

Safeguarding the Green and Blue Open Spaces of Malta's Grand Harbour

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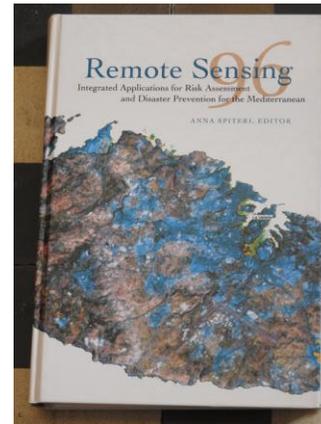


Safeguarding the Green and Blue Open Spaces of Malta's Grand Harbour

- Short intro's to our company's landmarks in promoting the use of satellite-image derived applications in Malta and our portfolio in weaving Participatory GIS and satellite-derived products for optimum land and water management
- Some examples of the outcomes of the application of PGIS and the role of satellite imagery as a powerful tool to engage with local communities
- The application of PGIS and use of satellite imagery in the ENPI CBC Med funded MARE NOSTRUM project
- Current, ongoing ENI CBC Med funded AQUACYCLE project in which we aim to extend the role of PGIS to the domain of water and sanitation



IRMCo's landmarks in promoting the use of satellite image derived applications in Malta



1996: Hosting of EARSeL Conference
Integrated Applications for Risk Assessment and
Disaster Prevention for the Mediterranean

2017: Hosting of Copernicus
Training and Information Session
on the occasion of Malta's Presidency of
the Council of the EU



Since 2017:
Member of the Copernicus Academy



IRMCo's portfolio in weaving participatory GIS and satellite-derived products for optimum land and water management



Participatory multi-Level EO-assisted tools for Irrigation water management and Agricultural Decision-Support
(FP6, 2006-2009)

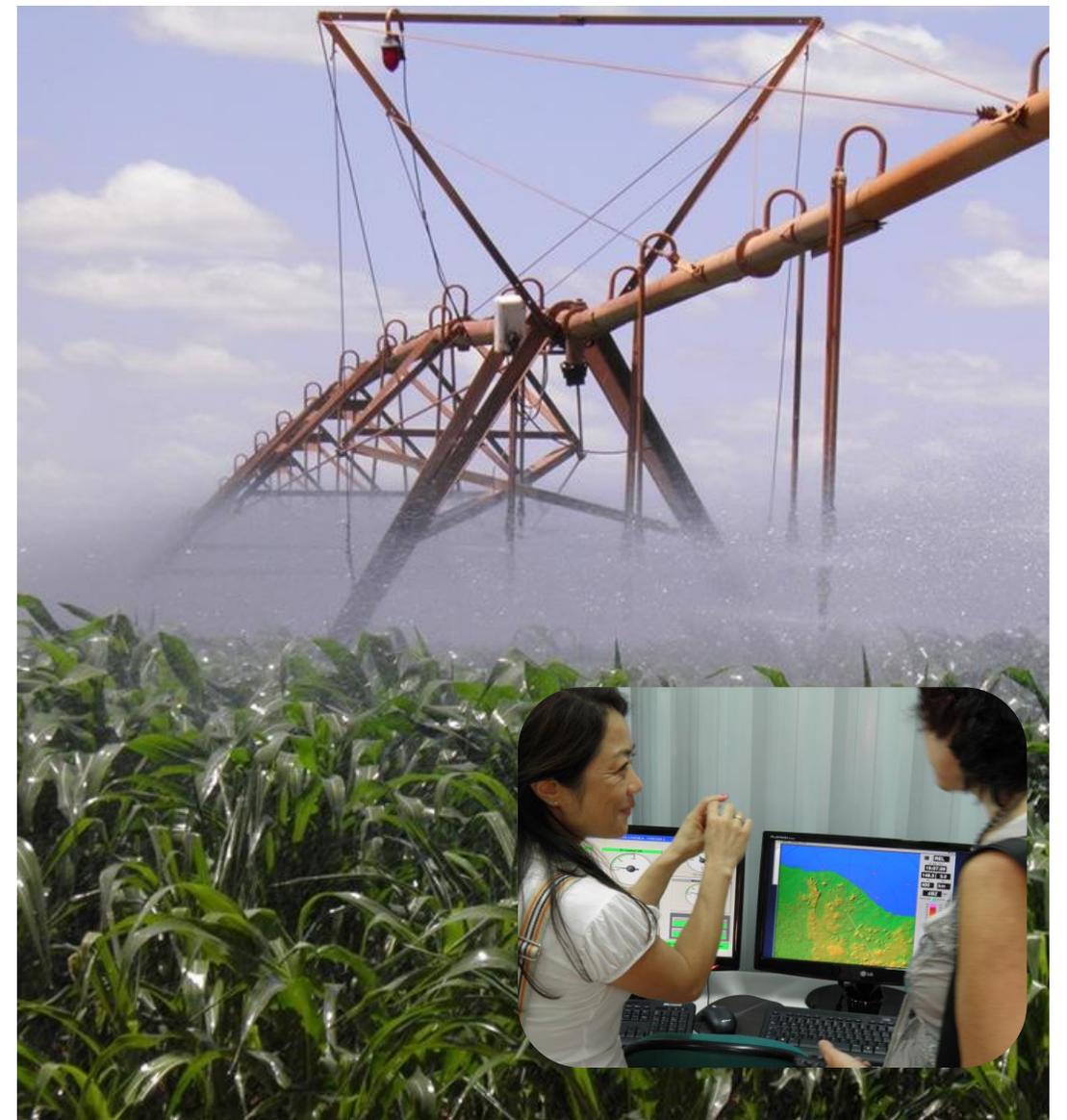


Sustainable Irrigation water management and River-basin governance:
Implementing User-driven Services
(FP7, 2010-2013)



Bridging the policy-implementation gap in Integrated Coastal Zone Management (ICZM) across the Mediterranean Sea Basin
(ENI CBC Med, 2013-2015)

FP7 project SIRIUS: Sustainable Irrigation water management and River-basin governance: Implementing User-driven Services



Farmers drawing their vision for a fair and equitable sharing of water



Farmers recall the water situation before the construction of the Aswan Dam



Sefsafa and Daqalt canals in the Nile Delta, Egypt
July 2011

Farming community points to optimum location for a reservoir



Farmers explain the conflict between the communities upstream and downstream of a dam



Forquilha, Brazil
August 2012

Farmers draw a new water vision



Farmers explain how they wish to replace the ageing irrigation distribution system with a more equitable system for all



Morada Nova, Brazil
August 2012

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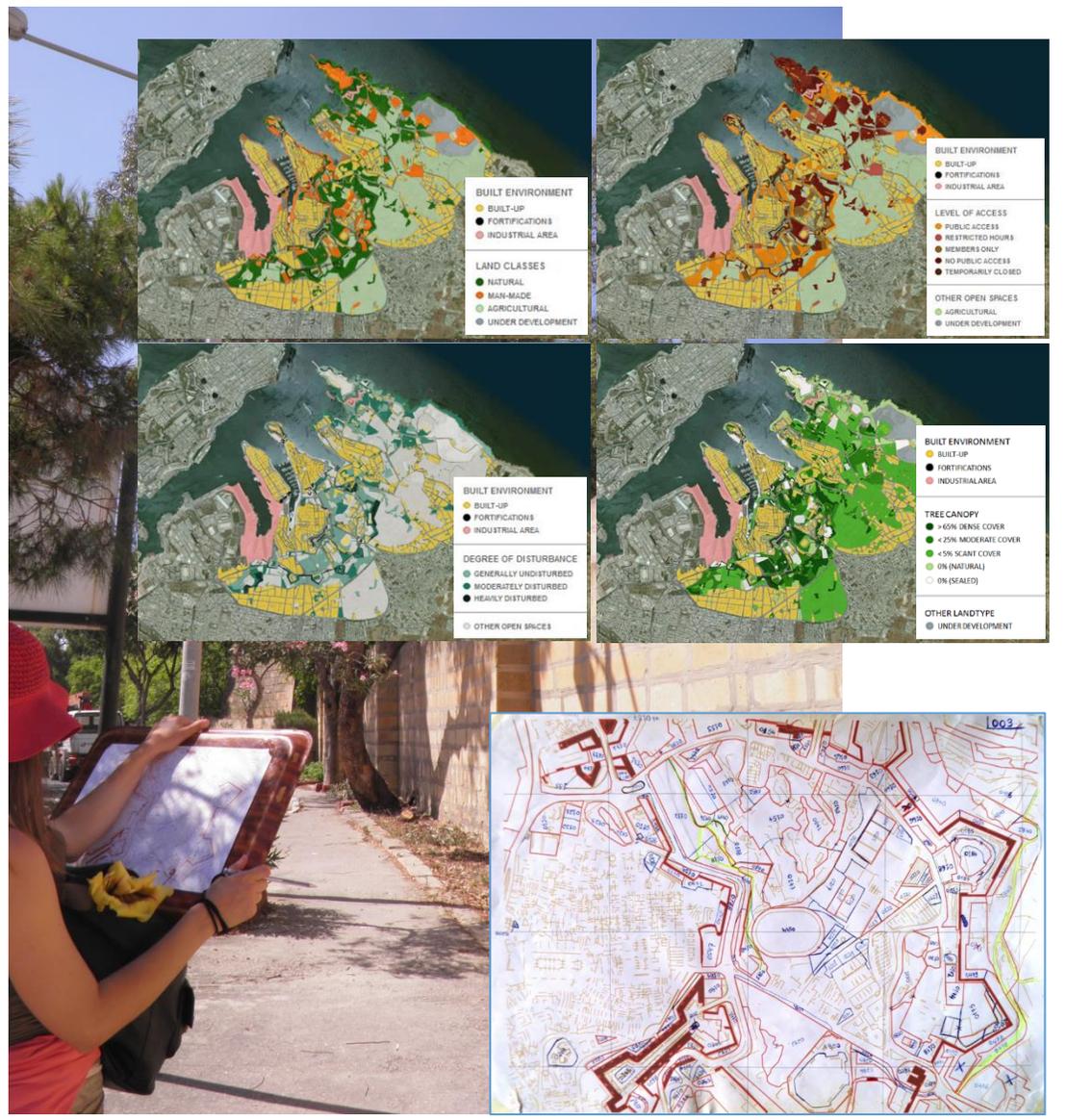
ICZM in Malta

