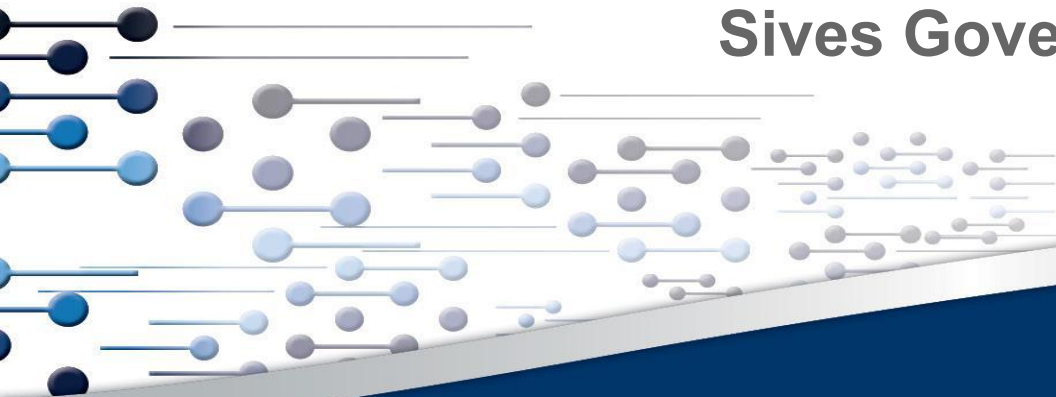


CSIR Earth Observation and in-Situ Observation Applications

A Spatial Informations Systems perspective

Bolelang Sibolla
Sives Govender



The CSIR mandate

***directed
multidisciplinary research***

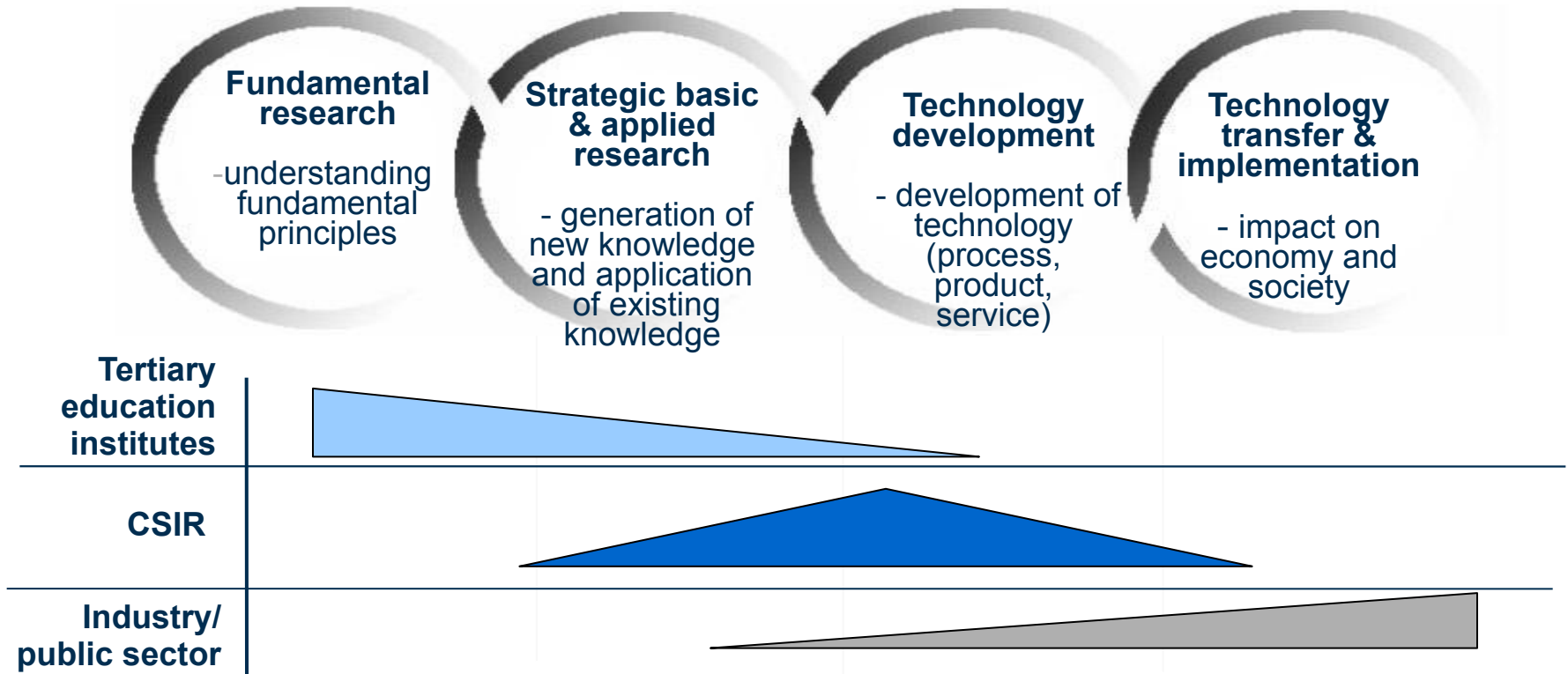
technological innovation

***industrial and scientific
development
quality of life***

*'The objects of the CSIR are, through
directed and particularly **multidisciplinary
research** and **technological innovation**, to
foster, in the national interest and in the fields
which in its opinion should receive preference,
industrial and scientific development,
either by itself or in cooperation with principals
from **private or public sectors**, and thereby
to contribute to the **improvement of the
quality of life** of the people of the Republic...'*

(Scientific Research Council Act 46 of 1988, amended by Act 71 of 1990)

Strategic position in the National System of Innovation



The CSIR spans the research and innovation value chain but its role is differentiated from TEIs and industry/public sector



Future production: Chemicals

Improving the competitiveness of chemical industries through innovation in bio (chemical) conversion, pharmaceuticals and advanced materials.

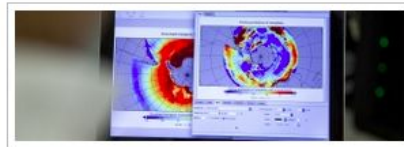
[READ MORE](#)



Future production: Manufacturing

Strengthening manufacturing and assembly, facilitating supply chain integration and improving the production and processing line by leveraging technological advances and supporting Industry 4.0 readiness.

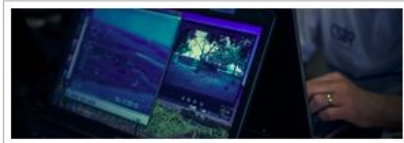
[READ MORE](#)



SMART Places

Achieving smarter resource use (energy, water, climate change and environment), infrastructure and service delivery through transformative technologies.

[READ MORE](#)



Defence and security

Strengthening capabilities in defence, civil security and cybersecurity through advanced technologies.

[READ MORE](#)



Future production: Mining

Supporting the growth and revitalisation of the mining industry through innovation for process, equipment and health and safety improvement.

[READ MORE](#)



Advanced Agriculture and Food

Strengthening the agricultural industry and associated agro-processing value chains through advanced technology and predictive science-based tools.

[READ MORE](#)



NextGen Enterprises and Institutions

Transitioning South Africa's institutions into a digitalised era.



NextGen Health

Driving a local healthcare industry and improving health outcomes through synthetic biology and advances in digital, diagnostic and treatment technologies.

