



FOR OIL SPILL RESPONSE – Croatian coastline and islands

“Statement of Capacity”
(practical review of a
possibility of application of
IMO/IPIECA’s guidelines in
OIKON – Institute for applied ecology,
Zagreb - Croatia)

11/2007

Agenda



Definitions

- Sensitivity mapping
- Map requirements
- Scale of mapping



Types of information with examples

- Shoreline types
- Subtidal habitats
- Wildlife and protected areas
- Fish, fishing activities, shellfish and aquaculture
- Socio-economic
- Oil spill response



Oikon mapping references



Definition: sensitivity mapping



“...Making and updating sensitivity maps are key activities in the oil spill contingency planning process. These maps convey essential information to spill responders by showing where the different coastal resources are, and by indicating environmentally sensitive areas.

The making of a map involves assembling information on resources and deciding on what guidelines for spill response should be included, through consultation with relevant organizations. This can be done regardless of whether or not the benefits of GIS and databases are available.



“Uses of sensitivity maps range from planning practical site-specific shore protection and clean-up to strategic planning for large remote areas...”

IMO/IPIECA (1994). Sensitivity mapping for oil spill response, Report No.1, London



Definition: Map requirements



They must convey an instant message and not require too much specialist knowledge to understand that message.



They should contain enough information to be of value, but be sufficiently uncluttered to prevent confusion.



They should not unnecessarily bisect natural features. For example, a bay or estuary should, where possible, be shown on one map rather than divided between two maps.



They should use suitable symbols which do not conflict and do not convey the wrong message.



They should be set at a suitable scale within the inherent accuracy of the data set.



They should clearly mark scale, direction, legend/key, date of production and title.



They should include a location map to show the relationship between any sub-area and the area as a whole.



IMO/IPIECA (1994). Sensitivity mapping for oil spill response, Report No.1, London



Scale of mapping



Tier 1: small localized spills at fixed installations (such as oil terminals). >> appropriate detailed scale of 1:10.000



Tier 2: medium sized spills, possibly some distance from industry facilities and potentially having a greater impact on the environment. >> appropriate intermediate scale of 1:100.000

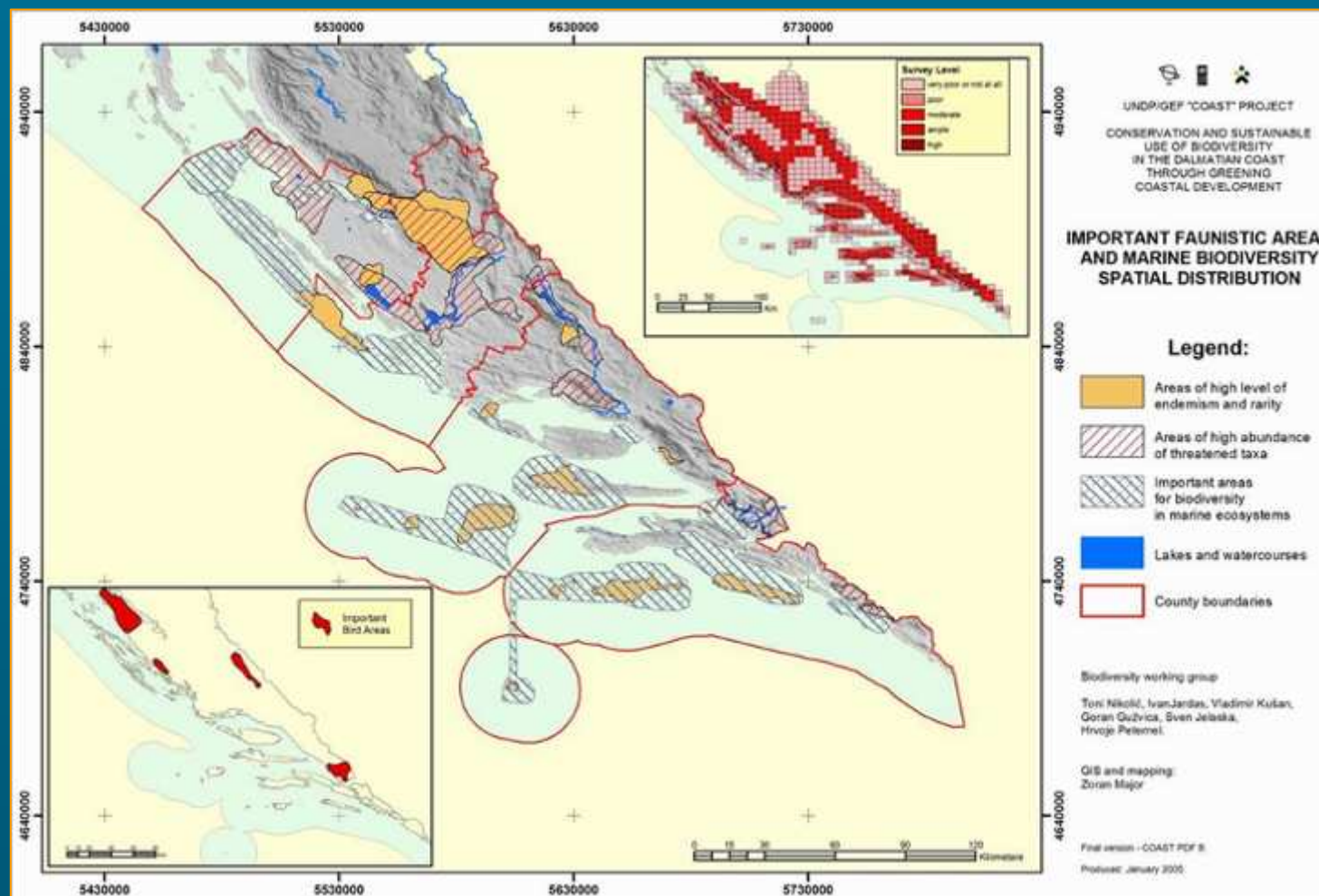


Tier 3: major accidents (e.g. collisions, explosions or blowouts) >> appropriate strategic scale of 1:1.000.000

For Croatia only Tier 1 and 2 levels are appropriate as Adriatic is small enclosed sea



Scaling recommendation



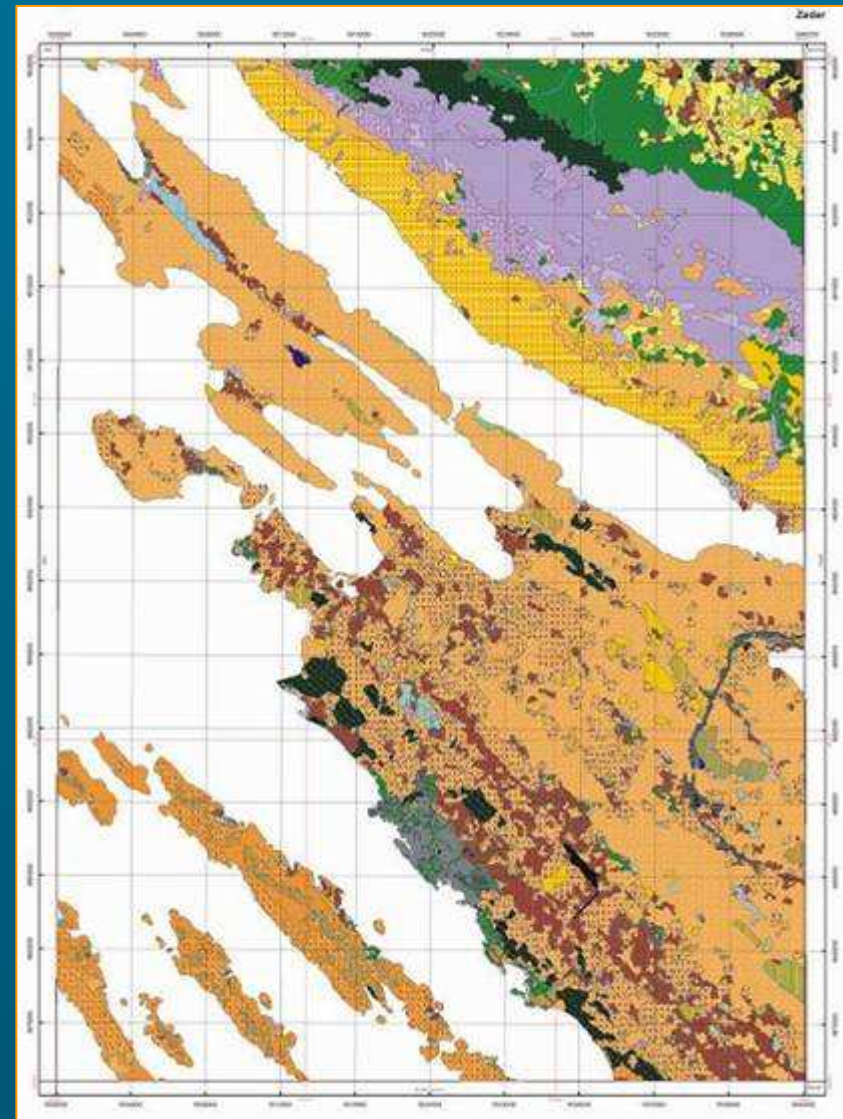
For most regions a cost-effective approach is to invest in **intermediate scale tactical maps** for the whole coastline, and **detailed maps** for those parts of the coastline which have been identified as 'high risk' during the contingency planning process.



