



SPACE SERVICES FOR VITAL SOCIETAL FUNCTIONS

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A GLOBAL GAME CHANGE THROUGH SPACE

Satellite constellations and “supersats” provide global transparency, connectivity and positioning



Credit: Vricon

Earth observation

Multisensor constellations:
Close to real time information
of the planet's land, oceans
and atmosphere.
Intense global collaboration



Positioning & Navigation

Global GPS - systems coexist
and compete to provide
accuracy and resilience



Communication

Satellite Constellations:
Global access to internet,
enabling a sustainable big
world on our small planet.



Exploration

New cost effective technology
provide new opportunities to use
and explore Space for the
benefit of earth

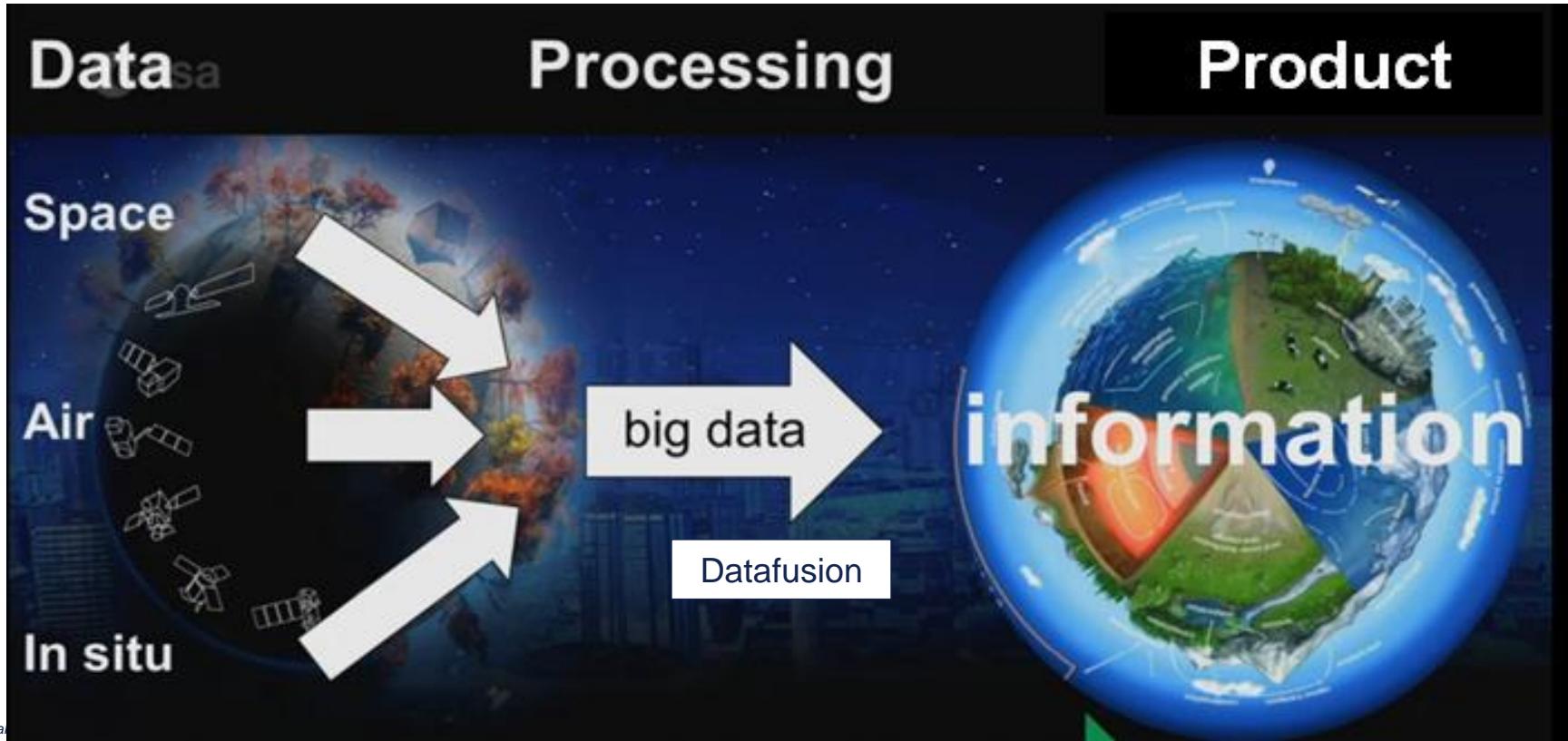
Enabling sustainable development of our planet







