Supporting The Industry by:
Daily Imaging Capabilities Using
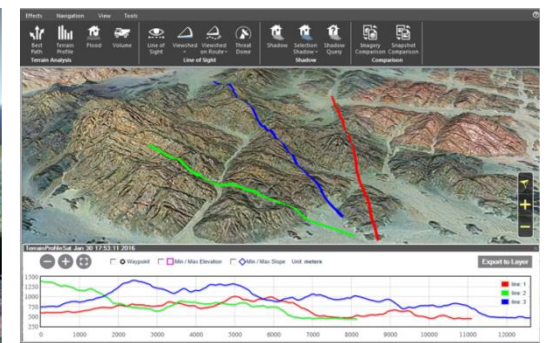**planet.** satellite constellation

CEDARE
ســيدارى

Center for Environment and Development
for the Arab Region and Europe

EDGE-PRO
For Information Systems

Mohamed Omar
Executive Vice President
Remote Sensing & GIS Consultant

EDGE PRO

- Joint Stock company
- Founded in 2004
- Qualified staff with more than 20 years of experience
- **Main industry:**
  - Satellite Imagery Provider
  - Remote Sensing
  - Geographical Information Systems
  - Photogrammetry
  - 3D Modelling & Virtual Reality
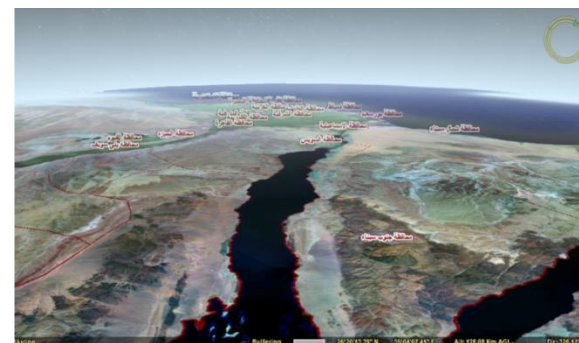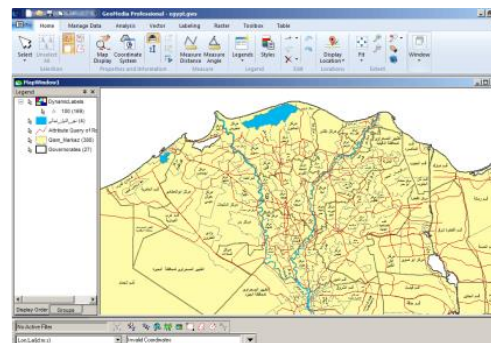
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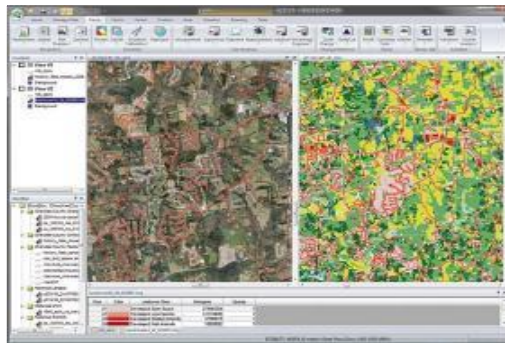planet. satellite constellation

(Mission / Configuration)

Mission Statement:

To image the whole world, <u>every day</u>, making changes <u>visible</u>, <u>accessible</u> and <u>actionable</u>.

- Founded in 2010
- 400 employees
- 3 x Offices: San Francisco, Berlin and Amsterdam

- Launched >230 satellites
- Largest constellation of earth-observation satellites ever
- Daily imaging capacity > 140 million square kilometres

planet.

Operational Capacity

Constellation	Specifications
Orbital Altitude	475km
Spectral Ranges	RGB + Near-Infrared
Spatial Resolution	3.125m GSD
Positional Accuracy	<10m RMS
Data Availability	<24h after collection via always-on service

planet.

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planet.

