

# Supporting marine dimension in NSDI Marine cadastre and Marine SDI

Zvonko Grzetić  
Bruna Vidović,  
Mladen Srdelić

Hydrographic institute of the Republic of Croatia  
Z.Frankopanska 161  
21000 SPLIT



## Background

- The oceans and coasts comprising 72% of the Earth's and they provide the essential life-support function without which life on earth would not be possible, they provide the cheapest form of transportation for our goods, they provide us with energy, food, recreation, and spiritual renovation.
- The multitude of activities supported in ocean and coastal areas is placing increasing pressure on the integrity of the coastal and marine ecosystems and many of the ocean and coastal resources are threatened through overexploitation
- Maintaining the quality of life that the ocean has provided to humankind while sustaining the integrity of ocean ecosystems, requires changes in how we view, manage, govern and use ocean resources and coastal areas.
- Management of the ocean is a complex space of inter-related, intertwined, converging and competing demands and interests. These legal instruments are diffused among a myriad of sectors in international, regional and national organisations

In this presentation is highlighted importance of spatial information and related technologies and policies, which are articulated in new concepts of Marine Cadastre and Marine Spatial Data Infrastructure as tools, instruments and institutions for efficient and more integrated management and administration of marine and coastal environments



## International Legaslative framework

- **UN Convention on the Law of the Sea (UNCLOS)**
- **Convention on Biological Diversity**
- **IMO Maritime policies and strategies ( Solas, E-navigation)**
- **International Hydrographic organization (IHO) - MSDI**

### UNCLOS

- The Law of the Sea Convention defines the rights and responsibilities of nations in their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.
- The most significant issues covered were setting limits, navigation, archipelagic status and transit regimes, exclusive economic zones (EEZs), continental shelf jurisdiction, deep seabed mining, the exploitation regime, protection of the marine environment, scientific research, and settlement of disputes



## EU Legaslative framework

### **Intigrated EU Maritime Policy (IMP)**

**Maritime Spatial Planning (MSP) - 2007**

**Integrated Coast Zone Managment (ICZM) - 2002**

- processes of analyzing and allocating the spatial and temporal distribution of human activities in coast and marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process.

**Marine Strategy Framework Dirsective (MSFD) - 2008**

- Environmental pillar of Integrated European Maritime Policy
- Promote sustainable use of the seas and conservation of marine eco systems;
- Sets out a common framework based on co-operation between Member States to ensure the sustainable use of marine goods and services
- Each Member State must achieve or maintain Good Environmental Status in the marine environment by 2020

**Mediterranean Action Plan (MAP)**

**Barcelona Convention and its Protocols: MSSD (2005) ICZM Protocol (2008)**

**INSPIRE Directive 2007/2/EC**



## Croatian Legislative framework

### Maritime Code

Law on Hydrographic Activities-Hydrographic Activity Act (OJ 69/98, 163/03),  
Law on sea ports and maritime domain

### Maritime domain

- The Croatian legislation defines the "maritime domain" as public property, which extends to one part of the state territory on the mainland, to the inner sea water and territorial sea, as well as to the corresponding seabed and subsoil, and has specific legal, functional and economic characteristics.
- The management of the maritime domain and its adequate protection, maintenance and economic exploitation can be secured only by a comprehensive application of regulations concerning maritime domain and ports, and regulations in the area of development, urban planning, construction, environmental protection, mining, tourism, marine fishing, nature protection and protection of cultural monuments, as well as through an efficient inspection and administrative supervision



## Complexity of coast and marine environment

### Spatially complex Marine boundaries

They are **virtual** rather than physical

- They may be **ambulatory** (time varying)
- They are defined in **3D** (and sometimes 4D)
- They can delineate **overlapping** rights, restrictions and responsibilities.



