

HOMER

Harmonising
Open data in the
Mediterranean through better access and
Reuse of public sector information

Open Data seminar - 11th March 2014
ERDF156 and the SEIS Development

Dr. Saviour Formosa

saviour.formosa@um.edu.mt

Developing a National Environmental Monitoring Infrastructure and Capacity

ERDF156

Dr Saviour Formosa



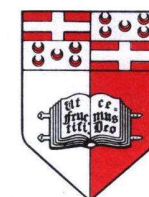
Operational Programme I – Cohesion Policy 2007-2013
Investing in Competitiveness for a Better Quality of Life
Project part-financed by the European Union
European Regional Development Fund (ERDF)
Co-financing rate: 85% EU funds; 15% National Funds



Investing in your future

ERDF156

Project Title	Developing National Environmental Monitoring Infrastructure and Capacity
Beneficiary	Malta Environment and Planning Authority
Partners	University of Malta, Environmental Health Directorate National Statistics Office, Malta Resources Authority
Budget	€ 4.9 M (€ 4.3 M)
	co-funded by ERDF (85%) national Government (15%) €0.2 m MEPA co-financed
Duration	Q3 2010 – Q4 2013



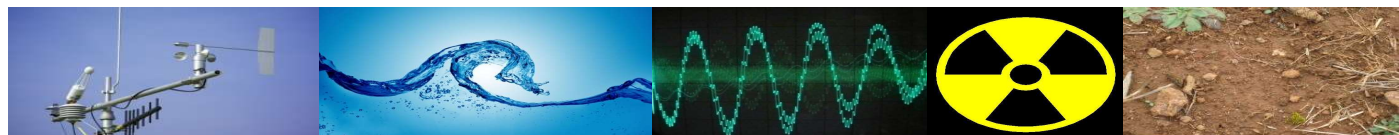
Direttorat ghas-Sahha Ambjentali
Environmental Health Directorate

The Scope

To develop the national environmental monitoring infrastructure and capacity for Malta, with the focus on monitoring 5 environmental themes plus 1:

1. Air
2. Water
3. Noise
4. Radiation
5. Soil
6. Marine

IR Factor: Themes are integrated with Information Resources systems



The Initial Scoping 2006-2009

Due to the various national/EU environmental obligations, MEPA is committed to upgrade Malta's environmental regulatory capacity, including efforts to ensure full compliance with relevant Community Directives as well as national legislation.

However....

Environmental monitoring and reporting is hampered by:

- incomplete monitoring strategy
- lack of baseline environmental data on ambient conditions
- lack of monitoring infrastructure & modern monitoring equipment
- limited human resources



Needed....

Enhancement of national monitoring programmes in the five environmental themes through:

- Identification of information gaps in monitoring processes and filling data gaps
- Carrying out environmental baseline surveys
- Procurement of monitoring equipment & information management systems
- Training of staff

The Two Fulcrums: 2010 - 2013

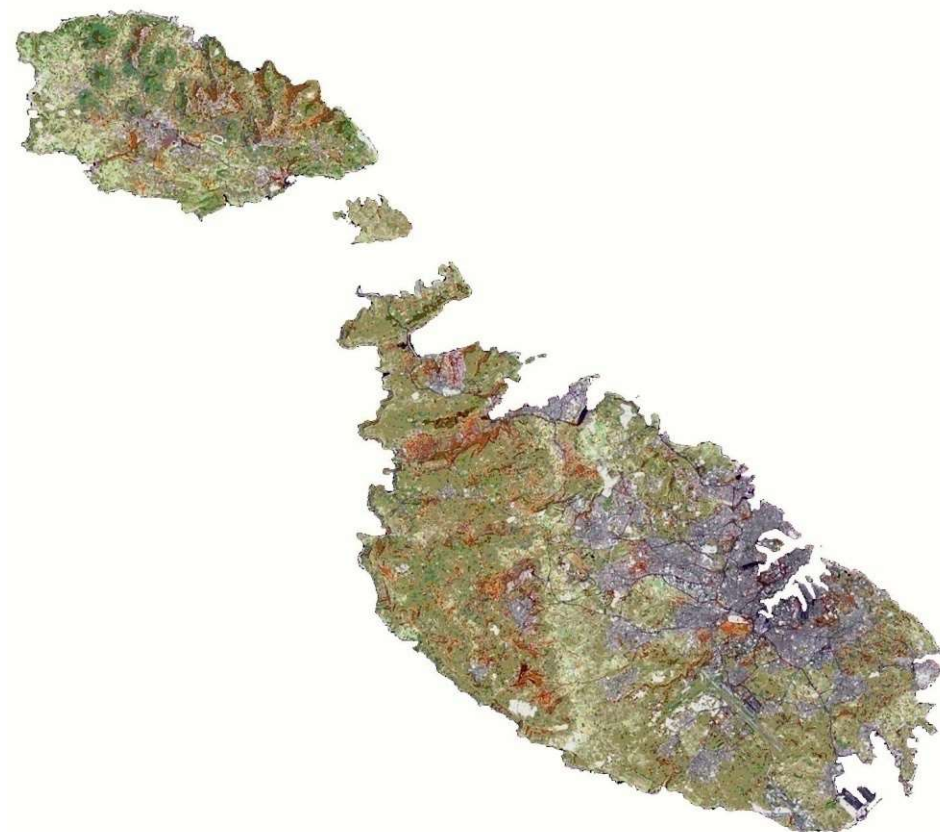
(1) Environmental monitoring requirements

in the areas of air, water, noise, radiation, and soil, an environmental monitoring strategy and detailed monitoring programmes to be designed and drafted.

The strategy is accompanied by detailed tender specifications for the procurement of equipment, systems, training and data collection requirements that could not be identified prior to the completion of the strategy.

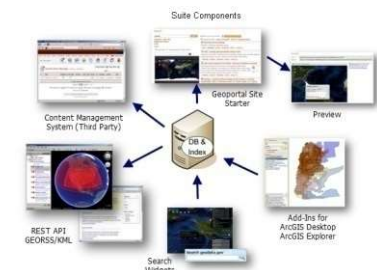
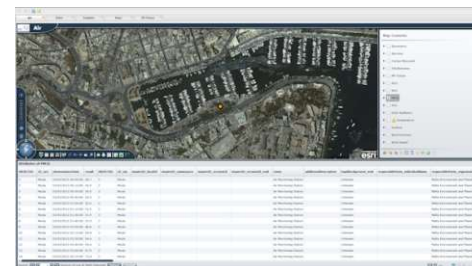
(2) Baseline studies

conducted in the areas of water, noise, radiation and soil, together with 3D terrestrial spatial surveys and bathymetric surveys of coastal waters within 1 nautical mile.



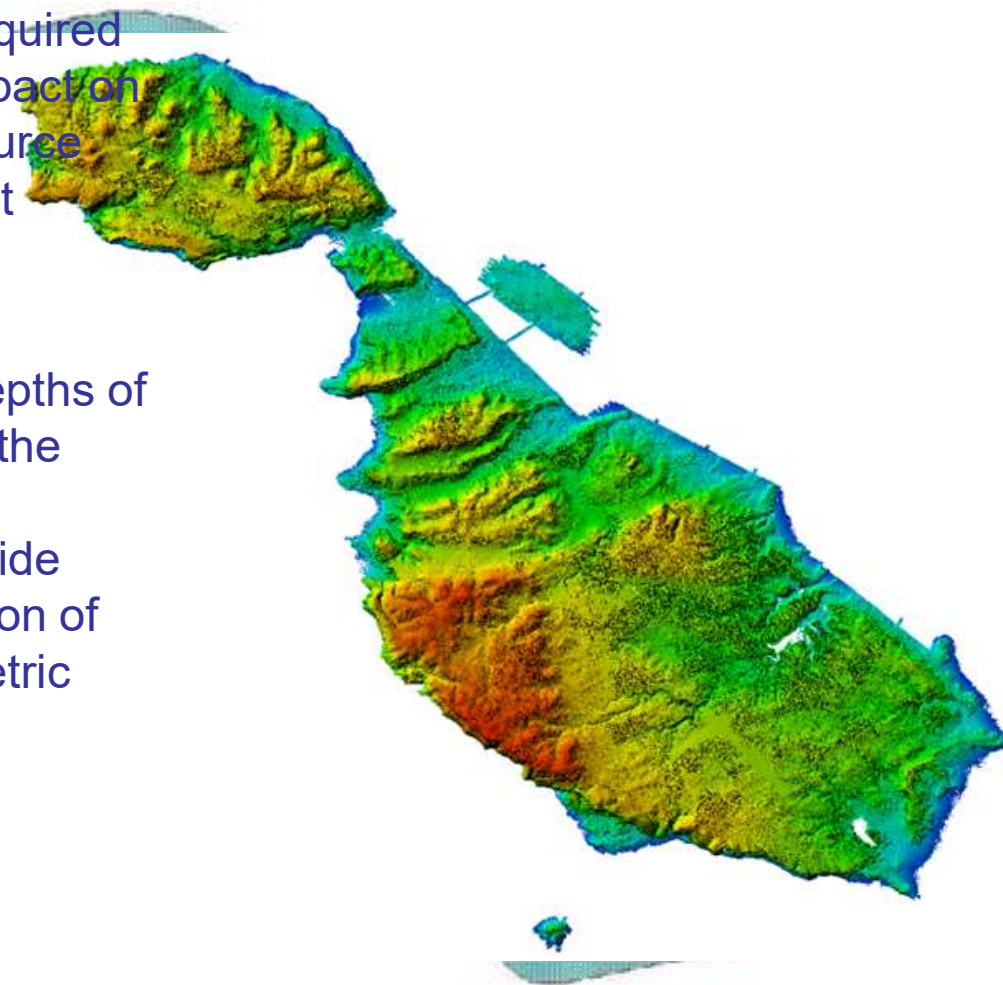
The Outcomes

- (1) **Strategy for Environmental Reporting** in the areas of air, water, noise, radiation, and soil.
- (2) **Baseline Studies** conducted in the areas of water, noise, radiation and soil, together with 3D terrestrial spatial surveys and bathymetric surveys of coastal waters within 1 nautical mile.
- (3) **Acquisition of Equipment** for the collection of real-time and ad hoc data.
- (4) **Dissemination Tools** for the distribution and reporting of data to the Public, Scientific Domains and EU/International Reporting.