Example: Habitat map of Croatia

Description of methodology and habitat classes available in electronic magazine Drypis on // www.Drypis.info.

Owner and custodian of habitat map is State Institute for Nature Protection (www.DZZP.hr)



Legenda			
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AD3	CD3	ED3	FD3
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AD5	CD5	ED5	FD5
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Vlaski podatak: Republika Hrvatska
Otvorak: Otvorak zavod za zaštitu prirode
Droba: DZP d.o.o. Institut za prirodoslovnu ekologiju

1: 100 000

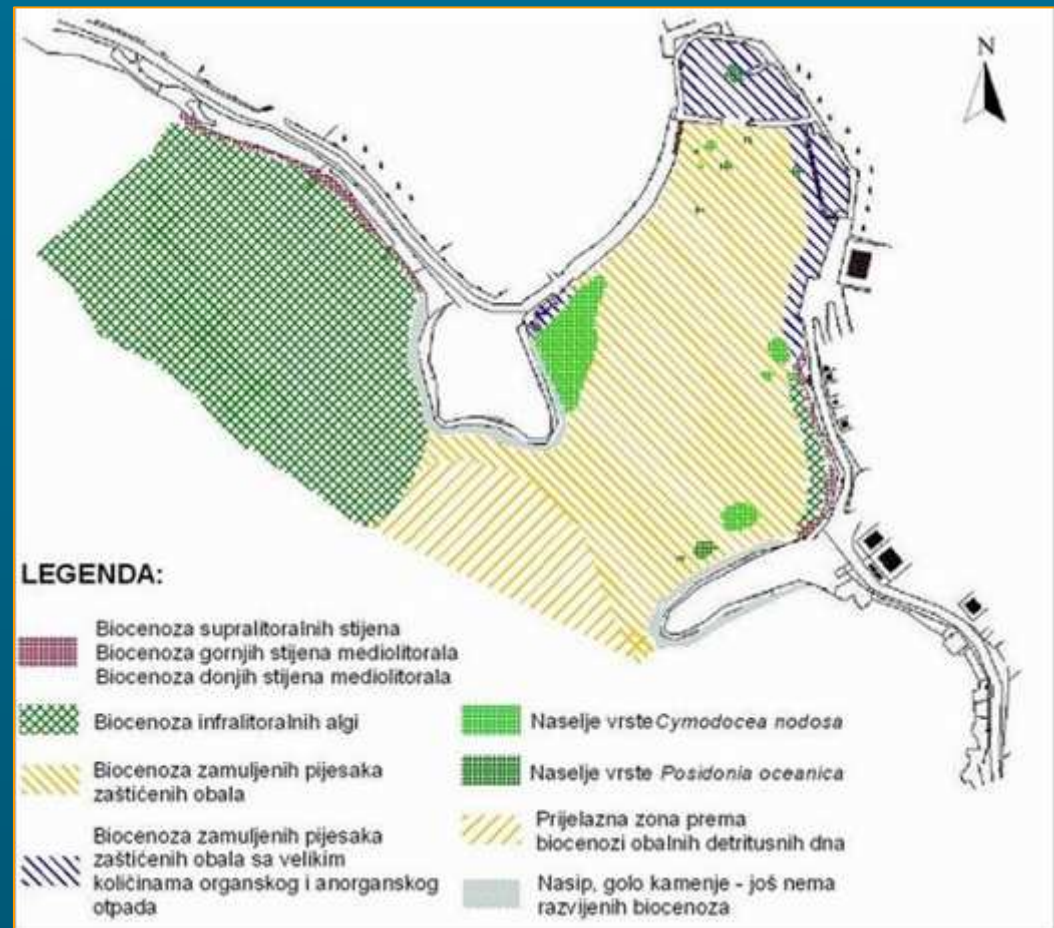
Projekcija: Gauss-Krüger
Ekvival: Gauss 1941
Datum: Hrvatski

Prvo izdanje: Oktobar 2004. god.
Druga podataka podataka: 1999-2007. god. (Amalul RTR- amala)
Planiranje i interpretacija: 2002-2003. god.
Otkriveno u 1. verziji Nacionalne klasifikacije staništa (2004. god.)



Example: Detailed habitat map

Detailed habitat map
of near shore
benthos in
1:5000 scale



Types of information

(that could be included on maps)



Shoreline types - vulnerability or environmental sensitivity index (ESI) mostly used on intermediate scale maps (various indexes such as Gundlach and Hayes (1978), UNEP or south African model)



Subtidal habitats – commonly include Coral reefs, Sea grass beds and Kelp beds



Wildlife and protected areas - show the areas of greatest sensitivity for wildlife species some already with certain legal protection status



