



Earth observation R&I in support to environmental policies

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Content of presentation

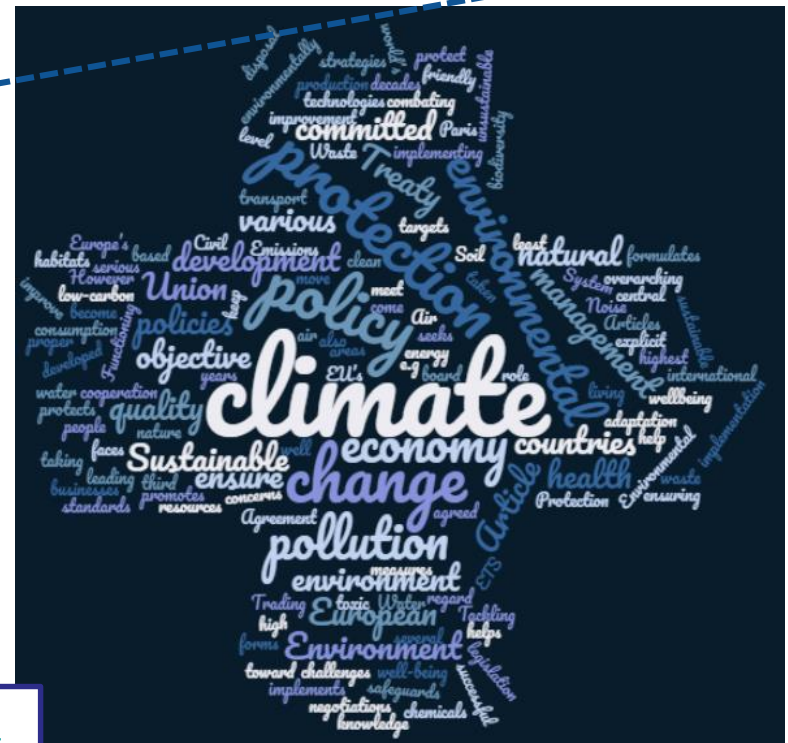
1. EU Environmental Policies
2. EO & R&I
3. Future challenges



EU Policies

Environment and Climate Change

 Agriculture	 Audiovisual and media	 Budget	 Competition
 Consumers	 Culture	 Customs	 Development
 Economic and monetary affairs	 Education, training, youth, sport	 Employment and social policy	 Energy
 Enlargement	 Enterprise	 Environment and climate change	 External relations
 External trade	 Fight against fraud	 Food safety	 Foreign and security policy
 Humanitarian Aid and Civil Protection	 Human rights	 Information society	 Institutional affairs
 Internal market	 Justice, freedom and security	 Maritime Affairs And Fisheries	 Public Health
 Regional policy	 Research and innovation	 Taxation	 Transport





EU Environmental Policies

- Climate change and the environment
- Biodiversity, nature and soil
- Water protection and management
- Air and noise pollution
- Resource efficiency and waste
- Sustainable consumption and production
- Chemicals

