Marine Earth Observation & Applications at University College Cork

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2nd Irish Industry Space Day, Hibernian Club, Dublin, September 2nd 2015
C. 20,000 full-time students:
- c14,000 undergraduate students
- c.4,000 Masters and PhD students
- c. 2000 part-time students

- c. 2800 employees and researchers collaborating with close to 700 other universities in 110 countries.
- University focused on three core pillars:
  Teaching, Learning, and Research

MaREI

a multi-disciplinary research centre based in UCC’s new Beaufort Building for Oceans and Coastal research

SFI MaREI Centre: a cluster of key university and industrial partners targeting the Marine Renewable Energy sector

NUIG, NUIM, UL, CIT, UCD & Industry partners ranging from multinationals to SMEs, led by UCC
Areas of Expertise

- Marine Ecology
- Marine Renewable Energy
- Geospatial Technologies
- Governance
- ICT
- River & Coastal Science and Engineering
- Composite Materials
- Intelligent Efficiency
- Energy Modelling & Storage
- Power Systems
- Bioenergy and Biofuels
- Wind Energy
- Climate Change
EO/GIS group currently contribute to the following thematic areas:

- Marine Ecology
- Marine Renewable Energy
- Geospatial Technologies
- Governance
- ICT
- River & Coastal Science and Engineering
- Composite Materials
- Intelligent Efficiency
- Energy Modelling & Storage
- Power Systems
- Wind Energy
- Bioenergy and Biofuels
- Climate Change
What do we do? – UCCs-MaREI EO/GIS team

- EO-derived Information discovery and Extraction
- EO data processing, & applications, and integration
- Communications and Outreach
- User needs gathering and stakeholder engagement
- Capacity building
Information Discovery
Supporting Data discovery and innovation

e.g. www.storm-surge.info
Supporting Data discovery and innovation

Provide people the Opportunity to discover, explore, and create

e.g. www.storm-surge.info
Enabling Information & Data Discovery

- Clear, concise & standardised Metadata!
- International Coastal Atlas Network (ICAN)

http://mida.ucc.ie
http://ican.science.oregonstate.edu/
Applications of SAR imagery for maritime security/safety and terrestrial monitoring

Hypertemporal time-series analysis and uses

Optical image processing & applications

Metadata standards, interoperability, data sharing, visualisation & outreach

Multi-data source integration and data mining.
Supporting Development with Applications-focus

Supporting our Aquaculture & Fisheries Industries

e.g. www.safiservices.eu
Supporting Maritime Security & Safety Operations
e.g. ESA-ANISTIAMO & ESA-NG-RMP
Maritime Surveillance: HOW?

AIS (Automatic Identification System)

Patrol ships and Aircraft

No AIS signal:
- Illegal activities?
- System’s malfunction?

• Costly operations
• Monitoring of limited areas
• Weather conditions dependency
ENVISAT ASAR IMP, HH
30 m spatial resolution
20th May 2011, 10:37 am
SAR-AIS COMPARISON

False alarm?

False alarm?

Illegal activity?
Providing data access and tools for online processing of EO data in coastal management applications

Thematic Exploitation Platforms (TEPs) are innovative virtual platforms which aim to make it easier to extract information from Earth Observation (EO) data.

Developing a gateway to coastal information from vast EO data archives for R&D

Take the survey:
H2020 – Coastal Research Synergy Framework

• Facilitate access to Earth Observation data and pre-processing tools to the research community,

• “De-mystifying the mystical” - strong involvement of research students is planned; designing the platform for young and inexperienced users.

• Enabling and driving science by providing a framework that encourages and supports innovation and knowledge exploration.

• Collaborative work environment built on a synergy between academia and industry, fostering knowledge transfer and the use of best practices.

• UCC leading communications & teaching/supervision, and conducting optical & SAR algorithm R&D.

• Kick off in December 2015
Stakeholders & Outreach

- Establishing and using comms. infrastructures
- Gathering, and managing info flow,
- Surveying users and community opinions
- Requirements gathering and stakeholder engagement
- Fostering support and supporting users
- Collecting, analysing and reporting on user experience and acceptance.
Capacity building

- Established reputation of leading, hosting, and co-organising high quality, focused, and effective training courses and events,

- Often deploy a successful consultation process whereby trainees shape the courses,

- Training events often balance capacity building with space for networking and collaboration building,

- UCC have gained from a number of contacts established at MaREI-hosted training events wrt proposals and collaborations,

- Skilled at designing and implementing the communications to support events.

- Work closely with SME’s to guide them in funding applications (e.g. H2020, ESA etc.)
Funding

EO/GIS group currently contribute to the following thematic areas

SFI Science Foundation Ireland

European Commission

ESA

IODE International Oceanographic Data and Information Exchange

EPA Environmental Protection Agency
Key Take Home

- UCC EO data integration, processing, and exploration skills in applying SAR, Optical and 4D temporal data to local, regional, national and global issues

- extensive experience in communications, and the use of communications avenues in outreach, dissemination, user engagement, surveying, capacity building, training, and network establishment

- part of the largest group of satellite EO researchers in Ireland with the Dept. of Geog,

- Through MaREI’s & UCC’s contacts we have access to an extensive national and EU network in Governance, maritime sector actors and stakeholders, industry, civil agencies, offshore infrastructure leaders and designers, etc.