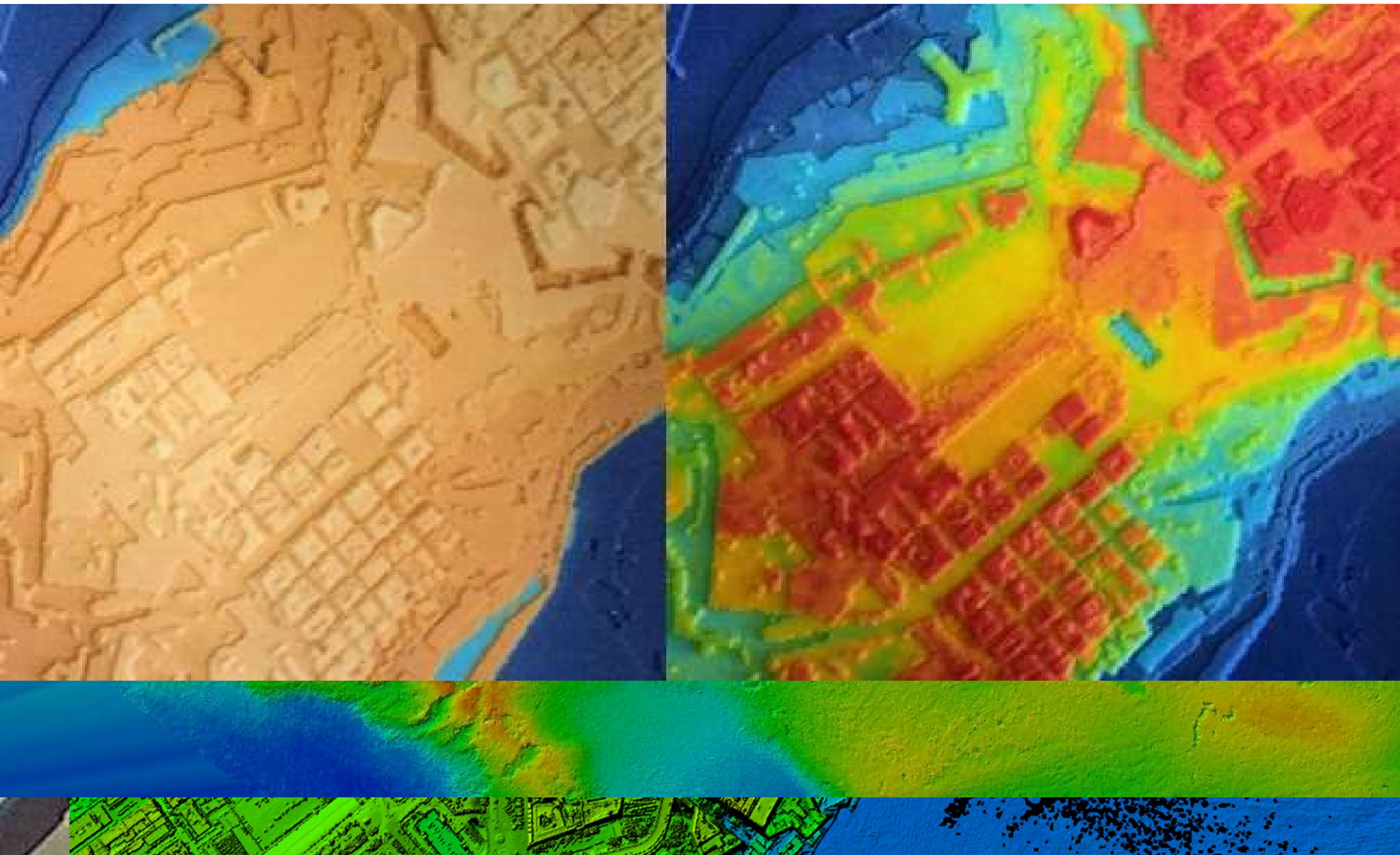


Information Resources

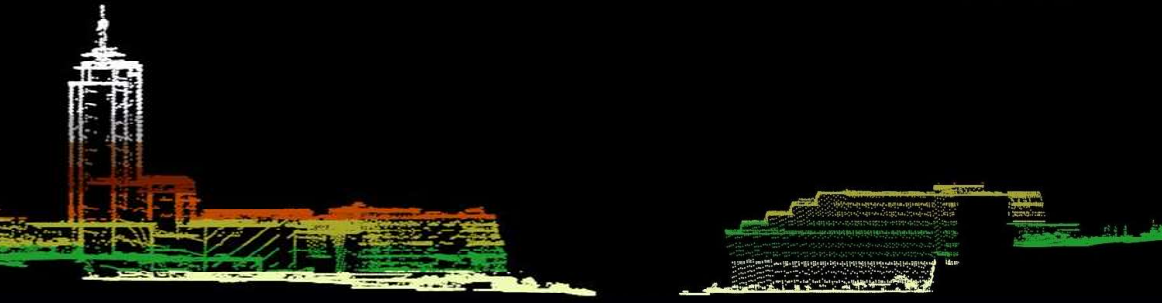
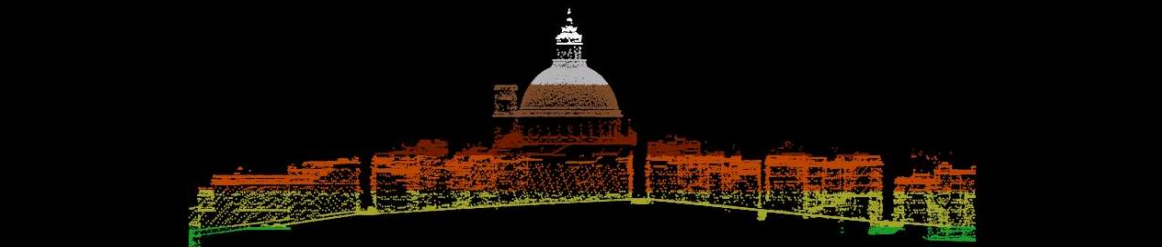
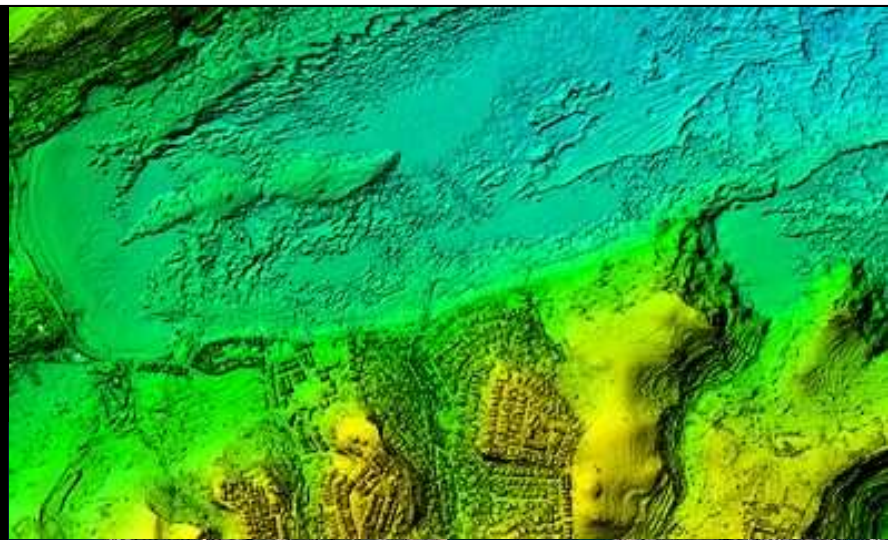
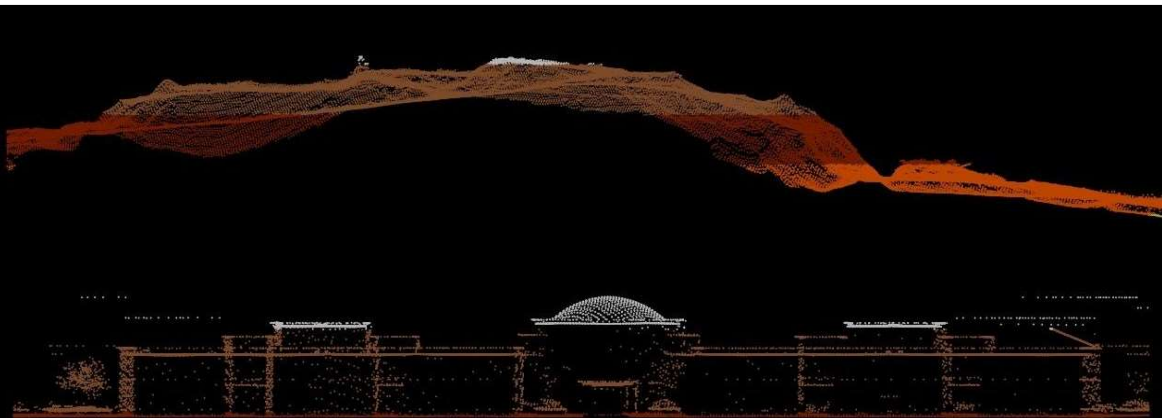
- Deliveries included a terrestrial **LIDAR** Scan (Topographic Light Detection and Ranging (LiDAR)) which resulted in a baseline map for the Maltese Islands infrastructure and **landcover/landuse** analysis which is required for the monitoring of structures that impact on noise levels, enforcement issues, resource monitoring and risk prediction, amongst others.
- **Bathymetric LIDAR** aerial survey for depths of 0 m to 15m within 1 nautical mile from the Maltese coastline and a ship-based **bathymetric scan** employing acoustic side scan sonar which will enable the creation of new nautical charts as well as bathymetric outputs that will help in marine spatial planning.