### Competing uses of Marine Resources

- Multiple and often overlapping rights
- Diverse forms of tenure exist in marine environment
  - Freehold title does not exist offshore:
  - Ability to hold lease rights
- Focus is more on resource and activity management
- Overlapping tenure and interests are common as distinct from the terrestrial environment

How can overlapping tenure be spatially managed ?



## Governing marine environment

**Marine Administration System** is term adopted for the administration of rights, restrictions and responsibilities in the marine environment,

**Marine cadastre** is defined as a management tool which spatially describes, visualises and realises formally and informally defined boundaries and associated rights, restrictions and responsibilities in the marine environment.

**Marine SDI** is the component of an SDI that encompasses marine geographic and business information in its widest sense. This would typically include seabed topography (bathymetry), geology, marine infrastructure (e.g. wrecks, offshore installations, pipelines and cables), administrative and legal boundaries, and areas of conservation, marine habitats and oceanography.”

(IHO Pub. C-17, Spatial Data Infrastructures “The Marine Dimension” Guidance for Hydrographic Offices. Ed. 1.1 February 2011).

**Sustainable Development**

**Marine Administration**

Marine Industries & Development

Policing & Conflict Resolution

Resource Management

Marine Use

Legislation & Conventions

Planning & Management

Institutional Framework

**MARINE SPATIAL DATA INFRASTRUCTURE**

**NSDI**

**Marine cadastre**

Oil & Gas Data      Navigation data

## Marine cadastre concept

**Marine cadastre definitions**

- Records containing information about the sea, seabed and marine waters, important for the safety of navigation, except for information of interest to the defense.

**(Law on hydrographic activities, art.15., Paragraph 1., NN. Br.68/98)**

- Maritime Information System, which includes both content and spatial extent of interest and ownership rights with respect to the property, various rights and responsibilities in the maritime jurisdiction

**Multipurpose Marine Cadastre MMC**

- Concept of extending the traditional marine cadastre’s primary focus of rights, interests, restrictions, and responsibilities to marine spatial extents, facilitating the sharing and combination of many other types of information related to any defined marine spatial extent (including information related to rights, interests, restrictions and responsibilities) to support the allocation and administration of

**Marine Cadastre**

Quality Information

**Decision-Support**

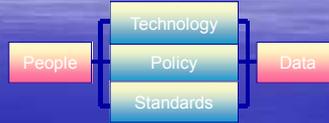
Economic Development      Social Development      Environmental Management / Protection

# SDI in Marine Environment

## Current situation in Croatia

### National Spatial Data Infrastructure (NSDI -NIPP)

- project development of spatial data infrastructure for Croatia compatible INSPIRE EU directive (SGA, 2008)

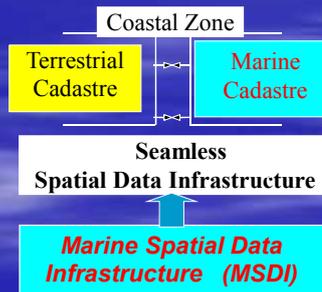


### Need for including a marine dimension to NSDI model

- by extending, modifying and testing the principles that underlie SDI models (in particular the NSDI model) in an coastal zone and offshore context with particular attention on the coastal zone. – seamless model

### Development of seamless SDI model

- will bridge the gap between the terrestrial and marine environment, creating the spatially enabled land-sea interface to more effectively meet sustainable development objectives



# Hydrography - fundamental backdrop

A successful national hydrographic policy will not only meet the requirements of the mariner but can provide additional and often greater benefits to the marine environments

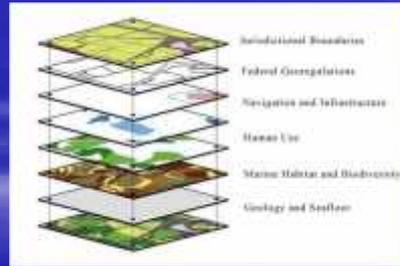
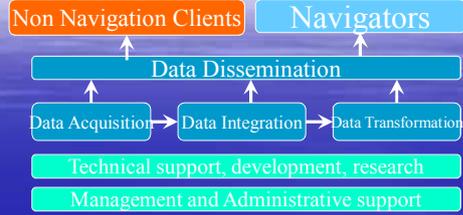
- Safety of navigation
- Protection of marine environment
- National infrastructure development
- Coastal zone management
- Marine exploration
- Resource exploitation
- Maritime boundary delimitation (UNCLOS, others)
- Maritime defence and security
- Disaster management



