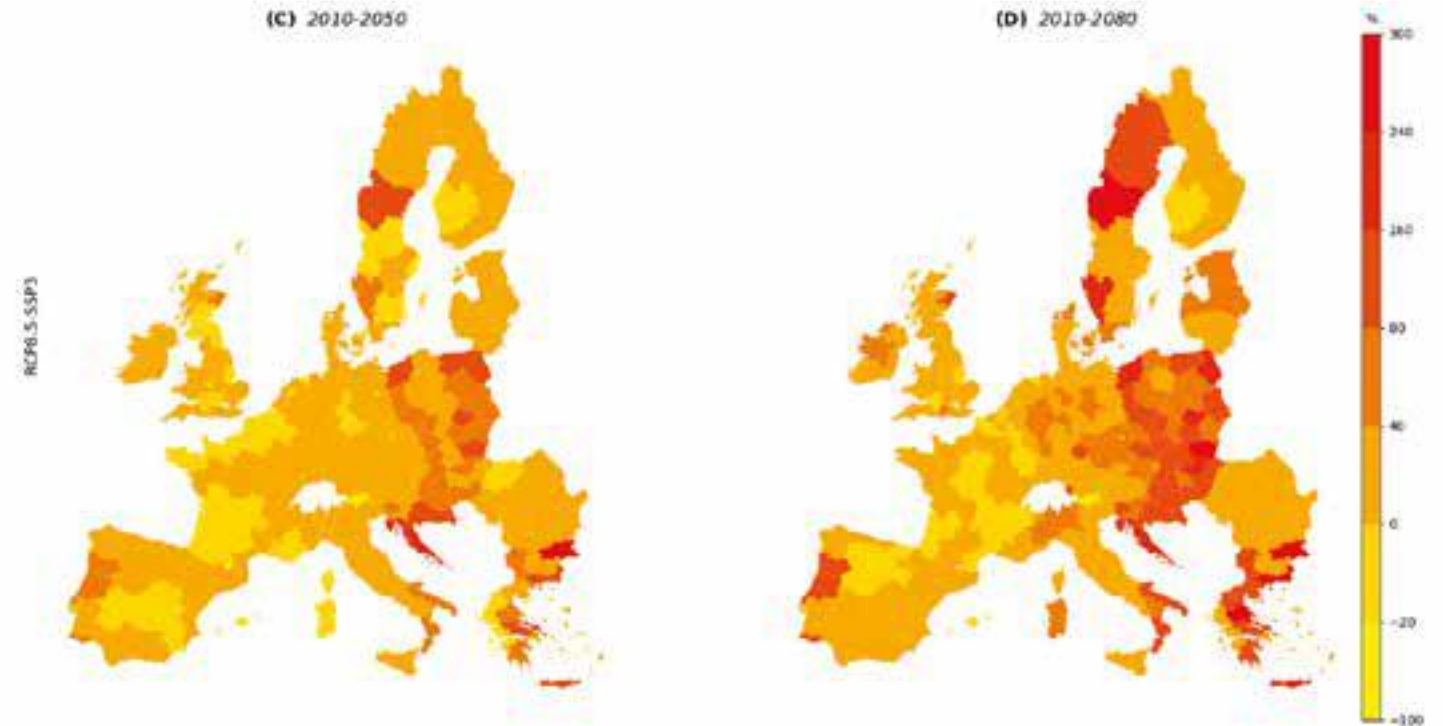
AALs from hurricane damage in the United States would increase from US\$5.5 billion to around 'US\$9.5 billion, and 1-in-250 year losses from \$85 billion to \$150 billion.



Insurance and Climate Change

Climate change will lead to economic costs.

These costs, known as the **costs of inaction**, provide key inputs to the design of new geo-analytics for different industries.