Observ

Utilizing from daily imaging of whole country
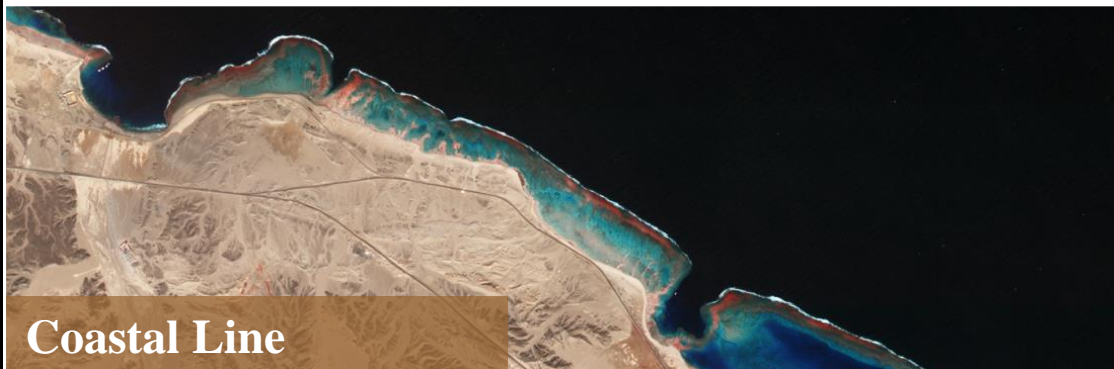
Coastal Line

Emerging Incidents

Urban infrastructure

Maritime Traffic
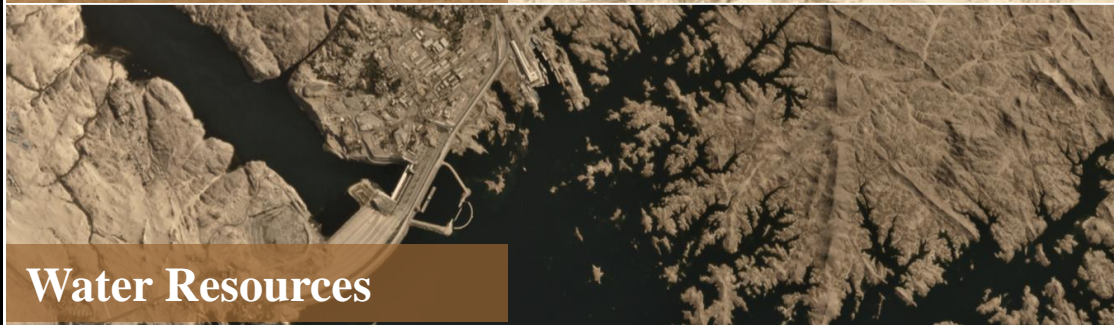
Water Resources

Natural resources

Monitor Critical infrastructure

Estimate economic values of ports

New Capital Power Station

Safaga Port, Red Sea

Follow up ports new logistic services

Sokhna Port

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How much work is done ! (The New Capital)

Observ

Monitor expansion in **Housing** services

Measuring rates of **Roads** construction

Progress in **Earth work** in the site

Ex: (~ 3 Km two lanes) added in last 2 months

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(Nature / Challenges)

Nature of Daily Imaging the earth?

Imagine a continuous (Yesterday, today & tomorrow) images feed that needs to be managed by specialists to study your multiple regions of interest (ROI).

Challenges !!!:

- **Downloading** lot of imagery series for each ROI
- Accumulating **hundreds of GB** data storage
- **Looking back** for a specific date for a certain ROI
- Preparing and **processing this increasing volume** of imagery data
- **Inspections & analyzing** imagery series to reach the whole study
- Delivering results in **Decision Support language/format**

Observ ?

Is a cloud/on premises service that provided based on daily earth imaging capabilities, downloaded, processed and managed by EDGE-PRO technical team with high quality added-values.

Observ is a fully automated Services:

- Automatic downloading imagery for your region of interest
- Automatic data preparing / processing
- Automatic spatially analyzing
- Automatic extracting of added values in Vector/DB format for rapid decision making.

Agriculture

Encroachments

Environment

Disasters

How EDGE-PRO managed the challenges ?:

Downloading issues

- Define your ROIs, configure dates (from/to), let the system do the rest forever

Big-data handling issues:

- Big-data <u>Compression</u> techniques, <u>Archiving/Indexing</u> and rapid <u>Retrieval</u> of imagery series based on (name, date, metadata, analyzed data, ROI, ...)