More than **40 years of policy**

- The Environment Action Programmes

- **Horizontal strategies**

- Sustainable development
- Growth and Jobs 2020
- EU biodiversity strategy

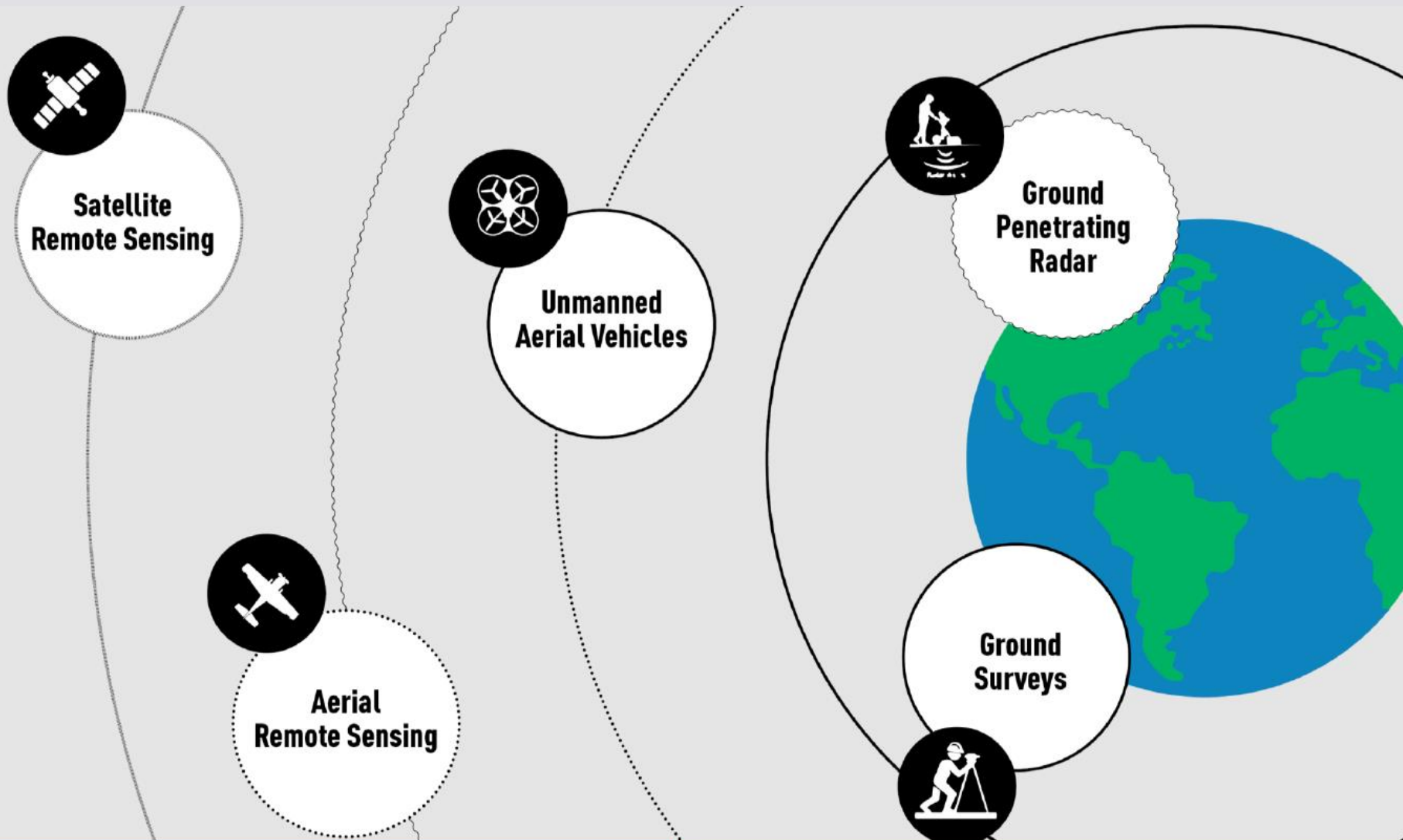
- Environmental **impact assessment** and **public participation**