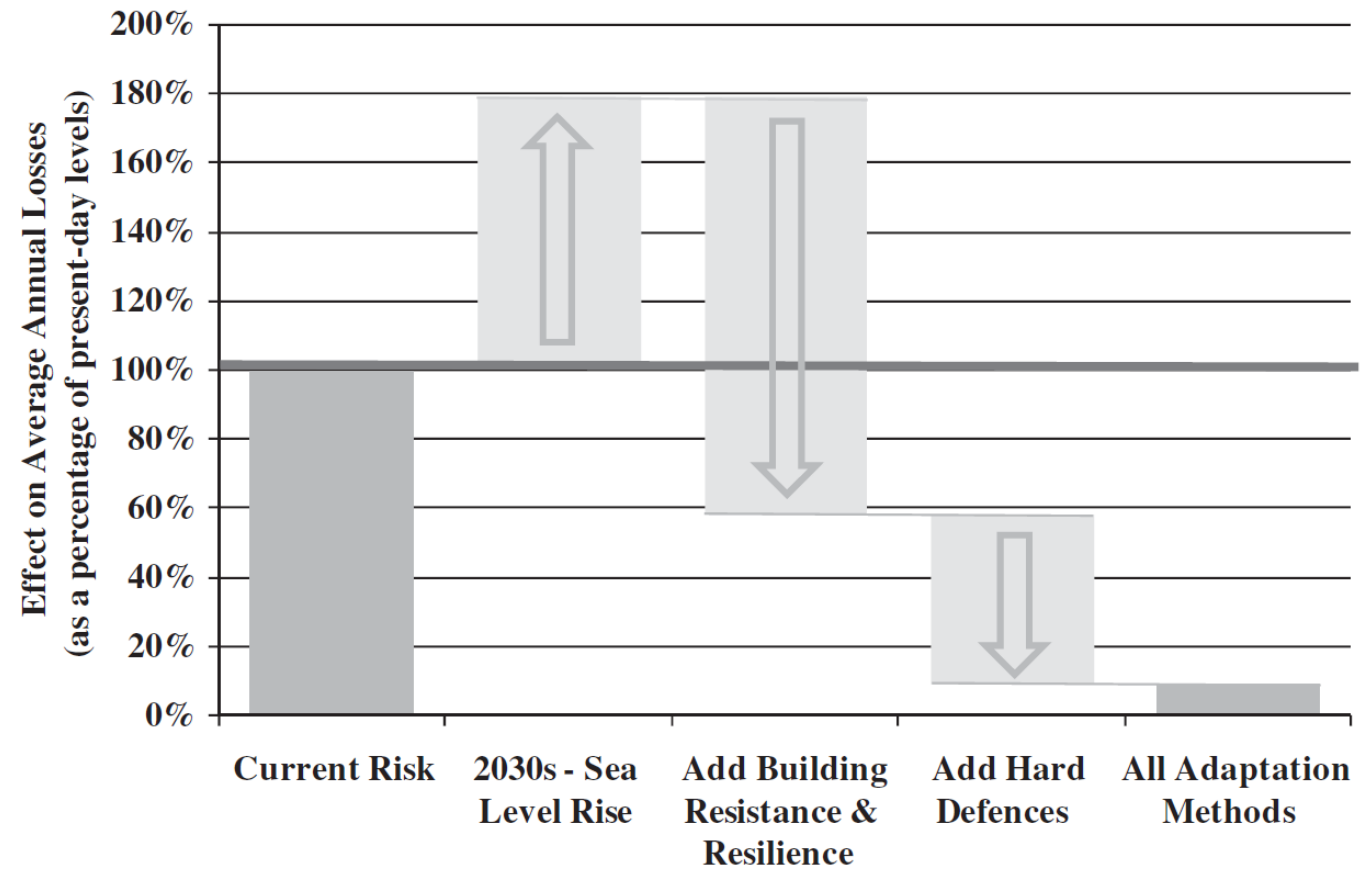


The percentage change of unaffordability under status-quo insurance arrangements for households in high risk areas under the RCP8.5-SSP3 scenarios of climate- and socio-economic change for the periods 2010–2050 (left) and 2010–2080 (right).(*)

You can't value what you can't measure

Proper mitigation can largely improve the AAL in risk insurance.

Space technology can play a key role in making available data at low marginal cost at a large geographical scale and for long temporal interval.