Imagery Analysis issues:

- Data investigations, spatial analysis with spectral object signatures is done in parallel automated processes
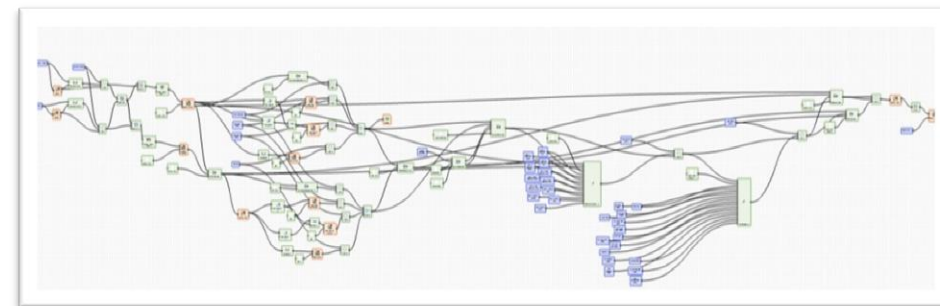
Delivering output issues:

- Imagery processing, extracting added-values information in (OGC standard) spatial Databases, that could joined directly with real-time decision support monitoring systems

Samples of Automated Workflows:

Downloading issues

- Define ROIs, configure (from date), download directory, let the system do the rest forever

Imagery Analysis & Output Delivery:

- Parallel automated processes for data spatial analysis
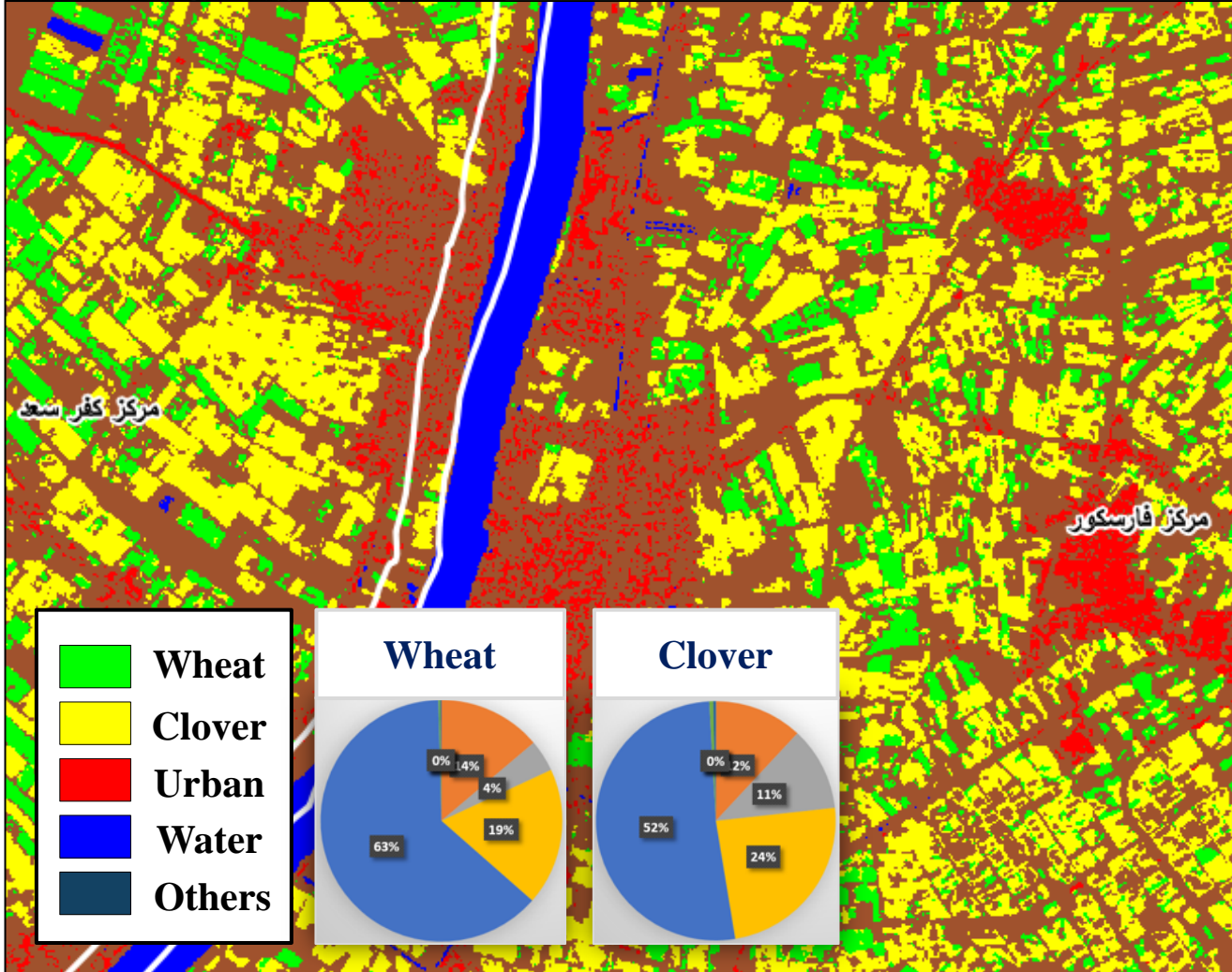- Extracting added-values information in (OGC standard) spatial Databases