A review of legislation, policy and existing research on integrated coastal zone management



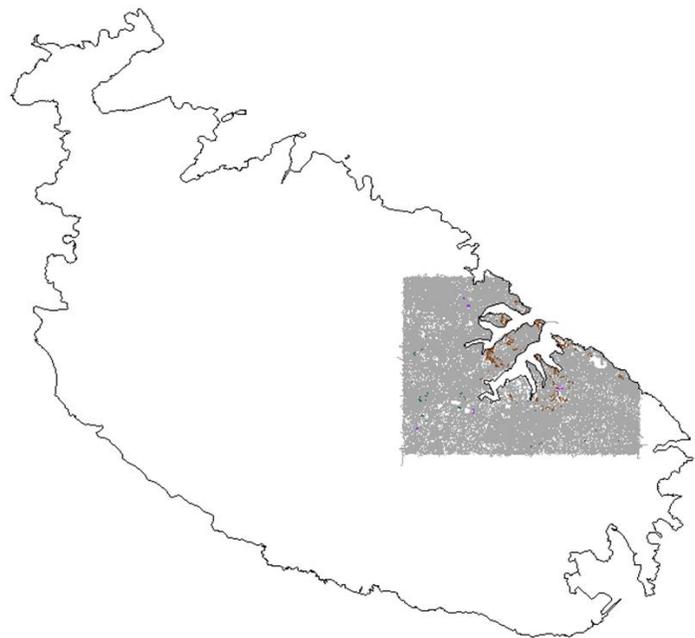
Integrated Resources Management Co Ltd
IRMCo, Malta

Desk review Malta's ICZM

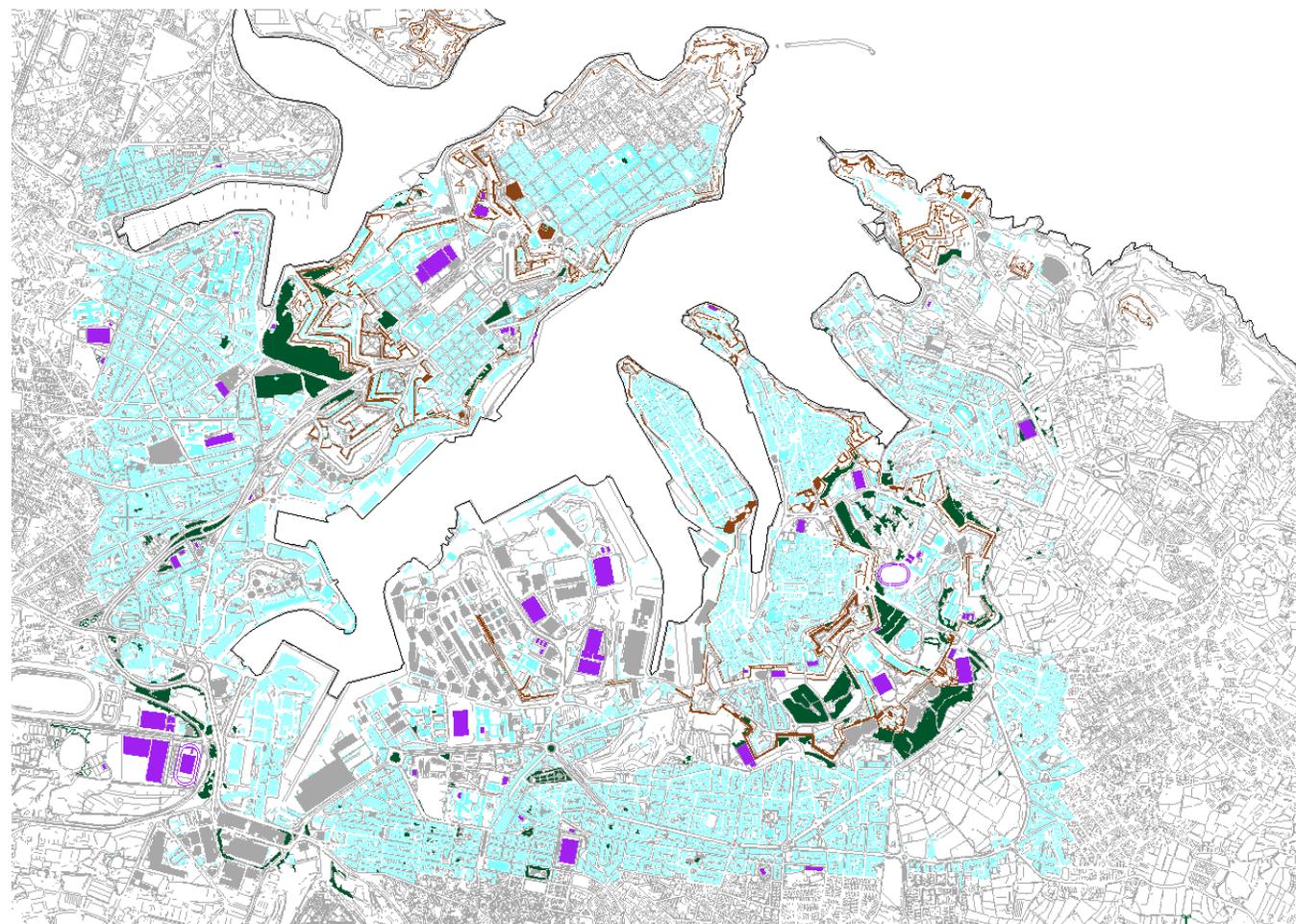


Field mapping of Open Spaces in Grand Harbour

Mapping of the Open Spaces started from the extraction of features from Survey Sheets



Geographic area covered
by 22 topographic survey
sheets 1:2500



Extraction of relevant features, such as e.g.
built up areas, fortifications, wooded areas, etc.

In parallel, appropriate legends were drawn up to characterize the Open Spaces

Desired information on Open Spaces:

- **Current use**
- Level of access
- Means of access
- Degree of disturbance (Natural Open Spaces)
- Level of maintenance (Man-made Open Spaces)

Agricultural areas	Natural Open Spaces	Man-made Open Spaces
Cultivated fields	Wooded area	Landscaped garden
Orchard	Shrubland	Roadside landscaping
	Rocky beach	Promenade
	Sandy beach	Sports facility
	(Other)	Playground
		Paved area
		Car park
		Cemetery
		Boat yard
		Water body
		(Other)

In parallel, appropriate legends were drawn up to characterize the Open Spaces

Desired information on Open Spaces:

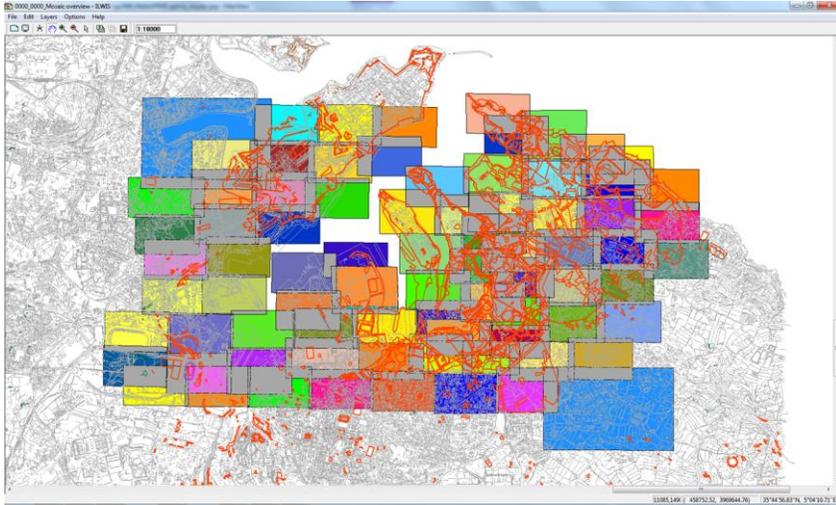
- Current use
- Level of access
- Means of access
- Degree of disturbance (Natural Open Spaces)
- Level of maintenance (Man-made Open Spaces)