- **International** environmental **cooperation**

- Implementation, enforcement and **monitoring**

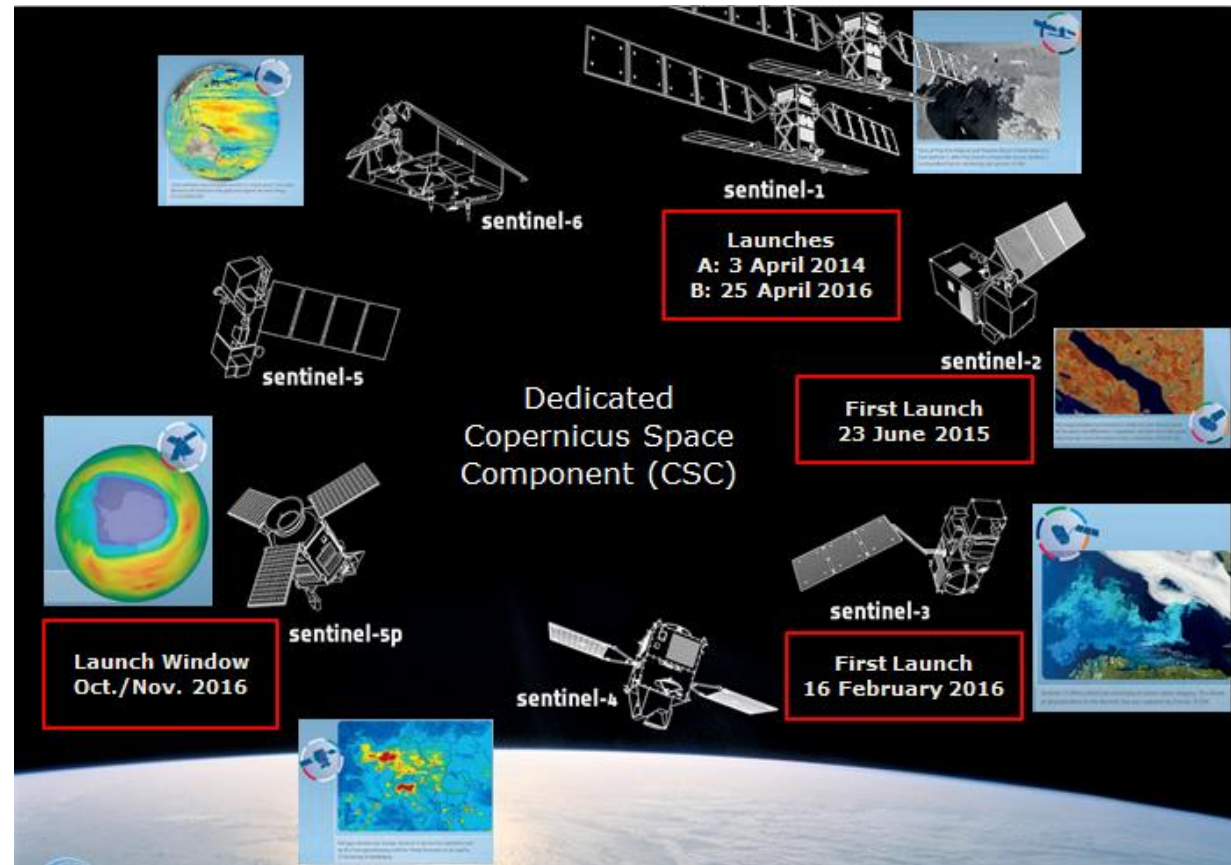
**SEVERAL HUNDRED DIRECTIVES,
REGULATIONS AND DECISIONS ARE IN
FORCE TODAY**

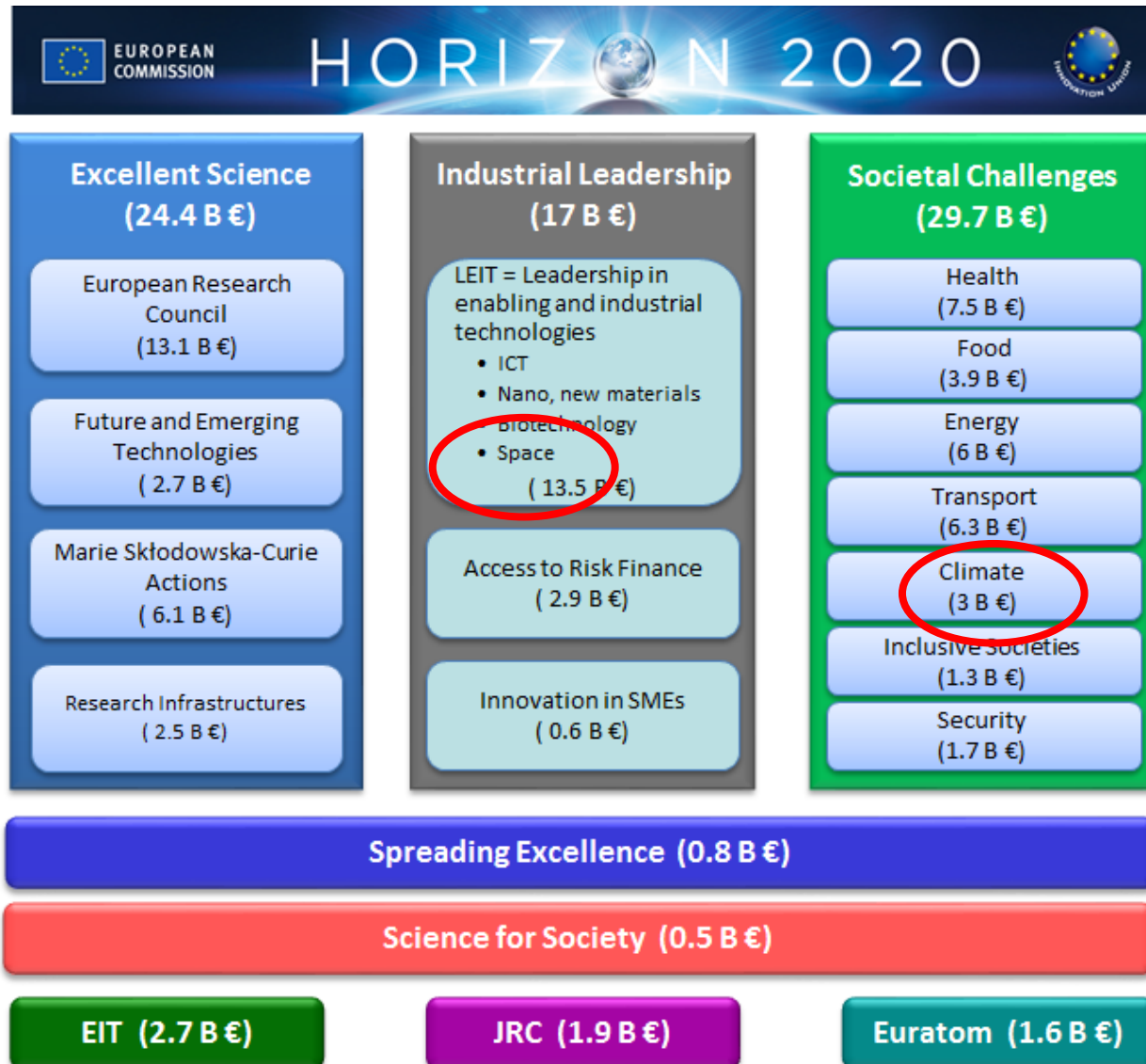
Earth Observation



Courtesy Sanjay Kumar

EU effort in Earth Observation





**77 billion EUR
from 2014-2020**

Horizon 2020: a tool for achieving the SDGs & supporting EU policies

- *A common ground for engaging all countries and different partners in the implementation of a universal and transformational agenda*
- *H2020 promotes sustainability in Europe and globally*
- *Its 60% expenditure commitment to Sustainable Development and 35% to Climate Change place the EU-funded research at the heart of the 2030 Agenda*
- *H2020 openness to the world is an opportunity for increased international R&I cooperation in support of the SDGs*



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EO contribution to



THE GLOBAL GOALS
For Sustainable Development

MYRRH Design © 2017



Courtesy Mark Noort HPC Int.





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HOME



2 ZERO HUNGER



Target 2.3

By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

EO contribution to achieving target
agricultural knowledge and information systems, crop health and yield monitoring, market access, agricultural land rights, agricultural market information, site evaluation, tackling pest and diseases, fertilizer advice, crop calendars

Indicator 2.3.1

Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size

Monitoring of indicator with EO
parcel identification and crop monitoring

Target 2.4

