



PROTEUS

Ecological mapping using satellite imagery: an Abu Dhabi case study

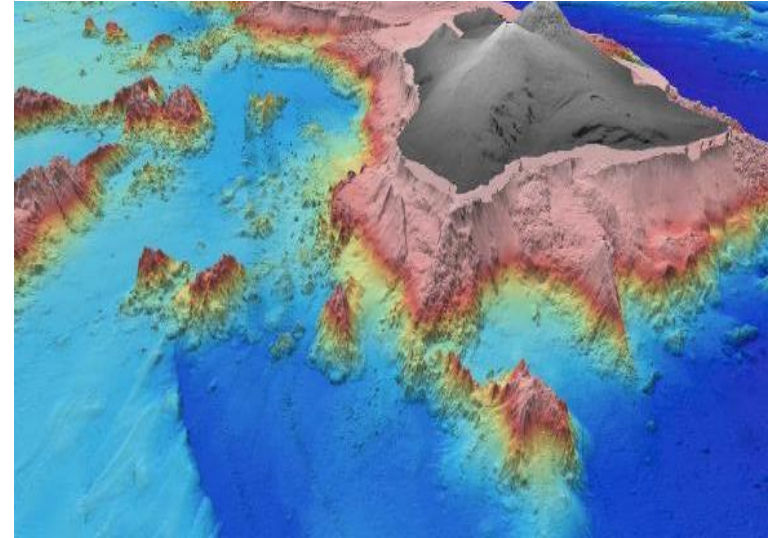
Middle East Geospatial Forum

16th February 2015

Richard Flemmings
rf@proteusgeo.com

About Proteus

- Formed in UAE 2011
- We specialise in delivering derived products from satellite imagery. All production carried out in Europe.
- Completed over 30 projects to date all over the world
- Customers include:
 - Environment Agency Abu Dhabi, SLRB, BP, Aramco, Exxon, GCS, Saudi Ports Authority, UKHO, NOAA, AECOM, CH2M



The Association of Geographic
Information Award for Excellence in
Research & Development



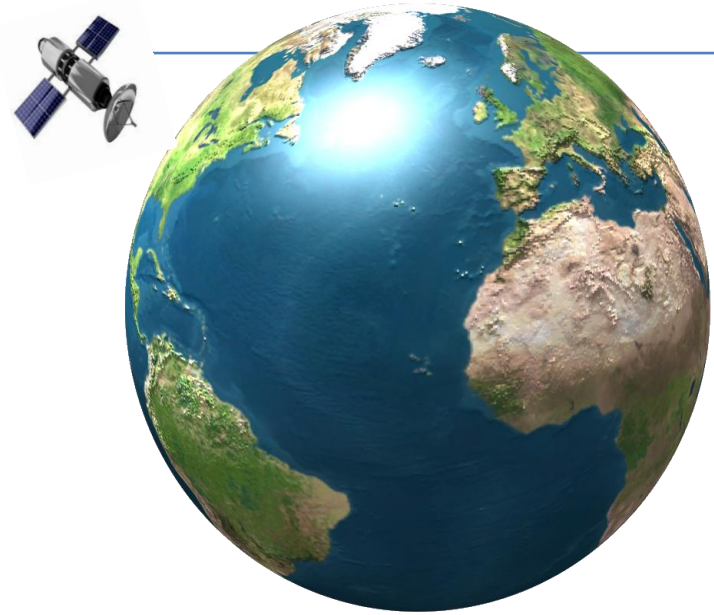
Digital Globe
Information Provider
Partner

Our vision

To significantly **reduce the cost and time** of the capture and production of satellite derived mapping by bringing new remote sensing techniques to the industry

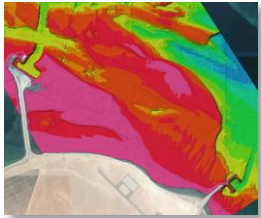
By combining world class project management with specialist mapping and GIS skills we offer to customers **full turnkey marine and terrestrial mapping solutions**

Using continually advancing remote sensing techniques from Europe, Proteus delivers **quality assured products** from its seasoned professional team world wide

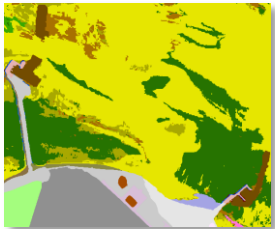


Types of products

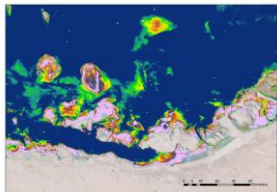
Marine



Satellite Derived Bathymetry
for shallow water



Marine habitat & benthic mapping

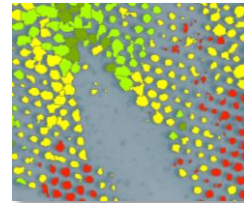


Water Quality Monitoring for large
or small areas

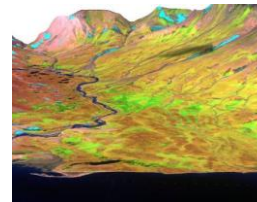
Terrestrial



Land Use Land Cover and Habitat
mapping



Forest & Agriculture mapping &
analysis

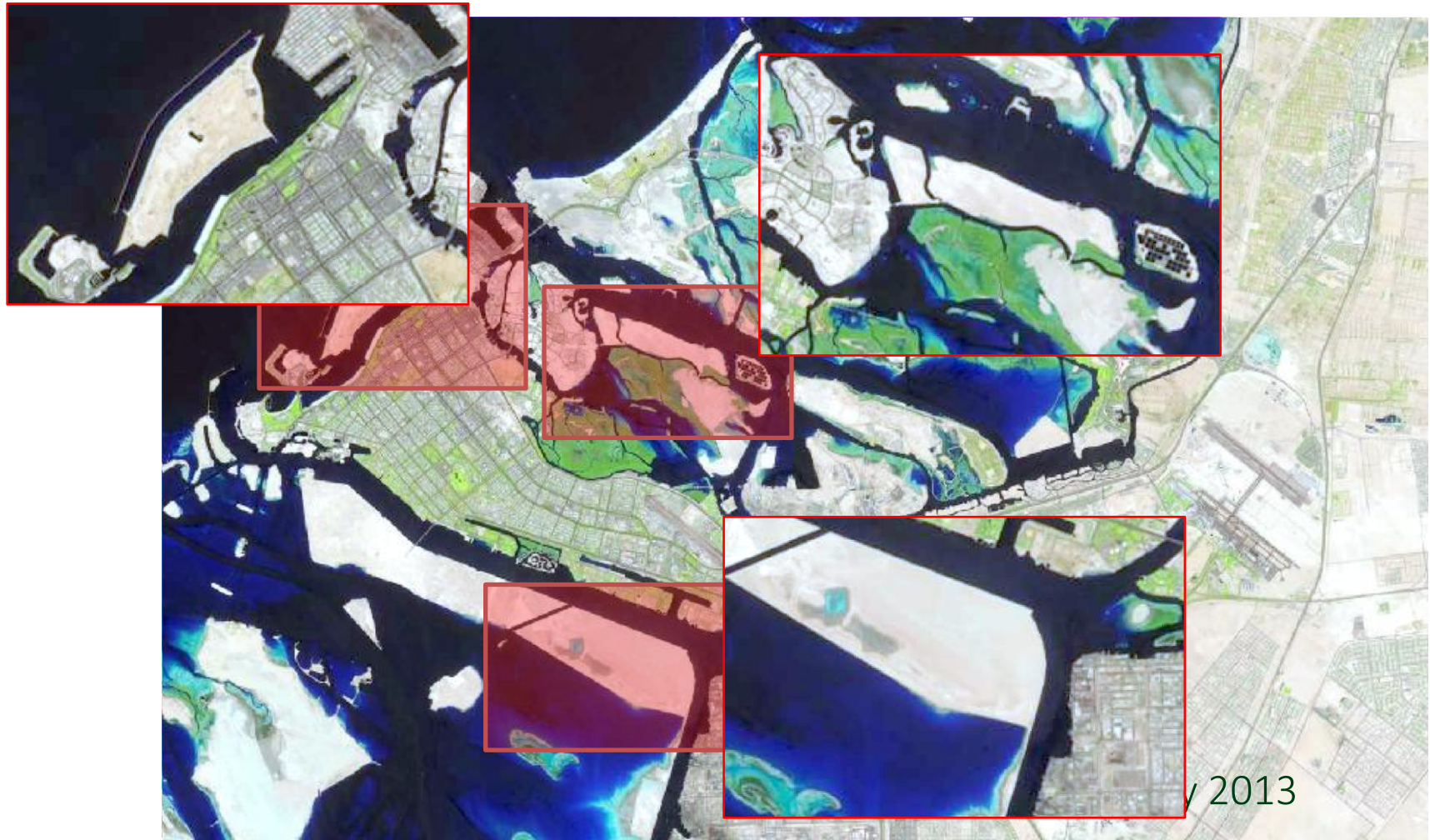


DTM, Topographic, Change
Detection etc

Case Study – Abu Dhabi



Rapid Development



Human Activity



Environmental Impact – Bu Tinah



UNESCO:
Marine Biosphere Reserve



Dugongs

- IUCN Red List - 'Animals endangered to extinction'.
- Abu Dhabi has the 2nd largest population in the world – 2,500
- Seagrass decline