Level of access
Public access
Restricted hours
Members only
No public access
Temporarily closed

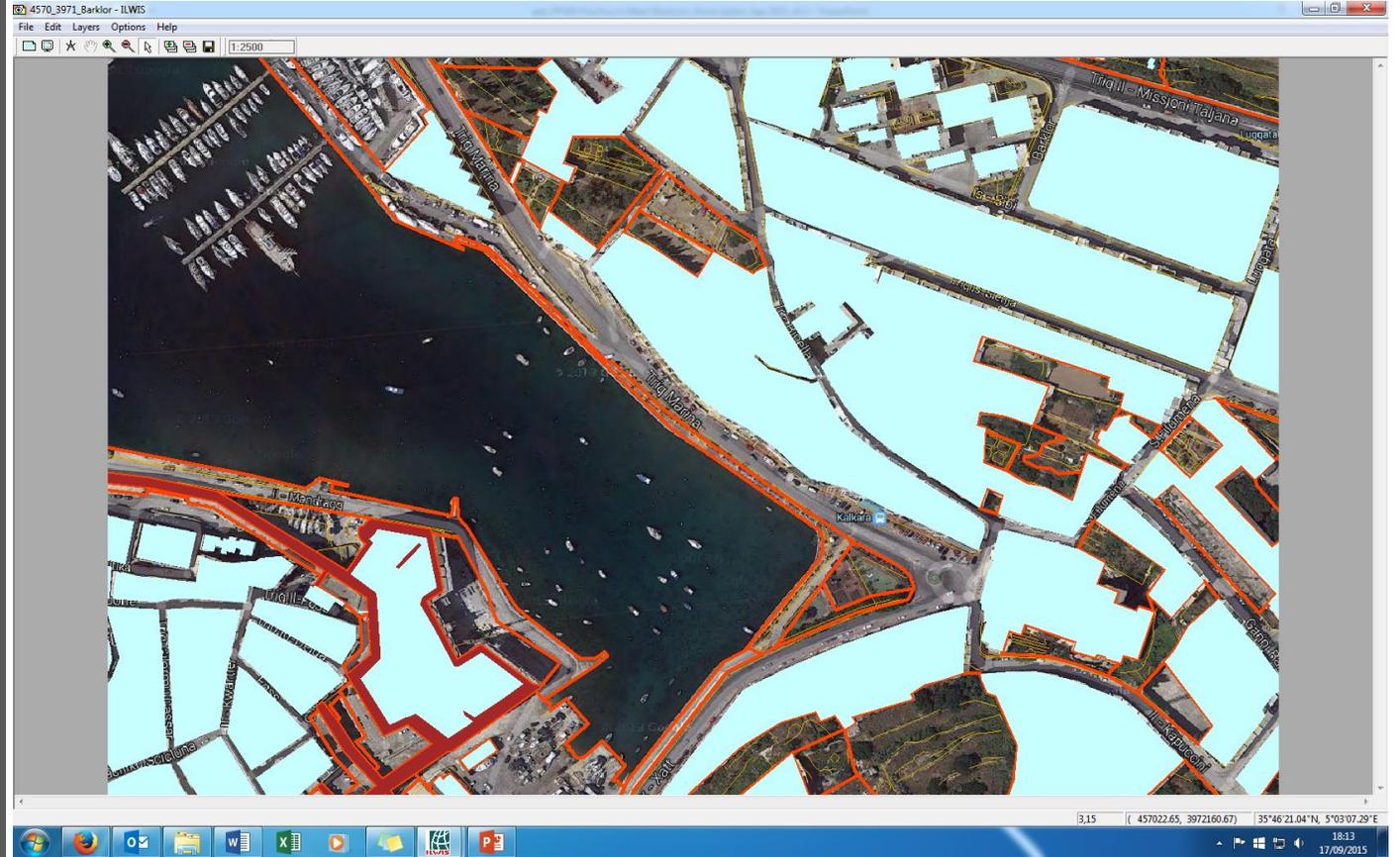
Means of access
On foot
On foot and by bicycle
Motorized vehicles

Natural Open Spaces	Man-made Open Spaces
Generally undisturbed	Regularly maintained
Moderately disturbed	Not regularly maintained
Heavily disturbed	Neglected

Identifying potential Open Spaces on Satellite Imagery



- 1) Georeferencing of satellite images
- 2) Adding polygons of built up areas



- 3) Drawing of polygons of potential Open Spaces

Preparing for field mapping of Open Spaces

Codebook			
Land type		Access	
Agricultural Land	AG	Public access 24/7	PU
Natural	NA	Public access restricted hours	RH
Man-made	MM	Members only access	MO
		Private access	PR
		Temporarily closed	TC
Type (agricultural land)		Means of access	
Cultivated Fields	CF	On foot	FO
Orchard	OR	On foot and bicycle	FB
		Motorized vehicles	MV
Type (natural)		Tree canopy	
Wooded area	WA	No trees, soil sealed	0% (sealed)
Shrubland	SL	Natural, but no trees	0% (natural)
Rocky beach	RB	Scant cover	< 5%
Sandy beach	SB	Moderate cover	15 - 25%
Other	O1	Dense cover	> 65%
Human impact (natural)		Predominant type of trees	
Generally undisturbed	UD	Olive	OL
Moderately disturbed	MD	Tamarisk	TA
Heavily disturbed	HD	Aleppo Pine	AP
		Ficus	FI
Type (man-made)			
Landscaped garden	LG	Eucalyptus	EU
Roadside/urban landscaping	RL	Citrus	CI
Promenade	PM	Cypress	CY
Sports facility	SF	Acacia	AC
Playground	PG	Carob	CA
Paved area	PA	Almond	AL
Car park	CP	Fruit trees mixed	FT
Cemetery	CE	Sandarac Gum Tree (Gharghar)	GH
Boat yard	BY	Tree of Heaven	TH
Water body	WB	Palm	PL
Other	O2	Mixed	MX
		Other	O3
Human impact (man-made)		Comments	
Regularly maintained	RM	Comment	CO
Not regularly maintained	NM		
Neglected	NE		

A 'Codebook' to guide data recording during field survey



Printing of A3 size base maps (1:2500 scale)

Outcomes of field survey

Date: 13/05/2014		Time: 15:00-17:30		Initials: SM		Weather: sunny		Map no: 004 + 007				
Site code	Land type	Type (agricultural)	Type (natural)	Human impact (natural)	Type (man-made)	Human impact (man-made)	Access	Means of access	Tree cover	Predominant type of trees	Comments	Photo(s)
0376	AG	CF	-	-	-	-	-	-	45-75%	MX	CO	13 3915, 3916
0377	MM	-	-	-	CE	NE	PR	-	>65%	MX	CO	13 3917, 3918, 3919
0378	NA	-	WA	UD	-	-	PR	-	>65%	CA	CO	13 3921, 3922
0379	MM	-	-	-	RL	RM	PU	FO	15-25%	MX	CO	13 3924
0380	MM	-	-	-	RL	RM	PU	FO	15-25%	MX	CO	13 3925
0381	MM	-	-	-	CP	RM	PU	MV	0/(sealed)	-	-	13 3927
0382	NA	-	SL	UD	-	-	PU	DA	>65%	CP1	-	13 3928
0383	NA	-	SL	MD	-	-	PU	DA	<5%	MX	-	13 3926, 29, 30
0384	MM	-	-	-	PM	RM	PU	FB	0/(sealed)	-	-	13 3932, 3933
0385	NA	-	SB	UD	-	-	PU	FO	0/(...)	-	-	13 3934
0386	MM	-	-	-	SF	RM	MO	FO	0/(sealed)	-	CO	13 3935
0387	MM	-	-	-	SF	RM	MO	FO	0/(sealed)	-	CO	13 3936
0388	NA	-	WA	UD	-	-	PU	DA	>65%	AC	-	13 3937, 3938
0389	MM	-	-	-	PM	RM	PU	FO	0/(sealed)	-	-	13 3939
0390	NA	-	RB	MD	-	-	PU	FO	0/(sealed)	-	-	13 3940
0391	NA	-	SL	UD	-	-	PU	DA	>65%	CP	-	13 3941
0392	NA	-	SL	MD	-	-	PR	-	0/(green)	-	-	13 3944
0393	NA	-	RB	MD	-	-	PU	DA	0/(sealed)	-	-	13 3946
0394	NA	-	SL	MD	-	-	PU	DA	15-25%	CP	-	13 3950
0395	AG	CF	-	-	-	-	-	-	<5%	CP	-	-
0396	MM	-	-	-	PA	NM	PR	-	<5%	CP	-	13 3949
0397	NA	-	WA	UD	-	-	PU	DA	>65%	CP	-	13 3951
0398	MM	-	-	-	LG	RM	PR	-	15-25%	MX	CO	13 3952
0399	MM	-	-	-	RL	RM	PU	FO	0/(green)	-	-	13 3954
0400	MM	-	-	-	LG	RM	PU	FO	>65%	OL	-	13 3955
0401	MM	-	-	-	LG	RM	PR	-	>65%	MX	-	13 3956
0402	MM	-	-	-	LG	RM	PR	-	>65%	GH	-	13 3957
0403	MM	-	-	-	LG	RM	PR	-	>65%	OL	-	13 3958
0404	MM	-	-	-	LG	RM	PR	-	>65%	CI	-	13 3959