SPACE SERVICES FOR VITAL SOCIETAL FUNCTIONS



GLOBAL WATCH CENTER

A daily recognised trustable situation picture of the state of the planet



Examples:

- Global Sustainability; *Supports All 17 UN sustainability goals*
- Managing Climate Change
- Regional & Global Development
- Forestry
- Agriculture
- Maritime & Fishery
- Maritime Security,
- Ice
- Environmental Security
- Ocean Ecology
- Carboxide Emissions
- Draughts, Water Supply
- Crises Management
- Societal Planning
- Migration
- Nature & Environment
- Ecological Diversity
- Security & Defence
- Health
- Transportation
- Energy
- Resarch & Technology
- Etc



Why a Global Watch Centre ?

- We are reaching the reflction point...
- UN and others have need for close to real-time data re global and environmental issues

VARFÖR GWC?



- Jorden är nära en mättnadspunkt vad avser människans påverkan på de stora ekosystemen med många olika stora problem som följd.
- FN och andra organisationer, liksom stater, institutioner och industri har behov av tillförlitlig snabbt uppdaterad data i begriplig presentationsform. Dialog i FN mycket positiv.
- Ett "GWC" i någon form Nödvändigt för att nå klimatmålen – men också så mycket mer:
- **Med hjälp av satellitdata i kombination med stöd-data kan en samlad bild av tillståndet på Jorden skapas; ett "planetariskt öga" för en samlad, verifierbar dagligen uppdaterad lägesbild av en mängd skeenden på vår planet, såsom:**
 - Uppföljning av FN:s 17 hållbarhetsmål
 - Naturkatastrofer, akuta miljöhändelser, extrema väderfenomen med mycket mera
 - Flyktingströmmar, migration, orsak och verkan
 - Maritim miljösäkerhet, hantering av miljökatastrofer såsom oljespill etc
 - Naturresursutnyttjande, såsom skogs- och jordbruk
 - Forskning i ett mycket brett spektra områden
 - Kommersiella applikationer
 - Katastrofhanteing, proaktiv och reaktiv
 - Etc...



GLOBAL WATCH CENTER -

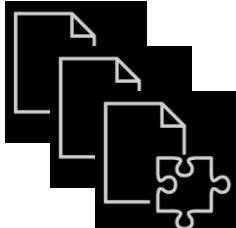
Data fusion, Big Data Analyzes and advanced presentation modules

Data from existing and coming satellites on the status of the planet (land-mass, oceans, atmosphere) are gathered. Today, about 150 TB data per day.



