

# ***5\*S: Space, Surveyors and Students – STEM and the Sustainable Development Goals.***



***Dr. Conor Cahalane***  
*Dept. Geography, Maynooth University*  
@con20or     : [conor.cahalane@mu.ie](mailto:conor.cahalane@mu.ie)

# What is the SFI Discover Programme?

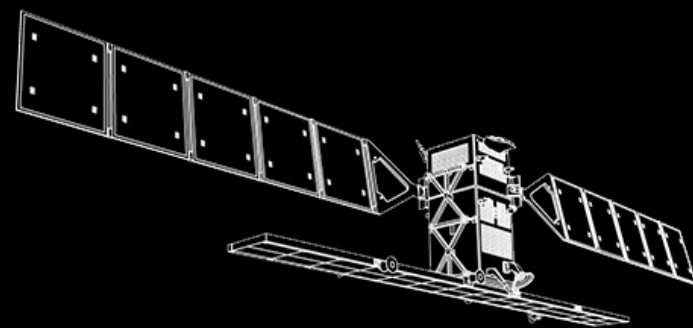
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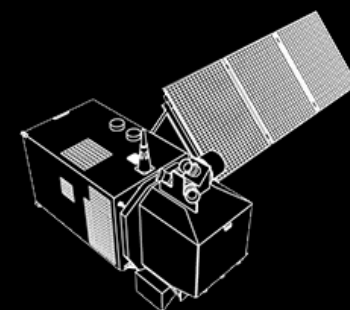
- Stimulate **engagement** and curiosity in STEM
- Use new ways to **attract** those who do not typically engage with STEM
- **Apply** STEM in innovative ways for the benefit of the public
- Inspire **curiosity** and confidence in the scientific method
- Provide **insights** into STEM-related careers and discoveries
- **Develop capacity** for the delivery of STEM Education