Fish, fishing activities, shellfish and aquaculture features



Socio-economic features



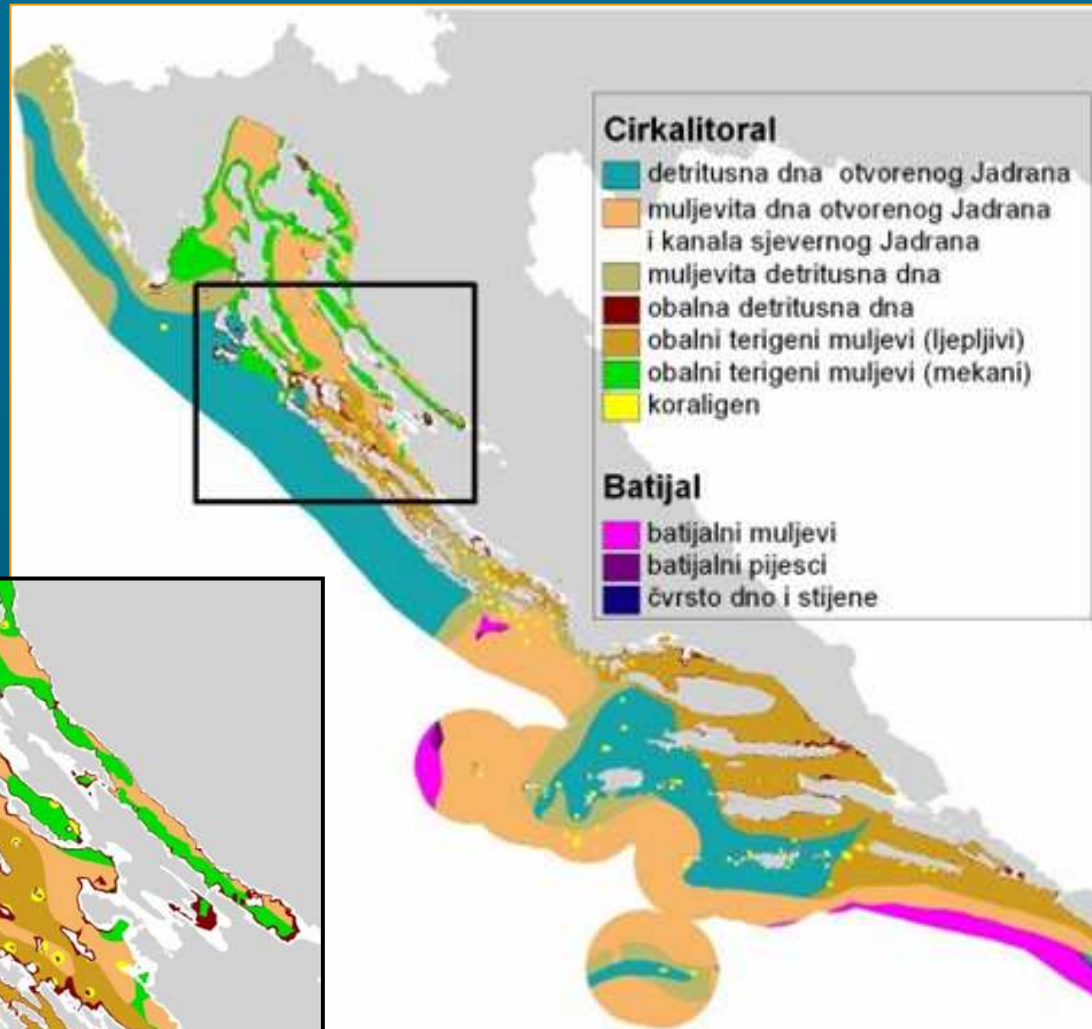
Oil spill response features



Example: Shoreline types

Croatia does not have ESI developed or regionally modified. This is a precondition task for any further work on sensitivity mapping.

Croatian part of Adriatic sea:
The final spatial distribution of the basic types of marine benthos in circalittoral and bathyal zone.

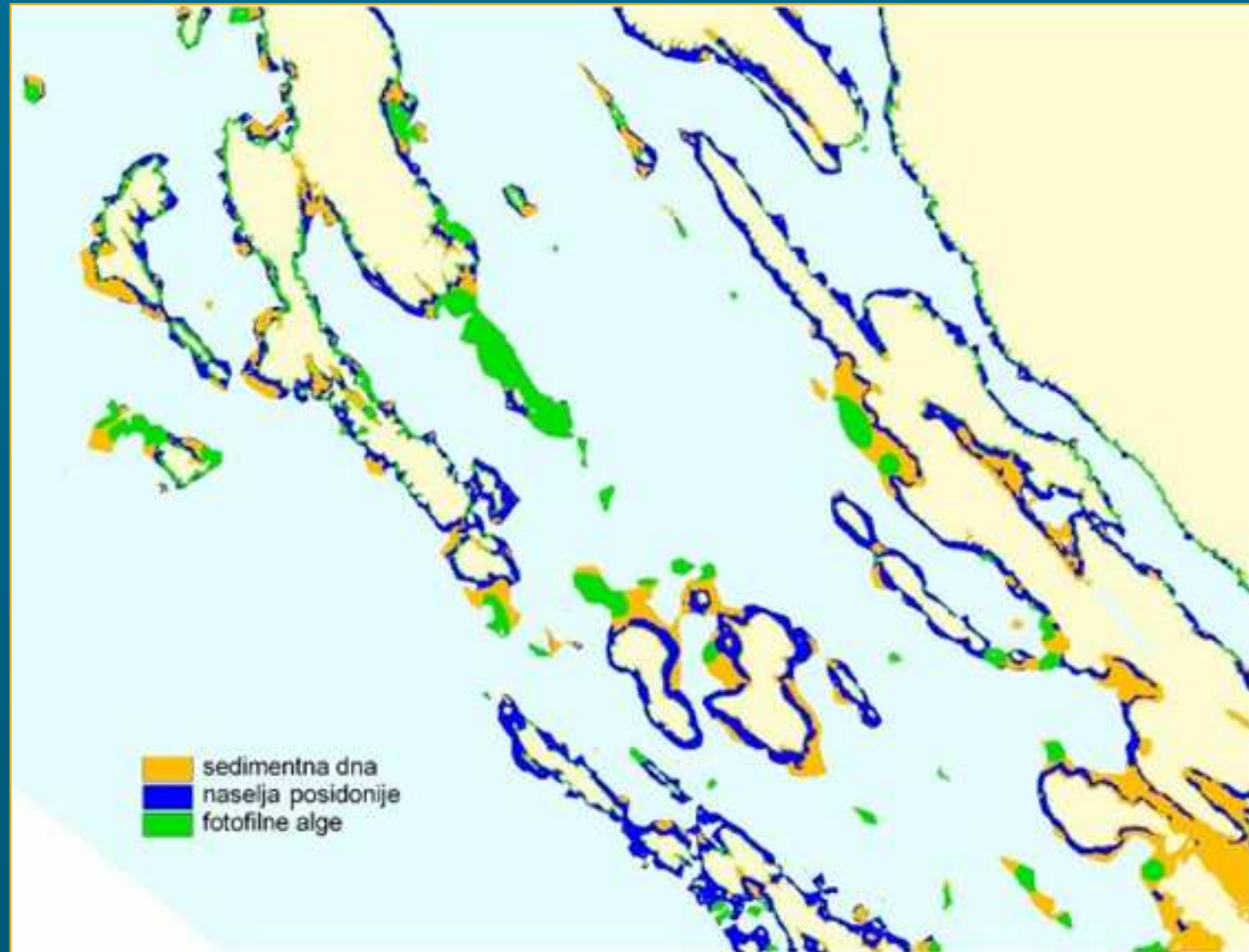


Example: Subtidal habitats

For Croatia of utmost importance are Sea grass beds. Sea grass bed mapping is existing at certain level probably sufficient for intermediate scale maps.

A spatial distribution of infralittoral benthic types derived by neural network model.

Legend:
sediment bottoms (orange), sea grass meadows (blue) and photophilic algae (green).