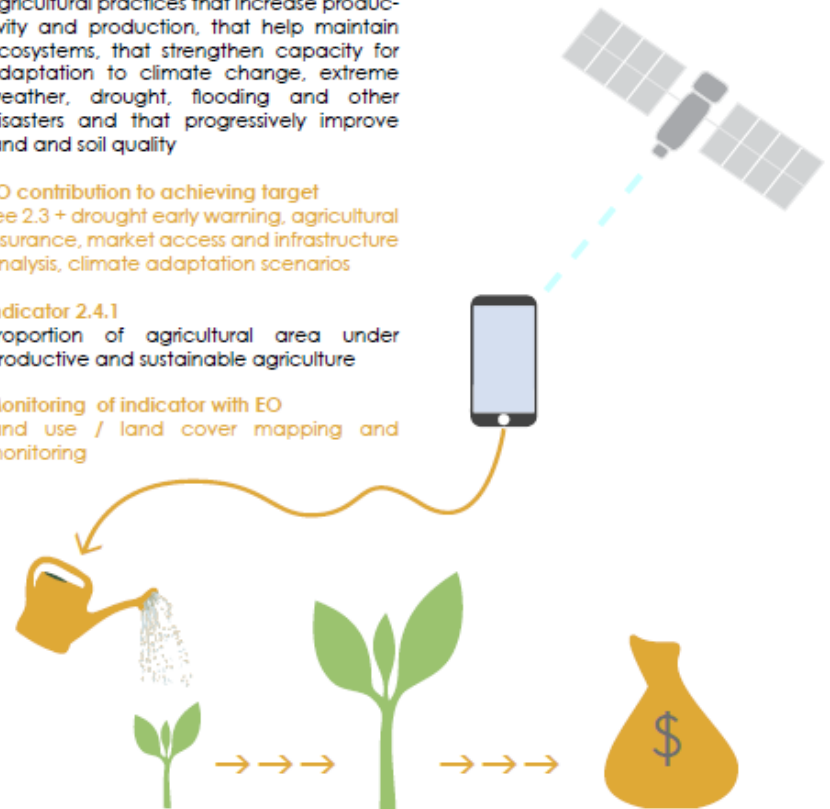
By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

EO contribution to achieving target
see 2.3 + drought early warning, agricultural insurance, market access and infrastructure analysis, climate adaptation scenarios

Indicator 2.4.1

Proportion of agricultural area under productive and sustainable agriculture

Monitoring of indicator with EO
land use / land cover mapping and monitoring



Courtesy Mark Noort HPC Int.



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3 GOOD HEALTH AND WELL-BEING



Target 3.3

By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases

EO contribution to achieving target
early warning systems for vector-borne diseases

Indicator 3.3.3

Malaria incidence per 1,000 population

Indicator 3.3.5

Number of people requiring interventions against neglected tropical diseases

Target 3.6

By 2020, halve the number of global deaths and injuries from road traffic accidents

EO contribution to achieving target
base mapping for the identification of roads and assessment of road conditions (paved, unpaved)

Target 3.8

Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all

EO contribution to achieving target
infrastructure and population density mapping to assess access to basic services (health facilities) disaggregated by population group; base map for planning of creation of health facilities

Target 3.9

By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

EO contribution to achieving target
air quality and water quality monitoring systems; mapping of potentially dangerous infrastructure (waste management facilities, industry, mining, nuclear facilities, etc.)