*2019 awards particularly encouraged applications with a space focus...*

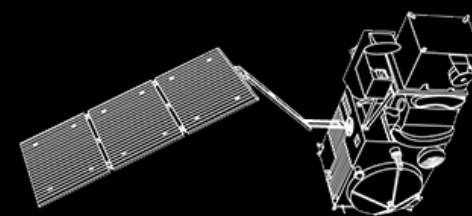




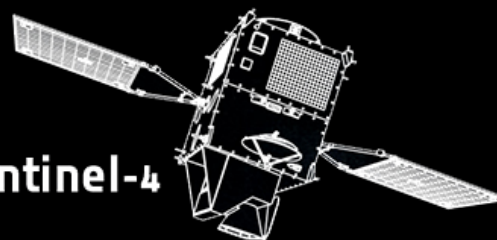
**sentinel-1**



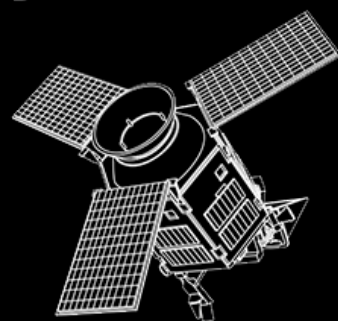
**sentinel-2**



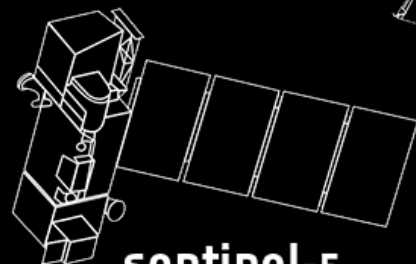
**sentinel-3**



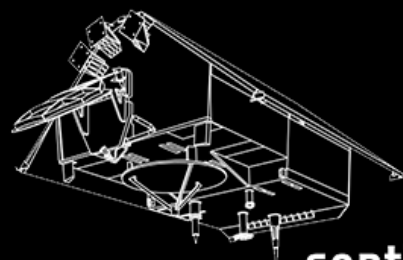
**sentinel-4**



**sentinel-5p**



**sentinel-5**



**sentinel-6**

# Surveyors and Satellites



siliconrepublic BUSINESS DISCOVERY CAREERS VIDEO MORE

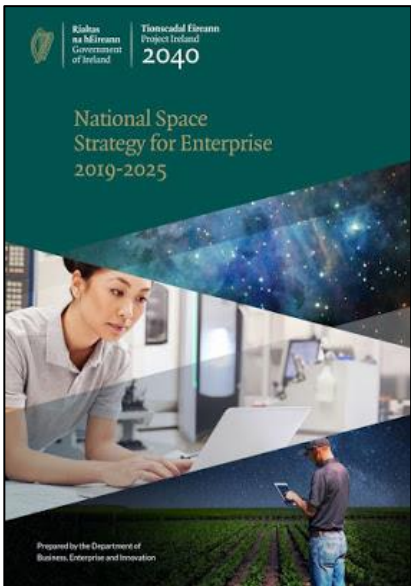


INNOVATION

## Ireland to invest €17m per year in ESA space programmes

by Carmel Doyle

21 NOV 2012 309 VIEWS



# GIS and Spatial Data







# Focus - UN SDGs



<< 17 UN SDGs

14 UN GGIM Fundamental  
Geospatial Data Themes >>

## Global Fundamental Geospatial Data Themes



# Platform



siliconrepublic

DISCOVERY

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## €500m worth of mapping software available to every school in Ireland

by John Kennedy

1 NOV 2018 1.05K VIEWS



## THE IRISH TIMES

Wed, Jul 29, 2020

NEWS

SPORT

BUSINESS

OPINION

LIFE & STYLE

CULTURE

Technology > How to ... | Data Privacy | Tech Tools

### All schools to receive digital mapping software under initiative

Esri Ireland's software aims to address 'evident Stem skills shortage' in country

Thu, Nov 1, 2018, 01:43

Ciara O'Brien



Esri Ireland's Joanne McLaughlin with St Kevin's College Finglas students Casey Farren Colloty and Nathan Furlong, and Aileen Croasdel. Photograph: John Ohle



**ArcGIS for Schools – The Free and Easy Way to Start Teaching with GIS**

Sign up now at [schools.esri-ireland.ie](https://schools.esri-ireland.ie)



# Partners – 2020 National Award

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## Maynooth University

- Geography: [Conor Cahalane \(PI\)](#)
- Education: [Angela Ricard](#)

TU Dublin: [Avril Behan](#)

Esri Ireland: [Aideen Croasdell](#)

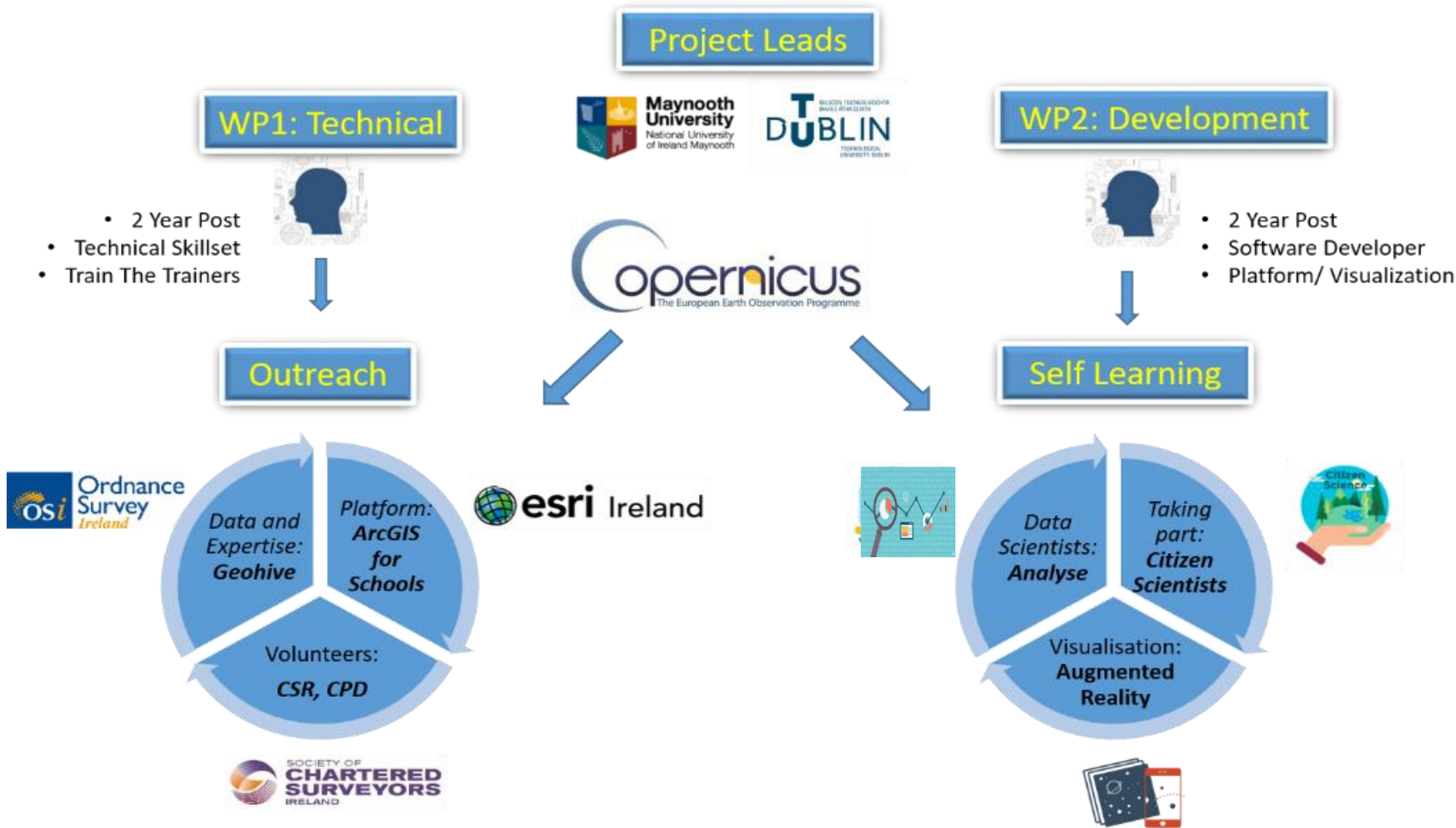
Ordnance Survey Ireland: [Lorraine McNerney](#)