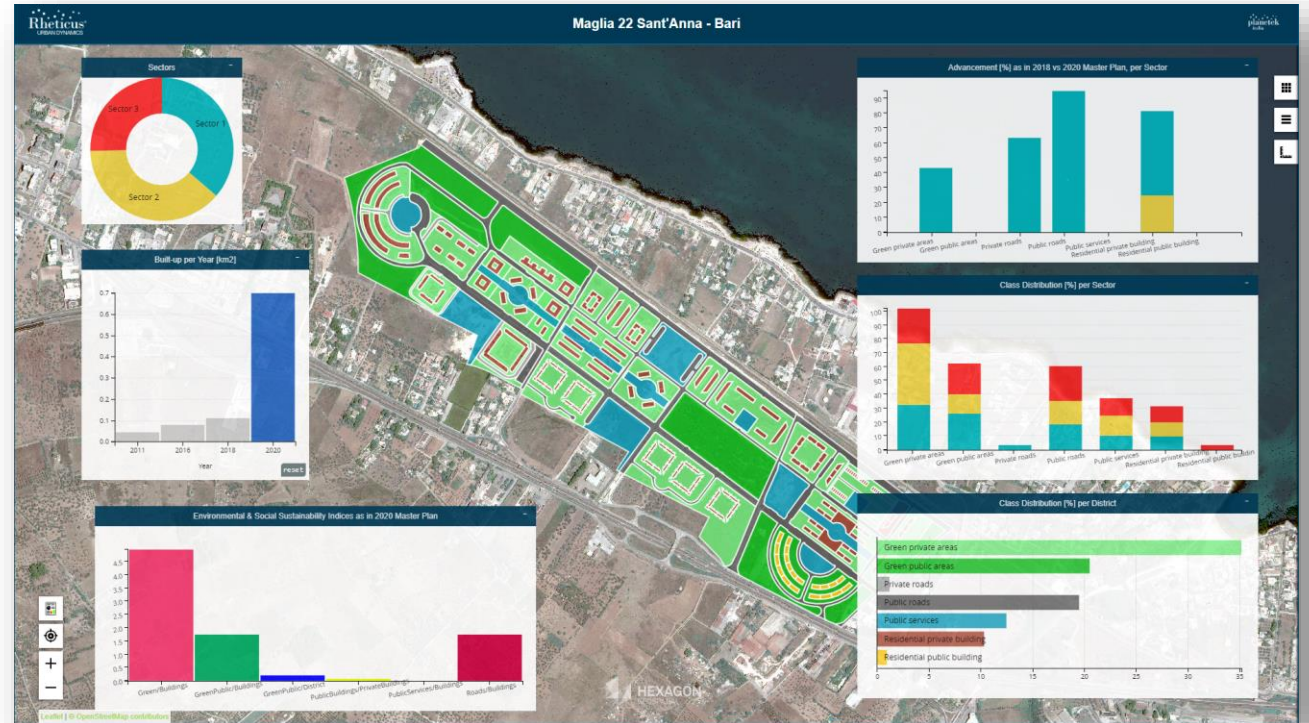


Predictive Spatial Economy

Time series of the indicators are connected with different regression approach with macroeconomy indicators:

- Using *Deep Learning* we define a non linear data model
- Then the model is inverted and Earth Observation (EO) derived indicators are used to predict Economy Indicators
- GDP variation can be estimated from EO data classification

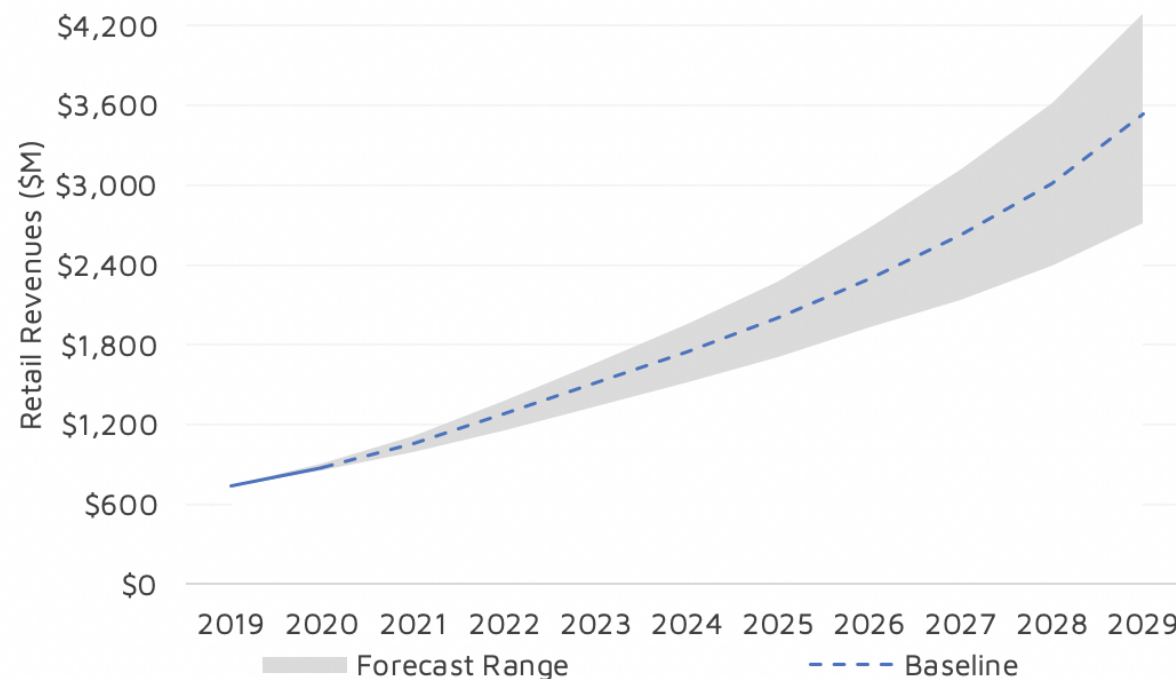
Land Cover is used as a proxy of the trade activities. AI is used in order to find proper correlation with related Economics



EO Analytics Commercial Value

“Big Data analytics via satellite will generate close to \$17.7 billion in cumulative revenues by 2028, owing to increasing demand from end users in the Transportation, Government & Military, Energy and Enterprise sectors.”(*)

Global Big Data Analytics via Satellite



Source: NSR

Conclusion

EO based Analytics allows:

- financial markets to measure and manage sustainability-related risks
- a vast range of other factors that affect risk and return in different asset classes estimation

- Asset owners will be able to test portfolios against their investment beliefs
- Asset managers will be empowered to actively engage with investees in a timelier manner
- Corporates will be able to verify internal data collection, compare performance with peers.
- Regulators will be able to more accurately assess environmental and social systemic risks within the financial system
- Policymakers will be able to track progress against the Paris agreement and COP26 climate pact
- A huge market is opening for this kind of Analytics



THANK YOU

Massimo Zotti

✉ zotti@planetek.it

🐦 [@massimozotti](https://twitter.com/massimozotti)

in [/in/massimozotti](https://www.linkedin.com/in/massimozotti)