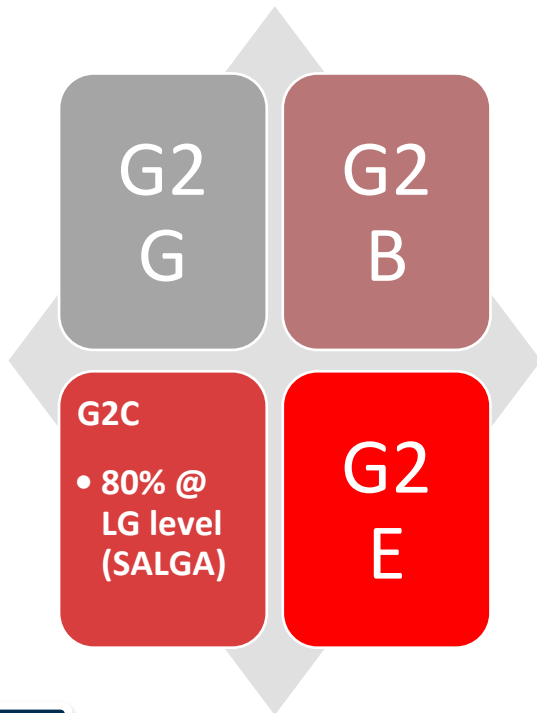


Smart Mobility

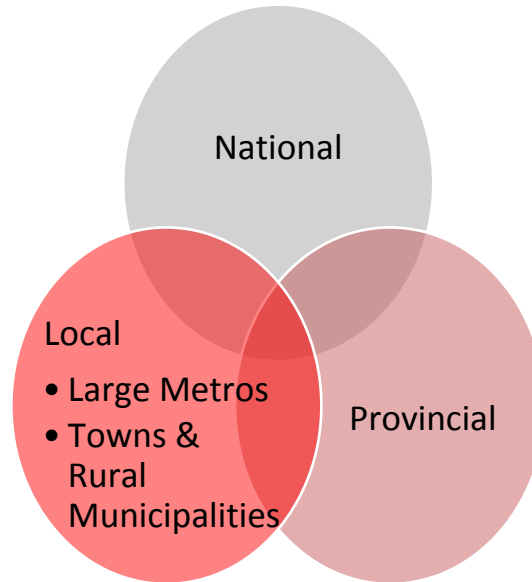
Enhancing the efficiency and safety of transport and logistics infrastructure and operations in support of a competitive economy.

SIS in e-Government

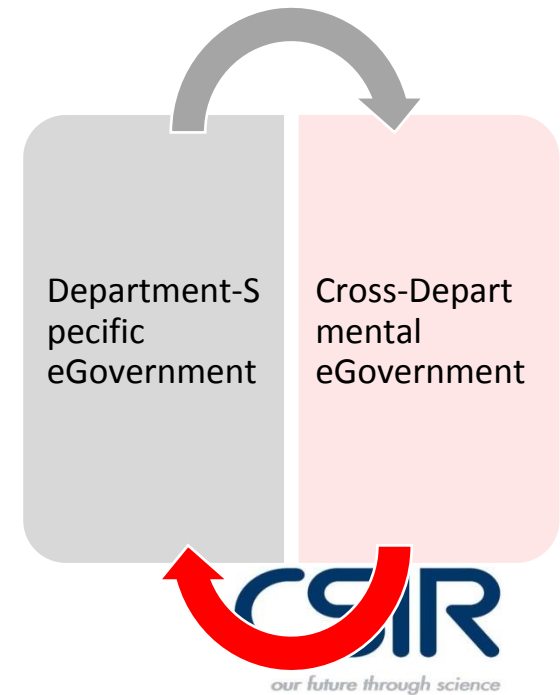
Modes of e-Government



Spheres of Government (RSA)



E-Government Categories





our future through science



Spatial Information Systems Research Group

Decision Support Value Chain

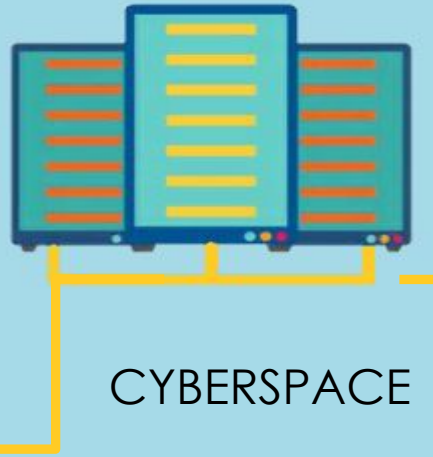
underpinned by operational linked sensing and modelling systems