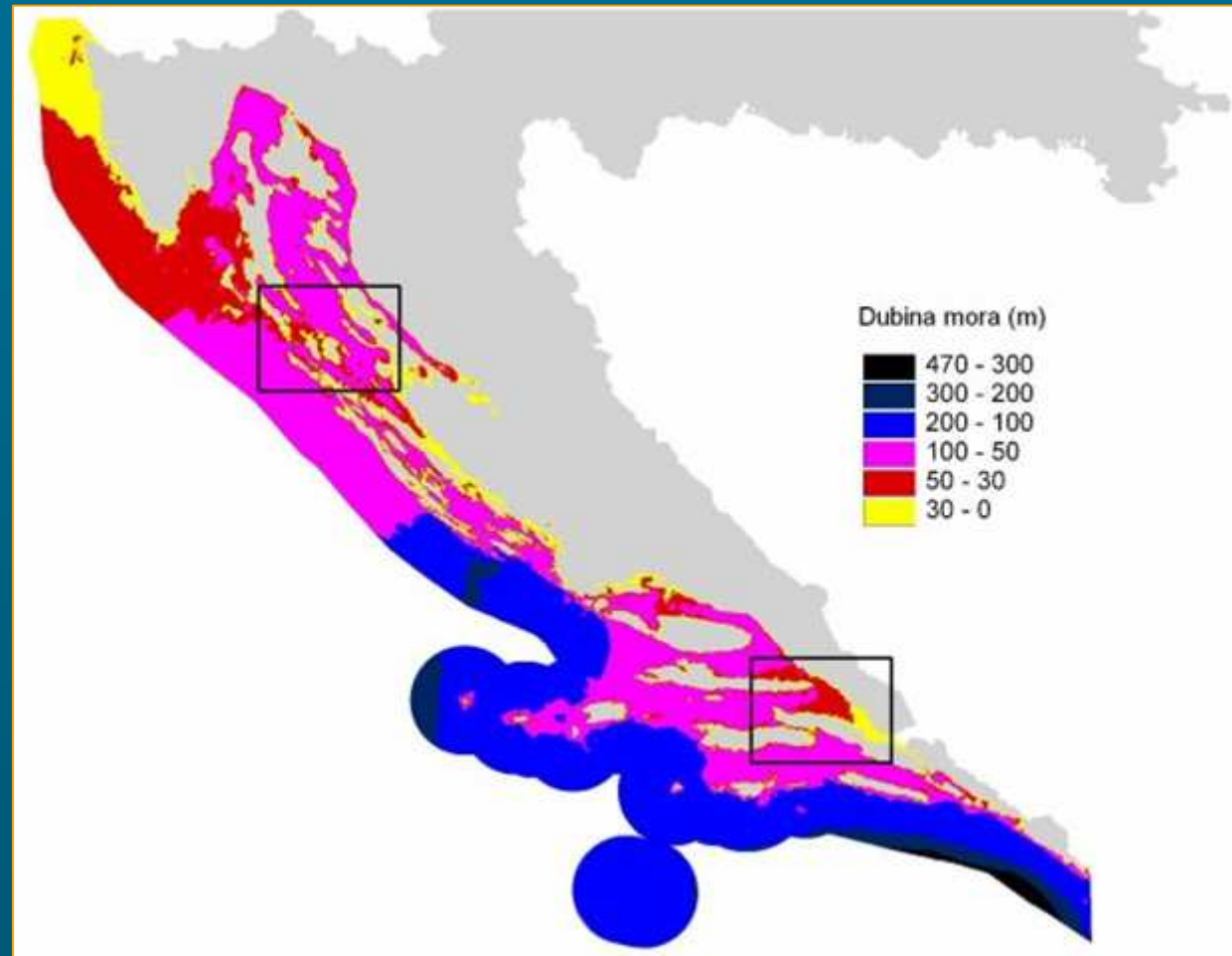


Example: Spatial distribution of the sea depth



Digital model of the sea depth derived from nautical maps in scale 1:100 000 for complete territorial sea of Croatia.

Legend represents depth of sea in meters.



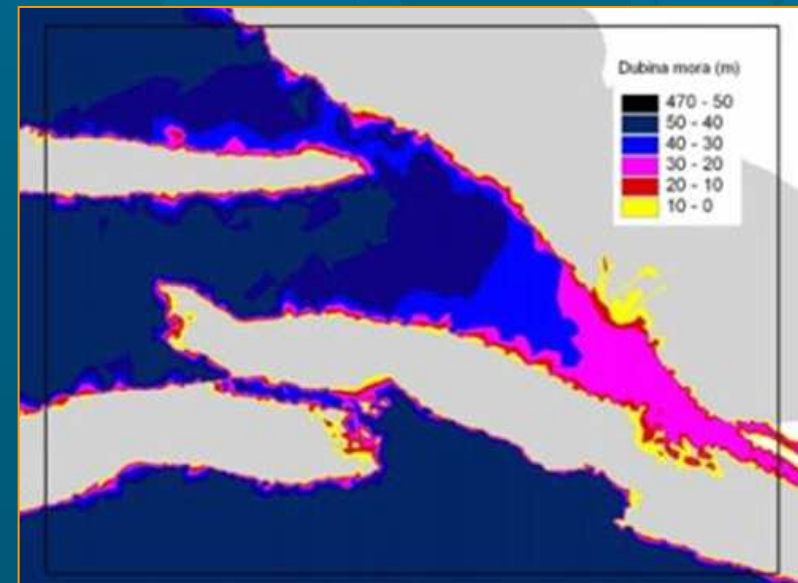
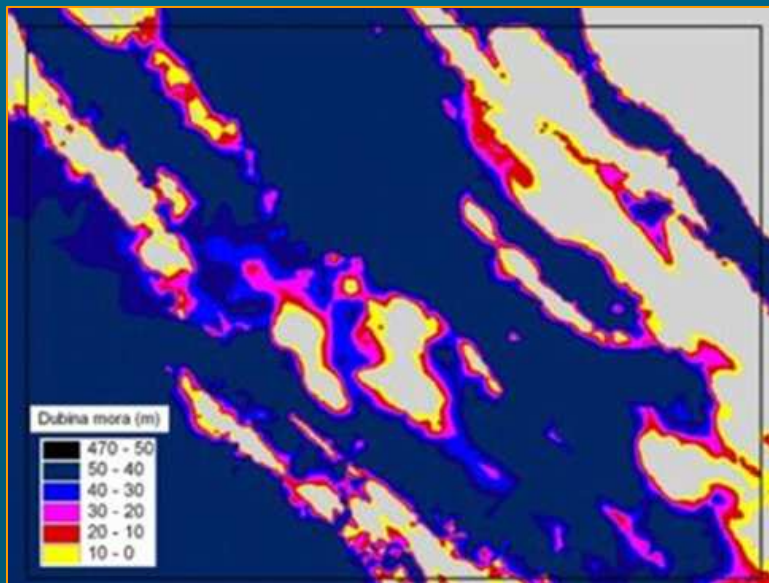
cont....:

Spatial distribution of the sea depth



Enlargements from the previous slide.

Legend represents depth of sea in meters.



Source: Oikon – Institute for applied ecology

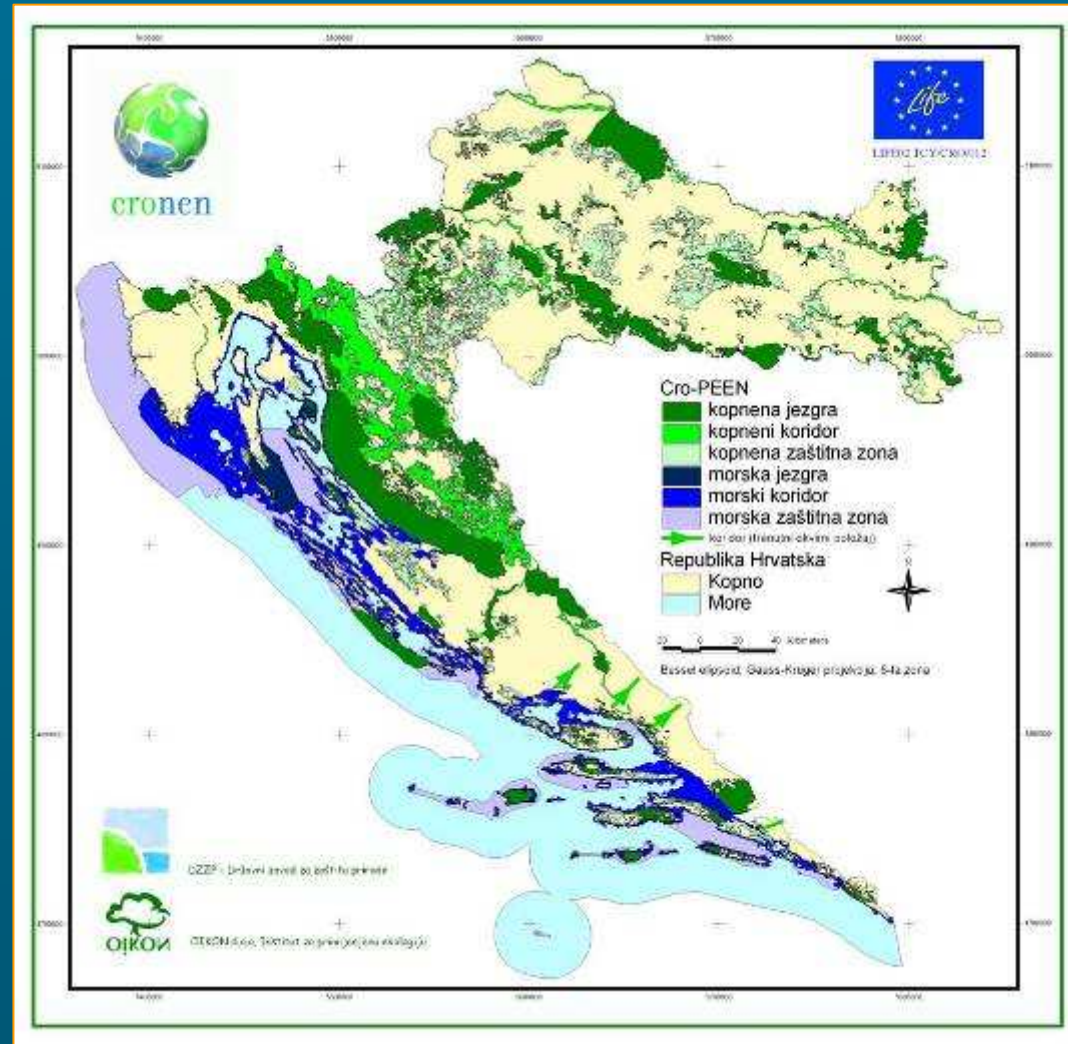


Example:

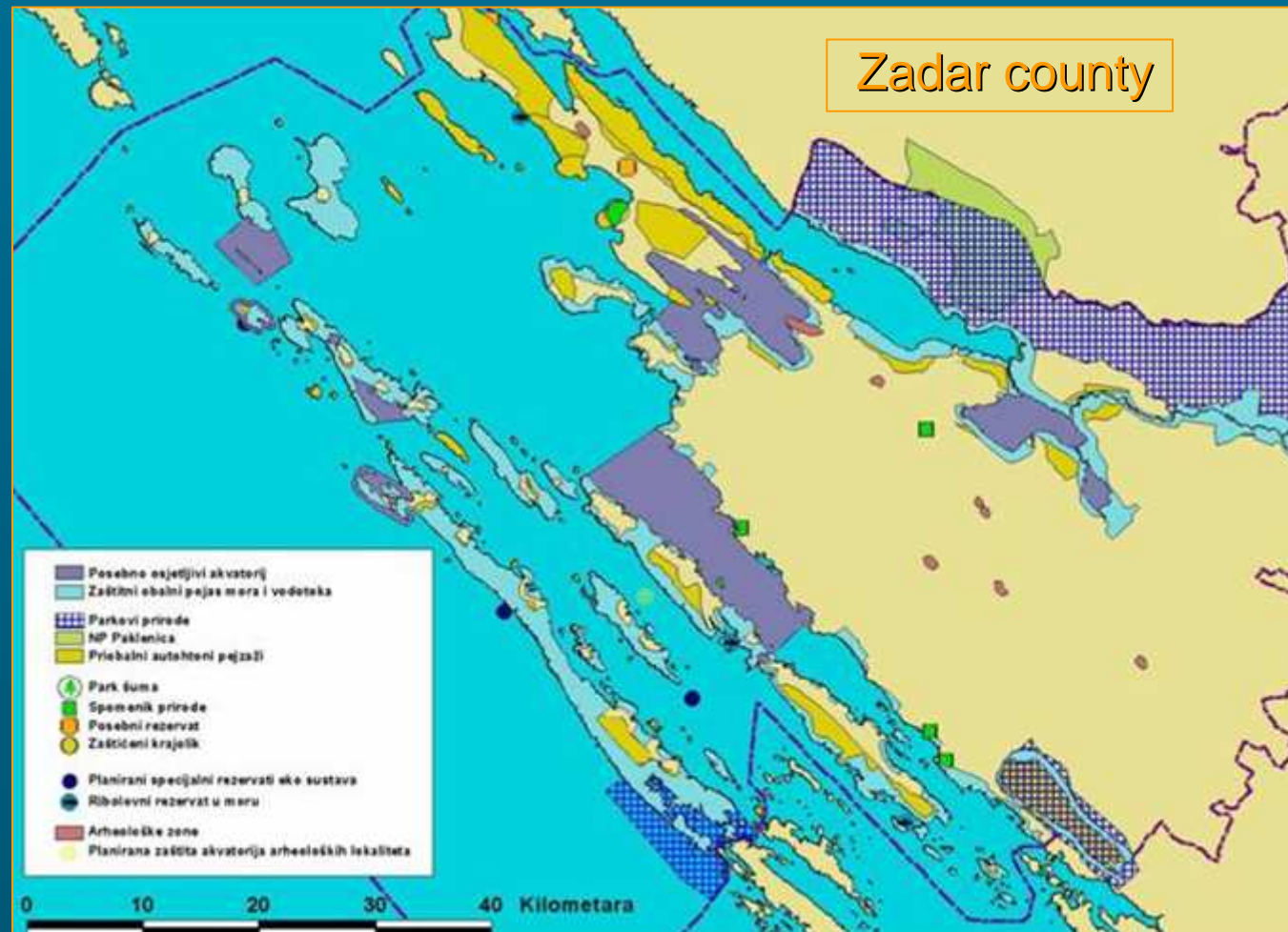
Wildlife and protected areas

Preliminary national
Croatian ecologic
network as part of
pan-European
ecologic network

Information available
probably at
sufficient detail for
intermediate scale
maps.



Example: Existing and planned protected areas



Example: Coastal habitats

A spatial distribution of the coastal habitats mapped as lines longer than 300 m for part of Istra and Kvarner.



Fish, fishing, shellfish and aquaculture



nearshore shallow water fishing areas, e.g. for finfish, crabs, lobsters, shrimps or other species; - *not existing as yet*



seaweed gathering; - *is not gathered in Croatia*



shellfish beds in the intertidal zone or nearshore shallow water; - *not existing as yet*



fish and crustacean nursery areas; - *not existing as yet*



beaches with fishing activities, e.g. hauling in nets; - *abandoned activity in Croatia*



permanent or semi-permanent fish traps and fishing platforms; - *not existing in Croatia*



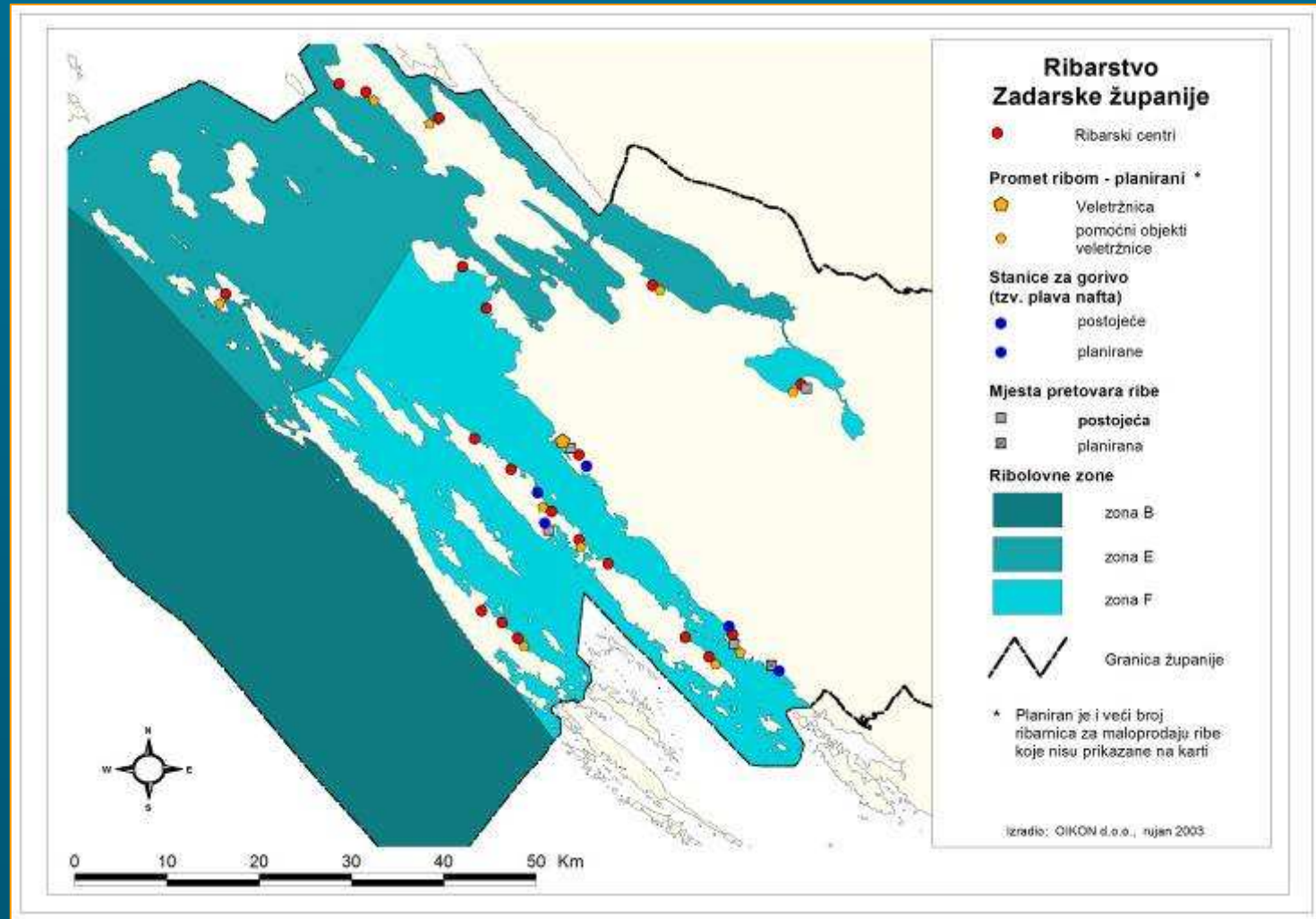
aquaculture facilities for fish, molluscs, crustaceans or seaweeds, e.g. intertidal trestles, floating cages and long-lines, and fish and crustacean ponds; and – *information available for intermediate scale maps*