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(Industry samples)

Crop Types Map
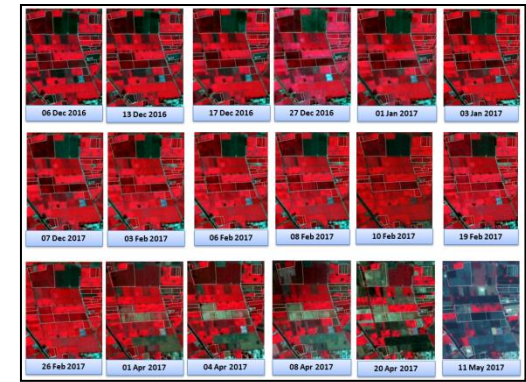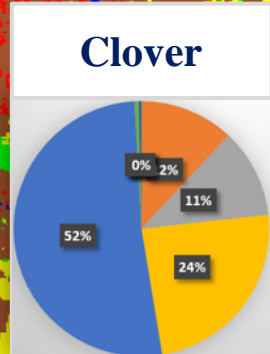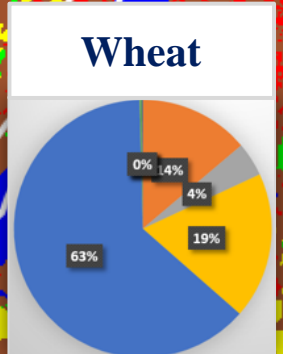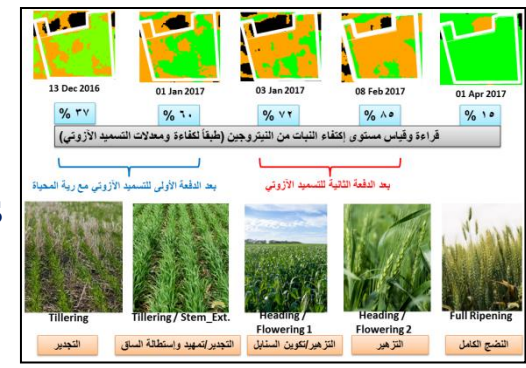**for Damietta**
Governorate in Egypt

Observ Agriculture

Observ

Wheat
Clover
Urban
Water
Others

Wheat
0% 4%
4%
19%
63%

Clover
0% 2%
11%
24%
52%

Up to 30 images taken in winter season.

Follow up:

- Crop growth stages
- Crop types
- Crop health

Monitoring vessels illegal activities:

- Extracting oil spill
- Calculating polluted areas
- Integrating imaging dates with vessel AIS-Information to identify causalities