Resulting data record from field survey



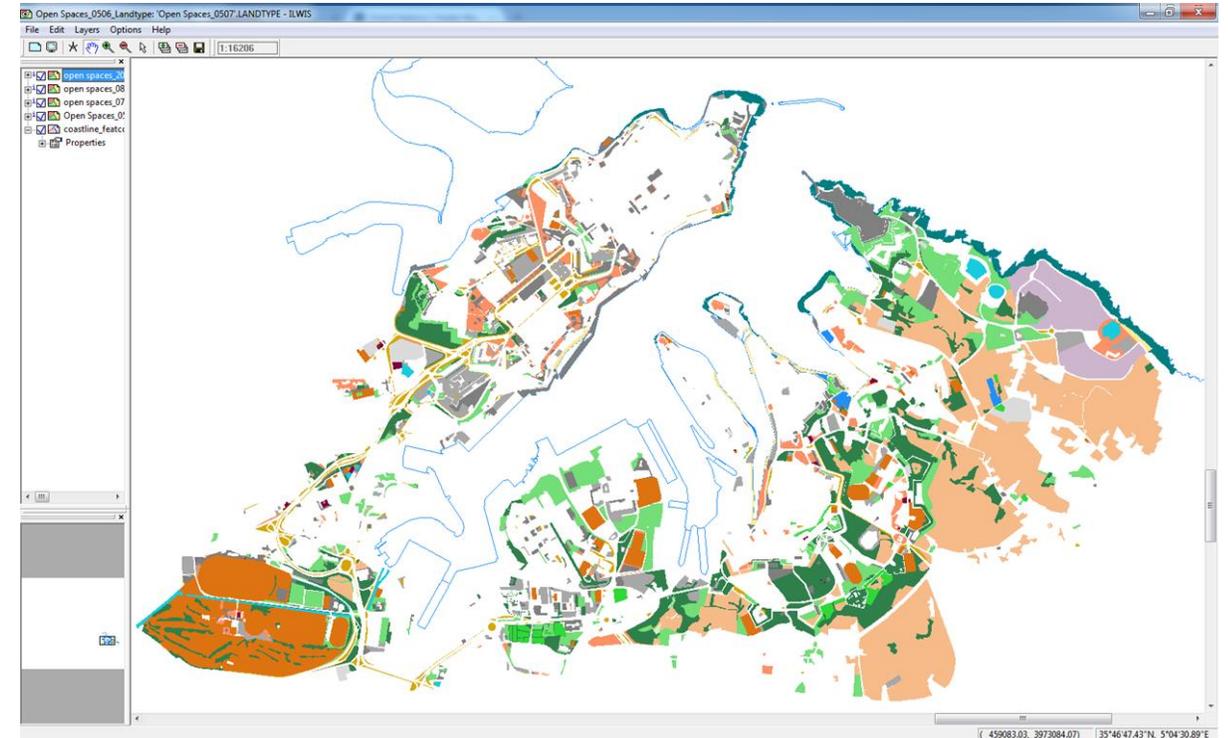
Resulting map from field survey

Back at the office

Excel Datainputting [Compatibility Mode] - Excel

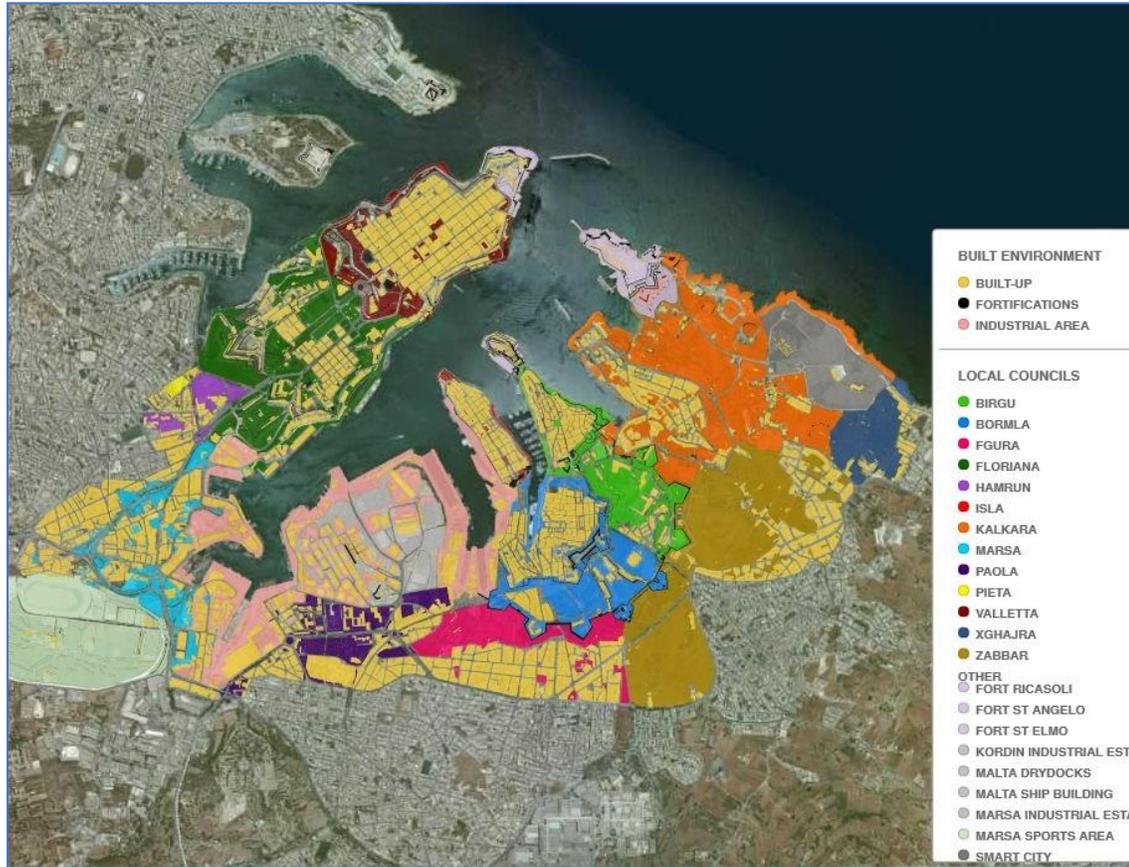
AGR_TYPE	NAT_TYPE	NAT_HI	MM_TYPE	MM_HI	ACCESS	MEANS	CANOPY	TREETYPE	COUNCIL	COMMENTS
			PM	RM	PU	FO	15 - 25%	FI	Isla	
			PM	RM	PU	FO	15 - 25%	TA	Isla	
			LG	NM	PR		< 5%	PL	Isla	
			BY	RM	PU	FO	0% (sealed)		Isla	CO
			CP	NM	PU	MV	0% (sealed)		Bormia	CO
	SL	UD	RL	NM	PU	FO	> 65%	GH	Isla	
			PU	DA	PU	FO	> 65%	AC	Isla	
			PM	RM	PU	FO	0% (sealed)		Bormia	
			PM	RM	PU	FO	> 65%	FI	Bormia	
			LG	RM	PU	FO	15 - 25%	O3	Bormia	
			PA	RM	PU	FO	> 65%	FI	Bormia	
			RL	RM	PU	FO	> 65%	FI	Bormia	
			RL	RM	PU	FO	15 - 25%	O3	Bormia	
			LG	RM	PU	FO	< 5%	O3	Bormia	
			PA	RM	PU	FO	0% (sealed)		Bormia	
			CP	RM	PU	FO	0% (sealed)		Bormia	
			LG	RM	PU	MV	< 5%	MX	Bormia	
			PR	RM	PR		< 5%	AP	Birgu	
			PM	RM	PU	FO	0% (sealed)		Birgu	
			CP	RM	PU	MV	0% (sealed)		Fort St Angelo	
			PM	RM	PU	FO	0% (sealed)		Birgu	
			PM	RM	PU	FO	0% (sealed)		Birgu	
			BY	RM	PR		0% (sealed)		Birgu	CO
			LG	RM	PU	FO	0% (sealed)		Birgu	
			CP	RM	PU	MV	0% (sealed)		Birgu	
OR							> 65%	FT	Bormia	
			LG	RM	PU	FO	> 65%	FI	Bormia	
			PA	RM	PU	FO	0% (sealed)		Bormia	
			LG	RM	PU	FO	15 - 25%	PL	Bormia	
			CE	NM	PR		> 65%	MX	Bormia	
			CP	RM	PU	MV	0% (sealed)		Bormia	
			CP	RM	PU	MV	< 5%	GH	Isla	
			PG	NM	PU	FO	0% (sealed)		Isla	
			SF	RM	MO	FO	0% (sealed)		Isla	
	WA	UD	PU	FO	PU	FO	< 5%	MX	Isla	
							> 65%	MX	Birgu	
	WA	MD	LG	NM	PU	FO	> 65%	O3	Kalkara	CO
	SL	UD			PU	FO	> 65%	OL	Kalkara	
	SL	MD			PU	FO	15 - 25%	MX	Kalkara	
	WA	MD			PU	FO	< 5%	CA	Kalkara	
	WA	UD			PU	DA	15 - 25%	CA	Kalkara	