Indicator 3.9.1

Mortality rate attributed to household and ambient air pollution

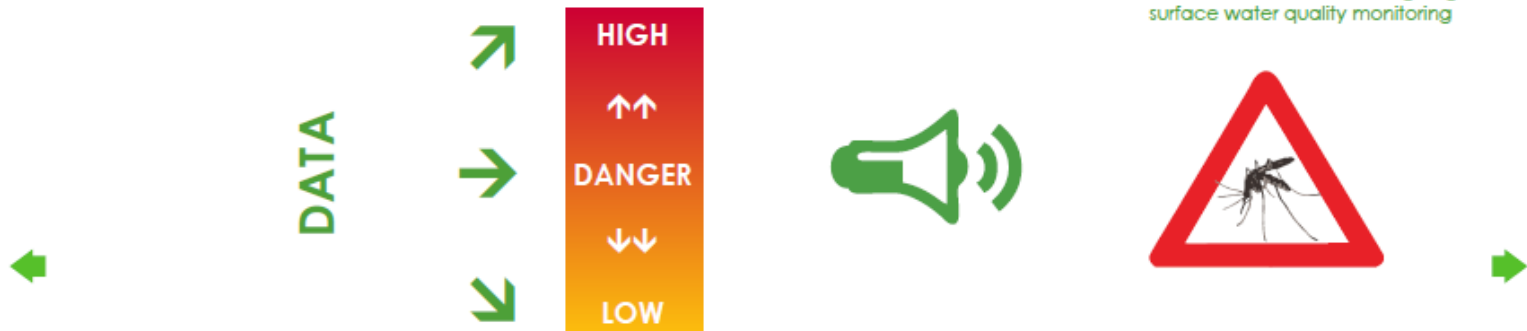
EO contribution to achieving target
air quality monitoring and early warning systems

Indicator 3.9.2

Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)

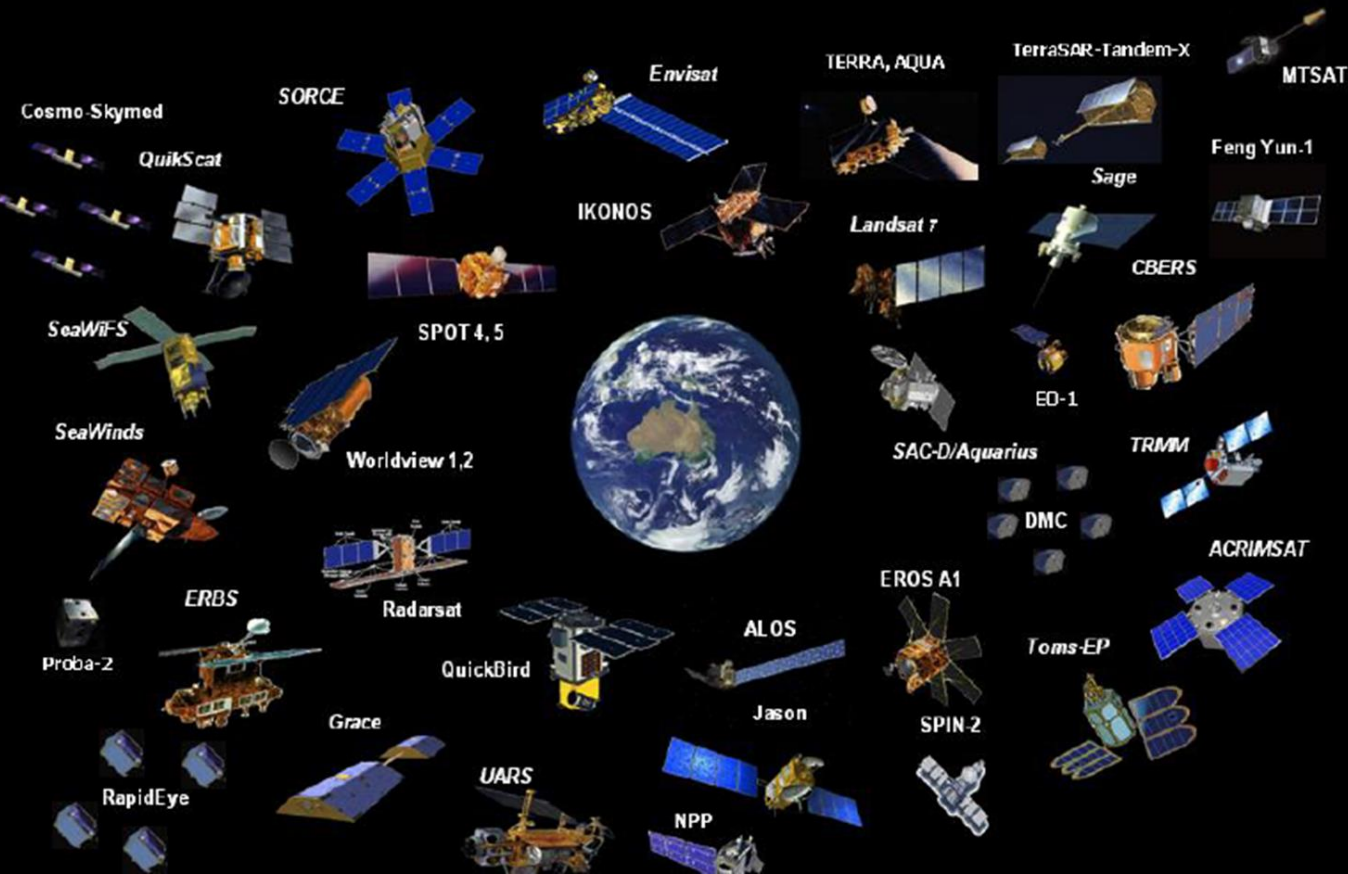
EO contribution to achieving target
surface water quality monitoring