Satellite Data

Supporting data from other sources are added



Supporting Data

User Questions
Output Requirements



AI support



Data Processing
Analyzes

Data management



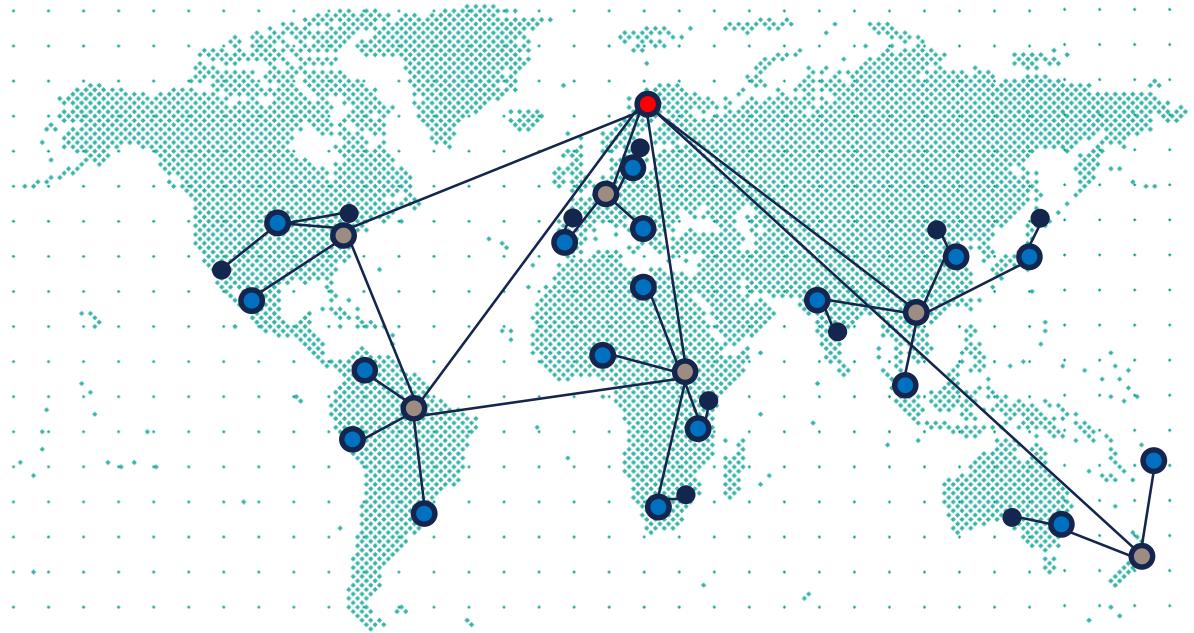
Distribution/
presentation

The Data is merged and analyzed in a way that allows for search of data and to be presented for different purposes

A Global Recognized Situation Picture is produced and distributed.

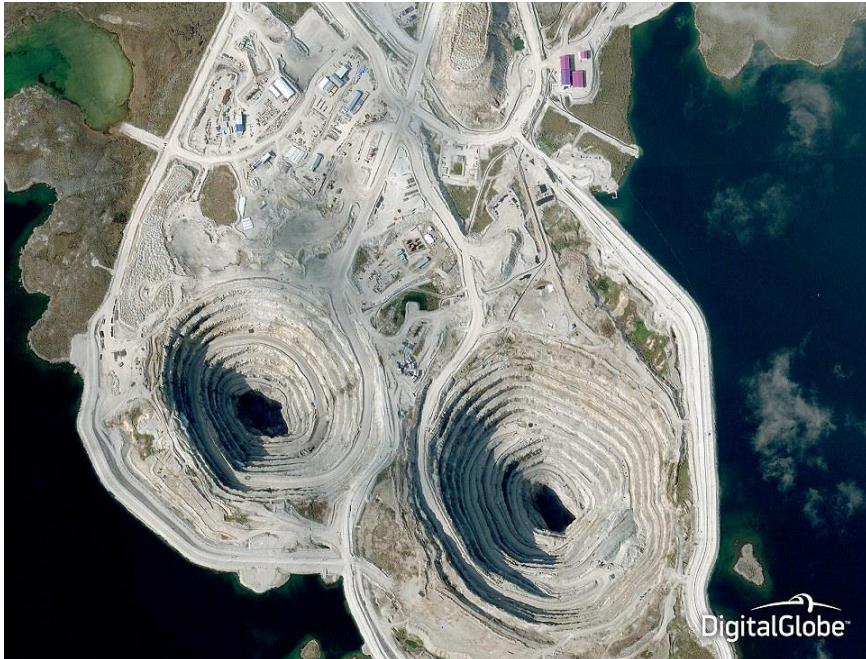
- Flexible for different usage
- Trustable (no fake data)
- Easy to use for different purposes; long term science and immediate actions

GWC DISTRIBUTION (4-LAGERSMODELL)