Inputting of data recorded during field survey

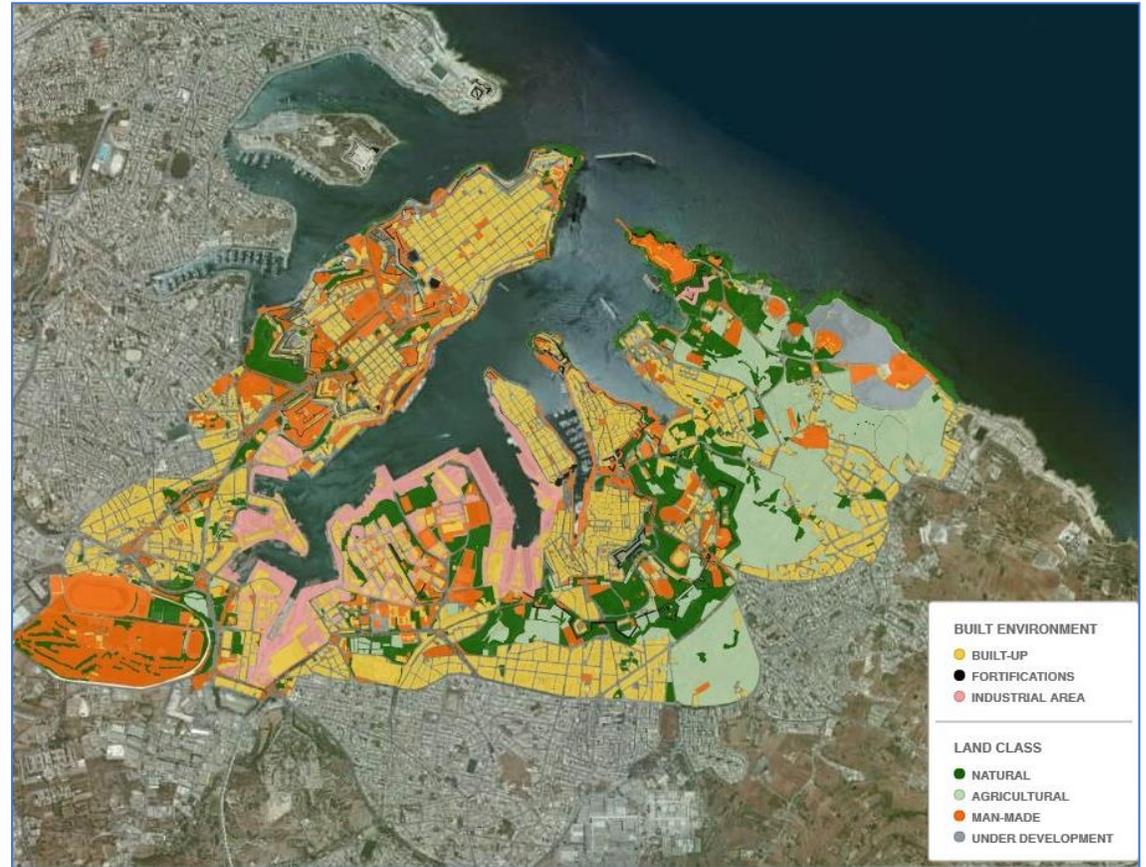


Digitizing of mapped open spaces

Resulting maps published using CartoDB

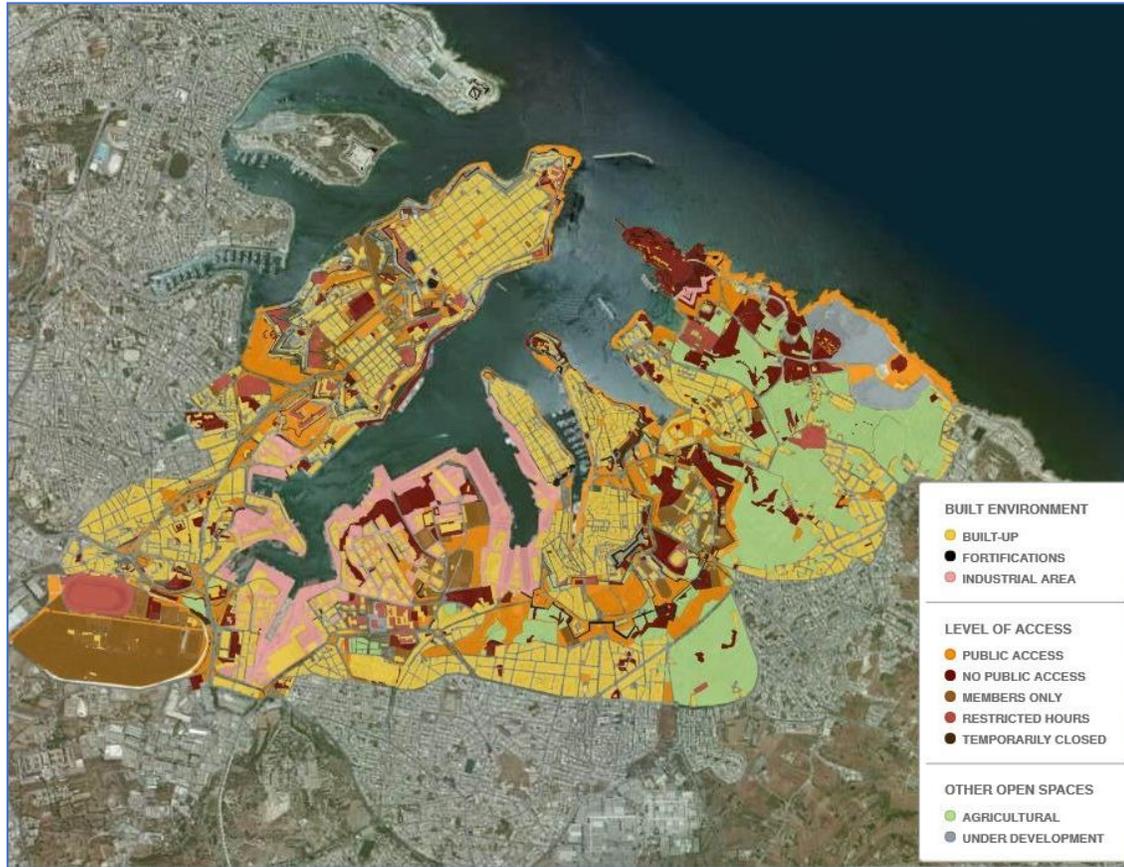


Local Councils
(administrative divisions of
Grand Harbour)