Abu Dhabi - Ecological Baseline Map

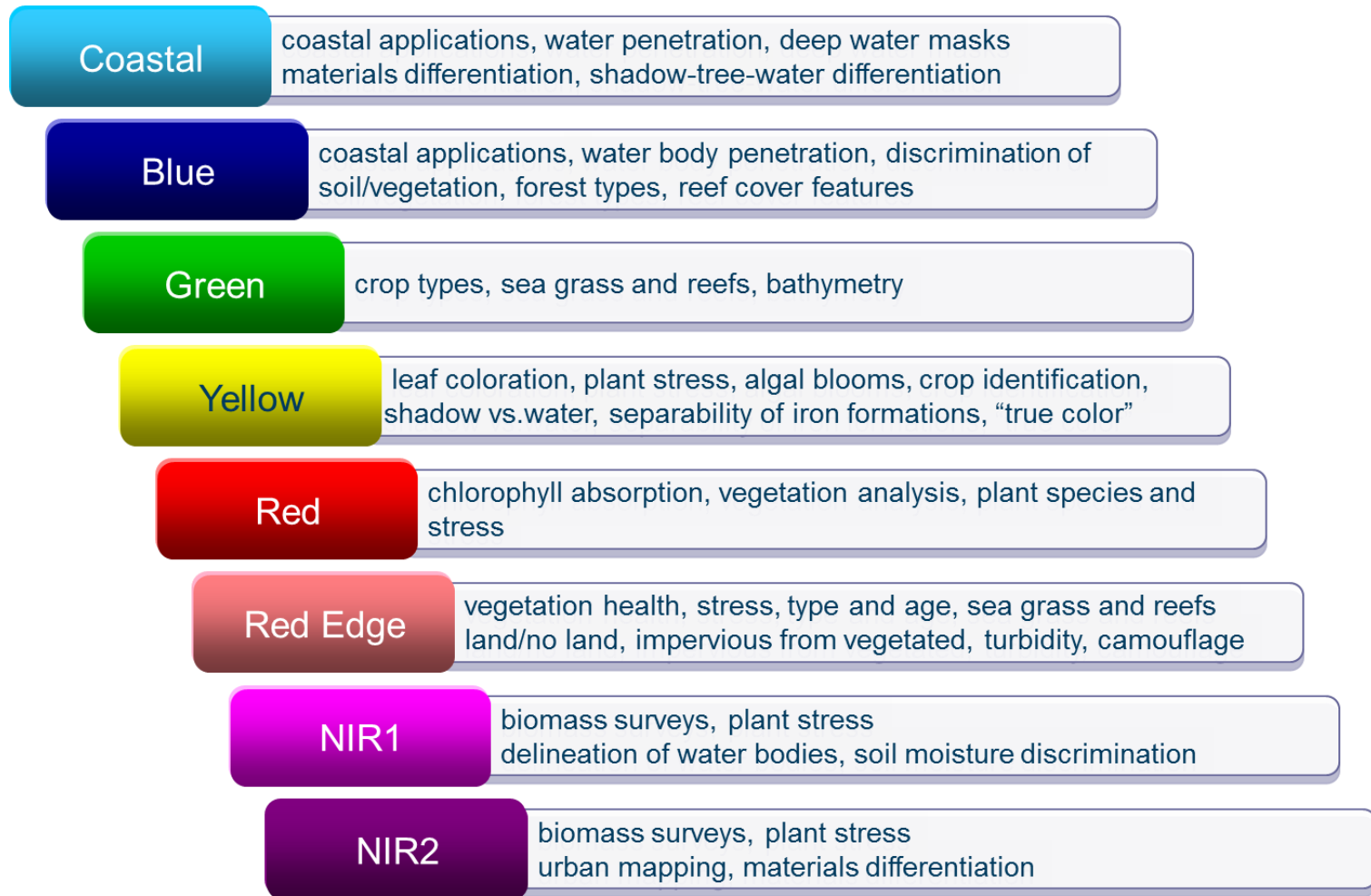


Project Goals

- Emirate-wide habitat map production
- Terrestrial and Marine
- 1:10,000 Scale output
- Provide a **baseline** for future larger scale, focused ecological surveys

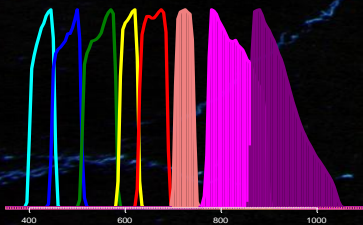


WorldView-2 8 band Satellite

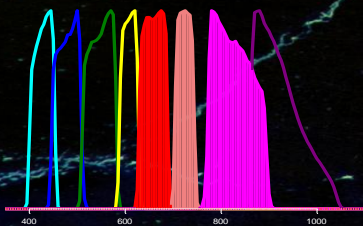
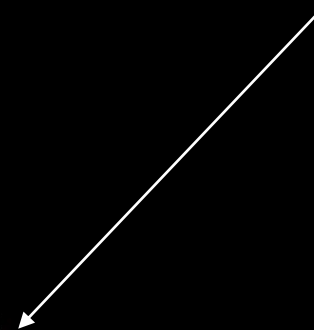


Wave patterns and
submerged aquatic
vegetation

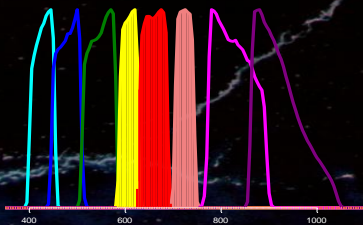
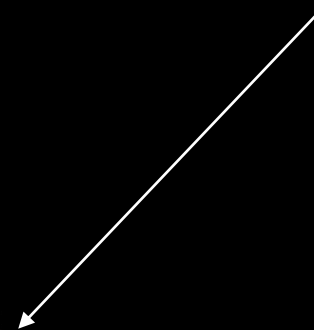
Linear reefs