Courtesy Mark Noort HPC Int.



The capacity to observe the Planet is radically evolving and this trend is accelerating

55 CEOS Agencies Operate 131 EO Satellites
300+ sensors and measurements



EU R&I in support of policy makers

Move from stand-alone observation data supply activities to integrated information services:

- Strong role for R&I -> integrated solution providers
 - Assimilation and interoperability (different data sources and types etc.)
 - Data fusion, automation and systemization
 - Artificial intelligence and cloud facilities
 - Integrated web based services
- Service solutions developed though R&I must involve the end users and the Commercial sector from the beginning

Examples of EO applications:



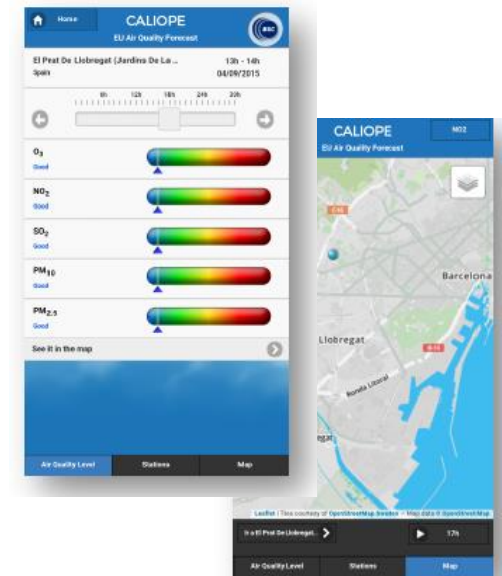
EU Horizon 2020



IATracker by IC5Team
An app to locate Invasive Alien Species using crowd-source data from citizens