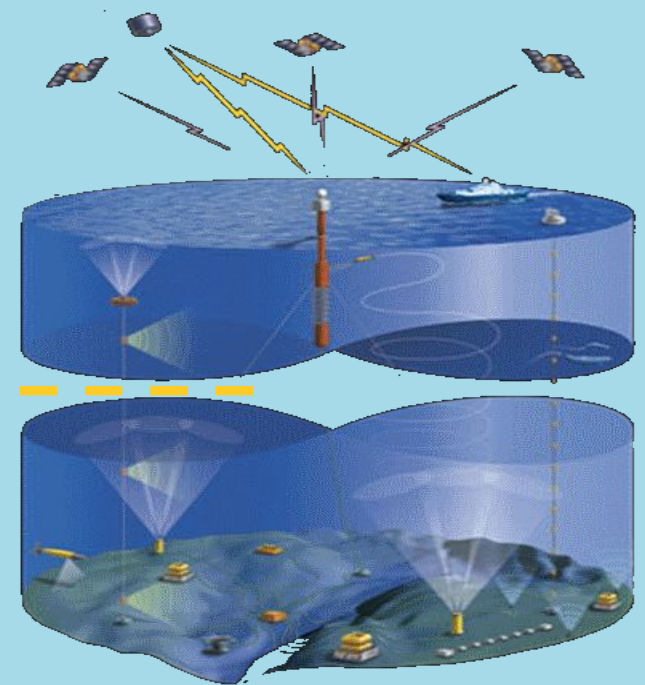
VALUE TO END USERS

DeSTs

Decision Support Tools



CYBERSPACE



SENSING in THE REAL WORLD

Decision Support Value Chain

underpinned by operational linked sensing and modelling systems



CYBERSPACE



SENSING in THE REAL WORLD

VALUE TO END USERS

DeSTs

Decision Support Tools



OUR TRACK RECORD

Phakisa Vision



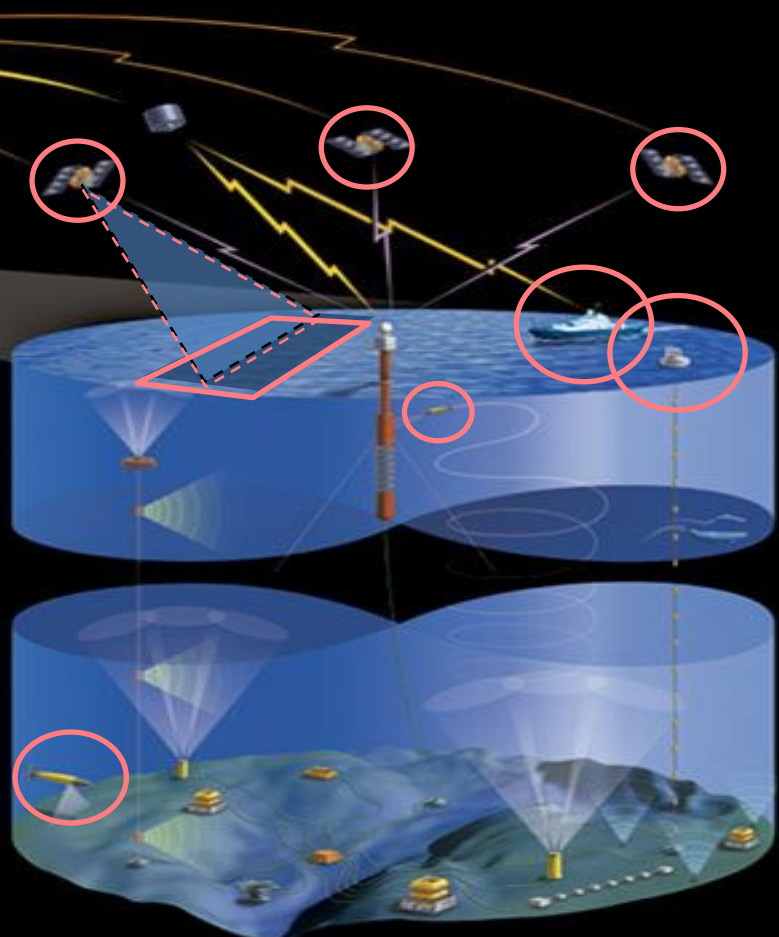
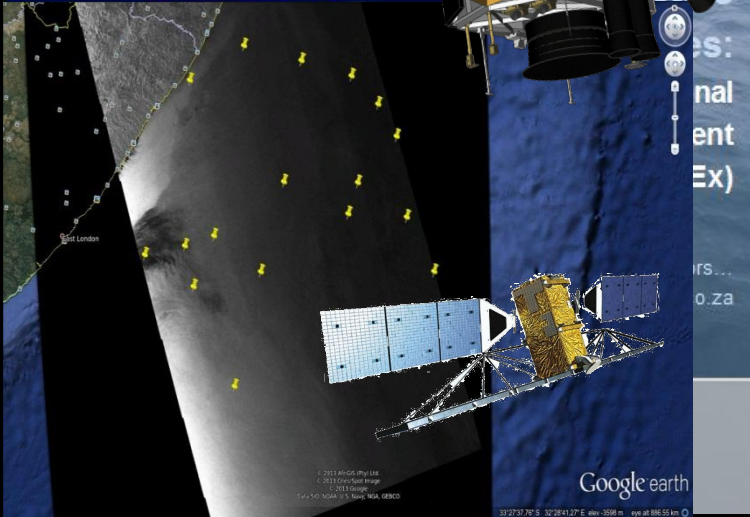
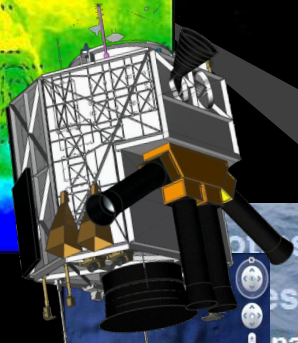
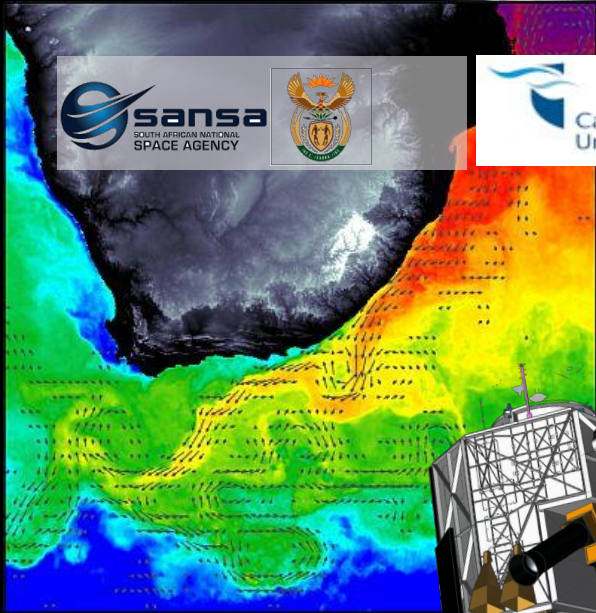
Environmentally Sustainable & Responsible Growth

Oceans Economy is part of the **Nine Point Plan** launched by President J Zuma in February 2015, for **Growing the South African Economy**

South Africa's **ocean economic potential** ranges between **R129 and R177bn by 2033***, with between **800 000 to 1 million jobs*** created



Projected GDP contribution and job potential were determined, reflecting economic realities at the time with certain underlying assumptions



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© 2013 Google Inc.