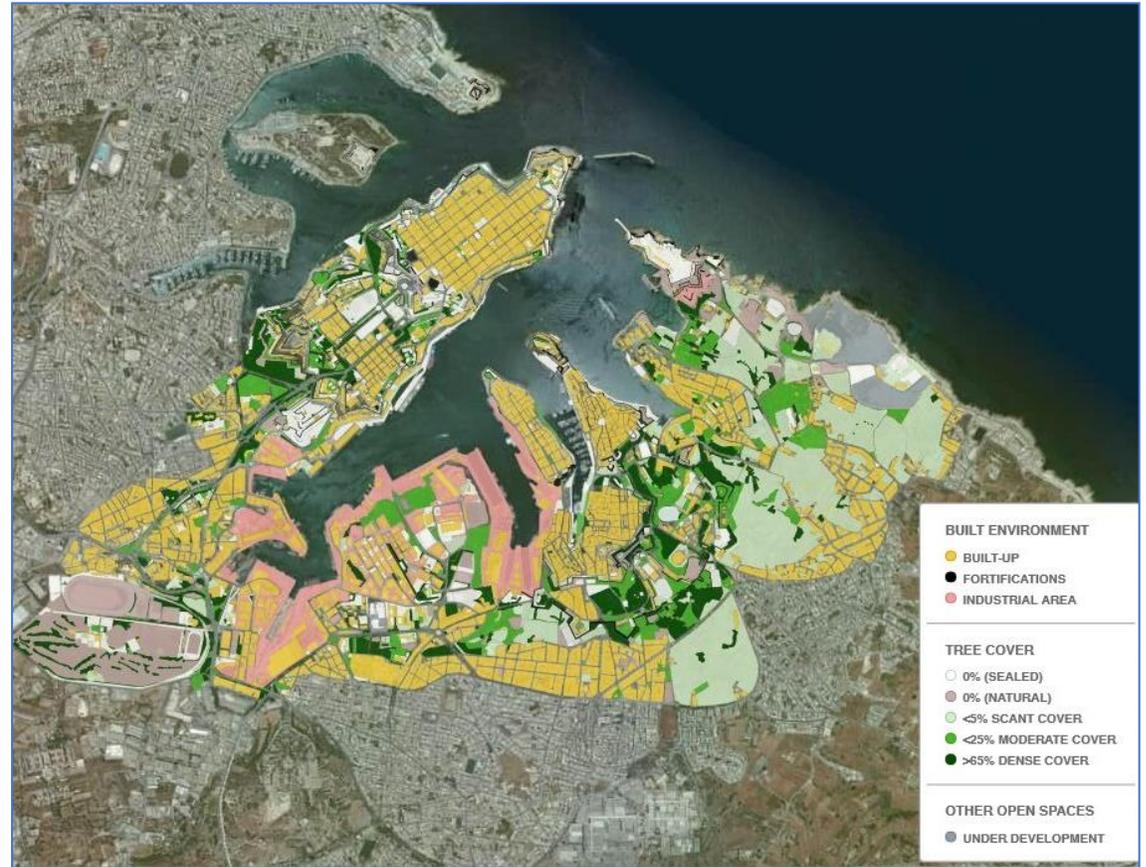


Land Classes: Natural, Agricultural,
Man-made

Resulting maps published using CartoDB

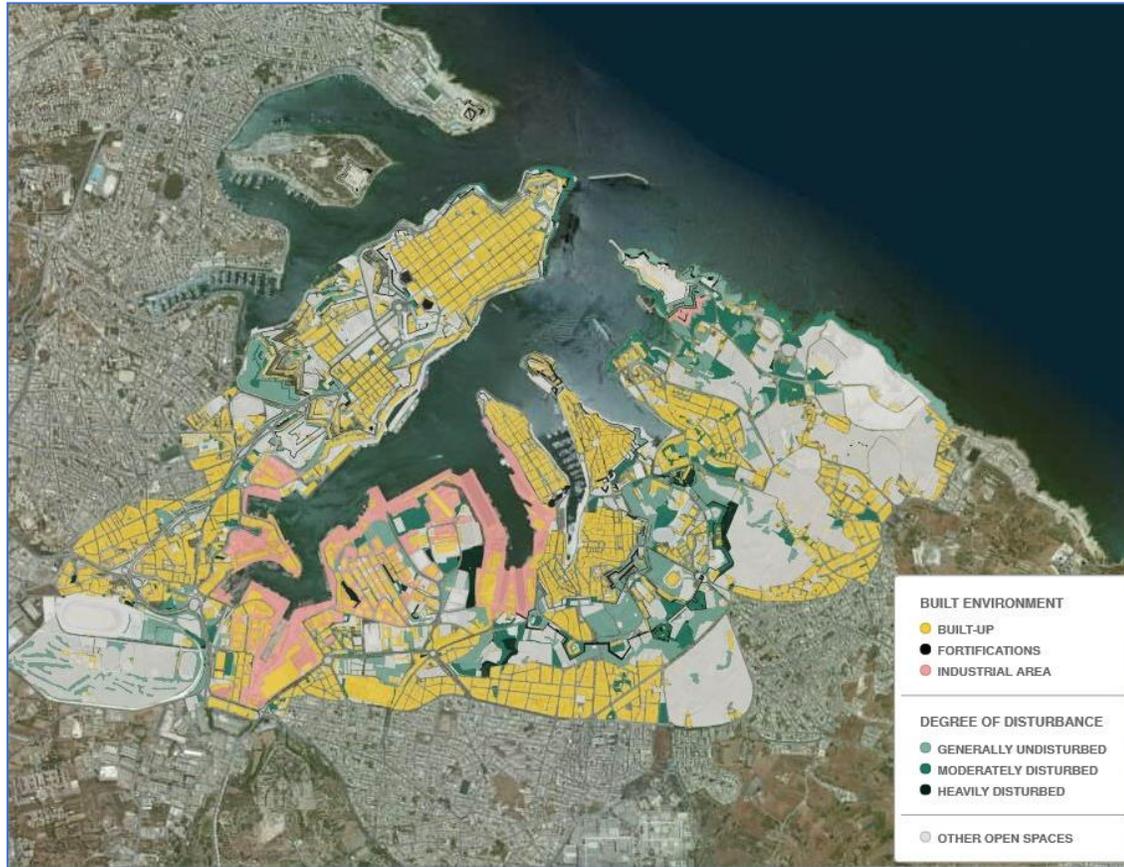


Level of Access

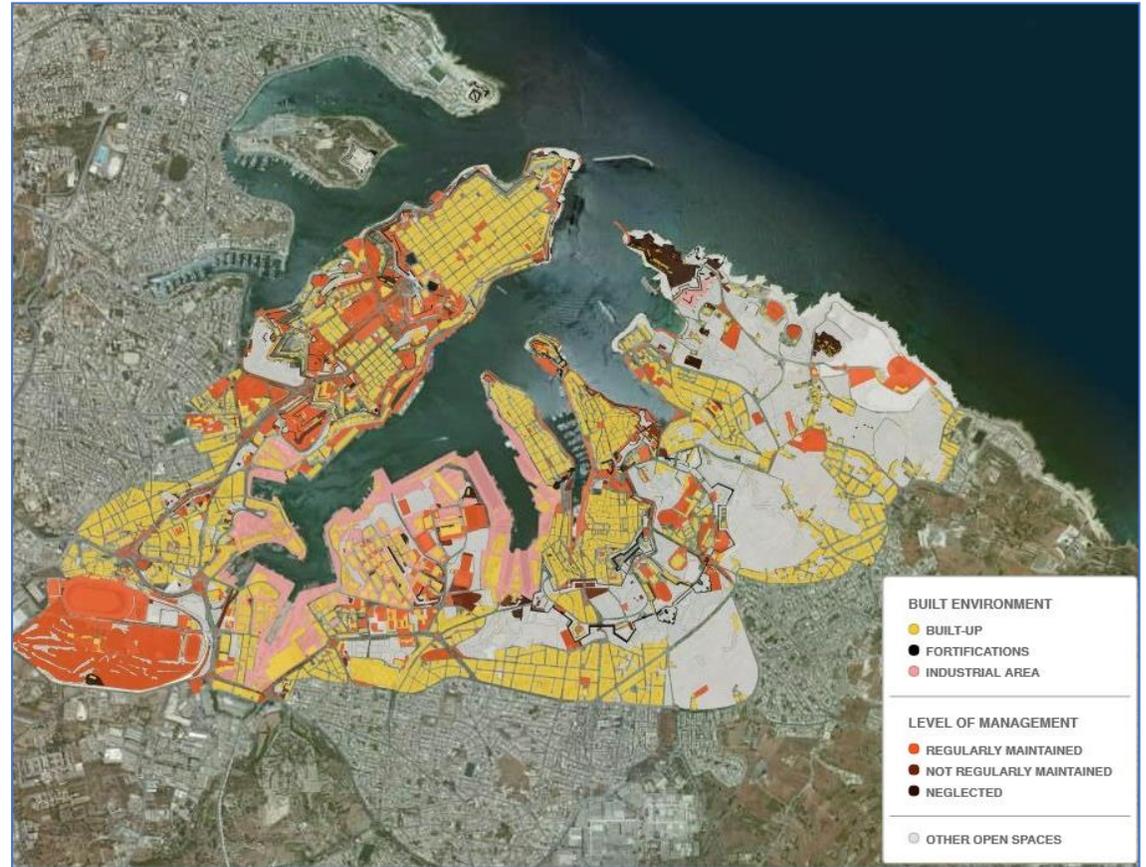


Tree cover

Resulting maps published using CartoDB

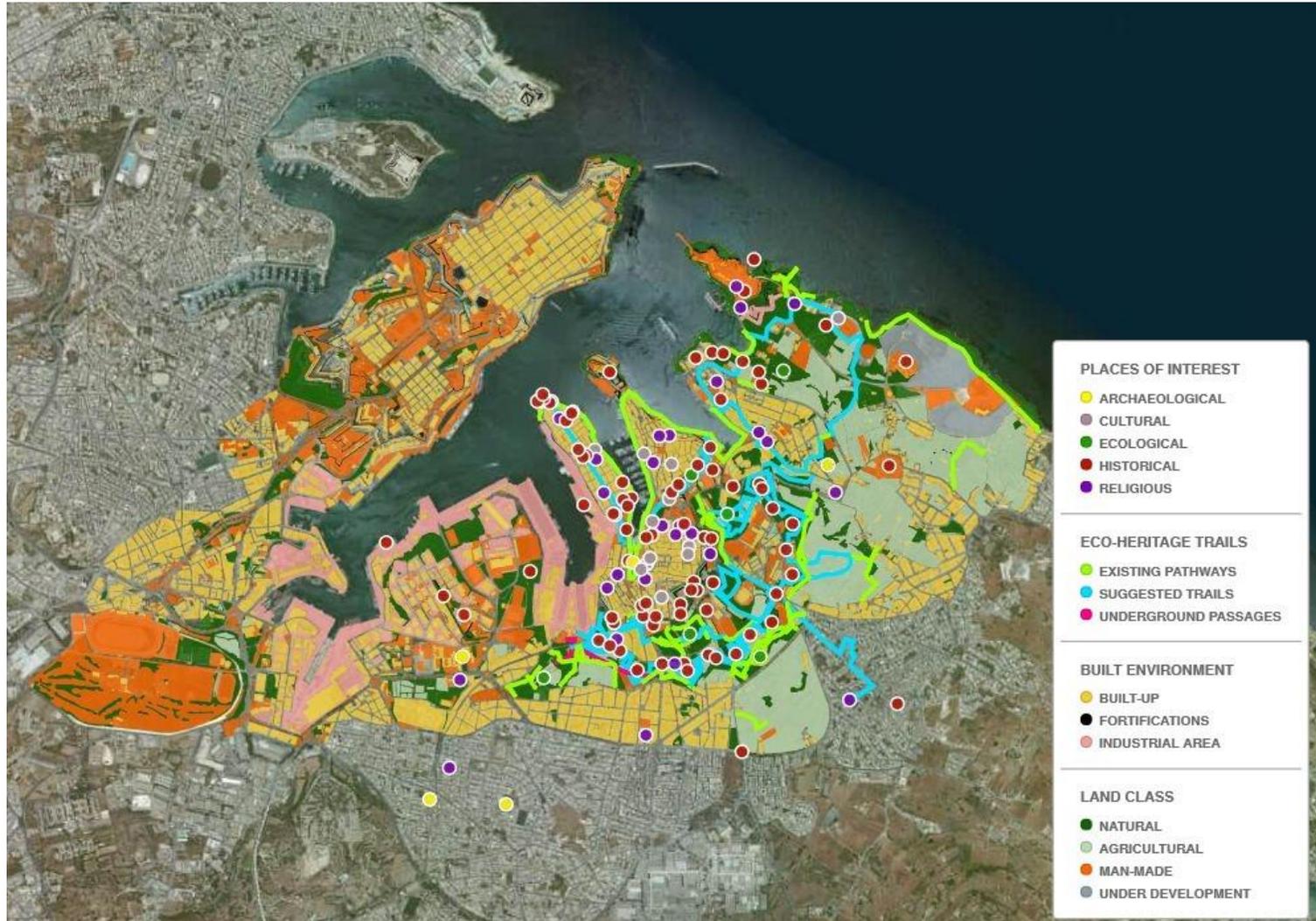


Degree of disturbance in
Natural Open Spaces

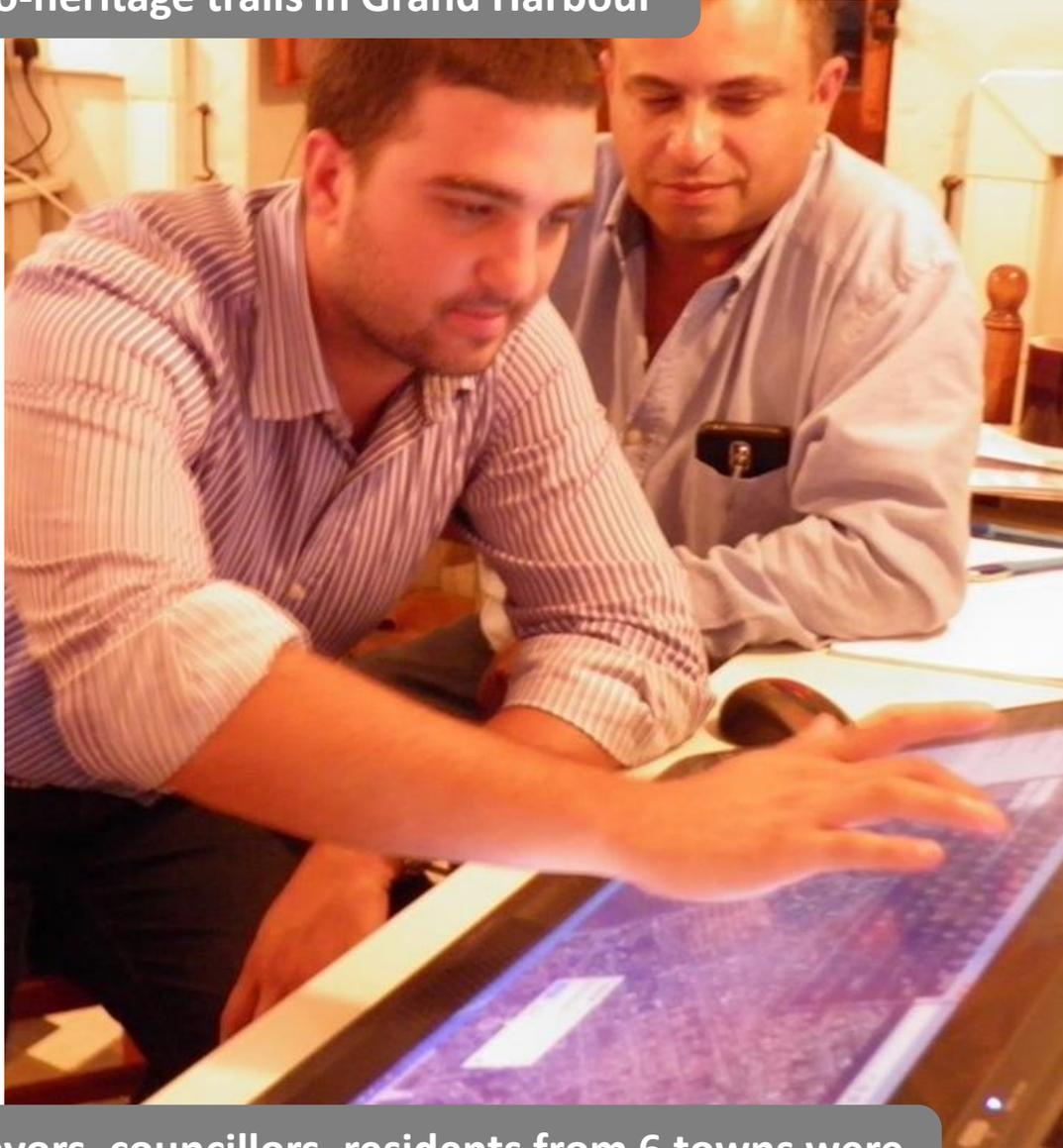


Level of Maintenance in
Man-made Open Spaces

Local community draws suggested eco-heritage trails in Grand Harbour



**Local community draws suggested
eco-heritage trails in Grand Harbour**



**Mayors, councillors, residents from 6 towns were
joined by historians, urban planning academia**



**10 workshops were held with local community
over a period of 3 years (2014-2016)**

Local Communities' Charter for liveable cultural landscapes in our Grand Harbour

RATIONALE

The representation of the Local Communities in the participatory process is the central objective of the Charter for Liveable Cultural Landscapes in our Grand Harbour. The Charter is a result of the participatory process and is a commitment to the Local Communities to improve the quality of their urban environment. The Charter is a result of the participatory process and is a commitment to the Local Communities to improve the quality of their urban environment. The Charter is a result of the participatory process and is a commitment to the Local Communities to improve the quality of their urban environment.

A Place for Our CHILDREN

GREEN AND BLUE OPEN SPACES