Information Resources

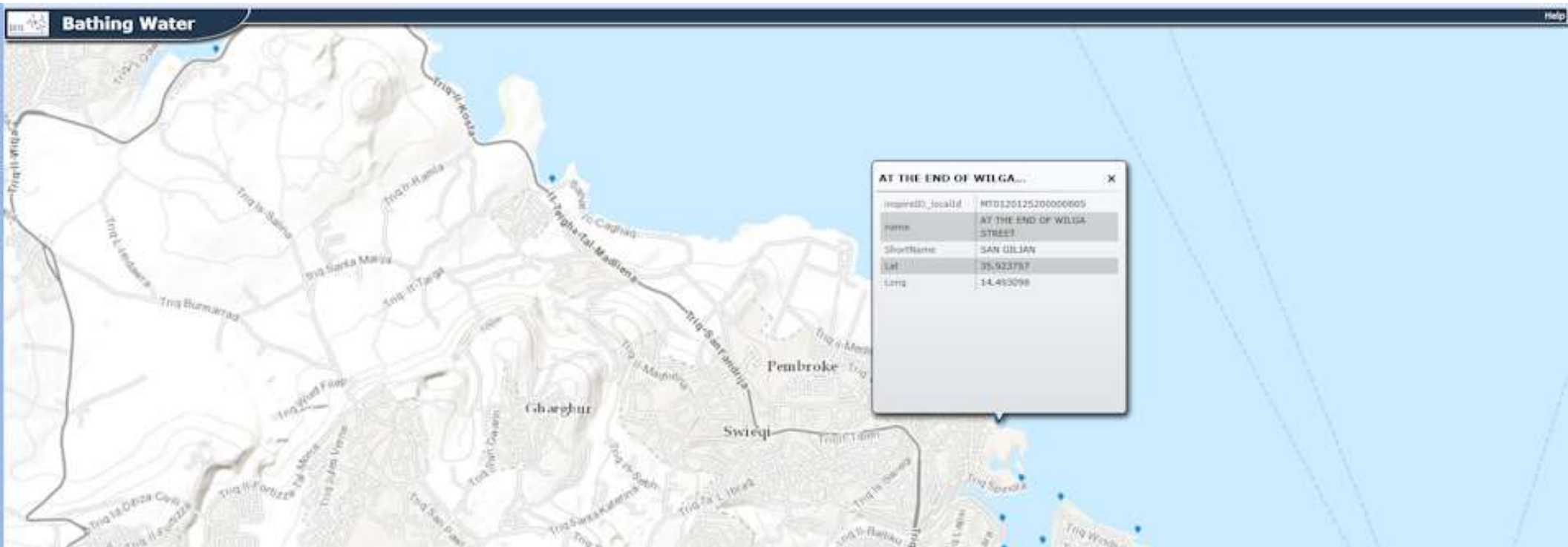


Visualisation



Dissemination – Main Themes

- Information and **Dissemination Services** for the Project “Developing National Environmental Monitoring Infrastructure and Capacity”
- Design of the Shared Environmental Information System (**SEIS**) and development of a **web-based GIS** interface



Information Resources

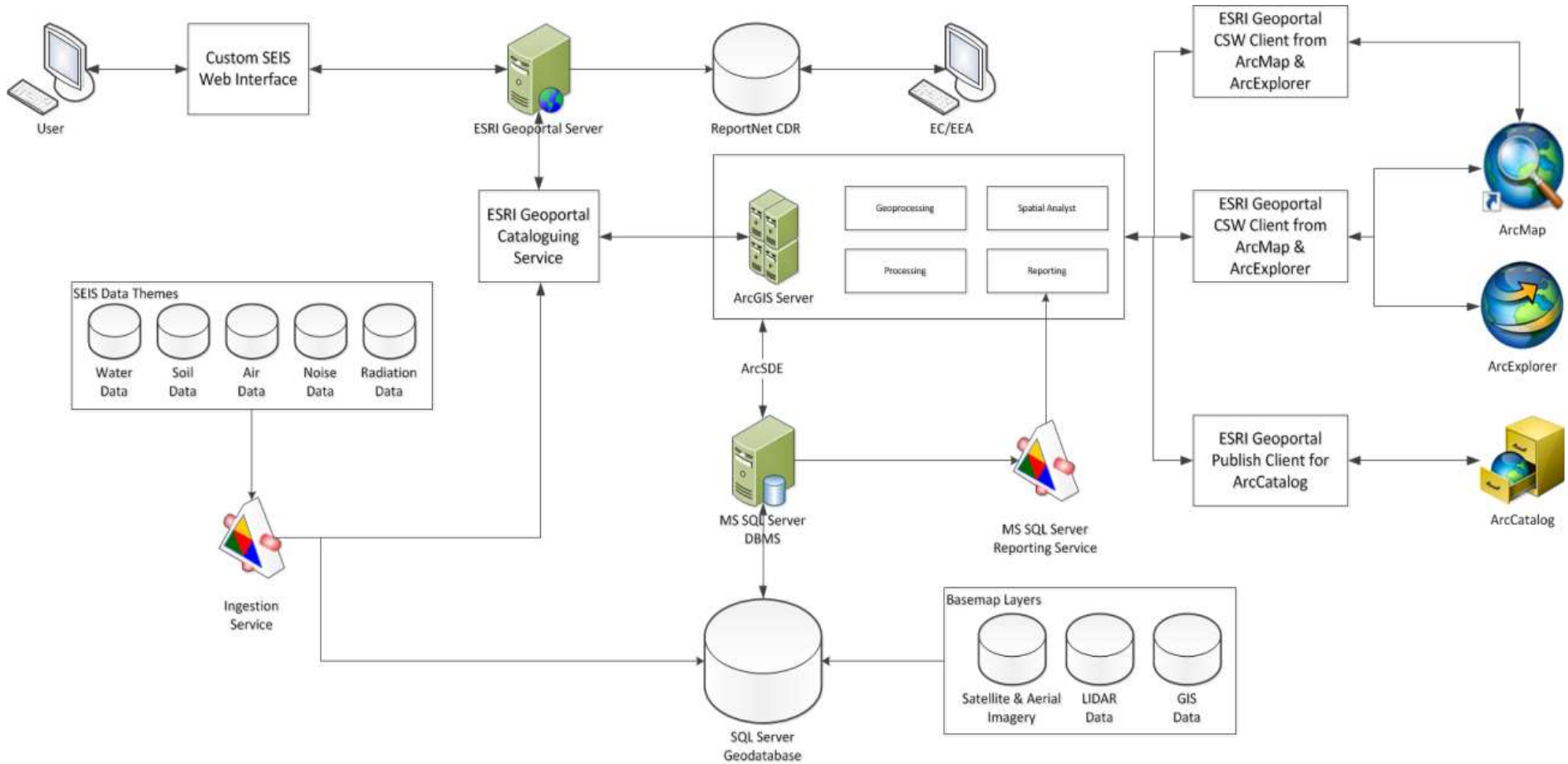
- SEIS
A Shared Environmental Information System will serve as the conveyor for such information and outputs from the project as based on INSPIRE, Aarhus and SEIS

SERVICES	ID	name	start/end times	result	STATUS	ID	name	capacity	availability	responsibility	organization
1	1	Public	01/01/2012 00:00:00 - 2012	0	None	1	Public			Public	Malta Environmental and Planning Act
2	2	Public	01/01/2012 00:00:00 - 2012	0	None	2	Public			Public	Malta Environmental and Planning Act
3	3	Public	01/01/2012 00:00:00 - 2012	0	None	3	Public			Public	Malta Environmental and Planning Act
4	4	Public	01/01/2012 00:00:00 - 2012	0	None	4	Public			Public	Malta Environmental and Planning Act
5	5	Public	01/01/2012 01:00:00 - 2012	0	None	5	Public			Public	Malta Environmental and Planning Act
6	6	Public	01/01/2012 01:00:00 - 2012	0	None	6	Public			Public	Malta Environmental and Planning Act
7	7	Public	01/01/2012 01:00:00 - 2012	0	None	7	Public			Public	Malta Environmental and Planning Act
8	8	Public	01/01/2012 01:00:00 - 2012	0	None	8	Public			Public	Malta Environmental and Planning Act
9	9	Public	01/01/2012 01:00:00 - 2012	0	None	9	Public			Public	Malta Environmental and Planning Act
10	10	Public	01/01/2012 01:00:00 - 2012	0	None	10	Public			Public	Malta Environmental and Planning Act
11	11	Public	01/01/2012 01:00:00 - 2012	0	None	11	Public			Public	Malta Environmental and Planning Act
12	12	Public	01/01/2012 01:00:00 - 2012	0	None	12	Public			Public	Malta Environmental and Planning Act
13	13	Public	01/01/2012 01:00:00 - 2012	0	None	13	Public			Public	Malta Environmental and Planning Act
14	14	Public	01/01/2012 01:00:00 - 2012	0	None	14	Public			Public	Malta Environmental and Planning Act

What is EU-SEIS?

- SEIS is a collaborative initiative of the:
- European Commission (EC) and
- European Environment Agency (EEA)
- It is aimed to establish a shared EU-wide environmental info system
- Member States obligations, Malta