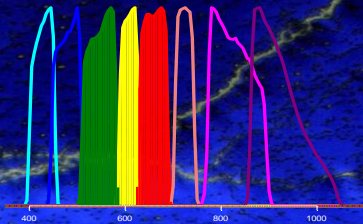
Submerged aquatic
vegetation



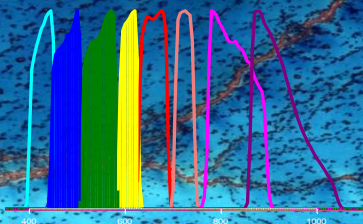
Submerged aquatic
vegetation

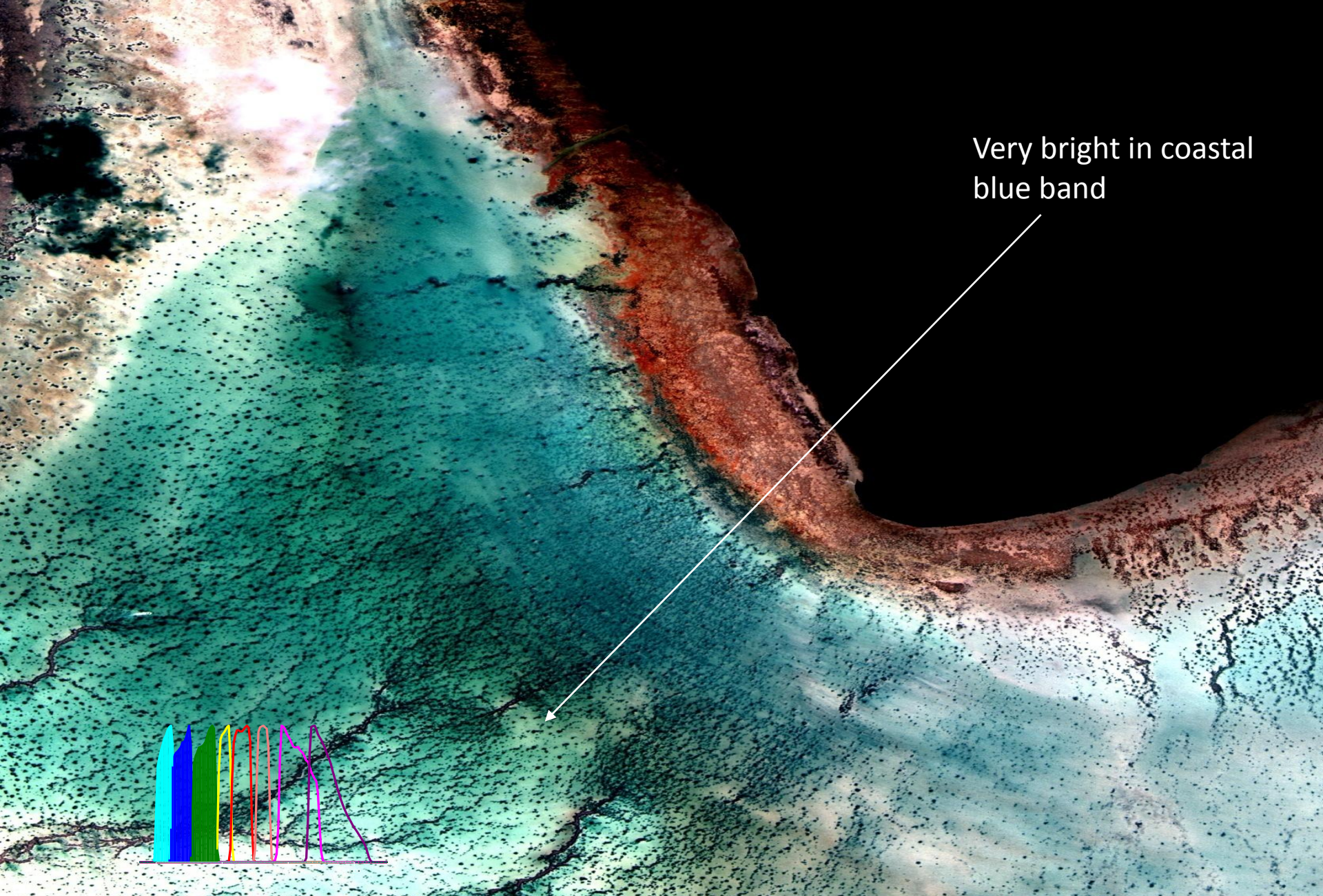


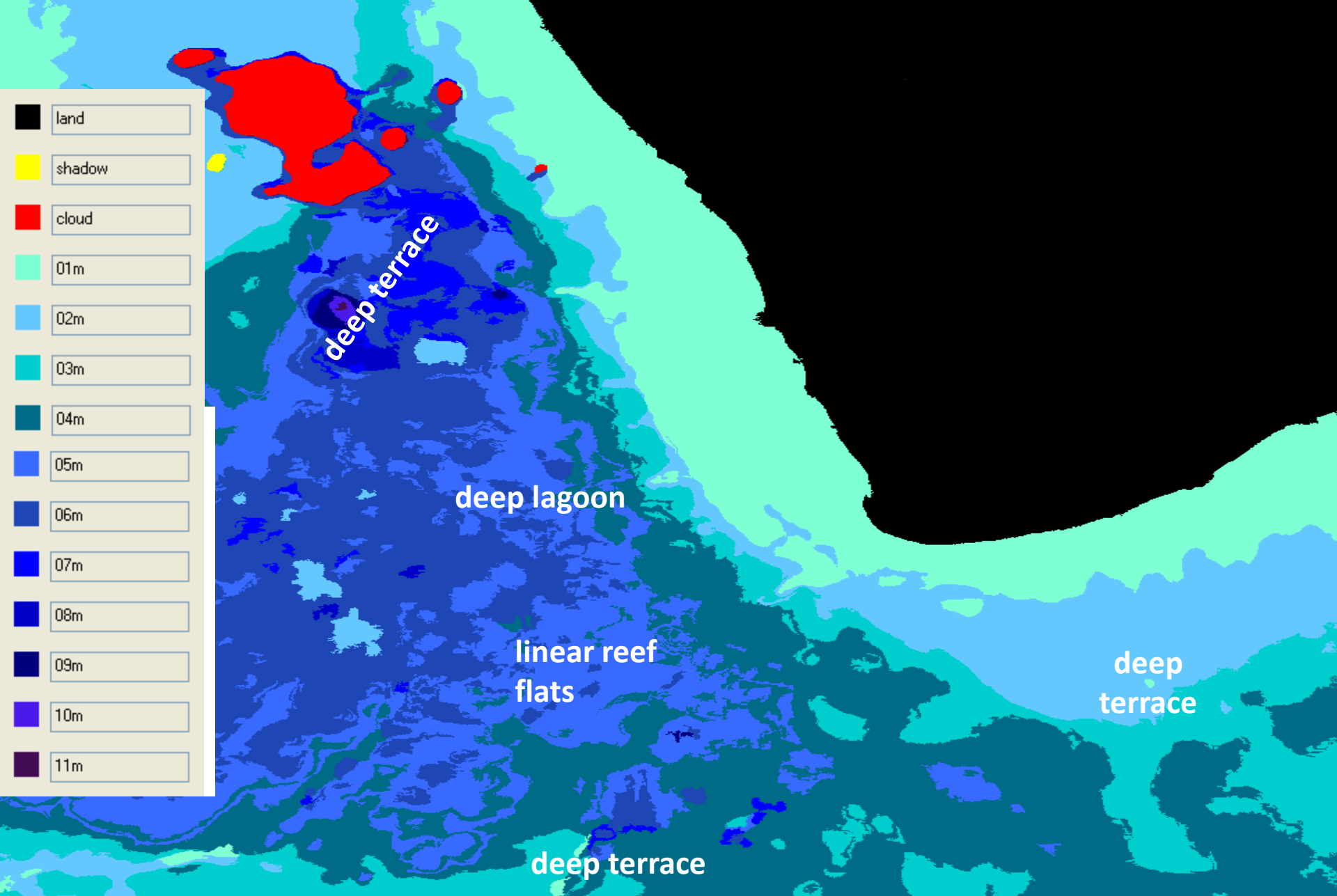
Region of light penetration
extends across the whole area