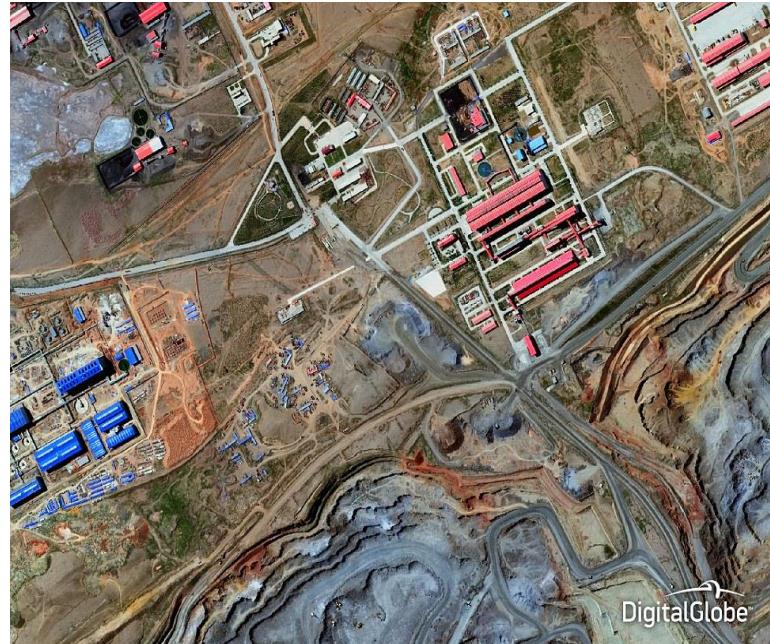


- GDN – Global Distribution Node
- RDN – Regional Distribution Node (per kontinent, under FN)
- LDN – Local Distribution Node (per land)
- LUN – Local User Node (universitet, industri och liknande)

EXAMPLE MINING



Satellite imagery of operational mines, such as The Diavik Diamond Mine in Canada, (pictured) allows for environmental impact assessment

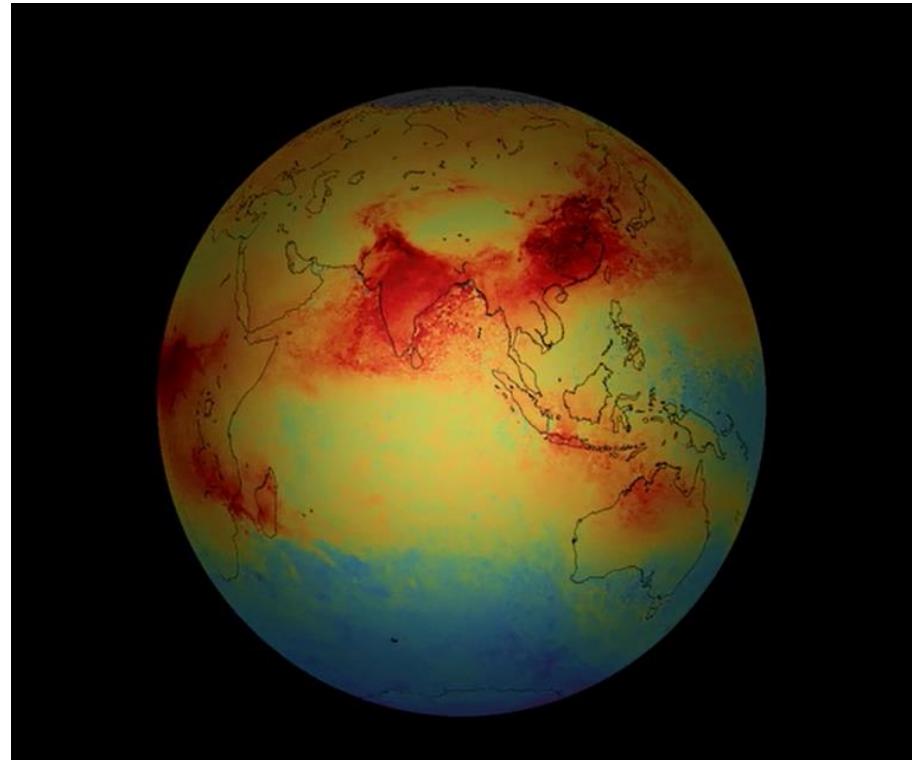


*The progress of mining can be monitored over time.
Above, Bayan Obo Mining District, western Inner Mongolia,
China*