SEIS Concept



Geodatabase

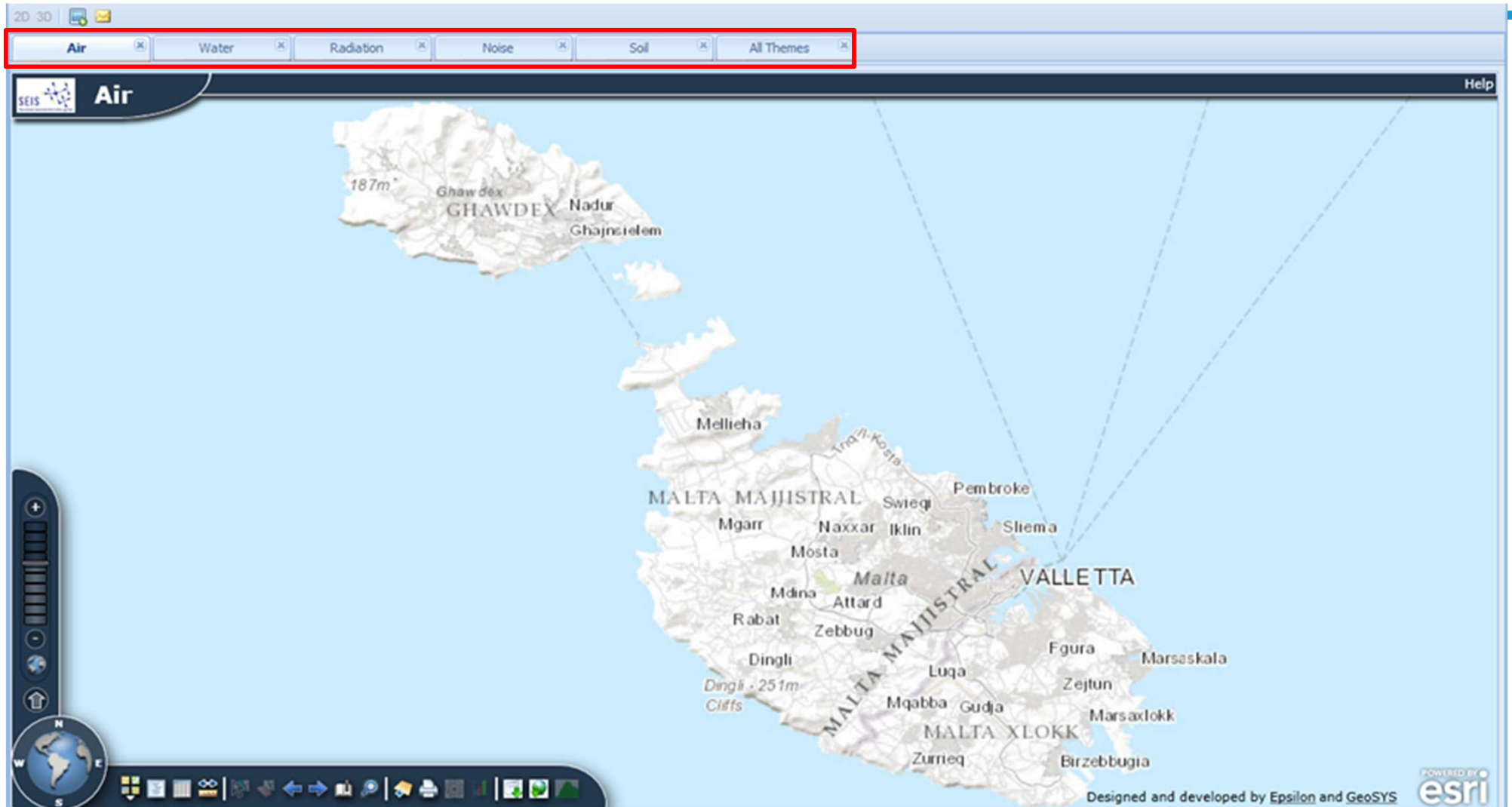
The SEIS Geodatabase includes:

- INSPIRE elements for which a correspondence with the source data has been found
- Additional elements not existing in the INSPIRE data model but present in the source data
- INSPIRE elements not existing in the source data
- All elements existing in the EEA reporting schemas
- Database creation via ESRI technology (Feature Classes, Tables, Coded Value Domains, etc.).

Malta Geoportal – www.seismalta.org.mt



EUROPEAN REGIONAL DEVELOPMENT FUND
MALTA 2007-2013



MAP WITH THEMES

Malta Geoportal



EUROPEAN REGIONAL DEVELOPMENT FUND
MALTA 2007-2013

Water

SEIS

Help

MEPA - Orthophotos

MEPA - DEM

MEPA - DTM

Streets

Topographic

Imagery

Light Gray Canvas

Shaded Relief

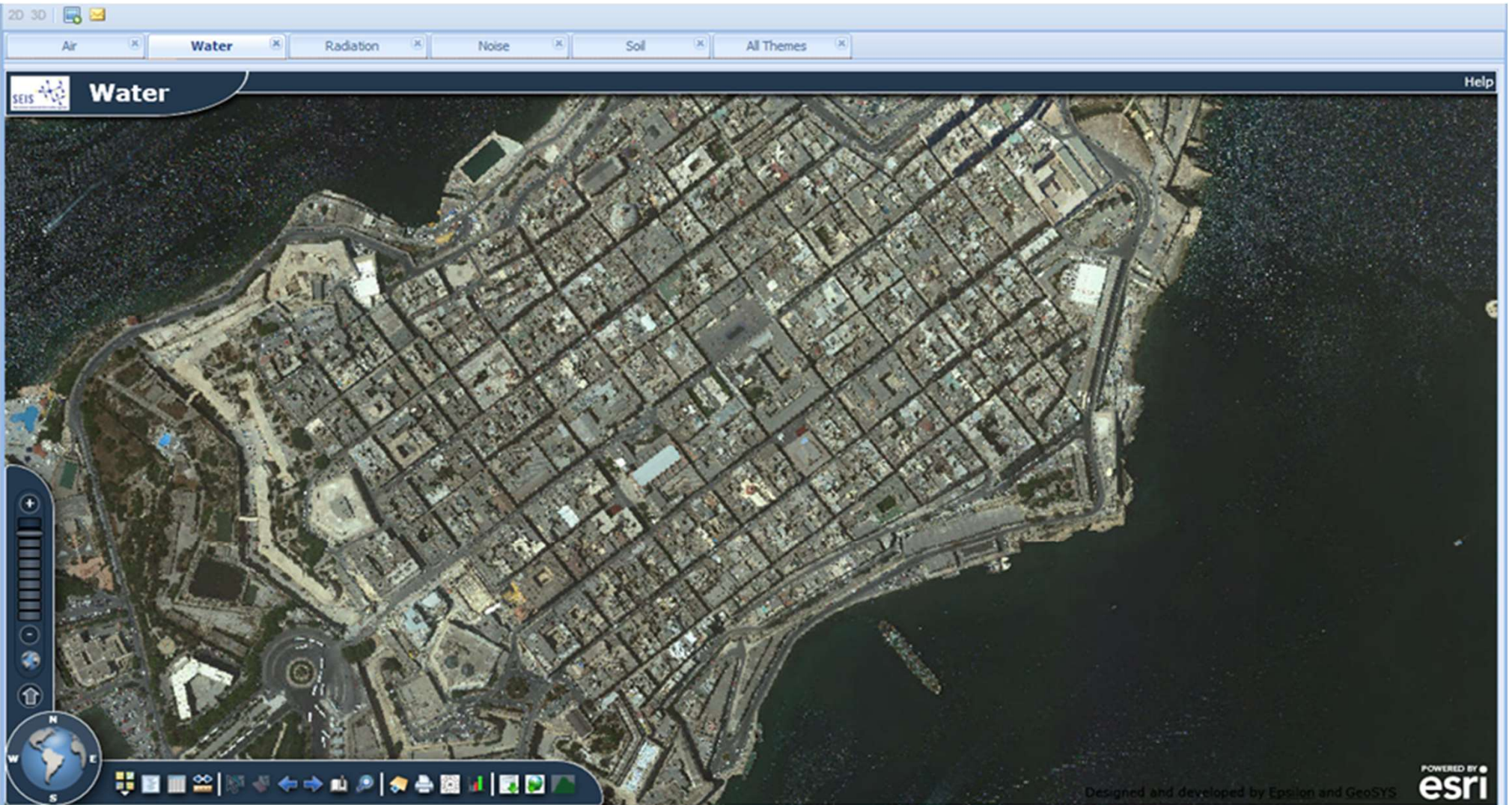
OpenStreetMap

Designed and developed by Epsilon and GeoSYS

POWERED BY esri

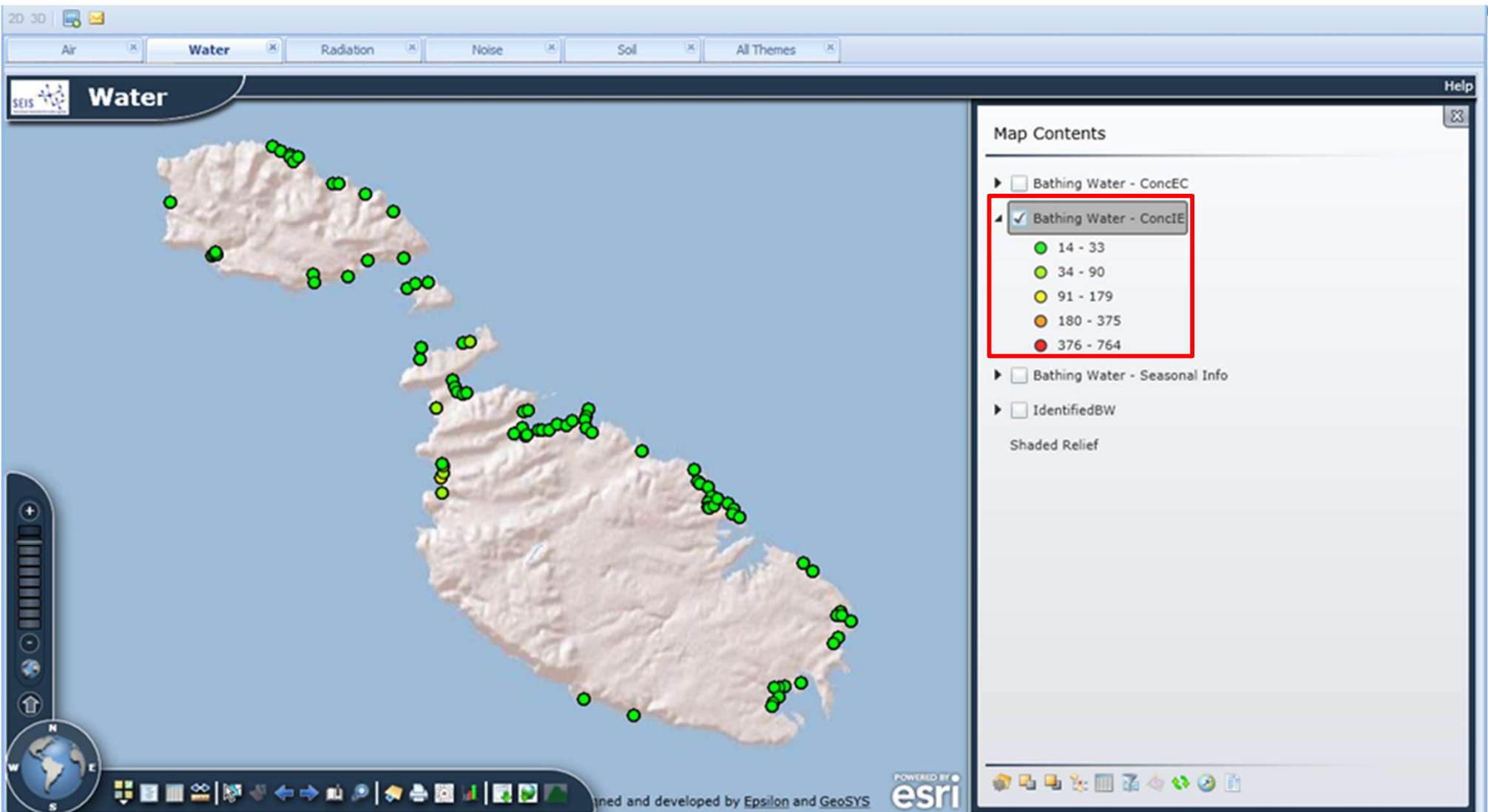
CHANGE BASEMAPS

Malta Geoportal



ORTHOPHOTO BASEMAP (ZOOMS TO 1:500)

Malta Geoportal



DISPLAY DATA LAYERS WITH LEGENDS

Malta Geoportal

The screenshot displays the 'Water' layer configuration in the Malta Geoportal. The 'Configure selected layer' dialog is open, showing the 'Transparency' slider set to approximately 50%. The 'Map Contents' panel on the right shows the 'Bathing Water - ConcIE' layer selected, with a legend for water quality ranges: 14 - 33 (green), 34 - 90 (light green), 91 - 179 (yellow), 180 - 375 (orange), and 376 - 764 (red). The map shows the island of Malta with several green dots indicating water quality data points. The interface includes a 'SEIS' logo, a 'Water' title bar, and a 'Help' button. The bottom of the screen shows the Esri logo and the text 'Designed and developed by Epsilon and GeoSYS'.