Incident date: 20 Feb. 2017
No. of Vessels: 2
Location: Damietta port

Incident date: 26 Mar. 2017
No. of Vessels: 1
Location: Damietta port

July 2016

April 2017

Observ Encroachments

Detect Encroachments in large area:
- 120 changes detected
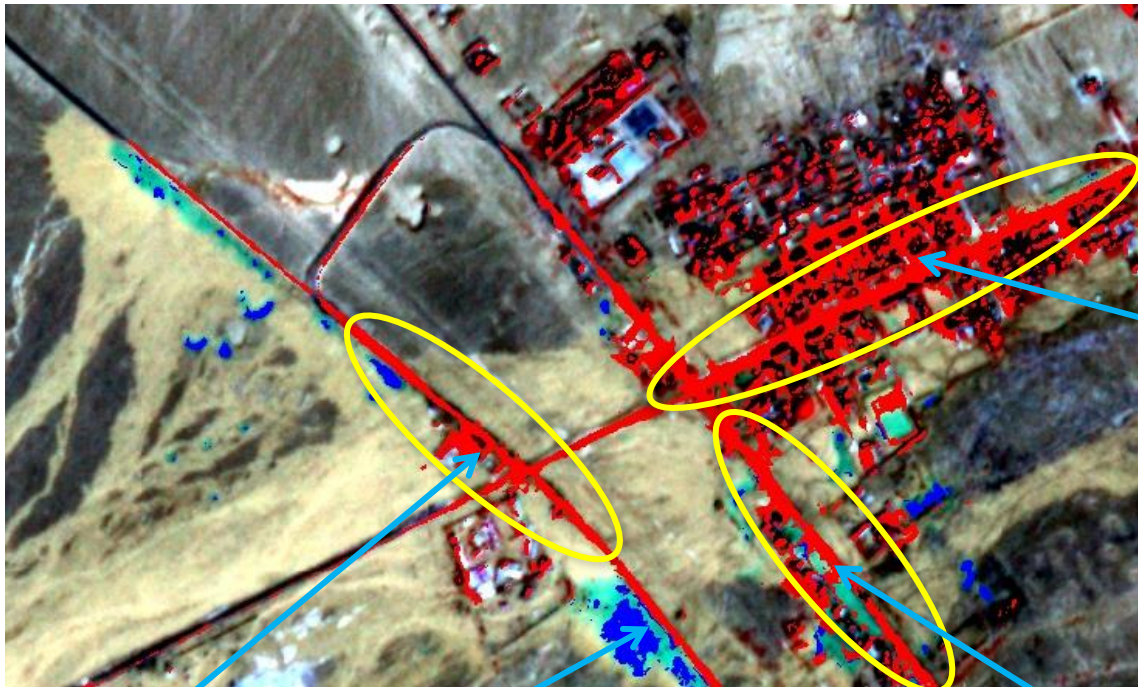- Smart Filtering of changes
- 80% output accuracy

Study Area:
- 3100 m x 2200 m

July 2016

April 2017

30 1 25.4306 N, 31 9 25.4060 E

Observ Disasters
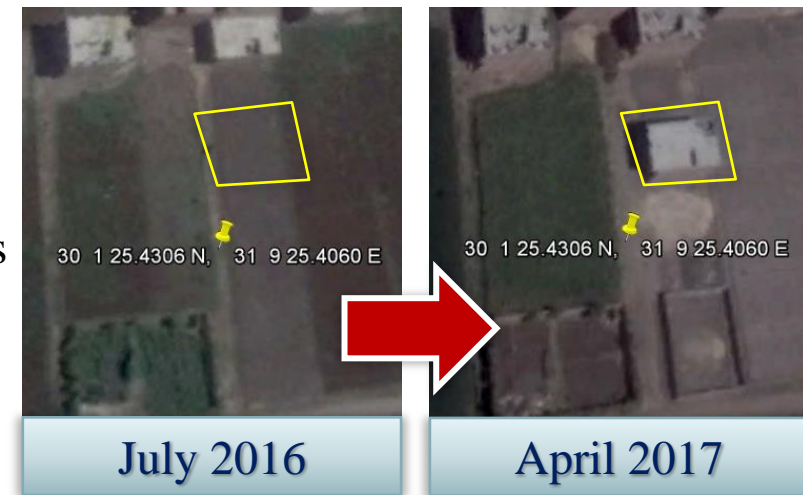
Road damage status:
Ras Gharib / Hurghada Road (2)
1670 m blocked
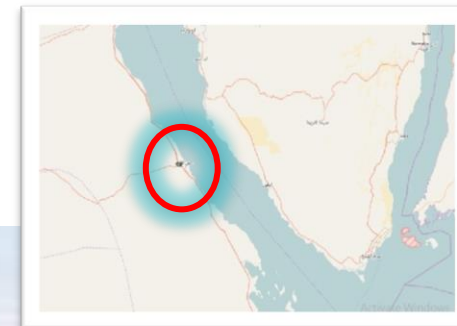**Ras Gharib / El-Shiekh Fadl Road (1)**
2815 m blocked
Hurghada / Cairo Road (3)
2480 m blocked

Accumulated water (1250 sq. m)

Imagery dates for Flood interval : 26 – 29 October 2016

Thank you