Society of Chartered Surveyors: [James Lonergan](#)





# What is 5\*S? STEM Outreach/Copernicus/SDGs



# Work Package 1 – “Top Down”

- Narrowed Focus on Junior Certificate (13-16yrs)
- ‘Top Down’ – curriculum, specific LOs.
- Must fit into already packed curriculum.
- Gatekeeper – LOs or nothing (COVID).
- Develop capacity – i.e. train trainers.
- Multipliers – teacher CPD.
- Co-creation with teachers .

## GEOGRAPHY

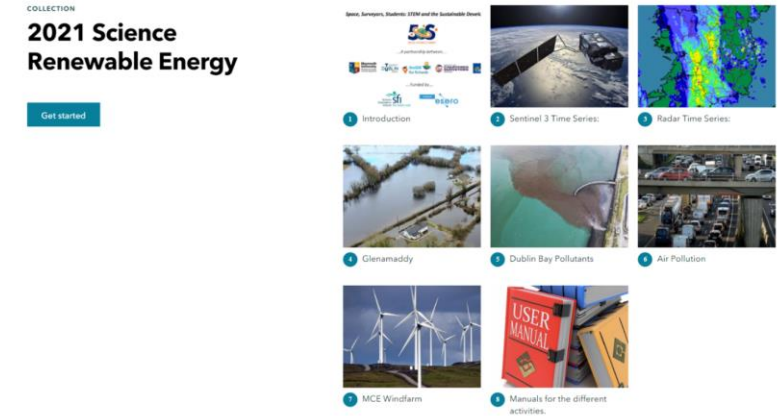
L.O	Exploring Phys World	Interact Phys World	People, Place & Change
1	✓	✓	
2	✓	✓	
3	✓	✓	
4	✓	✓	✓
5	✓		
6	✓	✓	✓
7	✓	✓	
8	✓	✓	
9	✓	✓	
10	✓		

## SCIENCE

L.O	N&S	E&S	CW	PW	BW
1	✓	✓		✓	
2	✓		✓	✓	
3	✓	✓		✓	
4	✓	✓	✓	✓	
5	✓	✓			✓
6	✓	✓			✓
7	✓	✓			✓
8	✓	✓		✓	✓
9	✓		✓		
10	✓		✓		✓

# What are we showing them?

- ArcGIS Online makes this possible.
- “**StoryMaps**” are the medium.
- 5\*S provide the content with focus on LOs
- Visit a class and talk them through a session.
- Minimum tech support required.
- Content tailored for different class durations
- Tailored for computing resources.



# Trainers 1 – Surveyors as GeoMentors

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- Core 5\*S Team
- Experienced Chartered Geomatics Surveyors
- Already working with space data, GIS.
- Insight into their careers
- Also 3<sup>rd</sup> level surveyors - more relatable?
- University Outreach (Maynooth & TU Dub)
- 60+ schools – multiple classes in each.



# Trainers 2 - Teachers (Summer Workshops)

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- ‘Multiplier events.’
- Science Week, Geography Week, Space Careers.
- Education Centres for greater reach (CPD).
- Moving into History, Maths – Science very tough..
- Heritage Centres, Creative Writing, Minority Groups.
- 100+ teachers.
- Qualitative interviews and focus groups.