## Role of Hydrographic office

Croatian hydrographic office has mandate for:

- Maritime navigation safety and efficiency
- Tides, Currents and Water Levels
- Seabed mapping for sustainable development
- National sovereignty, security and emergency preparedness



## Marine Cadastre - Implementation



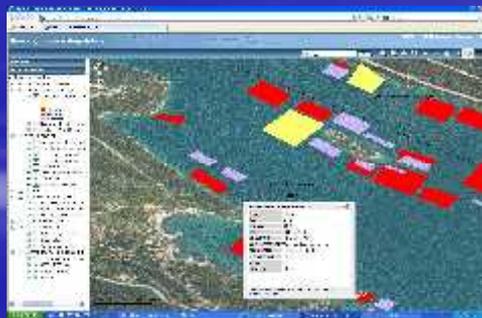
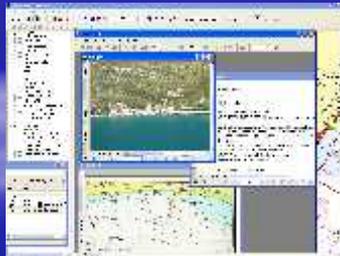
### AdriaGIS -Web GIS marine information system

#### Current state:

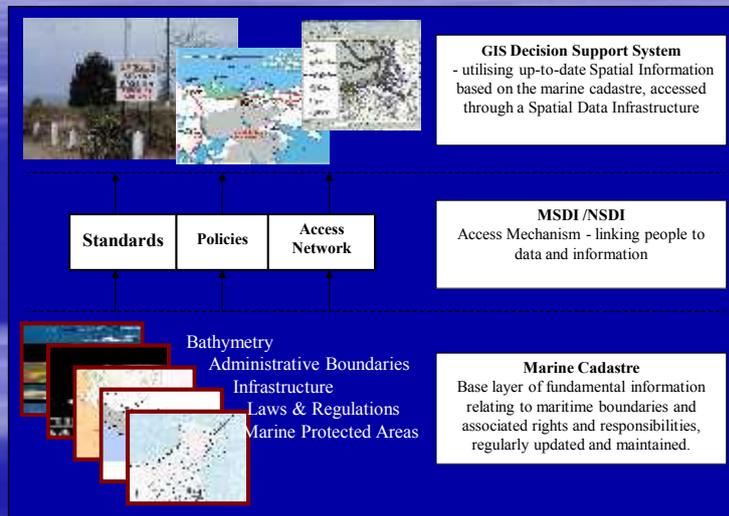
- Web GIS viewer with GIS layers related to marine and coastal environment

#### Future features:

- Multipurpose marine cadastre
- Web-oriented maritime registers publicly available
- Marine GIS geo-portal with the available thematic layers
- Management and maintenance of information by authorized institutions



## Integrated Marine Information System



## Conclusions

- A more integrated and holistic approach to management of coastal and marine environments would be facilitated by the extension of the SDI to coastal and marine environment on a seamless platform;
- Demonstration of the requirements and potential advantages of a coastal and marine SDI within the framework of a national NSDI, with further linkages to integrate with national, regional and global initiatives.
- There is need for integrated marine information systems that will contribute to the management of the coastal and marine environments both in the province and the region.
- The Croatian Hydrographic Office is enhancing its role as an organization recognized as the official provider of national hydrographic information.
- CHI is realigning its activities towards data accessibility and the integration of marine information in support of the safe and efficient use of our marine environments, the sustainable development and national sovereignty and security.