Google earth

33°27'07.5" S, 32°28'41.27" E, elev: 358 m, eye at 886.5 km Q

OCIMS OFFERINGS

NATIONAL OCIMS Search for ship names/terms

Legend: Speed, Ship-Names

- Select All
- Cargo
- Tanker
- Passenger Vessels
- High-speed Craft
- Tugs and Special Craft
- Fishing
- VMS Vessel
- Pleasure Craft
- Radar
- Aircraft
- GPS
- Ground Station
- Nav-Aid
- Unspecified
- SAR Detection
- Transponder Detection
- Radar Detection

Track Speed [knots]

0.5 6-10 11-15 16-20 21+

500 km

CURRENT SHIPS GEOFENCES SAR CAMERA

MMSI Name Callsign Flag Remove All

NATIONAL OCIMS Harmful Algal Bloom Decision Support Tool

Legend Value

Click on a feature to get feature value.

Harmful Algal Bloom Risk

| Area | 2018-10-14 | 2018-10-13 | 2018-10-12 | 2018-10-11 | 2018-10-10 | 2018-10-09 | 2018-10-08 |
|-----------------------|------------|------------|------------|------------|------------|------------|------------|
| Norwagaa Strait | ● | ● | ● | ● | ● | ● | ● |
| Dezener St Helena Bay | ● | ● | ● | ● | ● | ● | ● |
| SW Cape | ● | ● | ● | ● | ● | ● | ● |
| Fish Bay | ● | ● | ● | ● | ● | ● | ● |
| Coombing | ● | ● | ● | ● | ● | ● | ● |
| Langkling | ● | ● | ● | ● | ● | ● | ● |
| Garden Route | ● | ● | ● | ● | ● | ● | ● |
| Algoa Bay | ● | ● | ● | ● | ● | ● | ● |
| WMS Coast | ● | ● | ● | ● | ● | ● | ● |
| KCN South Coast | ● | ● | ● | ● | ● | ● | ● |
| KCN North Coast | ● | ● | ● | ● | ● | ● | ● |
| Elephant Coast | ● | ● | ● | ● | ● | ● | ● |

Now viewing: CH-A from CSIR MODIS Switched

Algal Blooms Selections CH-A from CSIR MODIS Switched CH-A from MODIS v1.1 CH-A from Sentinel-2 L2 CH-A from SST[Pro] Odyssa Analyzed

HIGH RISK AREAS: ST HELENA BAY SW CAPE GARDEN ROUTE ALGOA BAY

DATE ON VIEW: 2018-10-14

SEEK TO SPECIFIC DATE: -1 DAY +1 DAY

PICK DATE: 2018-10-14

NATIONAL OCIMS Coastal Flood Hazard Search by location name...

Water Level in [m] 0.2m

Menu

- FLOOD HAZARD AREAS
- SLR SCENARIOS
- Select Scenario: fs_knysna
- HYDRODYNAMIC MODEL
- FLOOD STORIES

Flood levels above Mean Sea Level in [m]

- Intermediate Low: 0.5m
- Intermediate: 0.5m
- Intermediate High: 1.0m
- Intermediate Extreme: 2.0m

Sedgefield

NATIONAL OCIMS Coastal Operations at Sea

SEARCH AND RESOLVE HISTORIC WEATHER

Latitude: -34 Longitude: 18 6705

Decimal Degrees

Wind Direction Degrees: 155.778 Wind Speed knots: 12.782

Last known time: 10:05 AM Rescue and ETA: 11:05 AM

Weather Source: GPS

Target Type: Person in water: State Unknown

Person in water: State Unknown

SEARCH ADD DRIFT ADD DRIFT

| Tag | Event Date | Event Type |
|-----|--------------|------------|
| 18 | 19 Oct 10:05 | Search |
| 19 | 19 Oct 10:05 | Search |

| Lat/Long | Target Type | Person in water: State Unknown | Weather Source | GPS |
|------------------------|--------------------------------|--------------------------------|------------------------|--------------|
| 34.13062 S, 18.67071 E | Person in water: State Unknown | Person in water: State Unknown | Weather Source | GPS |
| 13.782 knots 155.778° | Last known time | 19 Oct 10:05 | Rescue ETA | 19 Oct 11:05 |
| 34.13062 S, 18.67071 E | Search A | Search B | 34.13062 S, 18.67071 E | |
| 34.15477 S, 18.67233 E | Search C | Search D | 34.15287 S, 18.67211 E | |