LAYER PROPERTIES - TRANSPARENCY

Malta Geoportal

Water

Configure selected layer

Transparency

Symbology

Pop-Ups

Table

Filter

Auto-Updates

Heat Map

Clustering

Feature Retrieval

Renderer: Single Symbol

Size Color Transparency

0% 100%

Default Symbol

Standard

IdentifiedBW

Topographic

Bathing Water - ConcEC

Bathing Water - ConcIE

Bathing Water - Seasonal Info

The symbols defined here are superseded by the symbols on the individual graphics, if defined.

esri

LAYER PROPERTIES - SYMBOLOGY

Malta Geoportal

The screenshot displays the Malta Geoportal interface. The main map shows the island of Malta with several heat map overlays indicating water quality. The 'Water' layer is active, and the 'Bathing Water - ConcEC Heat Map' is selected in the 'Map Contents' panel. The 'Configure selected layer' panel is open, showing options for 'Transparency', 'Symbology', 'Add Heat Map', 'Intensity', and 'Color Scheme'. A color scheme selection window is also visible, showing various color gradients. The interface includes a search bar, a scale bar, and a compass. The bottom of the screen shows the Esri logo and the text 'Designed and developed by Epsilon and GeoSYS'.

LAYER PROPERTIES – HEAT MAPS

Malta Geoportal

The screenshot displays the Malta Geoportal interface. The main map shows the island of Malta with several red circular markers indicating specific locations. The 'Water' layer is selected in the top-left corner. On the right side, the 'Map Contents' panel lists several layers, with 'IdentifiedBW' checked and highlighted by a red box. Below this, the 'Configure selected layer' panel is open, showing various configuration options. The 'Clustering' option is highlighted with a green box, and its sub-panel is also highlighted with a green box, showing the following settings:

- Use point clustering
- Maximum points: 10
- Radius: 20
- Cluster Background Color
- Cluster Foreground Color

LAYER PROPERTIES - CLUSTERING

Malta Geoportal

The screenshot shows the Malta Geoportal interface. The main map displays the island of Malta with numerous green dots representing bathing water quality. A legend on the right, titled 'Map Contents', shows a tree view with 'Bathing Water - ConcIE' selected and expanded. A red box highlights the legend items, and a black arrow points from the legend to the table below. The table, titled 'Attributes of Bathing Water - ConcIE', displays the following data:

SampleDate	ConcIE	BWID	BWName	ShortName	GroupID	WBName	Year_BW	Closed	
30/06/2009 01:00:00	15	60	MT0150155500000C28	RAS IL-QAWRA (FRA BEN)	SAN PAWL IL-BAHAR	na	L'HRAX TAL-MELLIEHA - IL-BAJJA TAL-BALLUTA	2011	N
30/06/2009 01:00:00	15	61	MT0150155500000C29	IL-BAJJA TAS-SALINA (OPP TRIQ IT-TURISTI)	SAN PAWL IL-BAHAR	na	L'HRAX TAL-MELLIEHA - IL-BAJJA TAL-BALLUTA	2011	N
30/06/2009 01:00:00	15	62	MT0150155500000C30	IL-BAJJA TAS-SALINA (OPP TRIQ IR-RIZZI)	SAN PAWL IL-BAHAR	na	L'HRAX TAL-MELLIEHA - IL-BAJJA TAL-BALLUTA	2011	N
30/06/2009 01:00:00	15	63	MT0150155500000C31	IL-BAJJA TAS-SALINA (QUAY AT CENS TAL-GEBEL)	SAN PAWL IL-BAHAR	na	L'HRAX TAL-MELLIEHA - IL-BAJJA TAL-BALLUTA	2011	N
30/06/2009 01:00:00	15	64	MT0150155500000C32	IL-BAJJA TAS-SALINA (OPP COASTLINE HOTEL)	SAN PAWL IL-BAHAR	na	L'HRAX TAL-MELLIEHA - IL-BAJJA TAL-BALLUTA	2011	N

Record: 0 Records (0 out of 2000 Selected) Options Commit

ATTRIBUTE TABLE – WITH TABULAR DATA EDITING

Malta Geoportal

The screenshot displays the Malta Geoportal interface. At the top, there are tabs for 'Air', 'Water', 'Radiation', 'Noise', 'Soil', and 'All Themes'. The 'Water' tab is active. The main map area shows a 3D topographic map of Malta with several blue location pins. A 'Find Nearby' dialog box is open, showing 'Layer: IdentifiedBW' and 'Distance: 500 Meters'. A red box highlights the 'IdentifiedBW' layer in the 'Map Contents' panel on the right. A black arrow points from the 'Find' button in the dialog box to the 'Attributes of IdentifiedBW' table below. The table lists various water bodies with their attributes.

Attributes of IdentifiedBW														
MT0150153700000C11	na	22/07/2009 01:00:00	15	30	43	MT0150153700000C11	IL-BAJJA TAL-MELLIEHA (OPPOSITE DA TOMMASO)	MELLIEHA	14.349725	35.972425	ETRS89	na	MTMalta	Malta
MT0150153700000C12	na	22/07/2009 01:00:00	15	30	44	MT0150153700000C12	IL-BAJJA TAL-MELLIEHA (OPPOSITE MAXIMA)	MELLIEHA	14.350952	35.969287	ETRS89	na	MTMalta	Malta
MT0150153700000C13	na	22/07/2009 01:00:00	15	15	45	MT0150153700000C13	IL-BAJJA TAL-MELLIEHA (OPPOSITE SAN REMO)	MELLIEHA	14.352246	35.967565	ETRS89	na	MTMalta	Malta
MT0150153700000C14	na	22/07/2009 01:00:00	30	15	46	MT0150153700000C14	IL-BAJJA TAL-MELLIEHA (OPPOSITE TUNNY NET)	MELLIEHA	14.355655	35.966431	ETRS89	na	MTMalta	Malta
MT0150153700000C15	na	22/07/2009 01:00:00	15	15	47	MT0150153700000C15	IL-BAJJA TAL-MELLIEHA (DAWRET IT-TUNNARA)	MELLIEHA	14.357827	35.966991	ETRS89	na	MTMalta	Malta

Record: <<< 1969 >>> Records (1 out of 2000 Selected) Options Commit

TOOLS TOOLBAR – FIND NEARBY

Malta Geoportal

Expand Collapse 2D 3D Ingest Water Ingest Radiation

Air Water Radiation Noise Soil All Themes

SEIS Water Help

INSPIRE (Services)