EXAMPLE CO₂



The Henan Coal Mine and power plant in China. Satellite shots can indicate the plant's emission and fuel



Carbon dioxide streams followed and measured from space

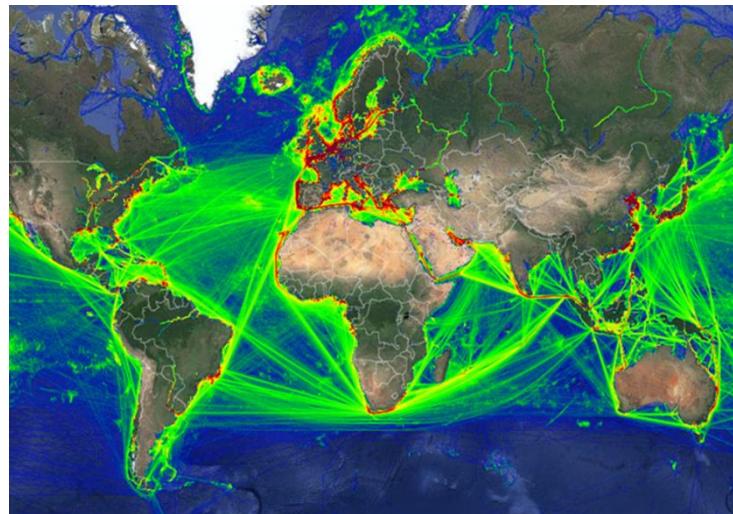
DIGITAL 3 D MAPPING - TO MERGE NEW DATA INTO