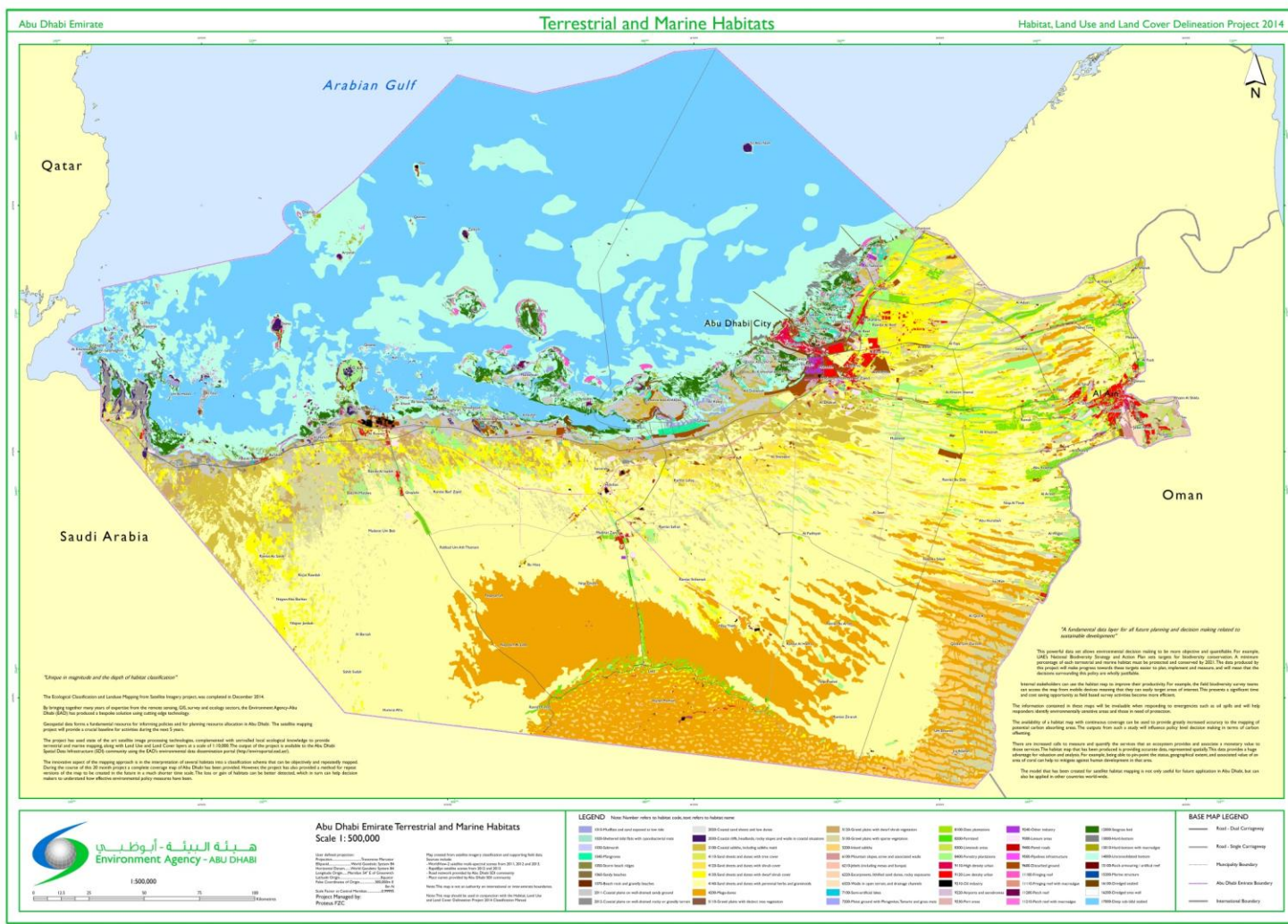
Submerged features
visible everywhere



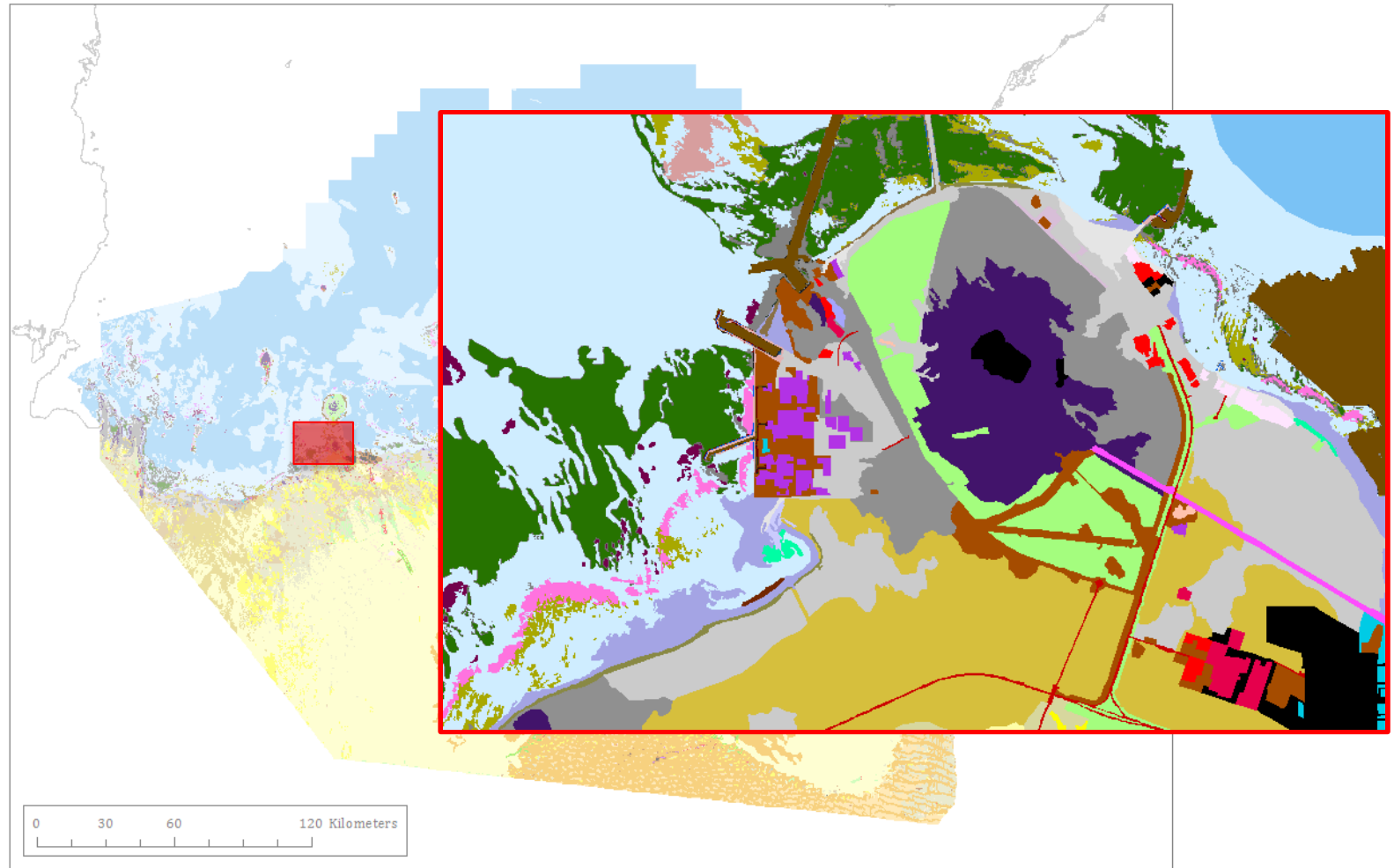




Output Map



Focus



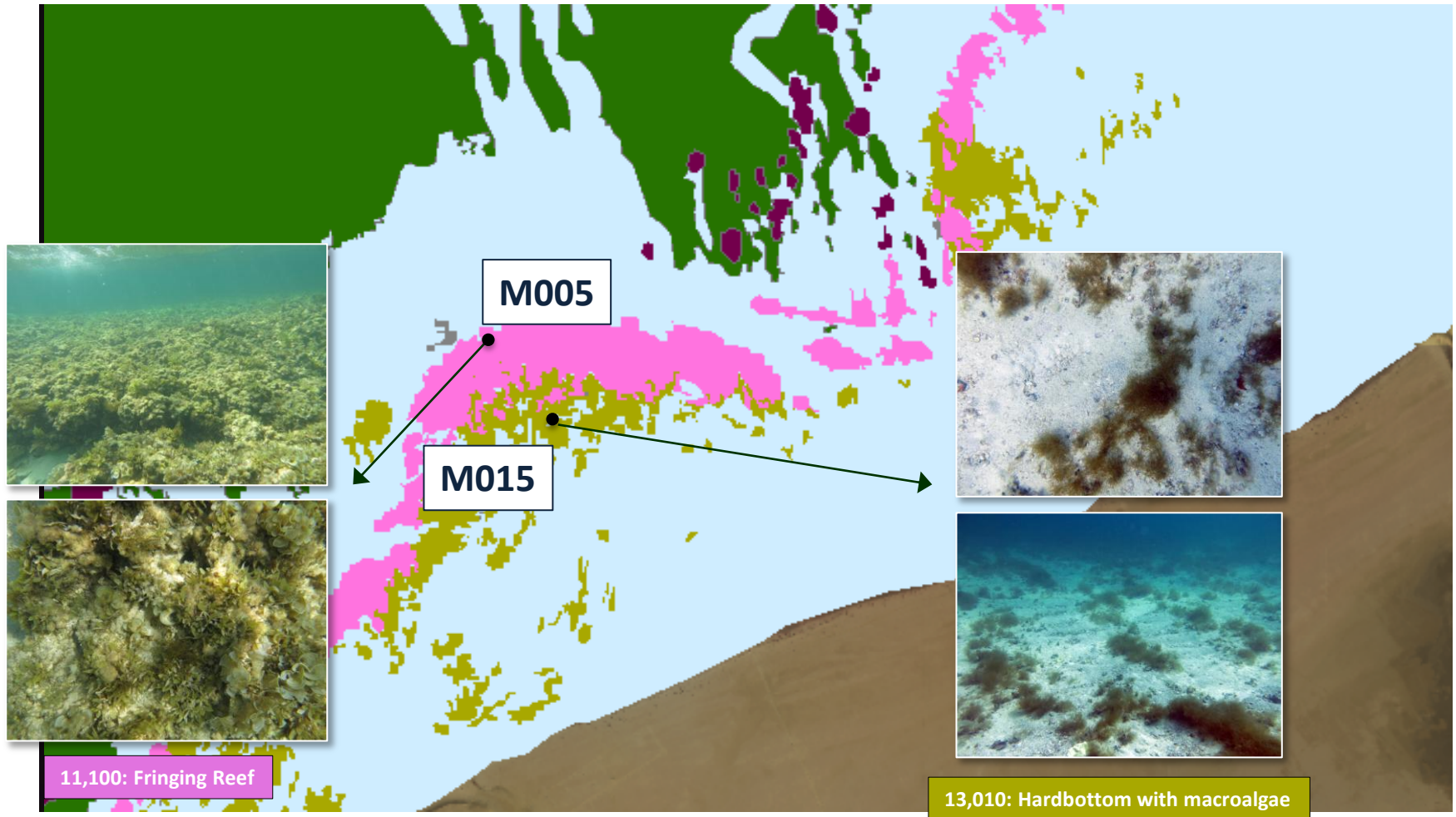
Marine Examples

Ground truthing to distinguish plant cover

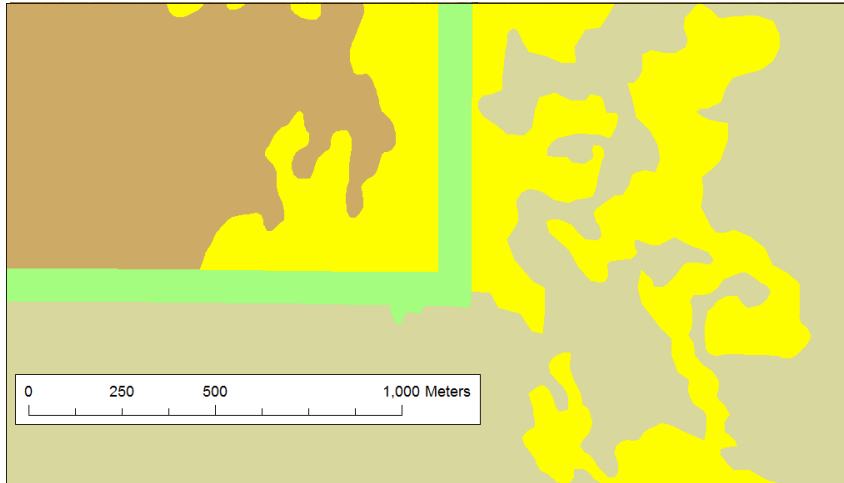


Marine Examples

Ground truthing to distinguish substrate



Fencing and Plantation Effects

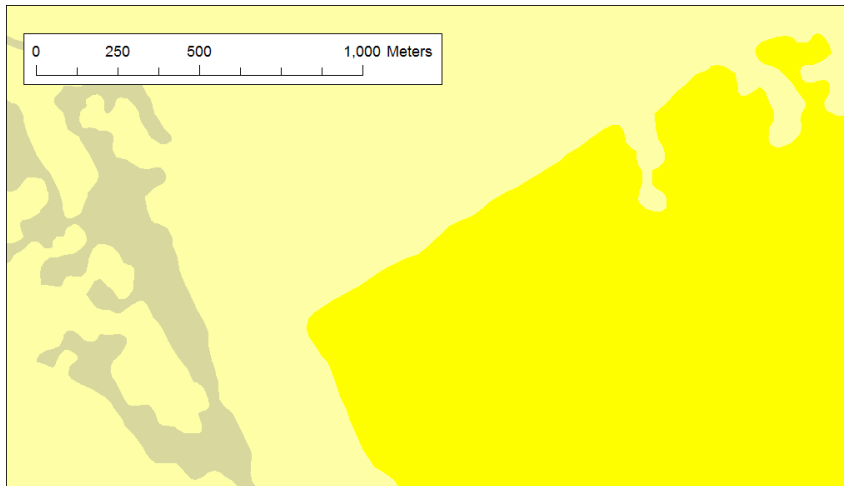