seaward entrances of rivers important for migratory fish such as salmon – *information available for intermediate scale maps*



Example: Fishing centres in Zadar county



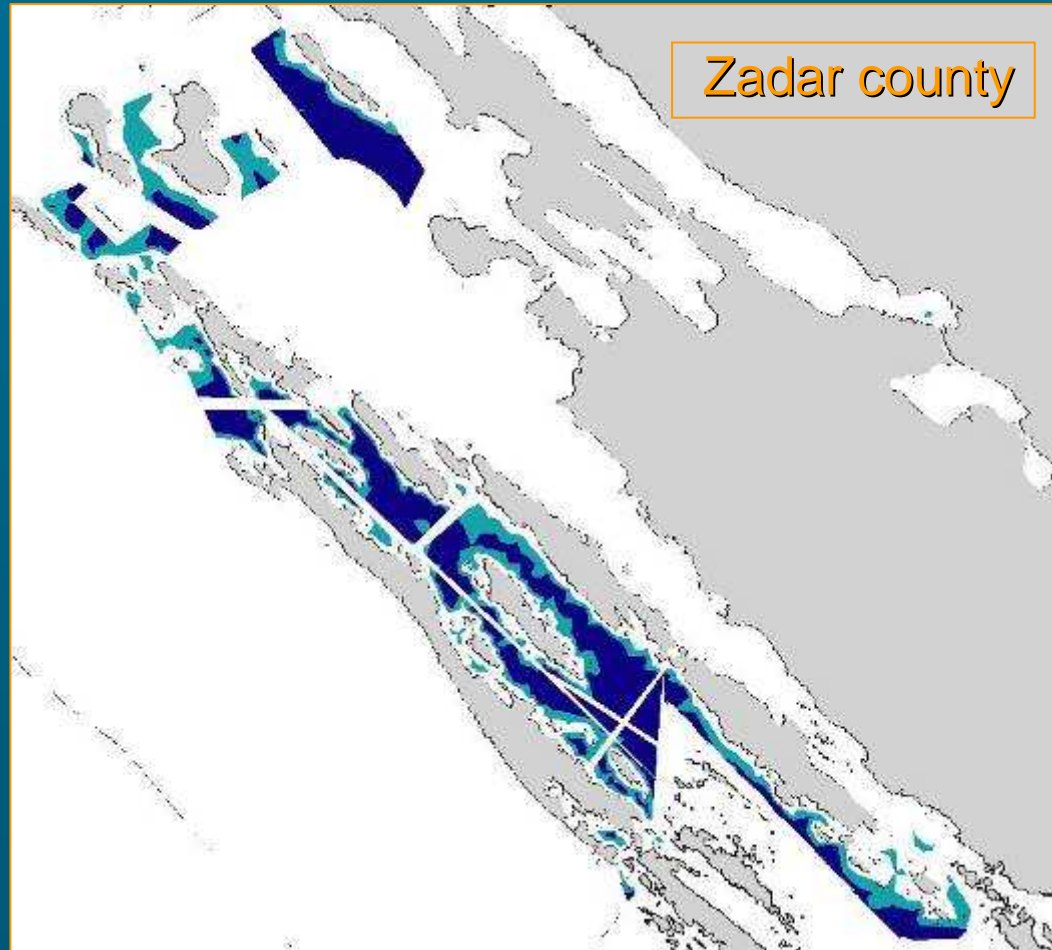
Example: Cage fish farming suitability

areas remaining as suitable for cage fish farming after the selection process based on the consecutive application of array of commonly used criteria, including:

- depth;
- sea waves exposure;
- exchange of sea water;
- „average“ sea currents;
- sea temperature;

appropriate recognition of interests of other sectors including:

nature protection, marine traffic, tourism.



The remaining areas are in various blue shades, depending on depth.
Blue: 30-50 m; dark blue: >50m

Socio-economic features



boat facilities such as harbours, marinas, moorings, slipways and boat ramps

– *information available for intermediate and detailed scale maps*



industrial facilities, for example water intakes for power stations and desalination plants, coastal mining, and salt evaporation lagoons

– *information available for intermediate and detailed scale maps*



recreational resources such as amenity beaches, bathing enclosures, water sport and game-fishing areas

– *information available for intermediate and to certain level detailed scale maps*