environmental affairs RESERVAZIEBION science & technology CSIR

Marine Services in Southern Africa



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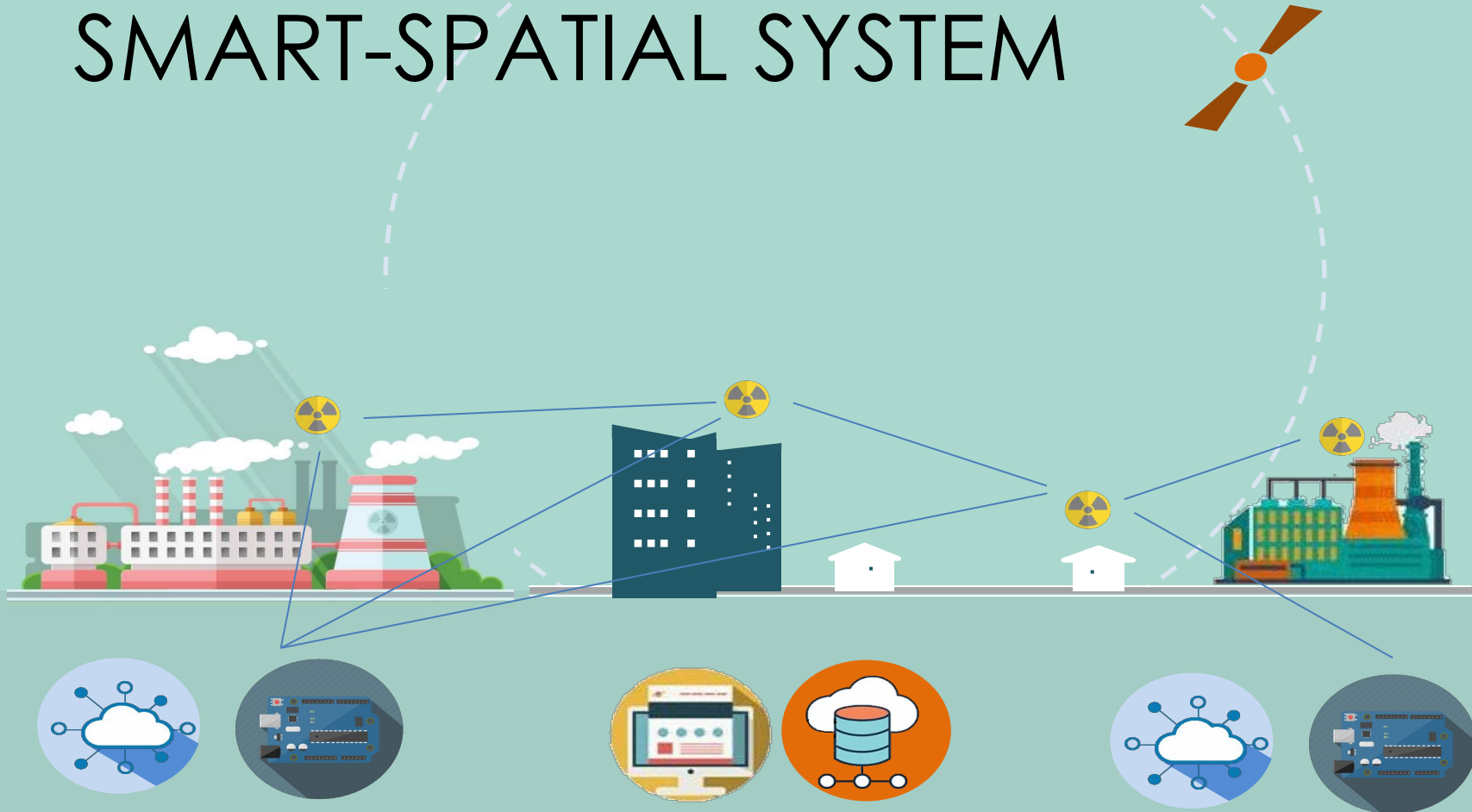
MARCOSOUTH

Promotes sustainable coastal and marine resources management and governance across the region.