Metadata Identification Distribution Quality

Identifier Contact Date Standard Reference

File Identifier

{A031CD4F-04A9-4A0E-B175-AC59B5E91DAF}

Metadata Language

English

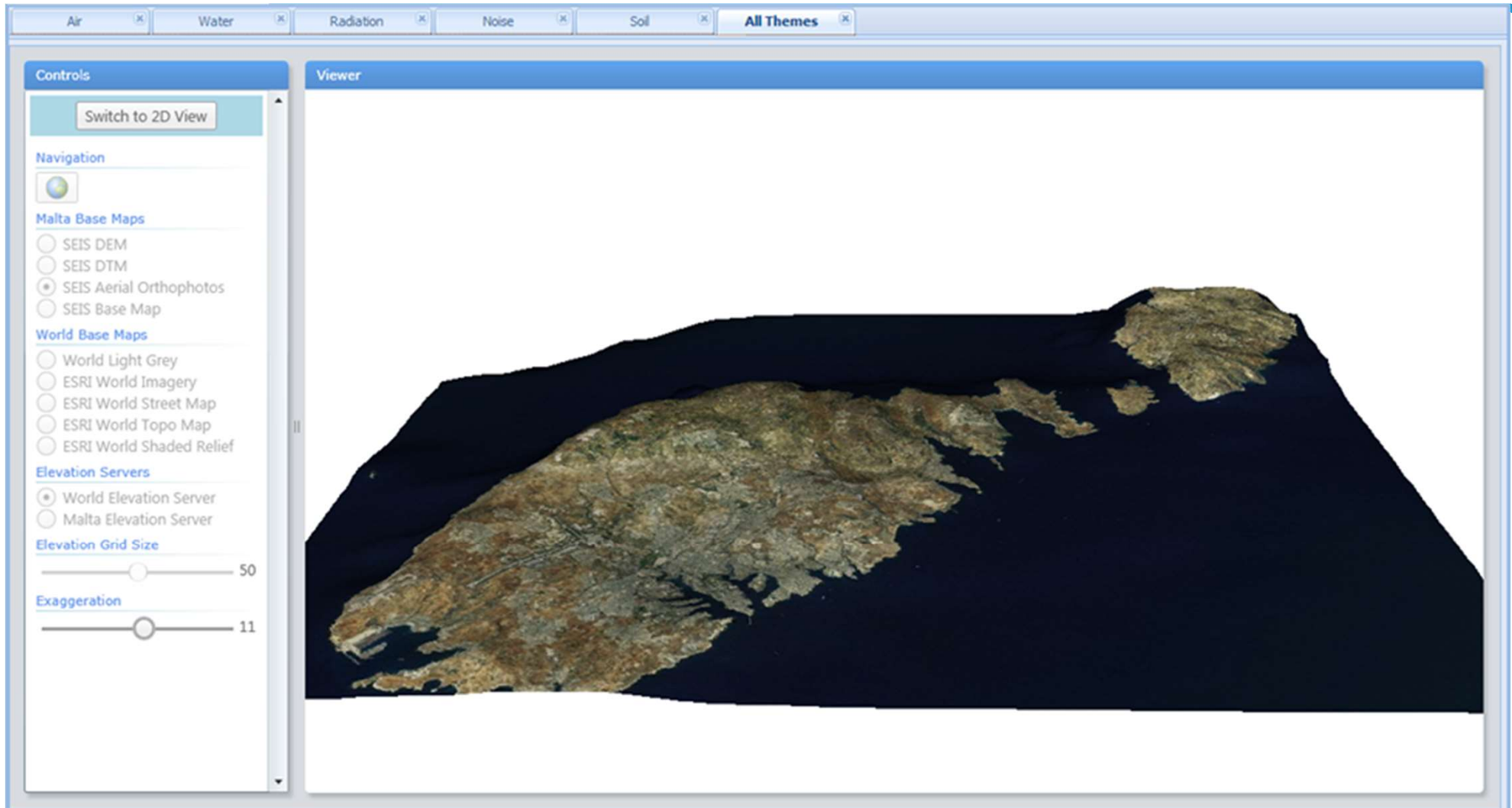
Hierarchy Level

Service

POWERED BY

METADATA EDITOR

Malta Geoportal



3D TOPOGRAPHIC VIEWER

SEIS-Malta in the EU

- Technologically state-of-the-art
- Ahead of most EU MS
- Only AT, DE, FR, CZ and some other more advanced-stage countries
- Flexible “tailoring” for expansion
- Easy to use
- Support from the main software entities
- INSPIRE based and other legislative tools

Preparing for the next generations

- Minecraft
- Virtual worlds
- Augmented reality
- Immersive Education



The Dwejra Case Study



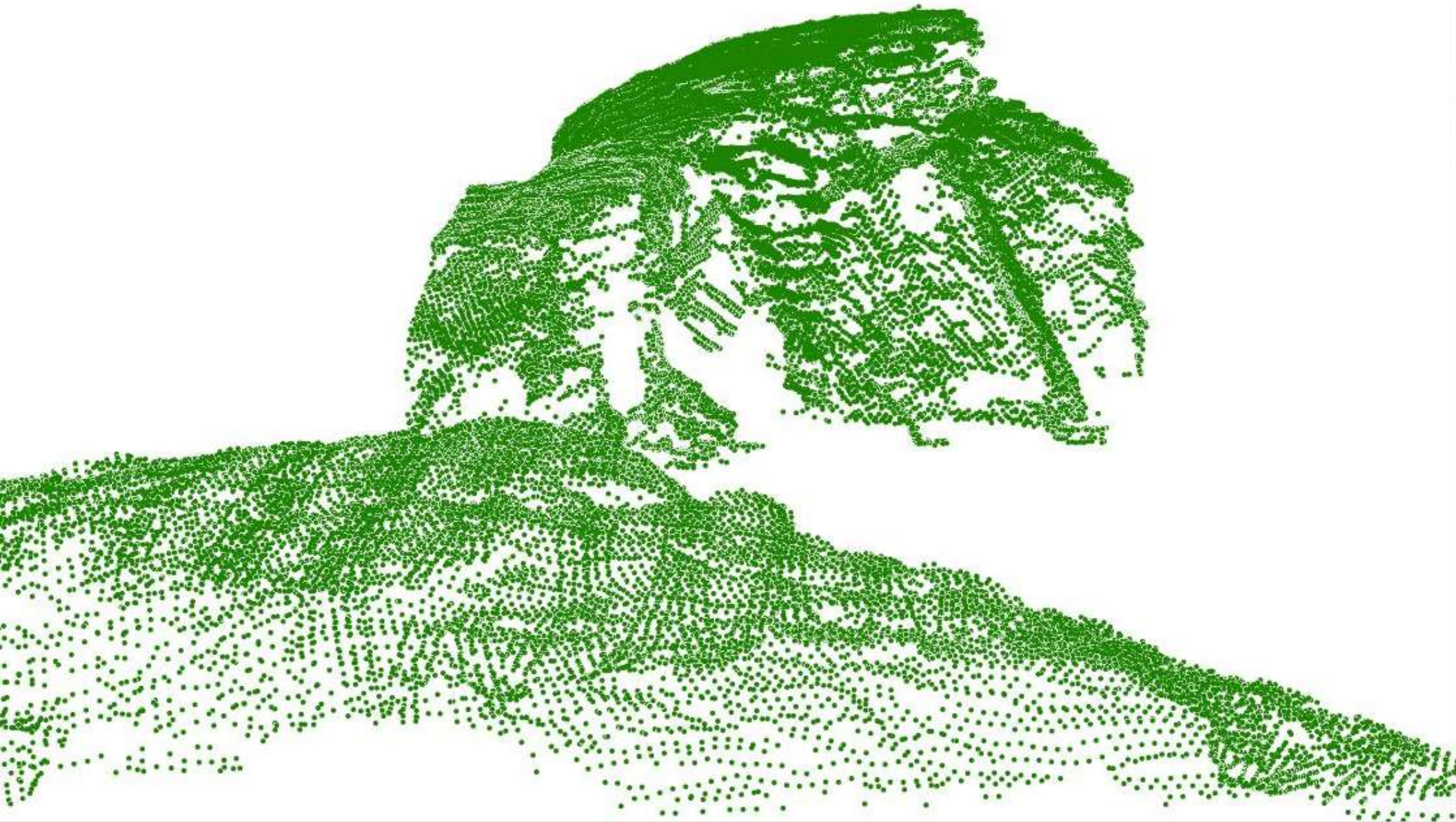
EUROPEAN REGIONAL DEVELOPMENT FUND
MALTA 2007-2013

