



# Inland ECDIS

The basic tool for other RIS key technologies

UNECE workshop 2016-06-23

Geneva

# Agenda

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- Inland navigation, the small differences to the maritime world
  - Inland waterways
  - Why Inland ENC's
- Inland ECDIS standardization process
- S-100, a closer approach of maritime and Inland ECDIS
- Inland ECDIS as basic map for the visualization of waterway related topics
  - RIS-Index, the link between the RIS-Services
  - Inland ECDIS charts as base maps in FIS portals
  - Inland ECDIS in navigation mode
  - Inland ECDIS in information mode

# Inland navigation - differences to maritime world

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- Maritime navigation is governed by worldwide regulations of IMO, e.g. COLREG and SOLAS
- Inland waterways (e.g. Mississippi, Amazon, Rhine, Danube, Volga, Yangtze, and all smaller navigable rivers and lakes) have specific features and regulations (specific signals, markings, traffic rules, groins, groundsills, revetments, ...)
- The lower parts of large inland waterways are used by both inland and maritime vessels
- Inland ENCs need to meet the requirements of inland waterways, but should also be available for maritime vessels



# Inland navigation - differences to maritime world

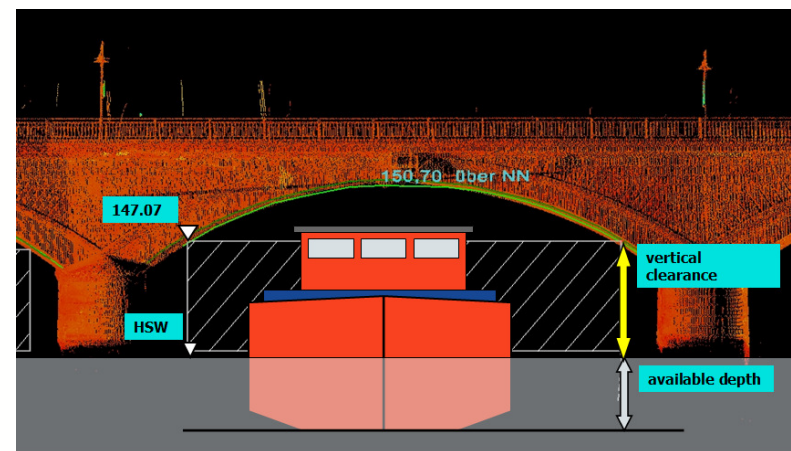
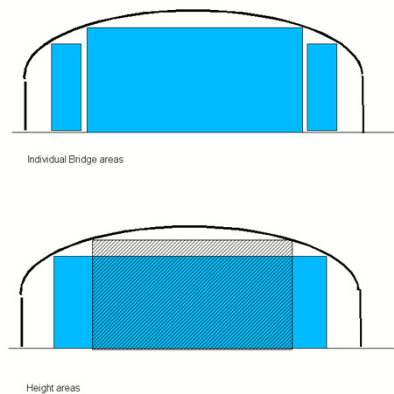
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- Waterborne traffic on inland waterways is not regulated by COLREG or SOLAS, but by regional or national regulations:
  - Europe: European Code for Inland Waterways (CEVNI) of the United Nations
  - USA: Code of Fed. Regulations 33 CFR
  - China and Brazil: a set of national and regional regulations
  - South Korea and Venezuela: national regulations
- These regulations contain specific waterway signals, signs and markings



# Inland navigation - differences to maritime world

- Objects such as bridges can only be encoded for maritime ENC's in a very basic form, but are extremely important for inland navigation
- In inland navigation it is normally not possible to take another route, if there is a problem on the original route: detailed information is critical for voyage planning (e.g. dimensions and operating hours of locks and movable bridges)





# Inland navigation - differences to maritime world

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# Inland navigation - differences to maritime world