5120-Gravel plains with dwarf shrub vegetation

4130-Sand Sheets and Dunes with Dwarf Shrub Cover

5130-Gravel plains with sparse vegetation

8400-Forestry plantations



4130-Sand Sheets and Dunes with Dwarf Shrub Cover

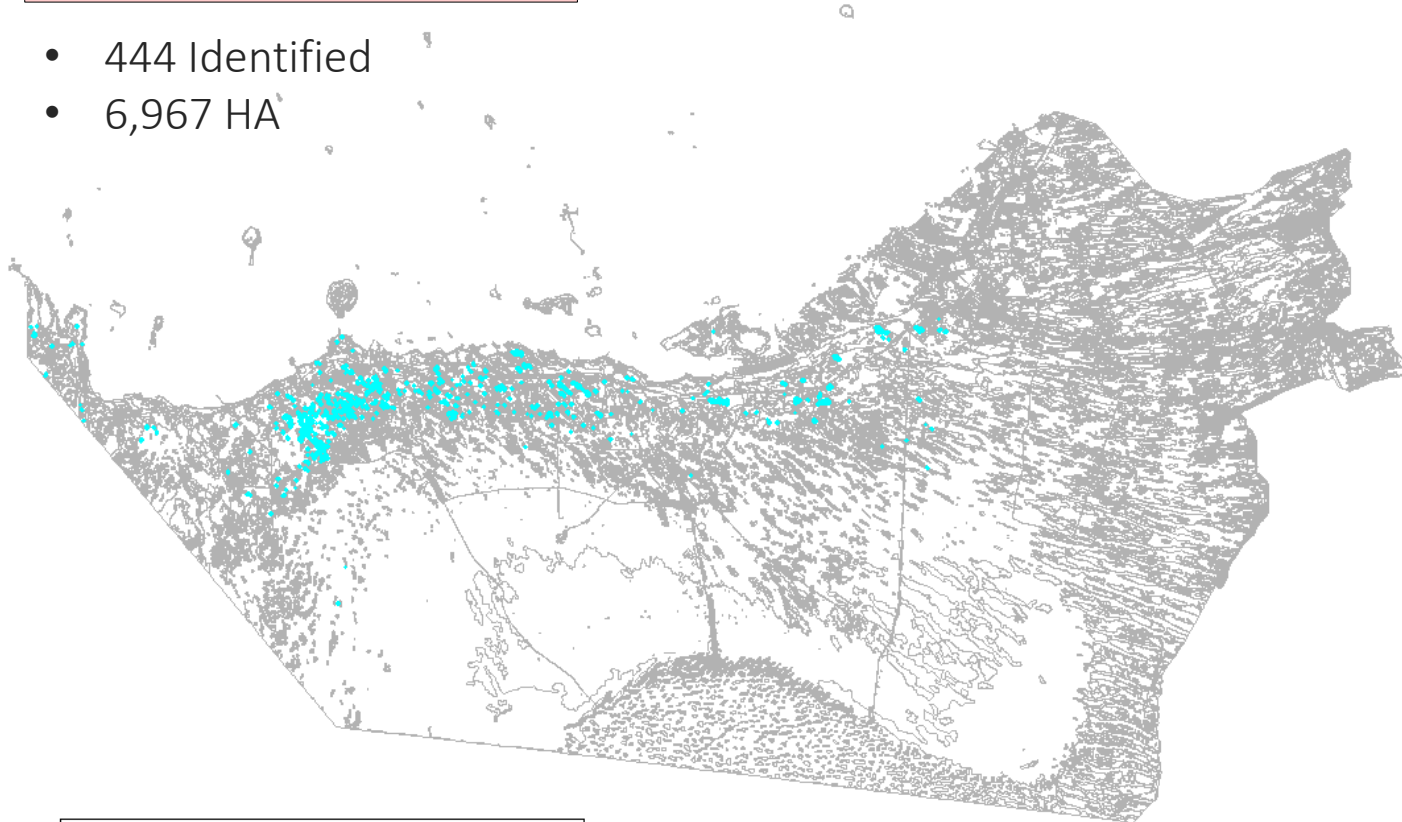
4140-Sand sheets and dunes with perennial herbs and graminoids

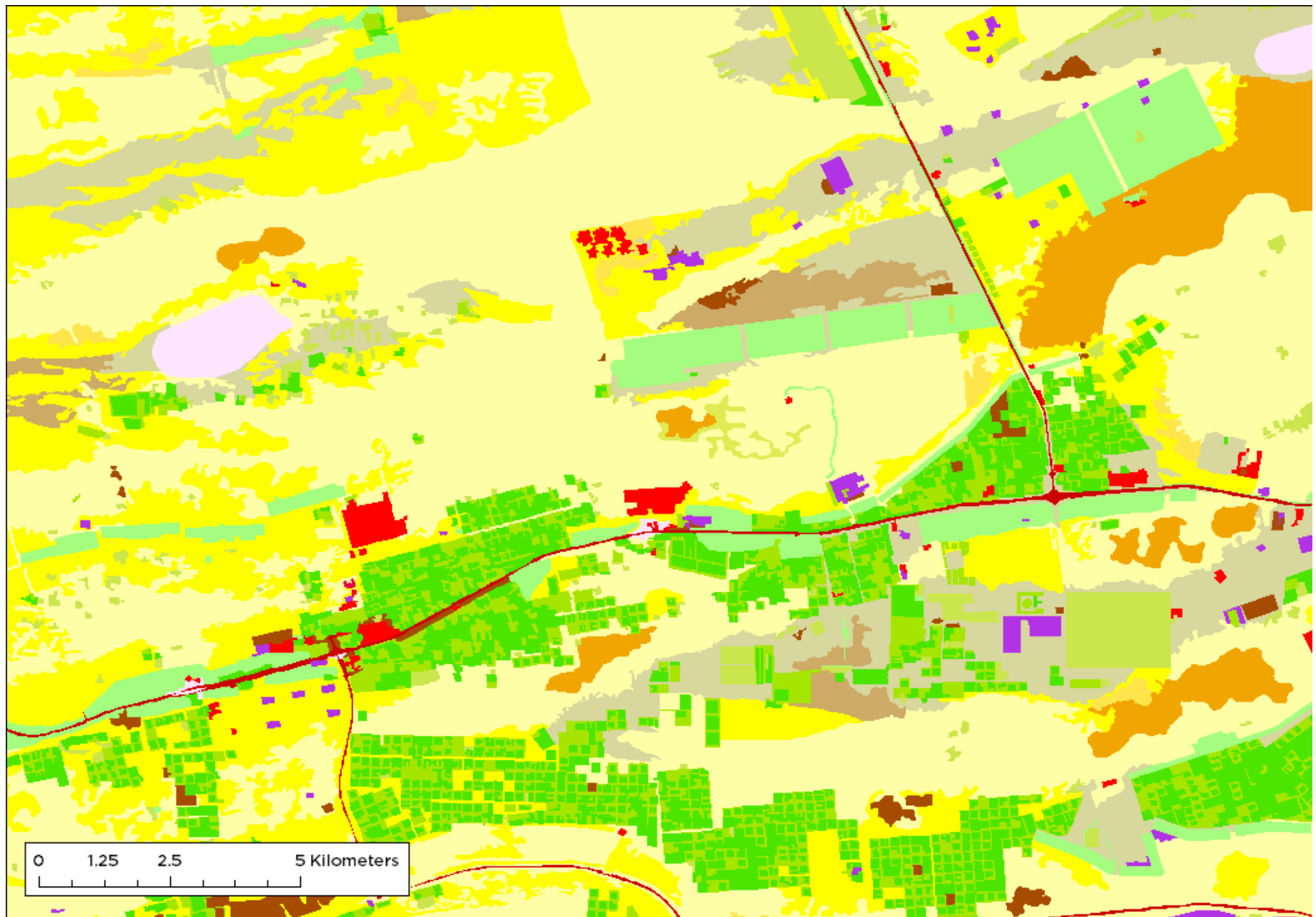
5130-Gravel plains with sparse vegetation