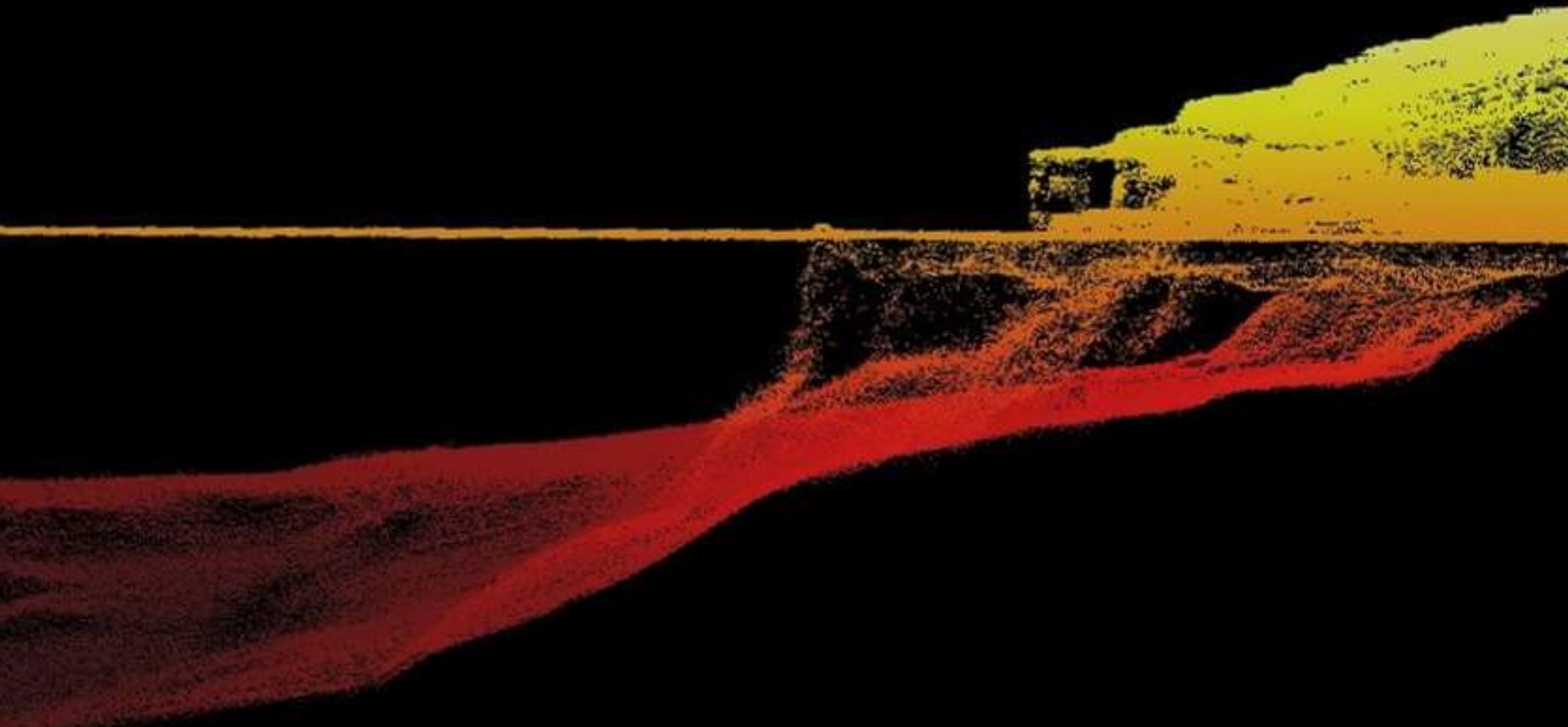


Testing: 2013 – LiDAR

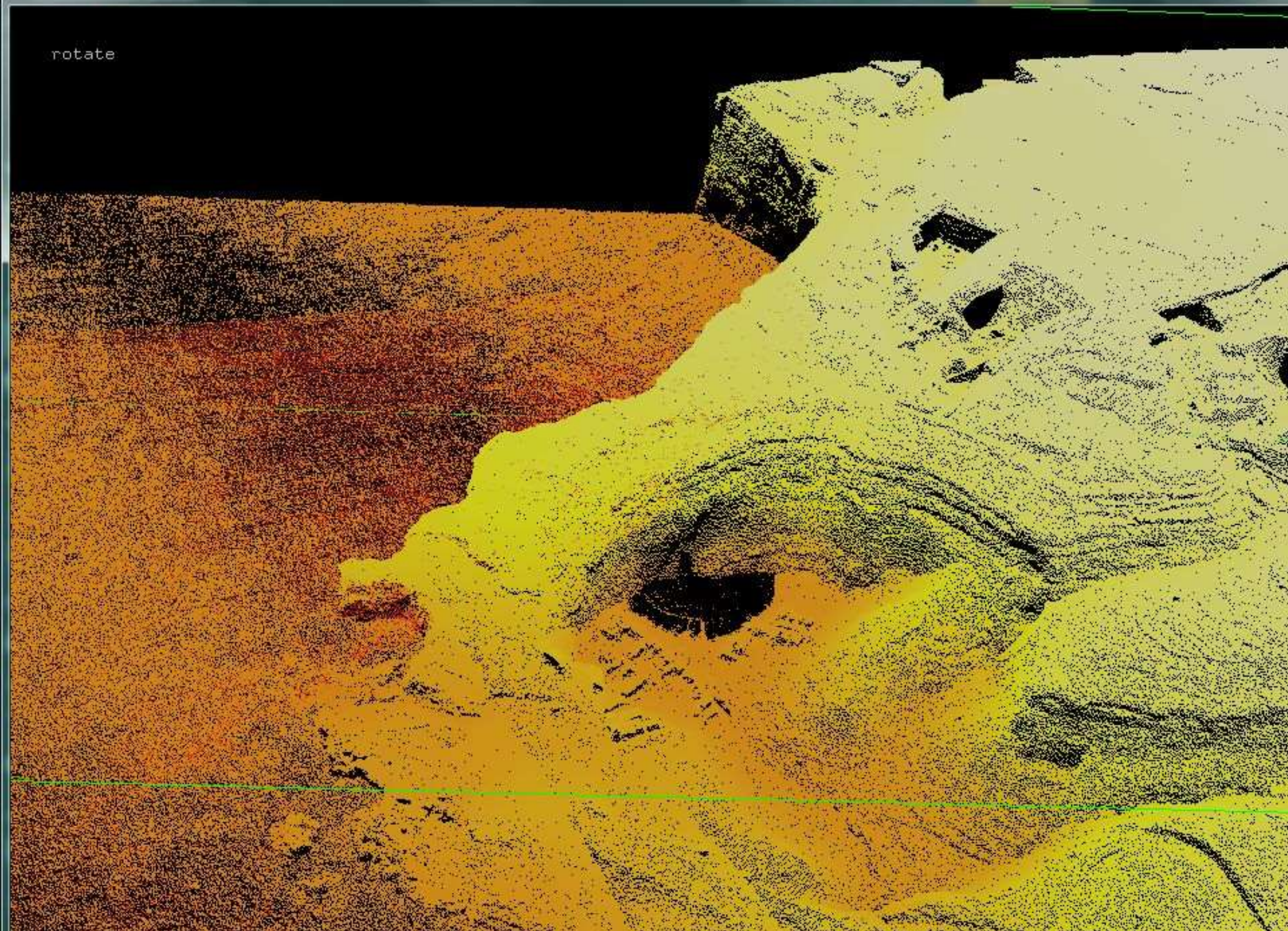


EUROPEAN REGIONAL DEVELOPMENT FUND
MALTA 2007-2013





rotate





EUROPEAN REGIONAL DEVELOPMENT FUND
MALTA 2007-2013

Minecraft 1.7.2

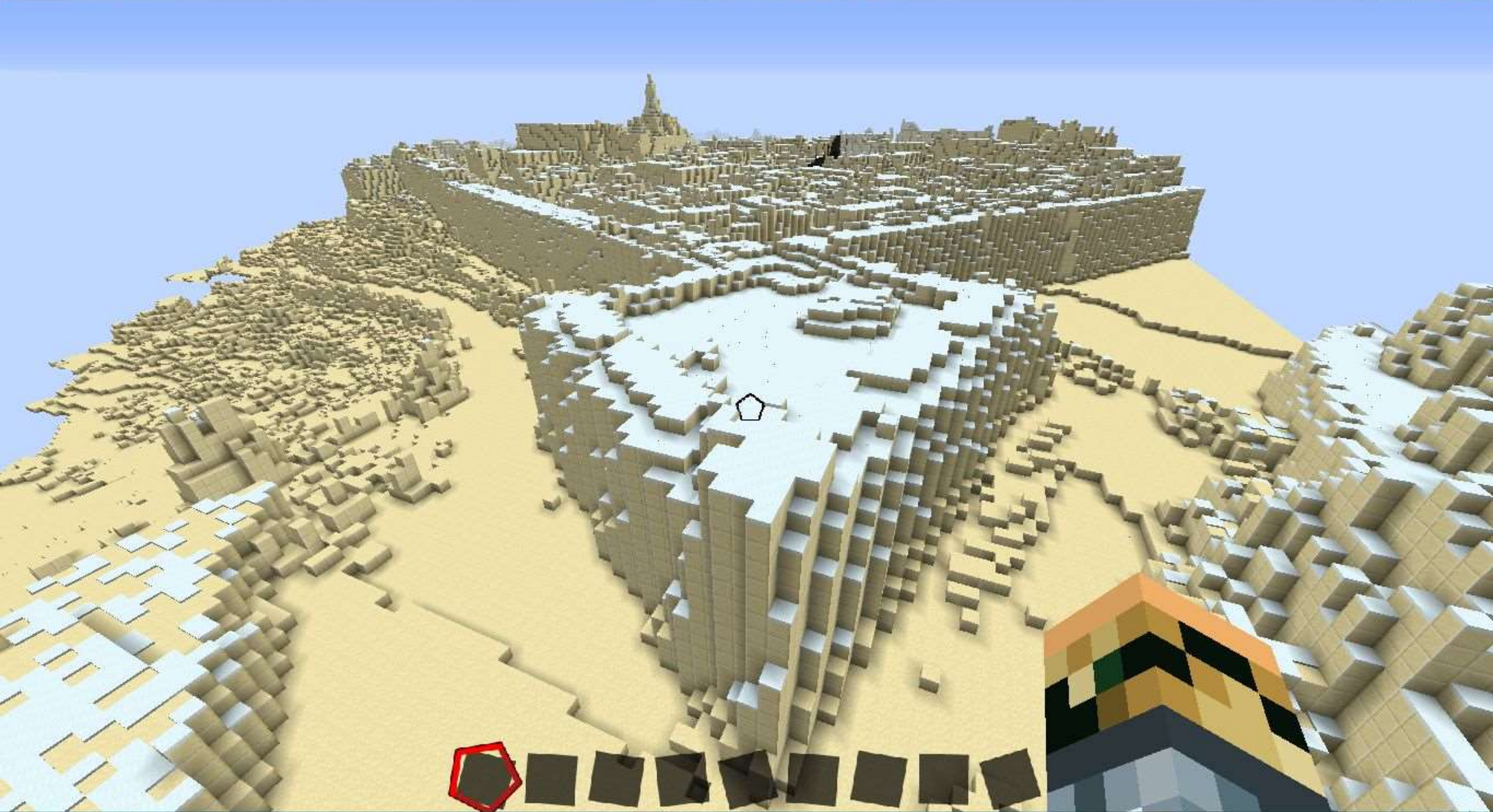
Minecraft 1.7.2 (9 fps, 1 chunk updates)
C: 1258/17424, F: 768, O: 0, E: 15403
E: 0/1, B: 0, I: 1
P: 0, T: All: 1
MultiPlayerChunkCache: 315, 315

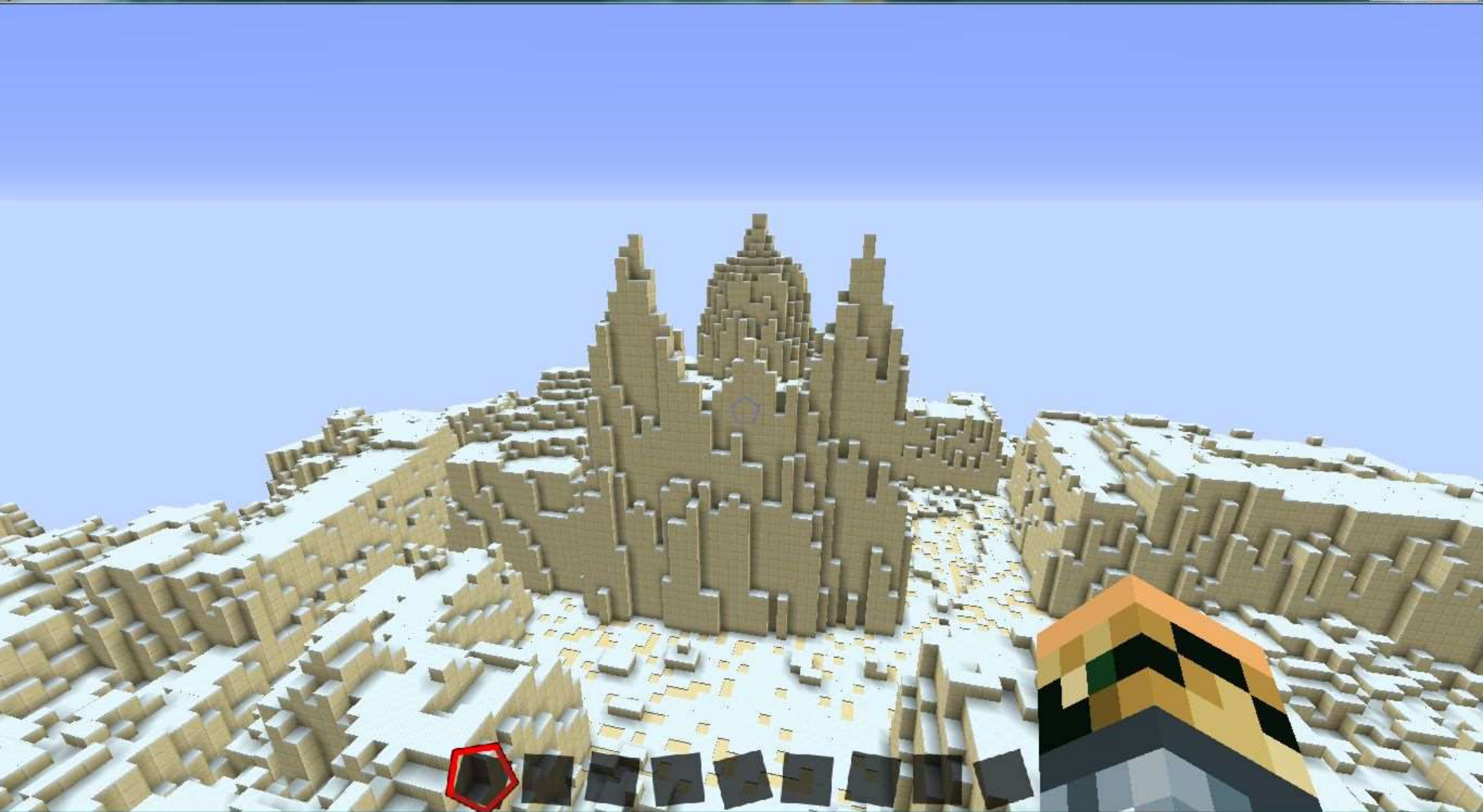
Used memory: 23% (209MB) of 910MB
Allocated memory: 61% (555MB)