# Trainers 3 – Student Teachers

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- Collaborating with Maynooth Education Department.
- BSc Ed Year 3 and BSc Ed Year 4.
- PME Science Year 1 and 2 – Game Based Learning.
- Create maps using Copernicus/focus on SDGS.
- Develop lesson plans.
- Formally embedded in assessment.
- Approx 200 Teachers in Training – GIS, GeoHive, StoryMaps.

# Work Package 2 – “Bottom Up”

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- Backdrop is Copernicus/Spatial Data/SDGs.
- Student responsible for their own learning.
- Augmented Reality (AR) (e.g. Pokemon go).
- Phone/Tablet Platform – but classroom support.
- Student will use this for a project of their choosing.
- Mirrors ESA “Climate Change Detectives” comp so added appeal.



# *“SatelliteSkill5”* - AR app in Development



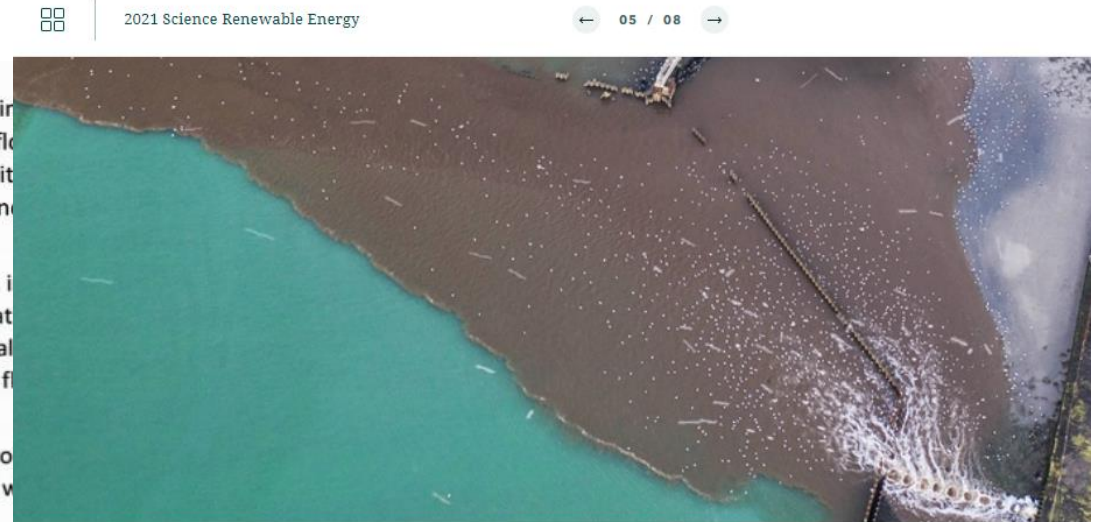
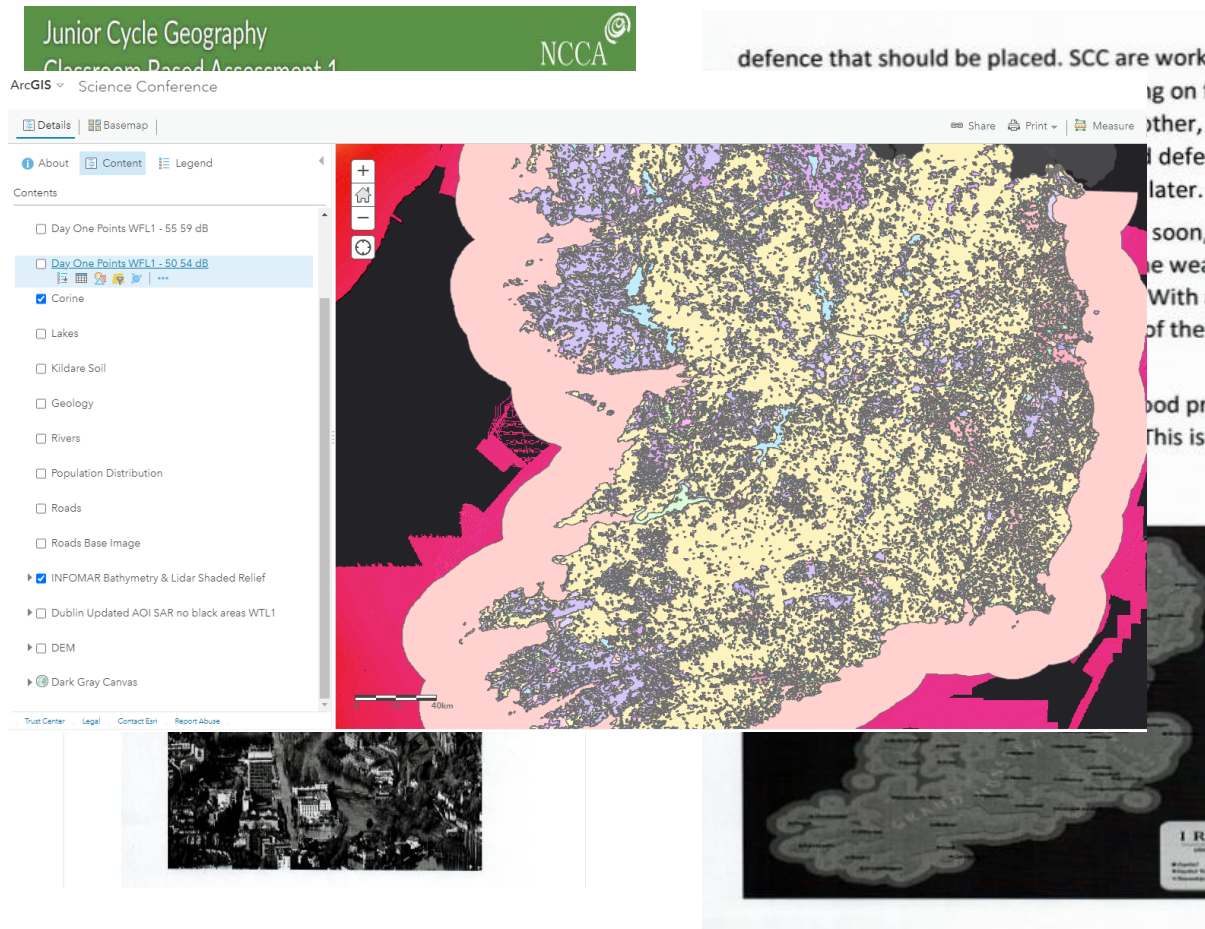
- 14 tasks (8) each focus on 1 SDG, 1 GGIM theme and use satellite/GIS data.
- Student ‘unlocks’ that UN GGIM dataset – this is the ‘game’.
- Learns a little about Satellites, RS, GIS, Spatial Data in doing so.
- Student uses data to explore their project topic in AGOL.