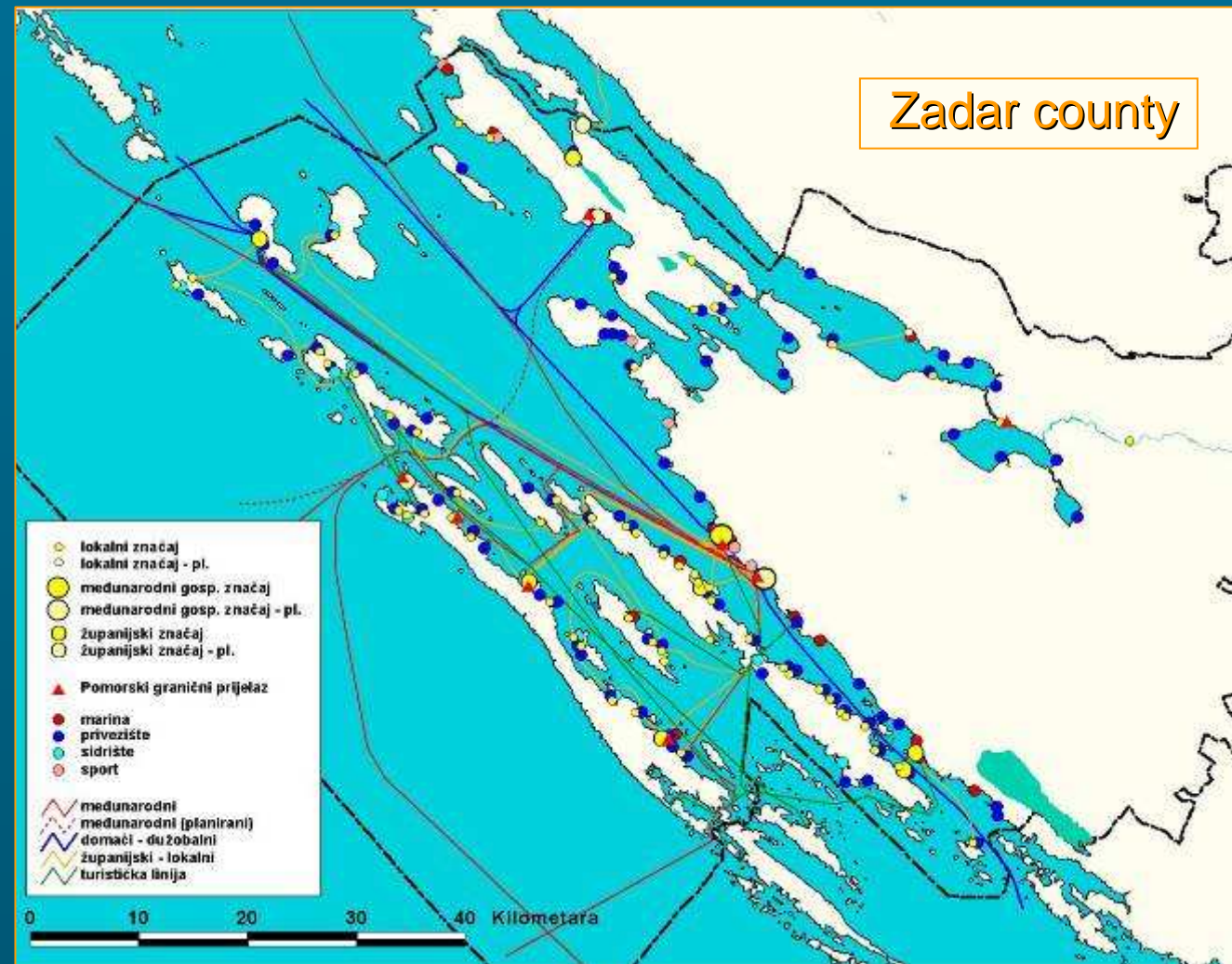


sites of cultural, historical or scenic significance, on or close to the shore

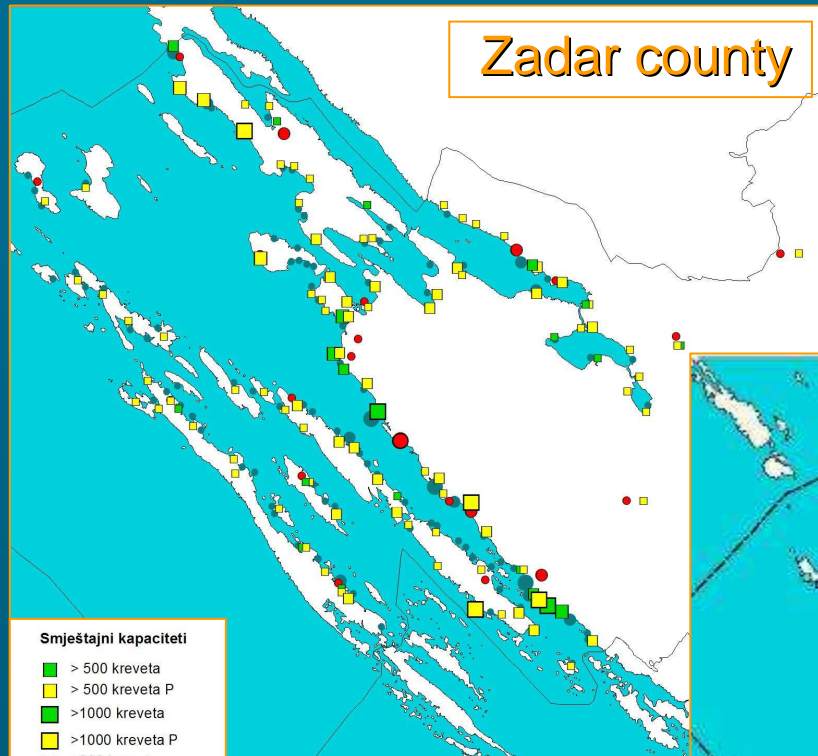
– *information available for intermediate scale maps*



Example: Marine traffic in Zadar county



Example: boat facilities and recreational resources



Smještajni kapaciteti

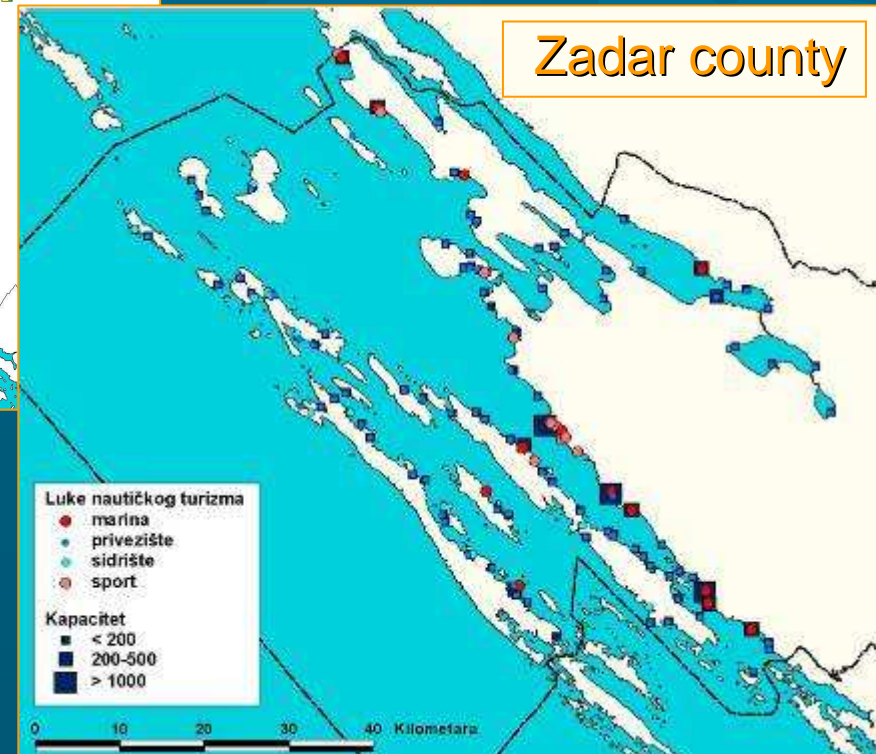
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Turistička središta

- makroregionalni značaj
- regionalni značaj
- subregionalni značaj

Nautičke luke

- < 200
- 200-500
- > 1000



Luke nautičkog turizma

- marina
- privezište
- sidrište
- sport

Kapacitet

- < 200
- 200-500
- > 1000



Oil spill response features



where dispersants could be used and where they should not be used



where booms could be deployed and the locations of any permanent boom moorings



which beaches of low sensitivity could, if necessary, have oil deflected onto them to save sensitive areas



locations of access points

- all of the above is not defined as yet on national level



www.oikon.hr



... At the end, a few words about OIKON

Oikon Ltd. – Institute for Applied Ecology was founded in 1997 as privately owned company with research, development and commercial programs/ projects.

Today, with a core staff of 31,



covering 12 disciplines and with



network of over 250 external consultants, with



over **400 successfully implemented projects** for customers both in Croatia (national government (15%), regional & local government (12%), public sector (43%), private sector (30%)) and abroad (UK, Bosnia, Romania, Albania), and



projects financed through multi - and bilateral development agencies,

OIKON is generally recognized as one of the leading environmental consultancies in Croatia.