[READ MORE](#)



NNR – operational example of SMART-SPATIAL SYSTEM





Radiation Dosage:

Normal



High



Offline



Selected



Station Health

Latest Observations at: **A3206**

| Time | Property | Value | Units |
|---------------------------|----------------------|--------|-------|
| 2018-05-28T11:04:22+02:00 | wind_speed_meters | 0.6 | m/s |
| 2018-05-28T11:04:22+02:00 | temperature | 20.8 | cel |
| 2018-05-28T11:04:22+02:00 | humidity | 46.8 | % |
| 2018-05-28T11:04:22+02:00 | wind_dir_true | 41.5 | deg |
| 2018-05-28T11:04:22+02:00 | pressure_bars | 1.0292 | [bar] |
| 2018-05-28T11:07:22+02:00 | rad1_value | 1.65 | uSv |
| 2018-05-28T11:04:22+02:00 | temperature_heatsink | 38 | - |

Sensor Health

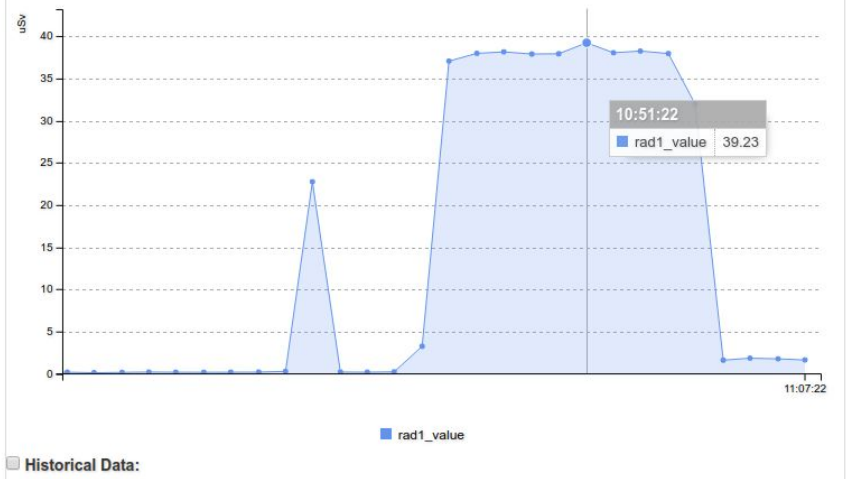
GMT-1 ●

MCA ☺

WES ●

MPPT ●

Tampered ●

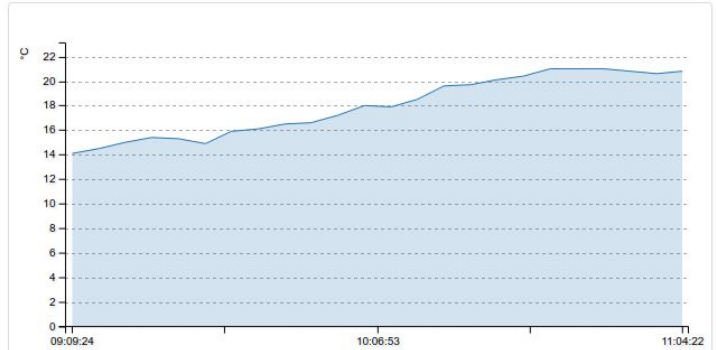


Temperature

Humidity

Pressure

Wind



Other Sectors

- Mining
- Health - Department of health
- Defence - Department of Defence
- Air Quality and Pollution monitoring

Future

- Continue to explore cutting edge, innovation research
- Focus on **collaboration with industry**
- New sectors which require **EO based services**
- Strengthen collaboration with SANSA
 - tried and tested data acquisition partner
 - maintain current provisioning of data
- Continue to explore storage and processing capabilities
 - Cloud based services
 - Increased application data cubes



Thank you

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Sives Govender (sgovender5@csir.co.za)



CSIR
our future through science