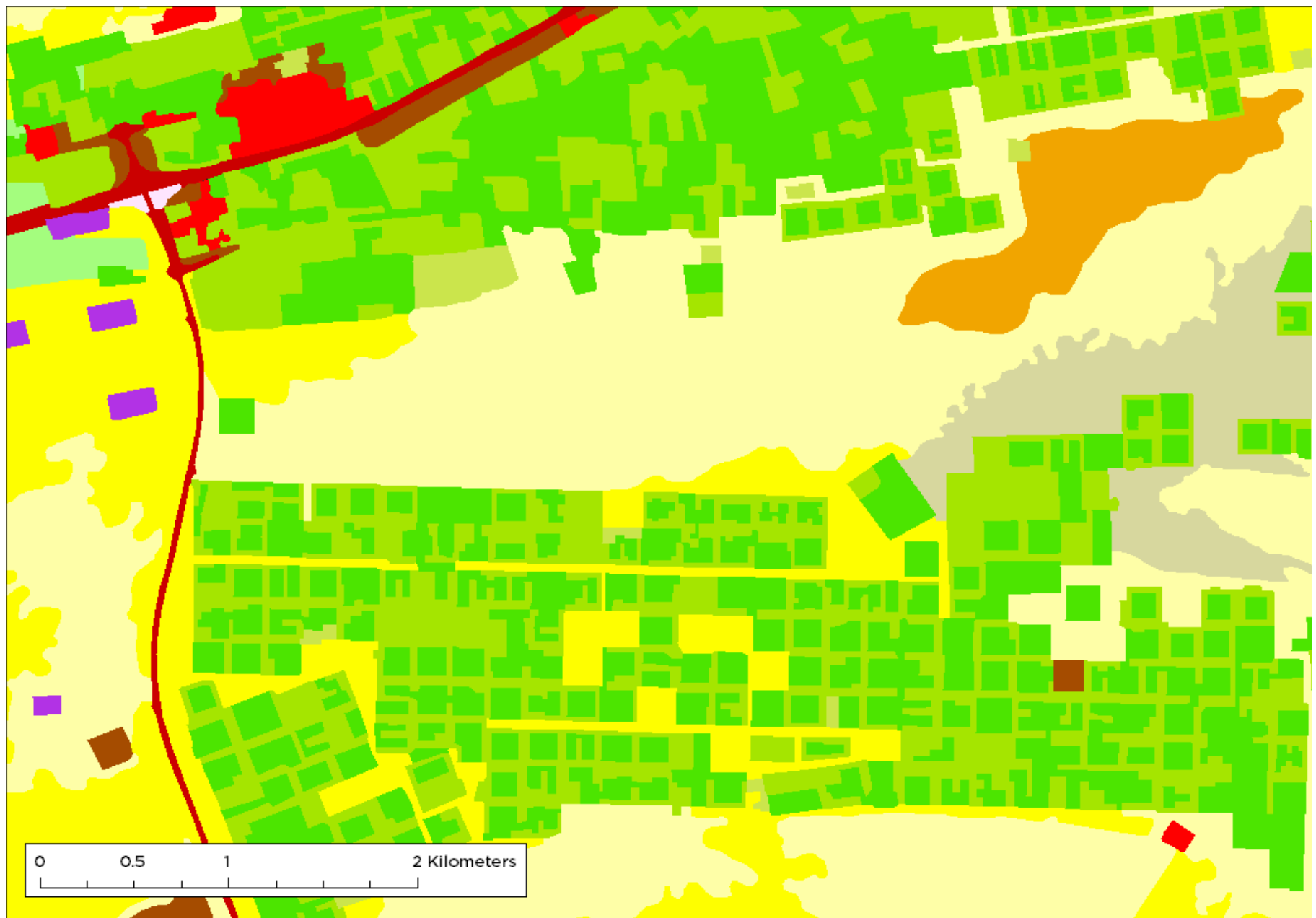
Jebels (including mesas and burqas)

6210 - Jebels (including mesas and burqas)

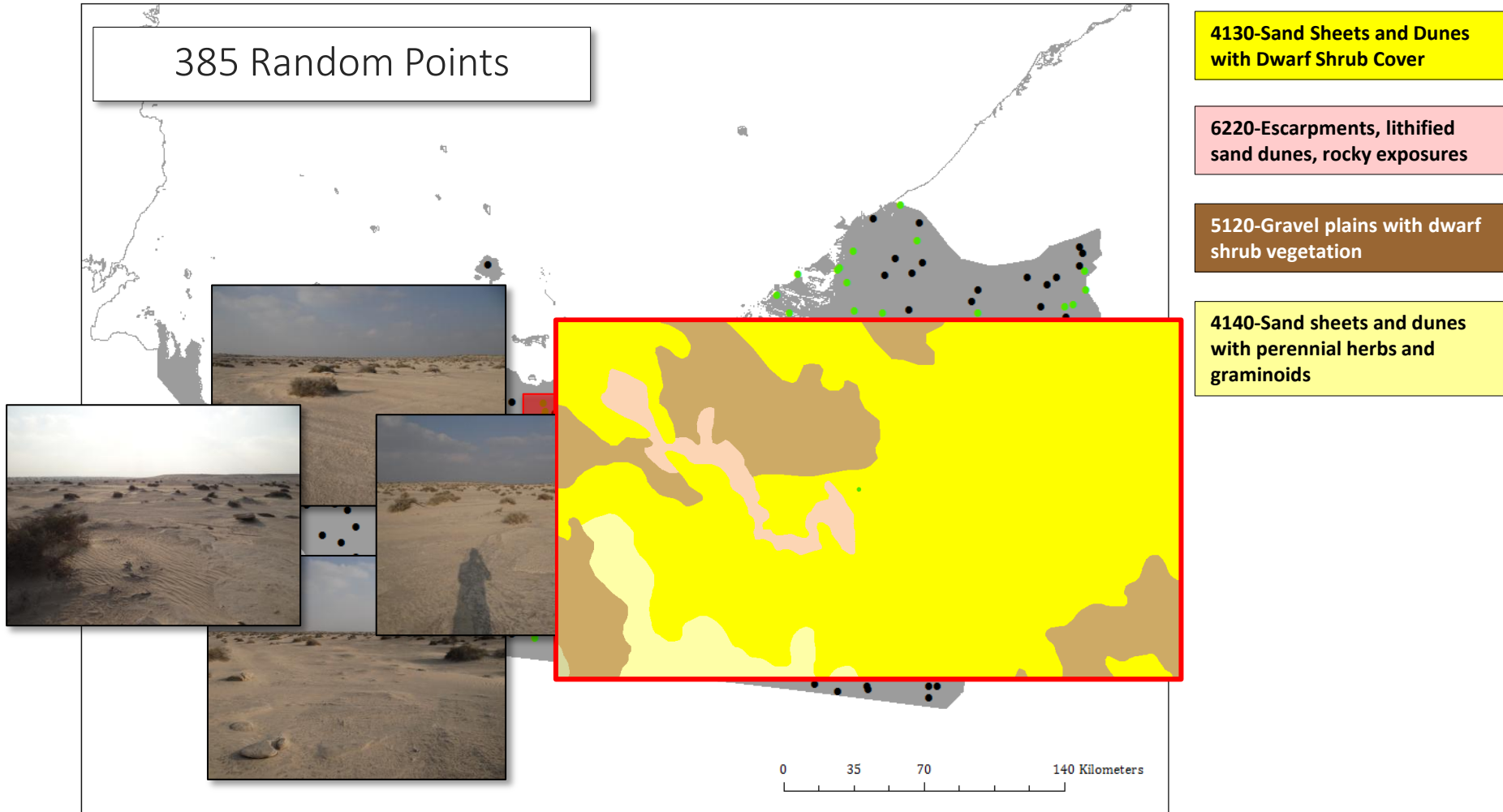
- 444 Identified
- 6,967 HA







Accuracy Checking (target 85%)



http://enviroportal.ead.ae

← → ↻ enviroportal.ead.ae/geoportal/

English تسجيل الدخول مساعدة نبذة عن البوابة الجغرافية ملاحظات خريطة الموقع

هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

الصفحة الرئيسية بحث استعراض تنزيل معرض الخرائط

... يمكنك بمساعدة

بحث

معرض الخرائط

تطبيقات هيئة البيئة

Coming Soon

تسجيل الدخول

اسم المستخدم:
كلمة المرور:
تسجيل الدخول
هل نسيت كلمة المرور؟

معرض الخرائط

الأخبار

20 Ideas for Your Green New Year...
EAD Publishes Guide to Support...
EAD and BP Strengthen Partnersh...

عرض المزيد

الأحداث

February

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
1	2	3	4	5	6	7
8	9	10	11	12	13	14

2014 2015 2016

الارتباطات ذات الصلة

EPA
United States Environmental
Protection Agency

مع نقة شاشة 768*1024 للشاشة التقليدية أو 864*1152 للشاشة للمريضة 9 Internet Explorer لتحقيق أفضل عرض، استخدم
تم إنشاء هذه البوابة الجغرافية باستخدام خادم البوابة الجغرافية. يرجى قراءة [إحدى المبررات](#) و [الخصوصية](#) أو [الوصول](#) إلى

Project Success



The Association of Geographic Information Award for Excellence in Research & Development

