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Image Sea Solutions

Satellite Earth Observation Brought to You!

Inspire Conference. Strasbourg (France)

September, 2017

Big data to assure environment protection. Special reference to the Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004, on environmental liability with regard to the prevention and remedying of environmental damage. Challenges and potential solutions.

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I. Big Data as an effective tool to protect the environment.

II. Environmental law instruments. 2007/2/EC Inspire Directive + Directive 2004/35/CE on environmental liability, prevention and remedying of environmental damage.

III. Challenges and potential solutions.



I. Big Data as an effective tool to protect the environment.

Big Data: huge data sets requiring new software applications to treat, store and perform the desired task or mission

Current Annual Data Volume: 2013 up to 30 PB (1024*1024GB) of data. 3,5 billion files / day, obtained from satellites, ships, aircrafts, buoys

Marine Big Data Projects: Argo (more than 10 thousand buoys deployed), Neptune-Canada, GOOS, OOI

NASA Satellite Aquarius: In 2 months collects more data than all ships and buoys in 125 years.



I. Big Data as an effective tool to protect the environment. (cont)

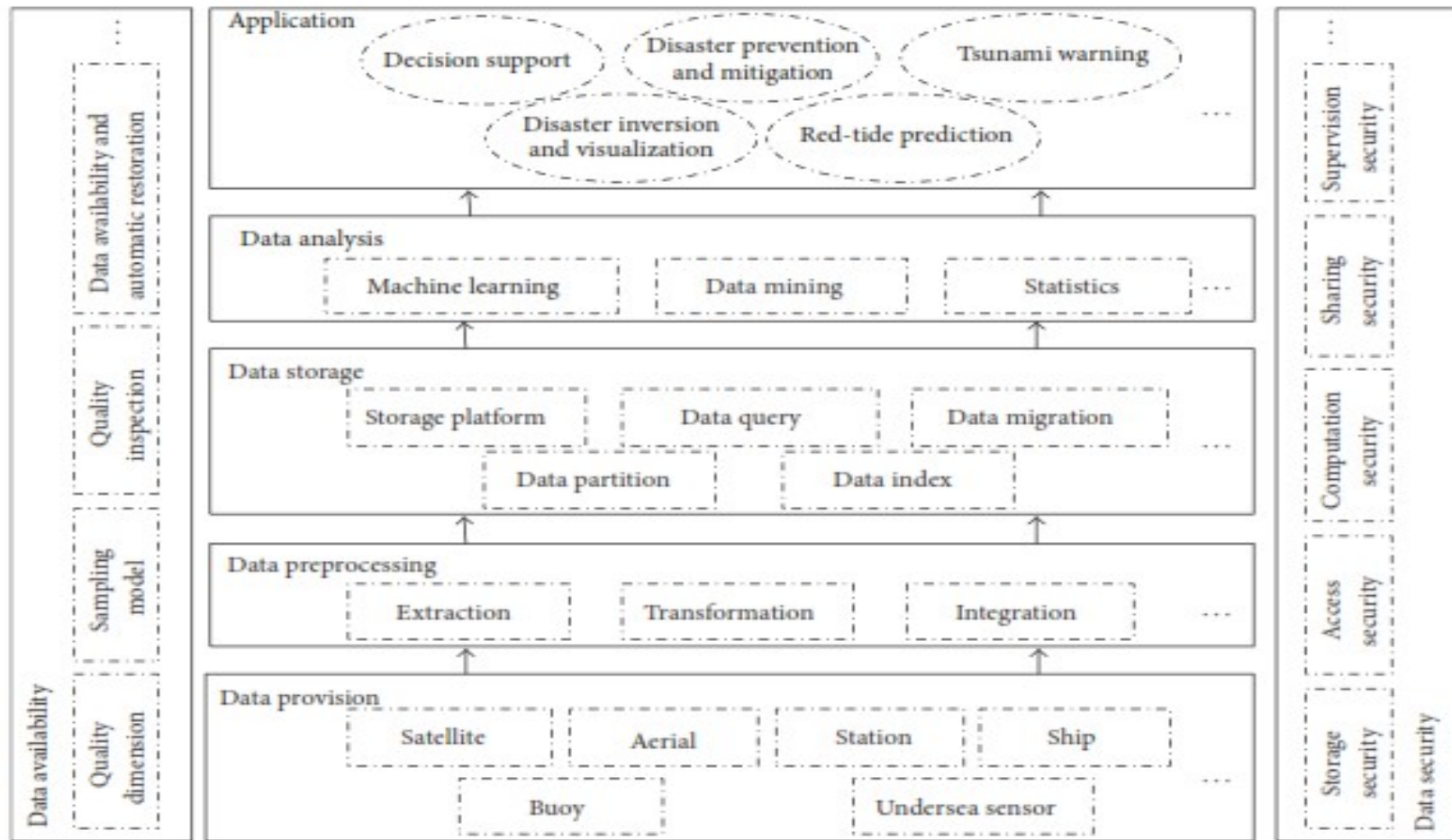
Marine Big Data: More focused and greater effectiveness; Argo found out that Earth's hydrological cycle has increased from 1950 to 2000 as revealed by Ocean salinities.

Uses: Acoustic remote sensing data determines marine distribution of the seafloor / preceding seismic activities (NEPTUNE-Canada)

Why marine Big Data?: a) Diverse data sources, b) Temporality and spatiality, c) High dimensional fields of research (physical, chemical and biological oceanography, marine environment and marine economy), d) Huge Volume, e) Requires Marine Secure Data, f) Requires Confidentiality and strategical study.



I. Big Data as an effective tool to protect the environment (cont)





II. Environmental law instruments

2007/2/EC Inspire Directive:

Article 3 defines spatial data' means any data with a direct or indirect reference to a specific location or geographical area;

AND

'spatial data set' means an identifiable collection of spatial data;

served among States as "metadata" (data containing other data, discovered, stored and used)



II. Environmental law instruments (cont)

Directive 2004/35/CE on environmental liability, prevention and remedying of environmental damage.

Article 1. *“establish a framework of environmental liability based on the ‘polluter-pays’ principle, to prevent and remedy environmental damage.”*

Annex I. Significant adverse changes if/when data refers to: — *the number of individuals, their density or the area covered, — the role, of the particular individuals or of the damaged area in relation to the species or to the habitat conservation, the rarity of the species or habitat — the species' capacity for propagation — the species' or habitat's capacity, after damage has occurred, to recover within a short time, without any intervention other than increased protection measures, to a condition which leads, solely by virtue of the dynamics of the species or habitat, to a condition deemed equivalent or superior to the baseline condition.*



III. Challenges and potential solutions. Can Big Data be used to determine environmental marine variations?

- a) *in Data Management: Data Capture, Storage, Analysis, Commercialization?*
- b) *Humans hazards: Oil spilling / Drilling / Fracking / Sound pollution / Marine Trade / Ship Routes / Marine Overexploitation / Overharvesting*
- c) *Solutions if Big Data is Properly used could constitute an evidence to prove statistically that a significant variation in the marine environment constitutes a hazard.*
- d) *Educating with environmental values to prevent, assess and develop new software strategies.*

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Thank you!

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