x: 9339.62893 (9339) // c: 583 (11)
y: 237.416 (feet pos, 239.036 eyes pos)
z: 13139.50069 (13139) // c: 321 (3)
F: 1 (WEST) / 67.9501

ws: 0.100, fs: 0.050, g: false, fl: 173







Post Project

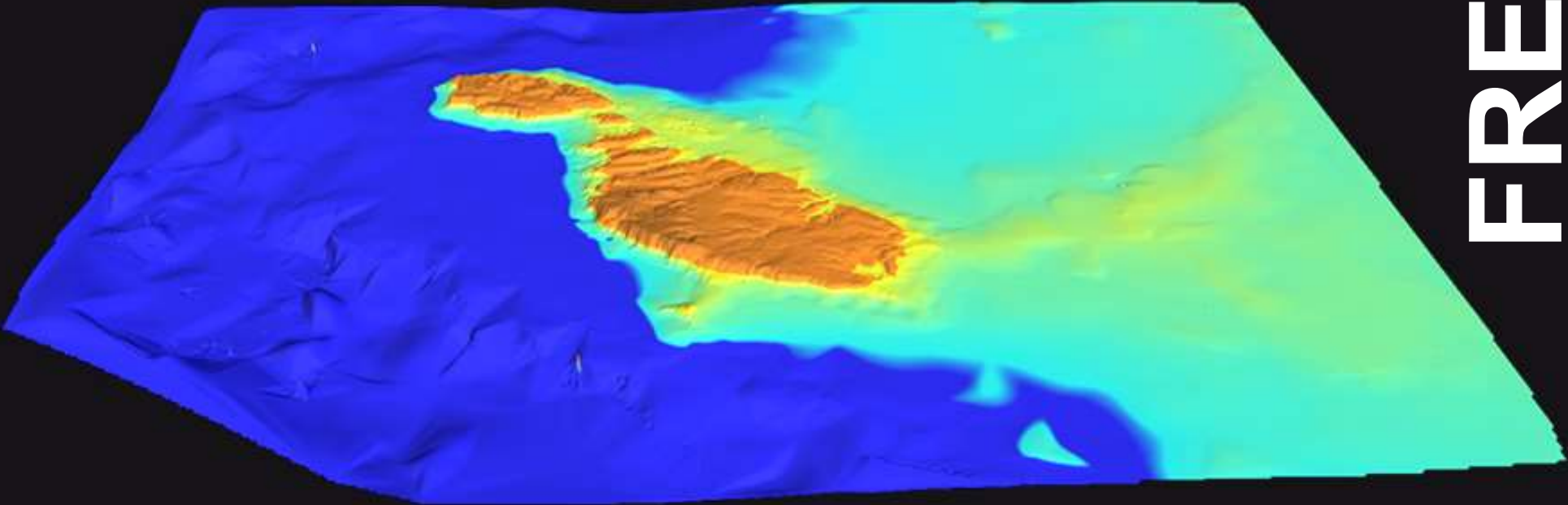
- Land Reclamation
 - Beach Replenishment
 - Urban roof area – solar power generation
 - Quarries – volume analysis and solar canopies
 - Archaeological surveying (Marine and Terrestrial)
-
- Sea level Rise
 - Inundation and flood zones
 - Noise Zones
 - Network Creation
 - Environmental monitoring (MPAs)
-
- Criminological Analysis
 - Enforcement – change analysis
 - Post-Disaster Management

Woman, 84, dies Sliema house incendio



An
died
when
Cath
lapse
day.
He
was
Anth
dog
escap
The
was t
cal co
hours
The
buili
work

Future Drive

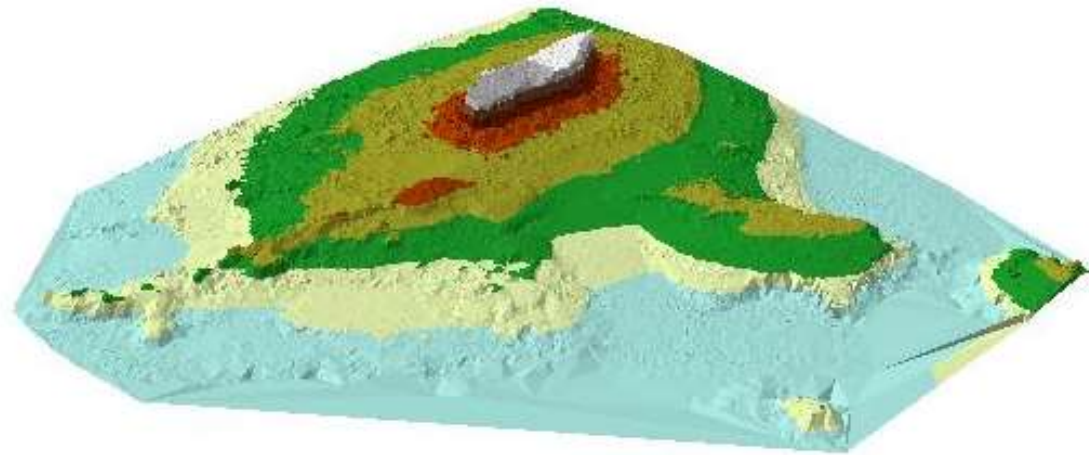


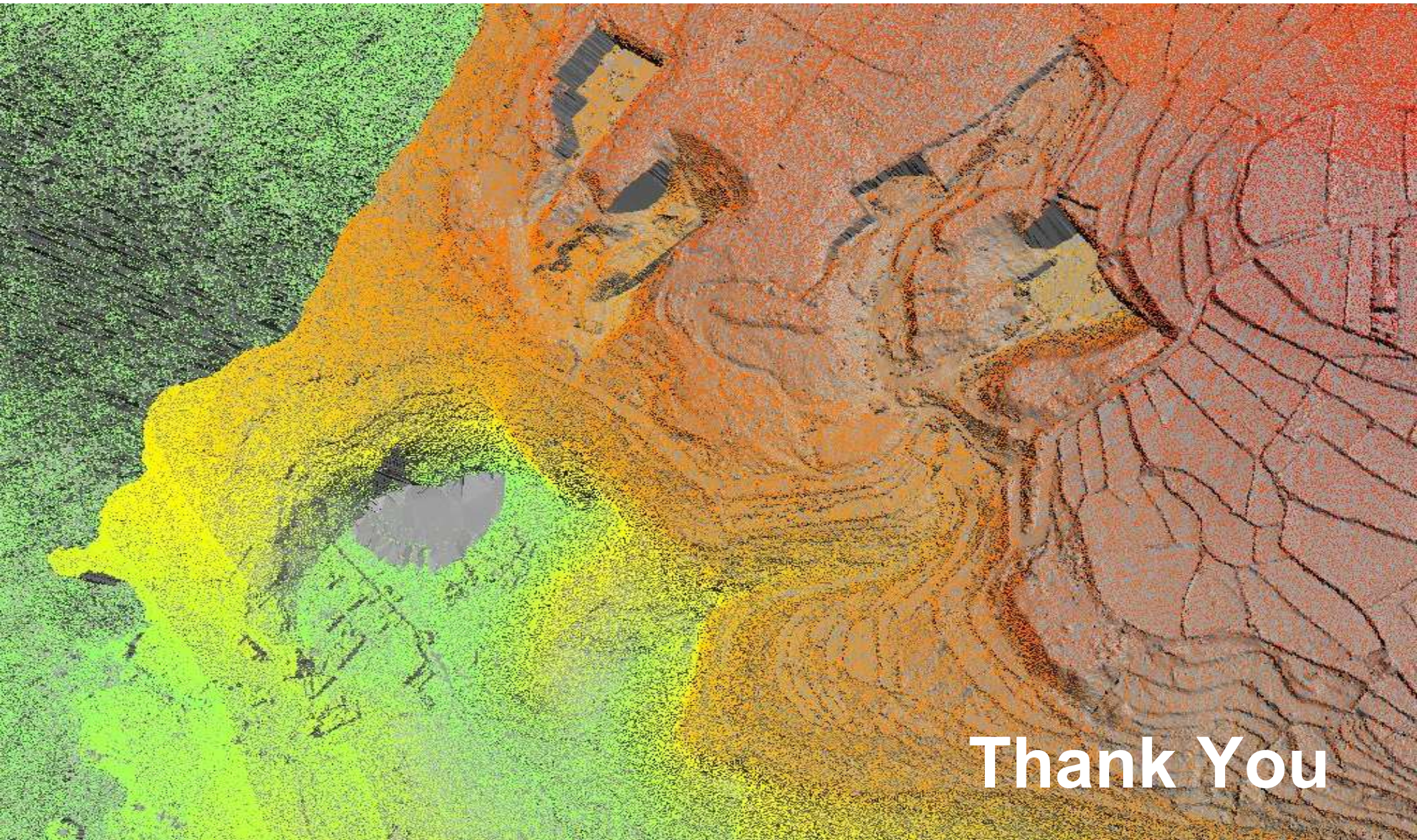
FREE



Learning from such a large project

- Main issues
- ERDF156 as a springboard
 - Gather once : Use many
 - Easy access to data through dissemination tools
 - Free distribution of data
 - Free webservice
 - Call for an integrated effort to identify all datasets that can be disseminated (ESF – ERDF funding?)
- **Need to eliminate the current situation from a charging state to a free dissemination state**





Thank You

Dr. Saviour Formosa PhD

saviour.formosa@um.edu.mt