Selected mapping references



Map of **habitats** of the Republic of Croatia 1:100.000



17 other **detailed habitat maps** 1:25.000 for protected areas of nature



CORINE Land Cover Database/map for Republic of Croatia 1:100.000 (1980, 1990 and 2000)



Croatian Pan-European ecological network (**CROPEEN**)



National forest inventory of the Republic of Croatia – Mapping and modeling



GIS services for *Sustainable development programs of all Croatian Islands* within the program



Map of **game management** units of the Republic of Croatia 1:25.000

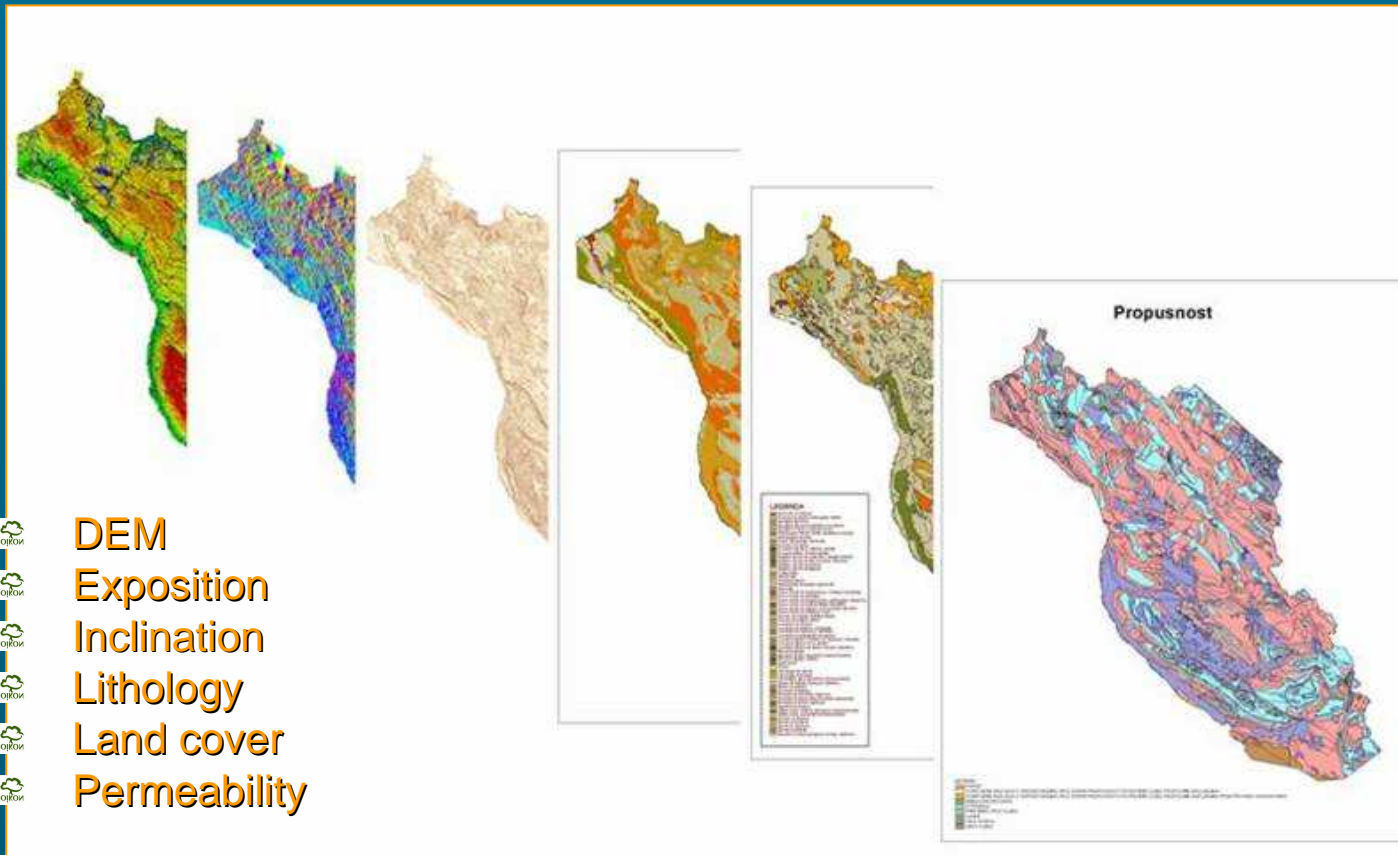


Map of **private forests** management units and districts of the Republic of Croatia 1:100.000

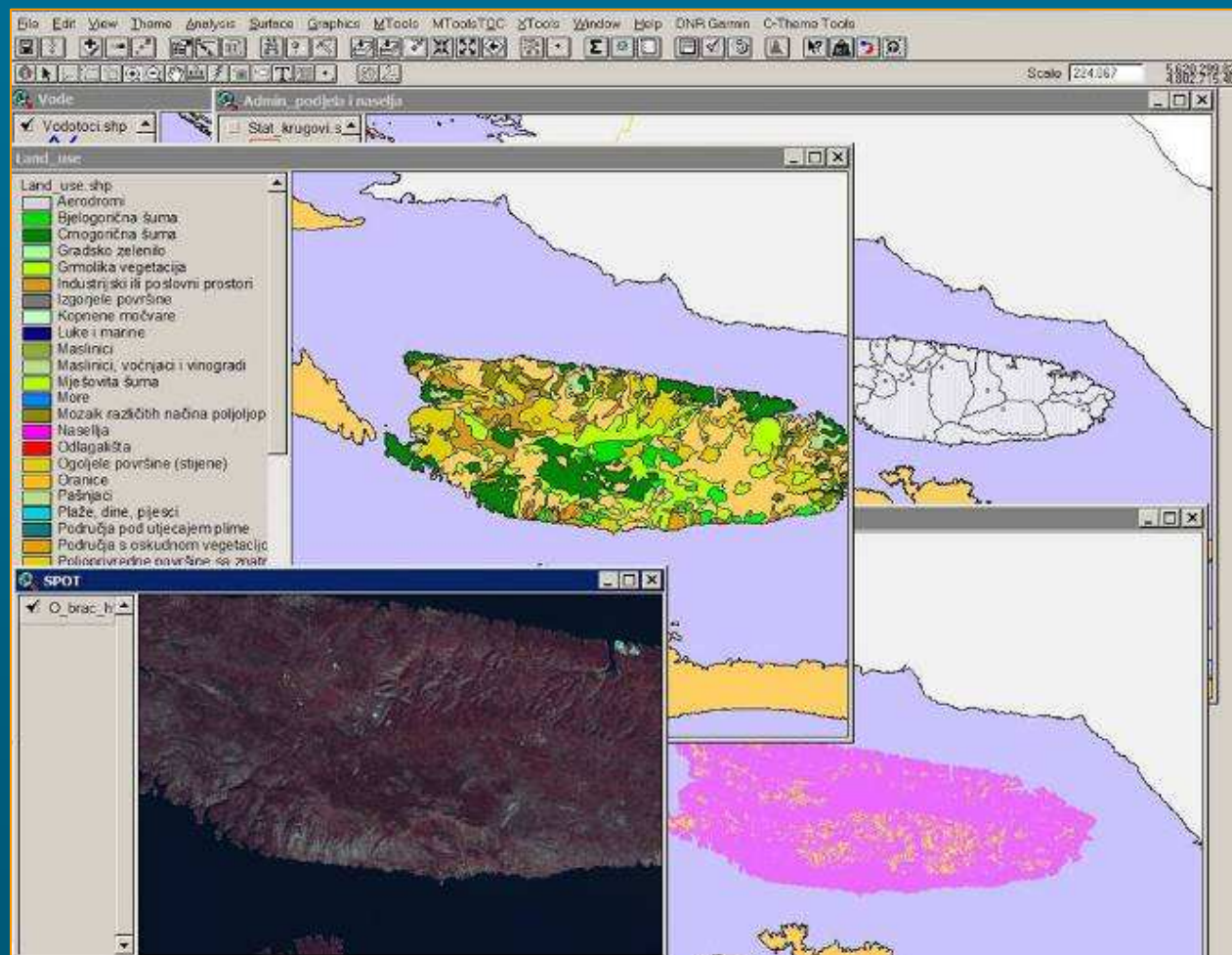
...and many more



Example: A string of mapping products



Example: GIS support services



Project: *Sustainable development programs of Croatian Islands within the program*



Regarding the sensitivity mapping for oil spills response we have:



access to technology



experience in thematic mapping of natural world at various scales



spatial databases of various relevant content



access to aerial and satellite images



solid topographic baseline



multidisciplinary human resources and knowledge

Consequently, we think that we are

the best possible provider for the establishment of sensitivity mapping for oil spills response on the Croatian side of Adriatic sea.



Thank you!

For additional information
please contact us

oikon@oikon.hr