Green and Blue Open Spaces in the Grand Harbour region are a precious and limited resource. In order to ensure that the region remains a healthy, vibrant and green and blue space, it is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space.



TREES

Trees are an essential part of the urban landscape and provide many benefits. They improve air quality, reduce noise, and provide shade. They also provide a sense of place and identity. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space.

BUILT HERITAGE

Built heritage is an important part of the urban landscape and provides a sense of place and identity. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space.



COASTAL AREAS

Coastal areas are a valuable part of the urban landscape and provide a sense of place and identity. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space.

GENUINE PUBLIC PARTICIPATION

Genuine public participation is essential for the success of the Charter. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space.

SOIL, AGRICULTURAL LAND & VALLEYS

Soil, agricultural land, and valleys are a valuable part of the urban landscape and provide a sense of place and identity. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space. It is essential to ensure that the region remains a healthy, vibrant and green and blue space.



Sign the Charter on www.grandharbourcharter.net
www.marenostroumproject.eu
www.environmentalmalta.com



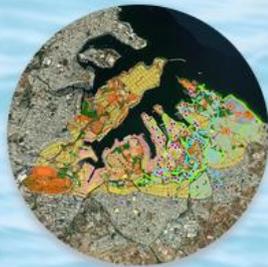
Aspirations of local community were collected in a Charter

Her Excellency, Marie-Louise Coleiro Preca, President of Malta, signing up to the Charter

Safeguarding Open Spaces around Malta's Grand Harbour



A place for our children...