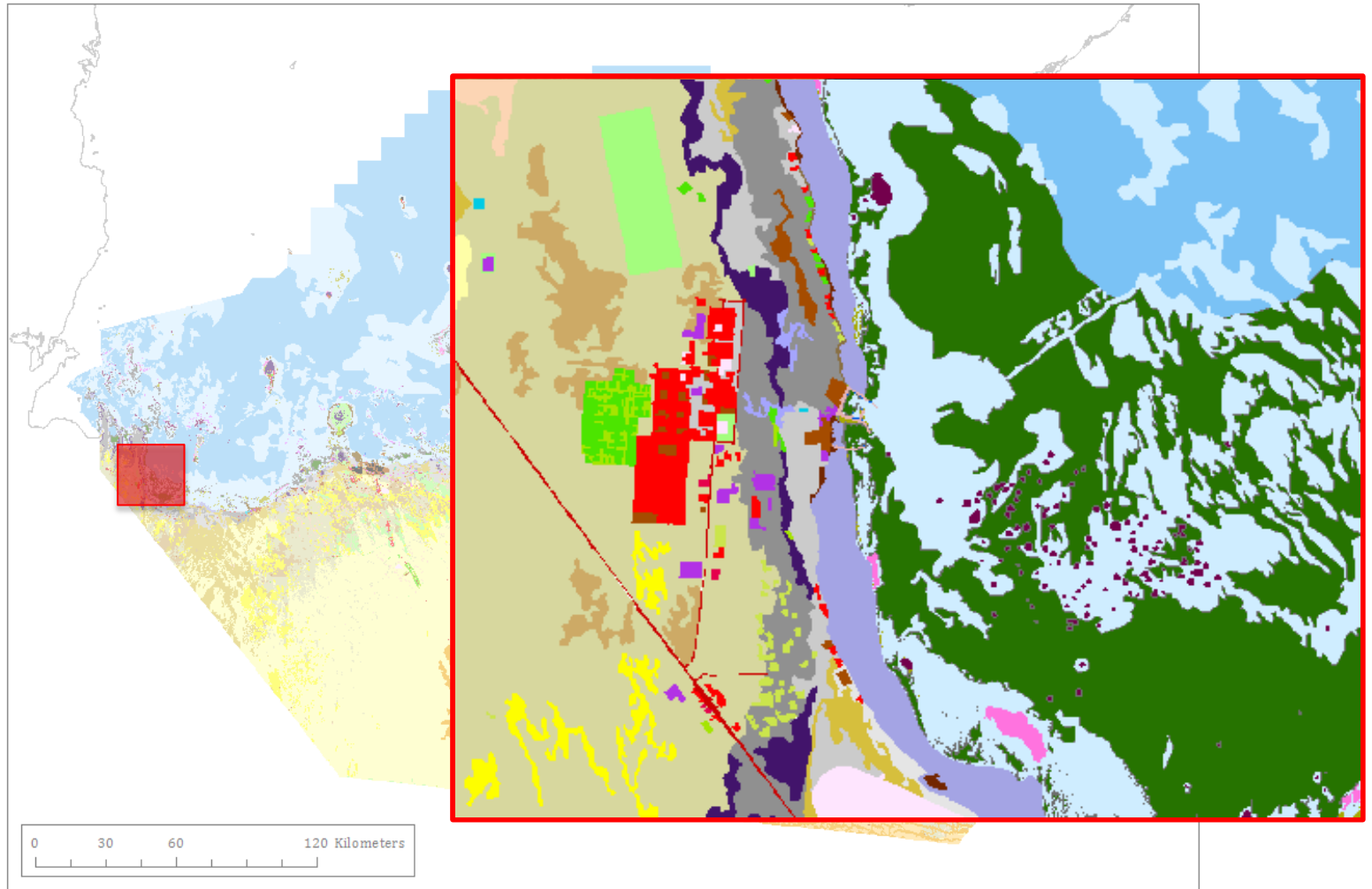
Acknowledging those projects that have advanced best practice, technology or tools to the benefit of the geospatial industry, this award went to **Proteus FZC** for their project **Terrestrial and marine ecological classification and land-use land-cover mapping from satellite imagery for Abu Dhabi emirate**.

AGI Judges commented that *“The scale of this project and the integration of land based / maritime satellite imagery to influence planning decisions/ track carbon is ground breaking”*.