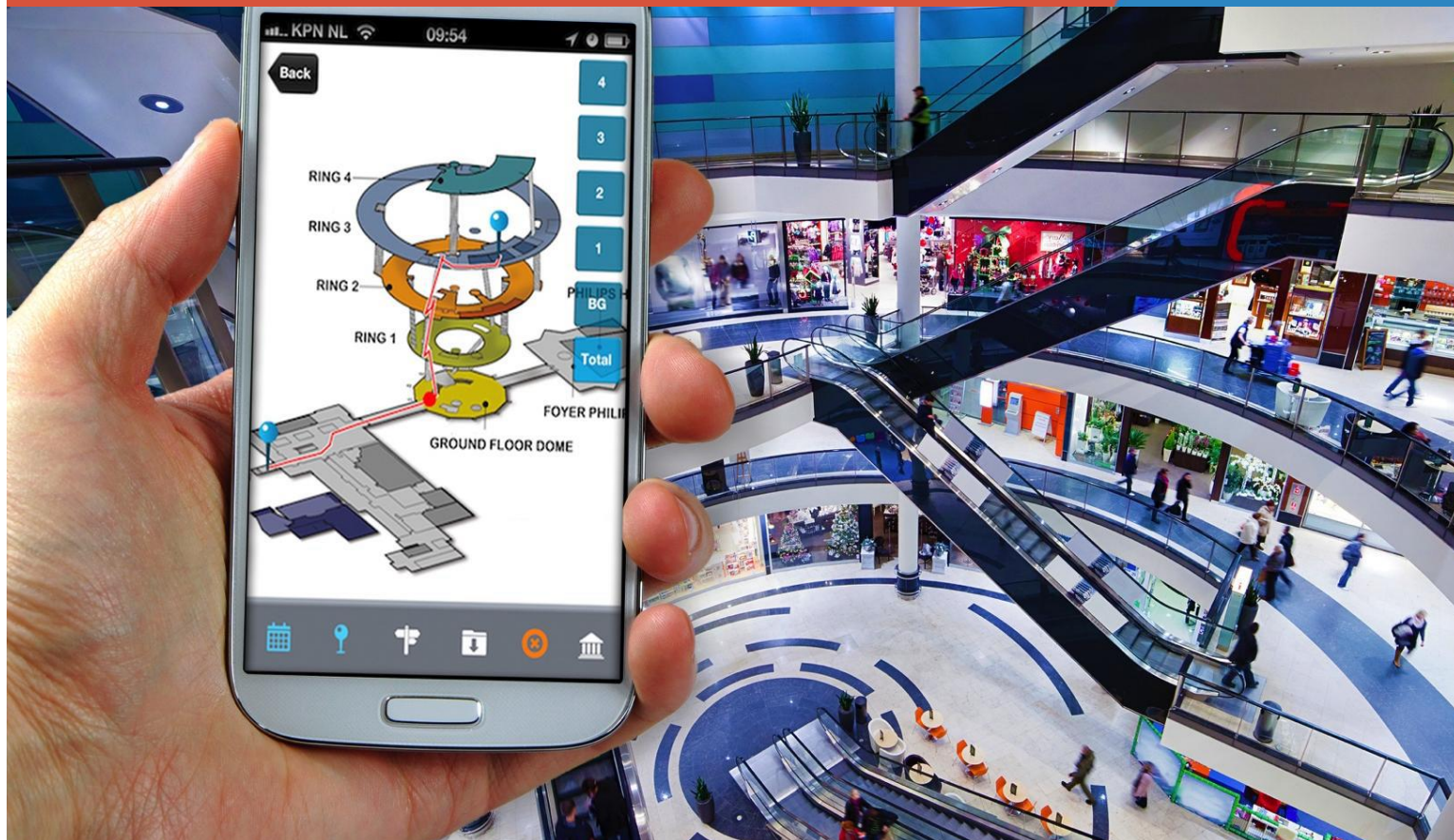
Caliope By Barcelona Super Computing Center
Air quality forecast over next 24 hours of major air pollutants



Future applications: Can be extended outdoor and benefit from EO

Indoor Location

GEOSPATIAL
media + communications



*From
Sanjay
Kumar*

Future R&I in Europe: Horizon Europe

Specific objectives of the Programme

Support the creation and diffusion
of high-quality knowledge

Strengthen the impact of R&I
in supporting EU policies

Foster all forms of innovation and
strengthen market deployment

Optimise the Programme's delivery for impact in a strengthened ERA



Pillar 1 Open Science

European Research Council

Marie Skłodowska-Curie Actions

Infrastructures



Pillar 2 Global Challenges and Industrial Competitiveness

Clusters

- Health
- Inclusive and Secure Society
- Digital and Industry
- Climate, Energy and Mobility
- Food and natural resources