Explore the Maps



Draw your Trail



Read the Charter



Watch our Documentary

Our latest application of PGIS
is in the domain of
water and sanitation:

Engaging with local communities
to draw up treated wastewater
reuse action plans



Towards Sustainable Treatment
and Reuse of Wastewater in
the Mediterranean Region

 www.enicbcmed.eu/projects/aquacycle

 @AQUACYCLE.ENI.CBCMED

 @AquaCycle_ENI

 @AquaCycle ENI CBC Med

PGIS landing pages are being created around the pilot demonstration sites of an eco-innovative wastewater treatment system consisting of anaerobic digester, constructed wetlands and solar raceway pond reactor



Pictures of the location of the pilot demonstration unit



The screenshot shows a Google My Maps interface for a map titled "Carte PGIS de Bent Saidane" with 16 views. The map is overlaid with a yellow polygon representing a target area. The left sidebar lists several layers:

- Bent Saidane WWTP**
 - Anaerobic digester
 - Area earmarked for irrigation
- Treated water reuse action plan**
 - Individual styles
 - Target area of ca 8 square km
- Couches d'information du WebGIS**
 - Individual styles
 - Superficie couverte de 140 k...
- Reseau hydrographique**
 - Uniform style
 - All items (1161)
- Lacs collinaires**
 - Uniform style
 - All items (2)
- endroits d'intérêt**
 - Individual styles
 - Ecole
- Base map**

The main map area shows a satellite view with a yellow polygon. A photo viewer overlay is open, displaying a landscape photo of a field with trees and mountains. The photo viewer shows the photo is 2 of 2 in a sequence. The map includes labels for "Jougar", "Ksar Ezzit", "ABAYA", "Dar Shawush", "Ali Bin Khalifah", and "Google My Maps". The coordinates 36.26456, 9.95646 are visible at the bottom of the photo viewer.

Places of interest

PGIS Landing page for Lebanon - ...
56 views
All changes saved in Drive

Add layer + Share Preview

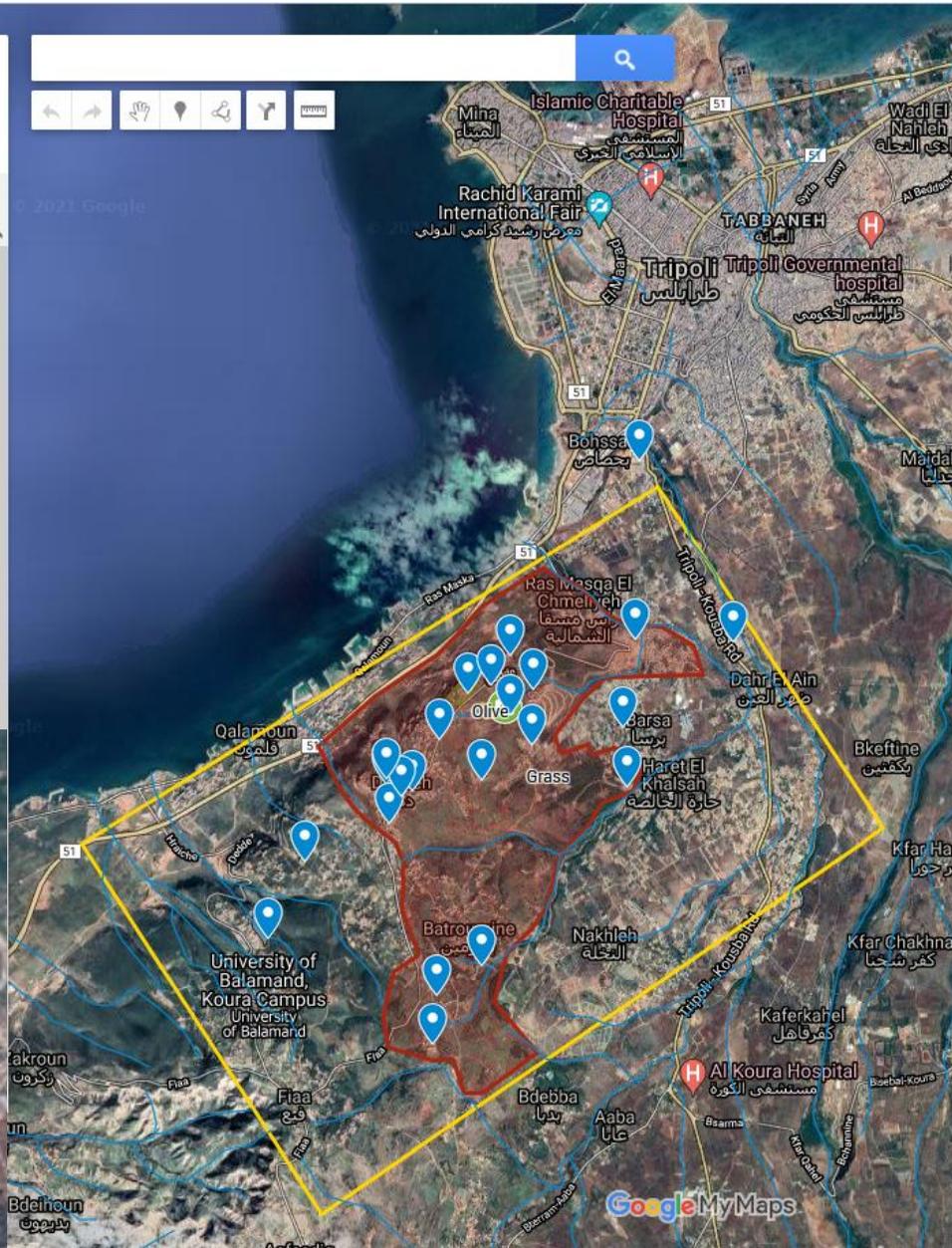
- Location of APOC Demo Unit

Places of Interest

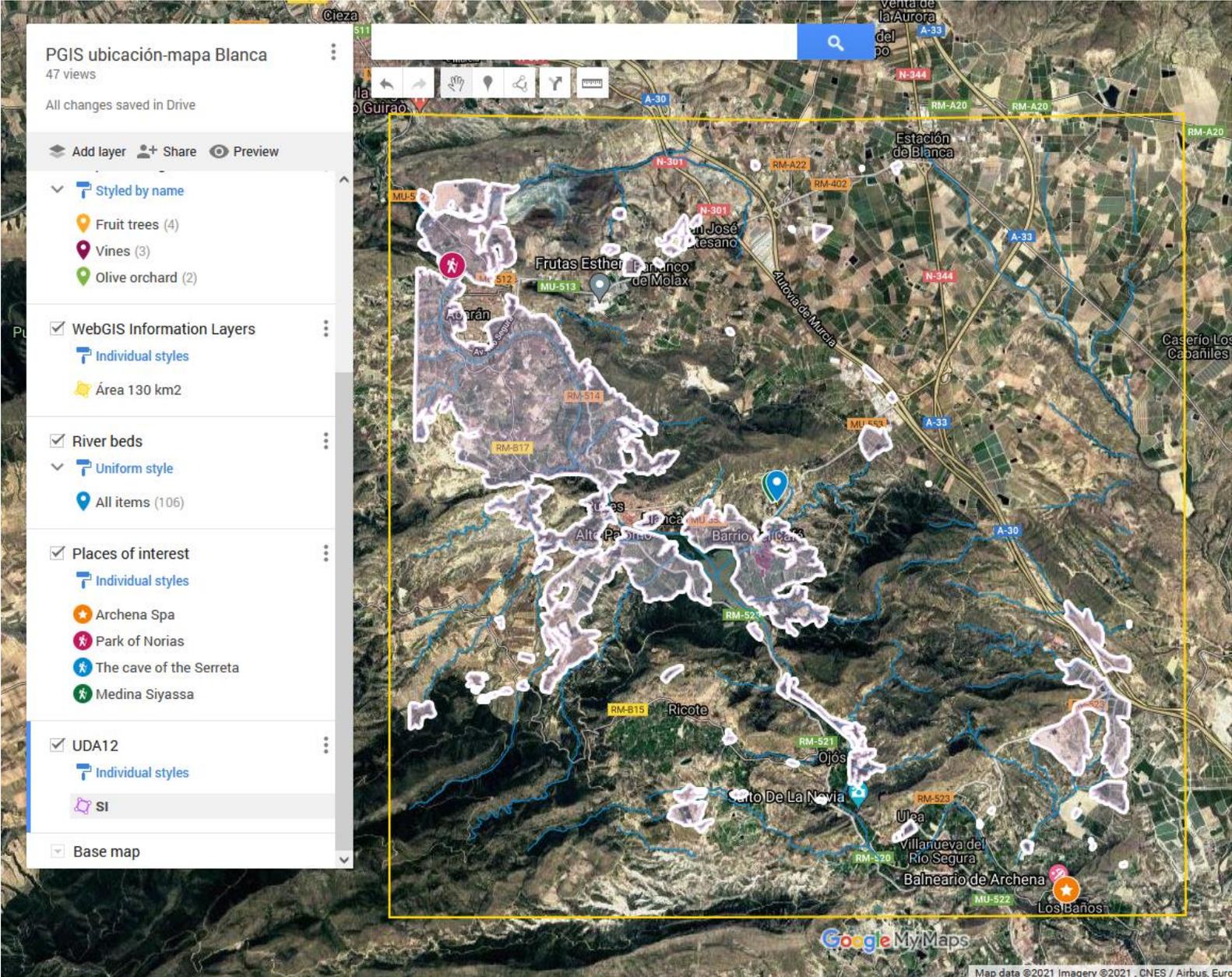
- Uniform style
- All items (23)

WebGIS Information Layers

- Individual styles
- Boundaries of WebGIS layers
- Boundaries of Wastewater R...



Areas already irrigated with treated effluent in the Murcia Region of Spain



Thank you for
your attention!



Her Excellency, Marie-Louise Coleiro Preca,
President of Malta at Verdala Palace, April 2016