EAD Business Benefits

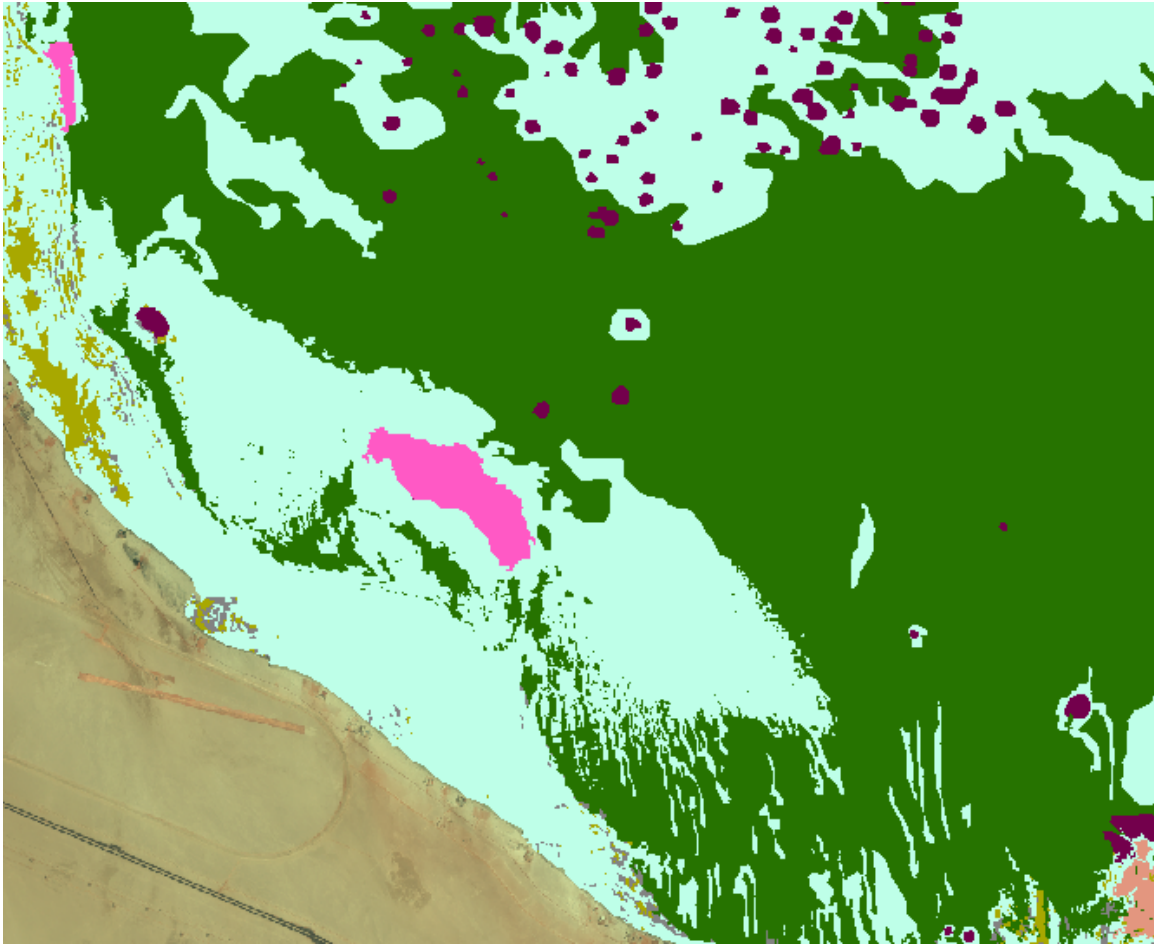


Focus



Marine Examples

Discovering habitats



11,200: Patch Reef

- Coral heads
- 2-3m water depth

14,000: Unconsolidated Bottom

- Sand surroundings
- 8-10m water depth

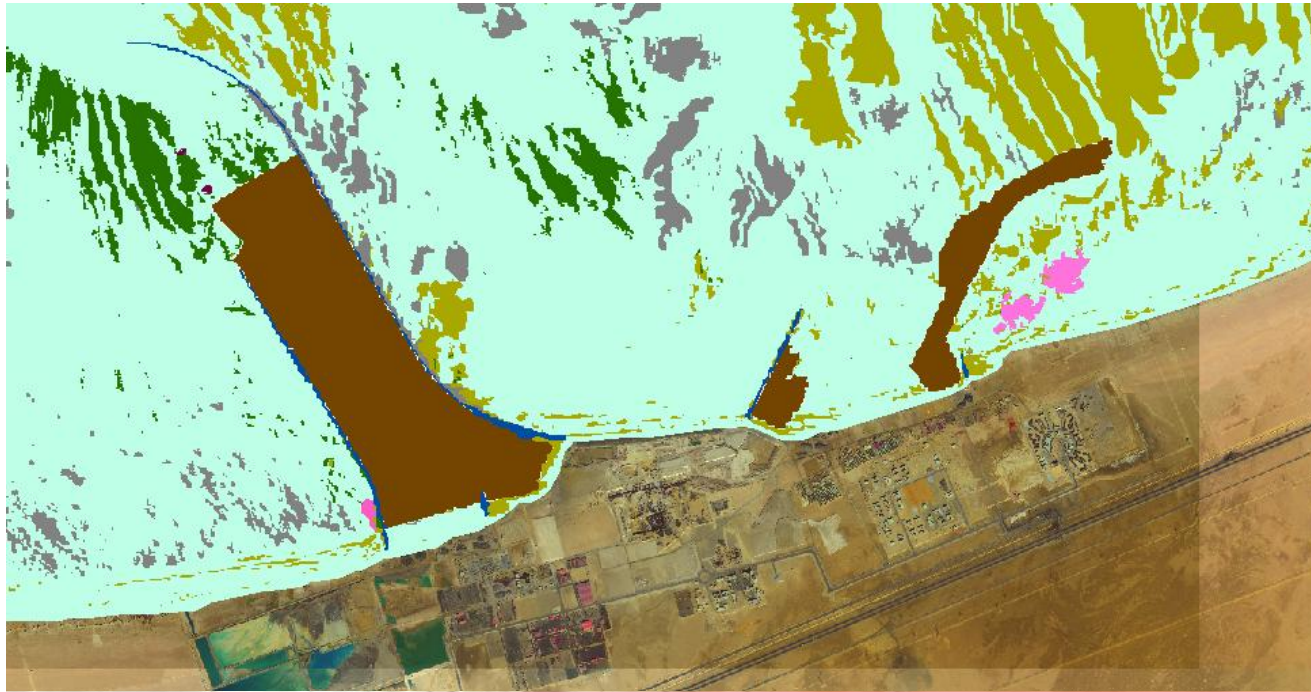
12,000: Seagrass

- Large seagrass bed

11,100: Fringing Reef

- Reef structure
- Geomorphology
- Aligned to coast

Change Detection – Environmental Impact Assessment



13,020: Hardbottom
with macroalgae

14,000: Unconsolidated
Bottom

16,100: Dredged Seabed

T I M E L I N E

2010 - Dominant Macroalgae

2013 - Increased Sand Deposits
- Less Vegetation

Change Detection – Environmental Impact Assessment

Braka Study Area – 8.5km²

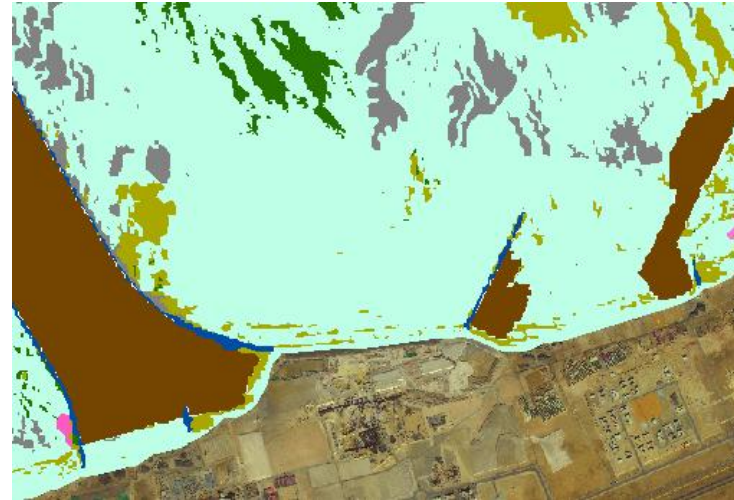
2010



13,020: Hardbottom with macroalgae

220HA

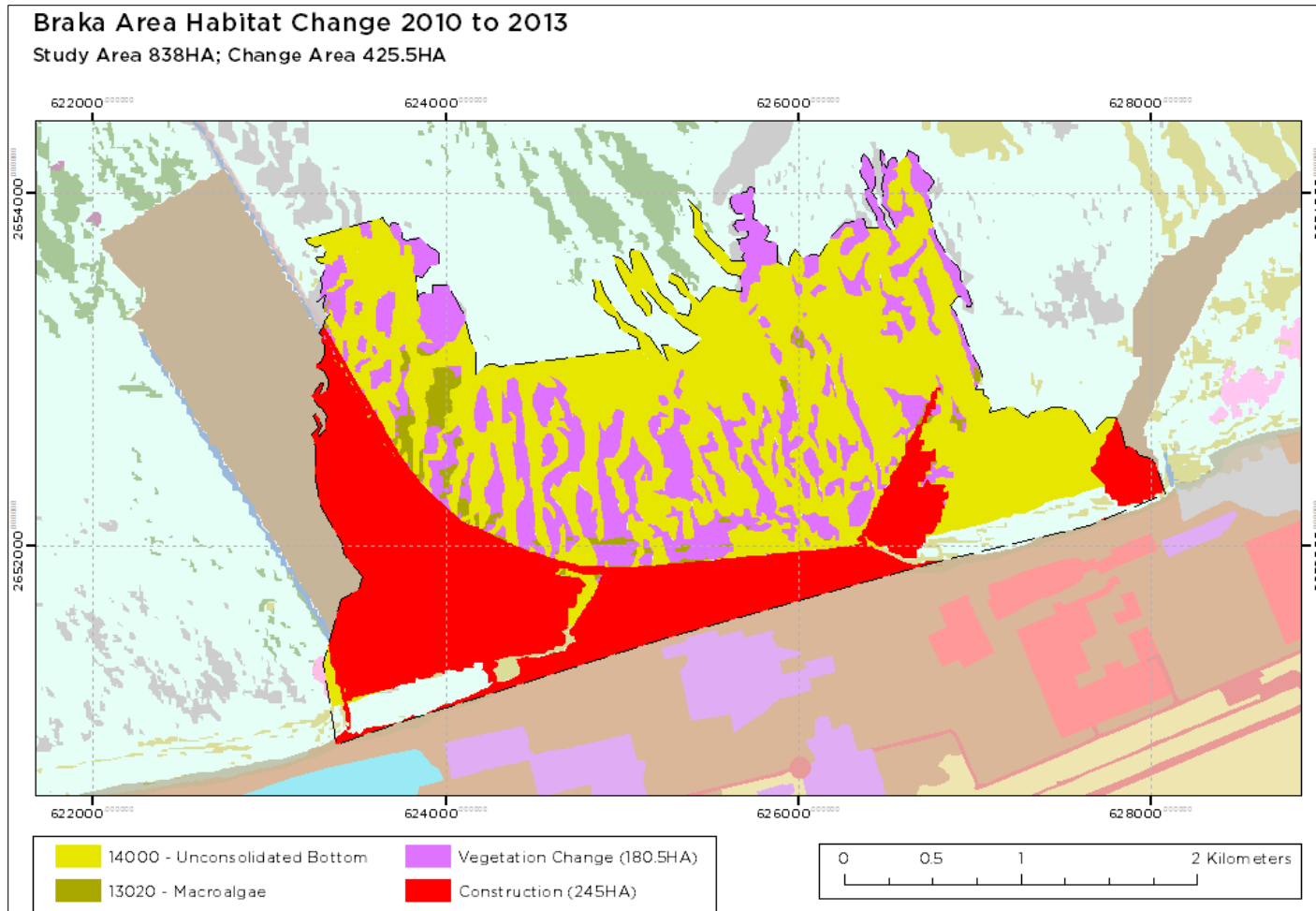
2013



13,020: Hardbottom with macroalgae

38HA

Change Detection – Environmental Impact Assessment



EAD: Strategic Business Benefits



Convention on
Biological Diversity

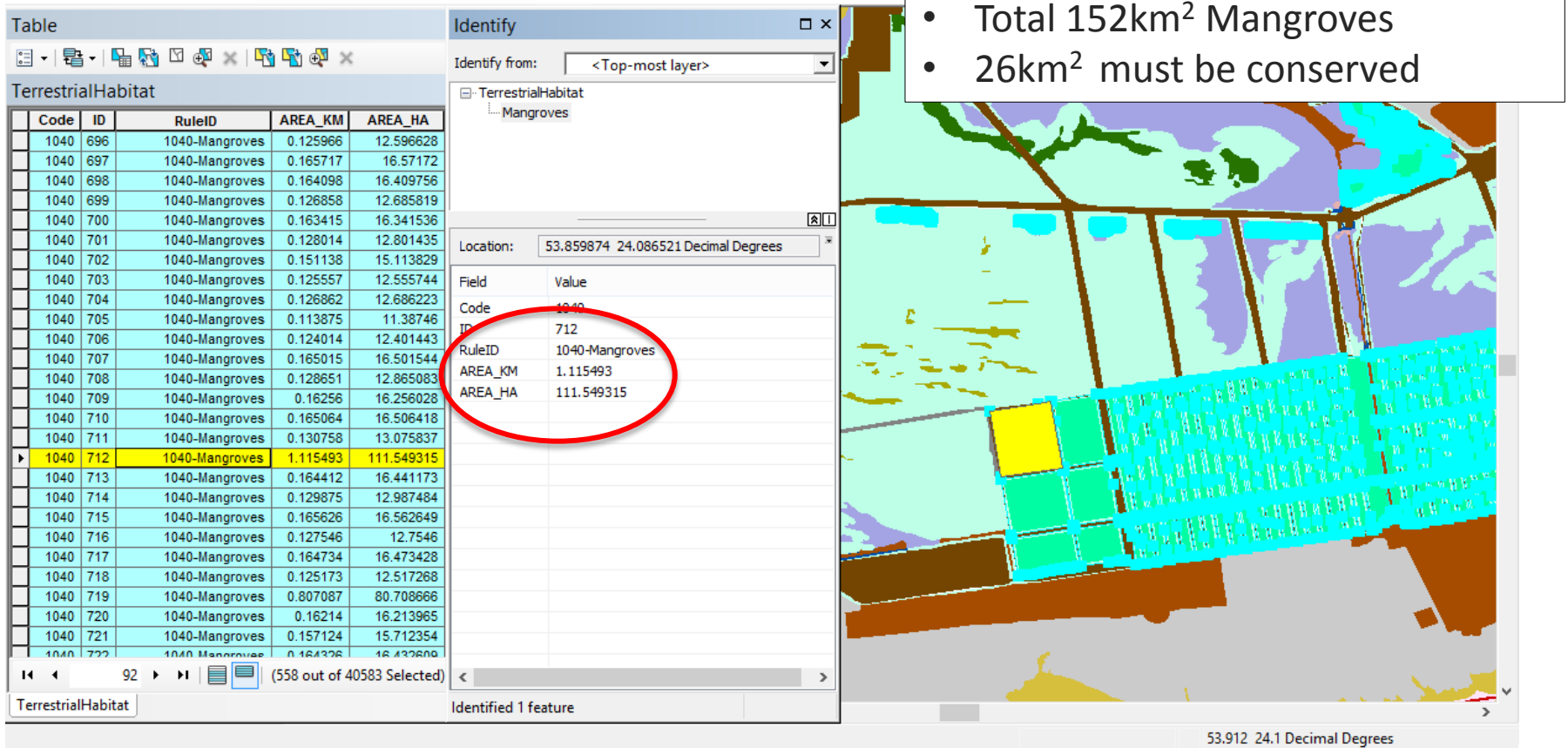
Strategic Plan for Biodiversity 2011 - 2020



By **2020**, at least **17 per cent of terrestrial** and inland water, and **10 per cent of coastal and marine** areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

EAD: Strategic Business Benefits

- These targets are now measurable



EAD: Efficiency Gains



Effective data correlation



Targeted bio-diversity surveys



Improved environmental permitting



Accurate and complete blue carbon information

EAD: Tools for Planning & Guidance



— Sustainable Development

— Legislation

— Conservation Planning

— Decision Making

Summary



- Continuous Coverage
- Proven Accuracies
- Powerful Planning Tool
- Multiple Uses
- Repeatable



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