3 D MAPPING FOR SOCIETAL PLANNING

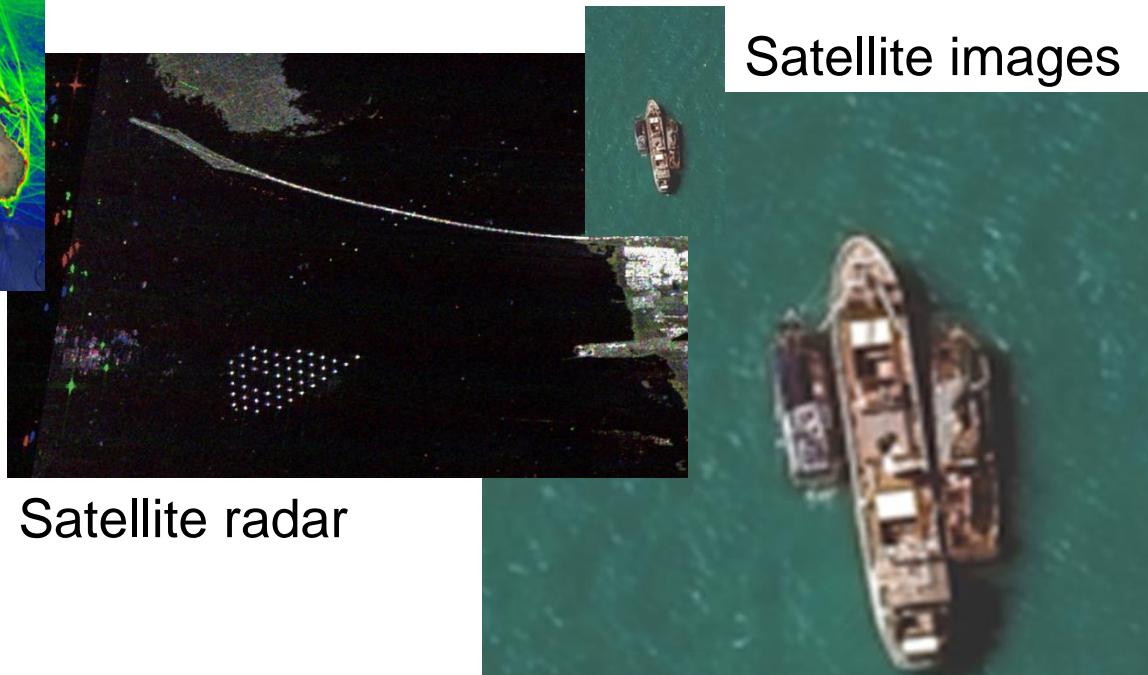


MARITIME SECURITY – HUMAN TRAFFICKING & ILLEGAL FISHERY



AIS – Global Shipping

Saved 2500 slave workers
Stopped illegal fishing and human trafficking

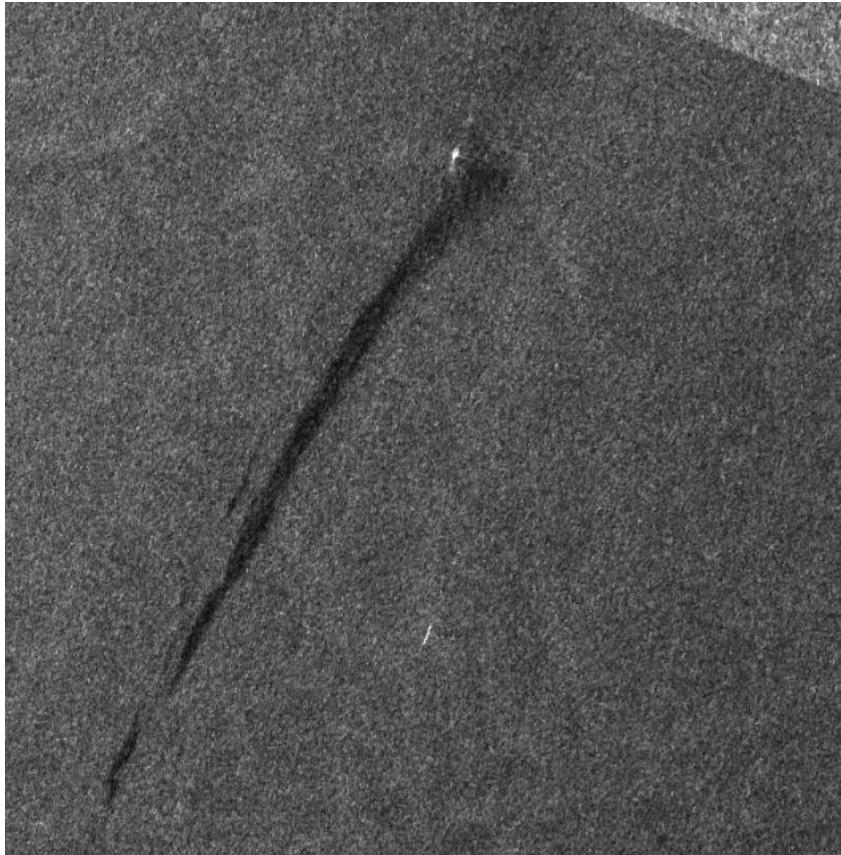


Satellite radar

OILSPILL VIA RADAR SATELLITE



- Oilspill detected in the arctic by a chinese radar satellite, managed by norwegian resources
- Near-Real Time (NRT) access to Synthetic Aperture Radar (SAR) data from satellites is today possible.
- Today, access go through a chain of planning, order, download, process, analyse and distribute data
- For GWC, this will be done more automatically so that large amounts of data from many different satellites can be used through one system.
- By that, images from photo, IR and radar satellites can be combined and used for detection, identification and to manage efforts to solve the situation





THANK YOU FOR YOUR ATTENTION!