Joint Research Centre



Pillar 3 Open Innovation

European Innovation Council

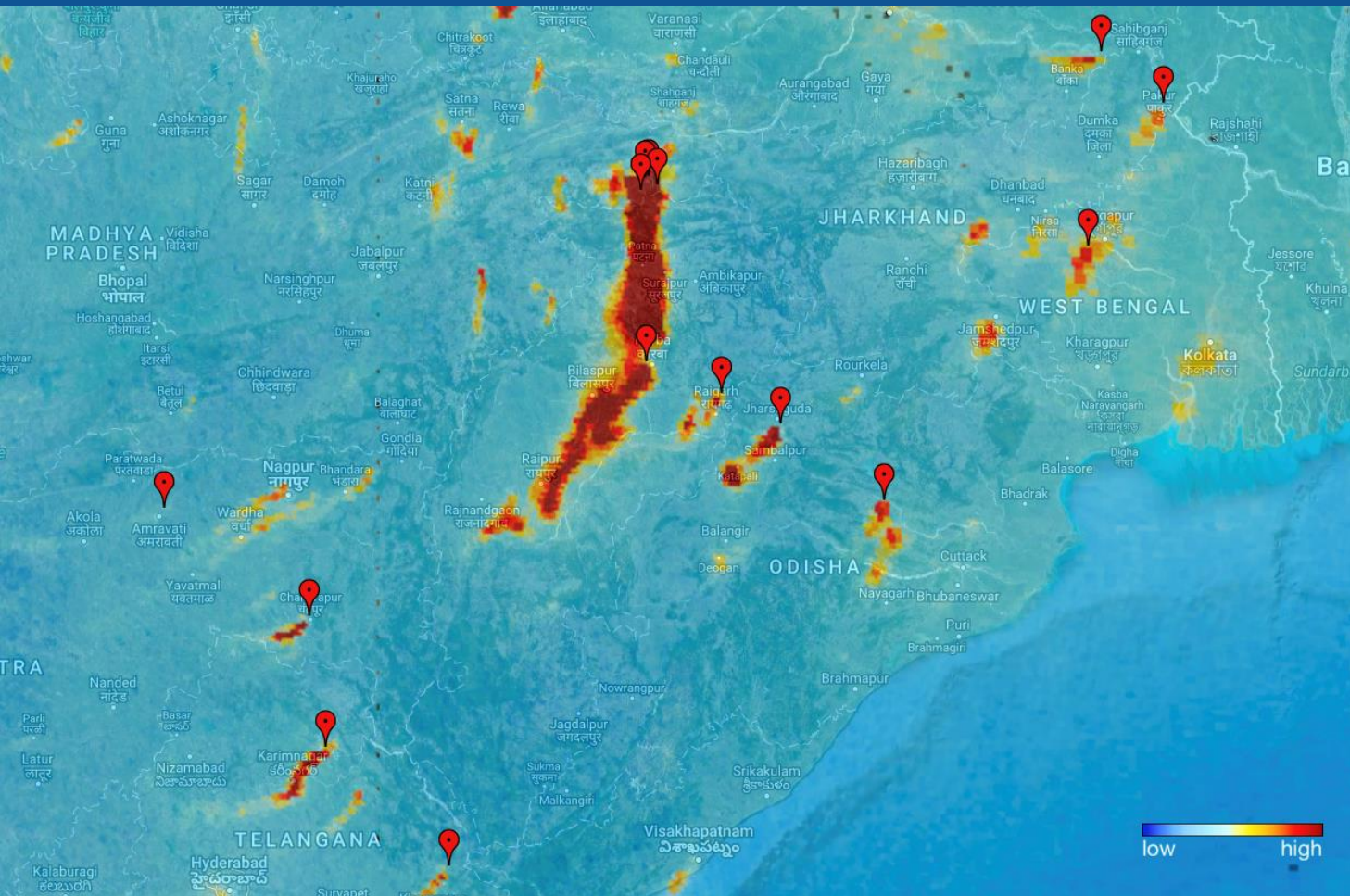
European innovation ecosystems

European Institute of Innovation
and Technology

Strengthening the European Research Area

Sharing excellence

Reforming and Enhancing the European R&I system



Thank you!

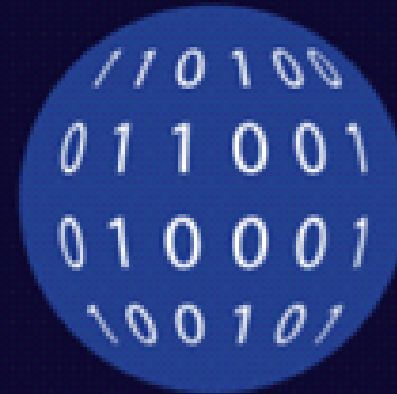
Courtesy of ESA

Pollution from power plants in India was captured by the Copernicus Sentinel-5P mission on 10 November 2017.

Proliferation of data and platforms

- DIAS
- GEOSS PLATFORM
- ESA HUBS & TEPs
- NEXTGEOSS
- RI
- INSPIRE
- EEA
- EOSC
- + many others including commercial!

- Massive amounts of data
- Full, open and free-of-charge
- Ease of access and use



**Over 10
Petabyte/year of
new data**
with just Sentinels-1,
-2 and -3 fully
operational
(data are downloaded
many times over)



7 AFFORDABLE AND CLEAN ENERGY



Target 7.1

By 2030, ensure universal access to affordable, reliable and modern energy services

EO contribution to achieving target

solar, wind, hydropower and biofuel potential assessment and monitoring of performance

Indicator 7.1.1

Proportion of population with access to electricity

Indicator 7.1.2

Proportion of population with primary reliance on clean fuels and technology

Target 7.2

By 2030, increase substantially the share of renewable energy in the global energy mix

EO contribution to achieving target

solar, wind, hydropower and biofuel potential assessment and monitoring of performance

Indicator 7.2.1

Renewable energy share in the total final energy consumption

Target 7.b

By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support

EO contribution to achieving target

mapping of energy utilities and access to electricity

Courtesy Mark Noort HPC Int