Global Fundamental Geospatial Data Themes



Search for *“SatelliteSkill5”* on Play Store or App Store – free!

# Report – brings us back to WP1



## Dublin Bay Pollutants

Copernicus satellites like Sentinel 1 are great for finding water, but Sentinel 2 helps us understand what is in it.

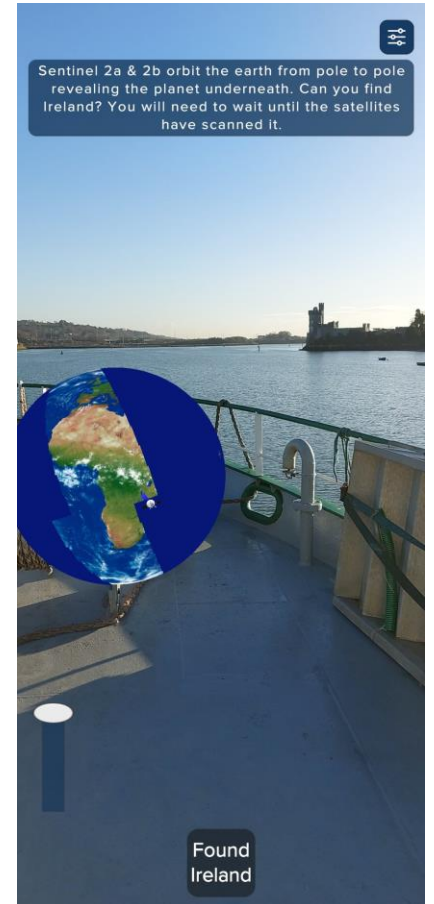
Jack Ffrench | November 12, 2020



# Next steps

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- 2019 – 2022 - Call Open for Version 2.0 at the moment
- Conservative estimates of content (space/survey/GIS) reach:
  - Over 10,000 students.
  - Over a quarter of all secondary schools in Ireland.
  - Over 100 teachers - CPD.
  - Over 200 student teachers also bringing GIS as a skillset with them.
  - 1,600 App downloads – free, use anywhere!
- Evaluation throughout – what is success? Critical.
- More info on <https://5sdiscover.maynoothuniversity.ie/>
- EuroSDR Workshop “*Geodata and Tools for Education and Research*”







 @5S\_Discover :: <https://5sdiscover.maynoothuniversity.ie/>