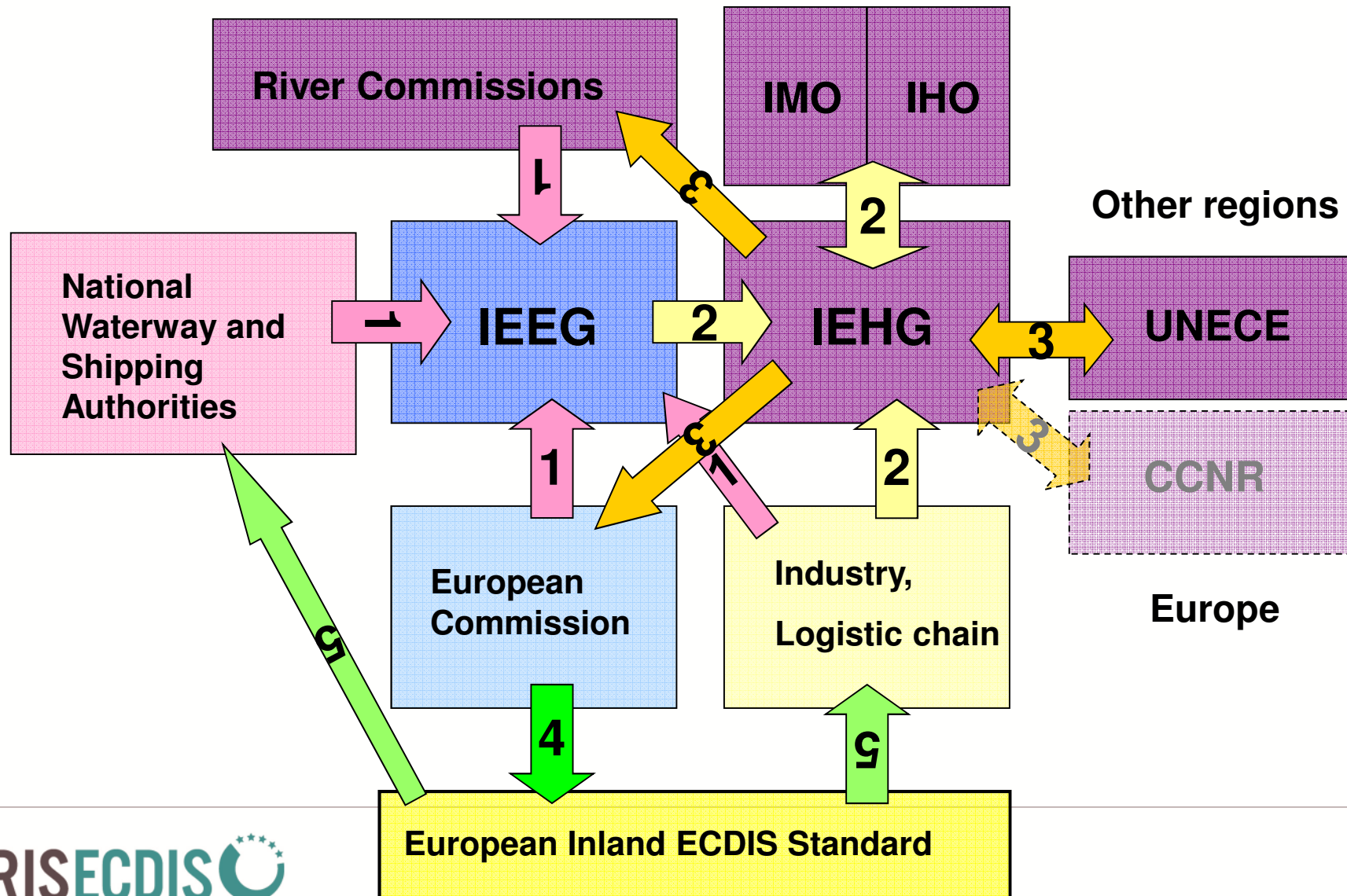
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## Definition of Inland Electronic Navigational Chart (IENC):

- The database, standardized as to content, structure and format, for use with inland electronic chart display and / or information systems operated onboard of vessels transiting inland waterways. An IENC is issued by or on the authority of a competent government agency, and conforms to standards [initially] developed by the International Hydrographic Organization (IHO) and [refined by] the Inland ENC Harmonization Group. An IENC contains all the chart information necessary for safe navigation on inland waterways and may contain supplementary information in addition to that contained in the paper chart (e.g. sailing directions, machine-readable operating schedules, etc.) which may be considered necessary for safe navigation and voyage planning.

[IENC Encoding Guide, Edition 2.4.0, Feb 2015]

# Inland ECDIS, standardization process





# S-100, a closer approach of maritime and Inland ECDIS

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- ◉ S-100 Universal Hydrographic Data Model  
(Basis:ISO 19100)
  - Better integration of electronic charts with other services of eNavigation and telematics solutions for other modes of transport
- ◉ S-101 IHO Electronic Navigational Chart Product Specification
  - ◉ will replace the S-57 product specification

# S-100, a closer approach of maritime and Inland ECDIS

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- S-100 Registry

- A common registration database for all product specifications, e.g. maritime (S-101) and inland (S-401)

- Advantages:

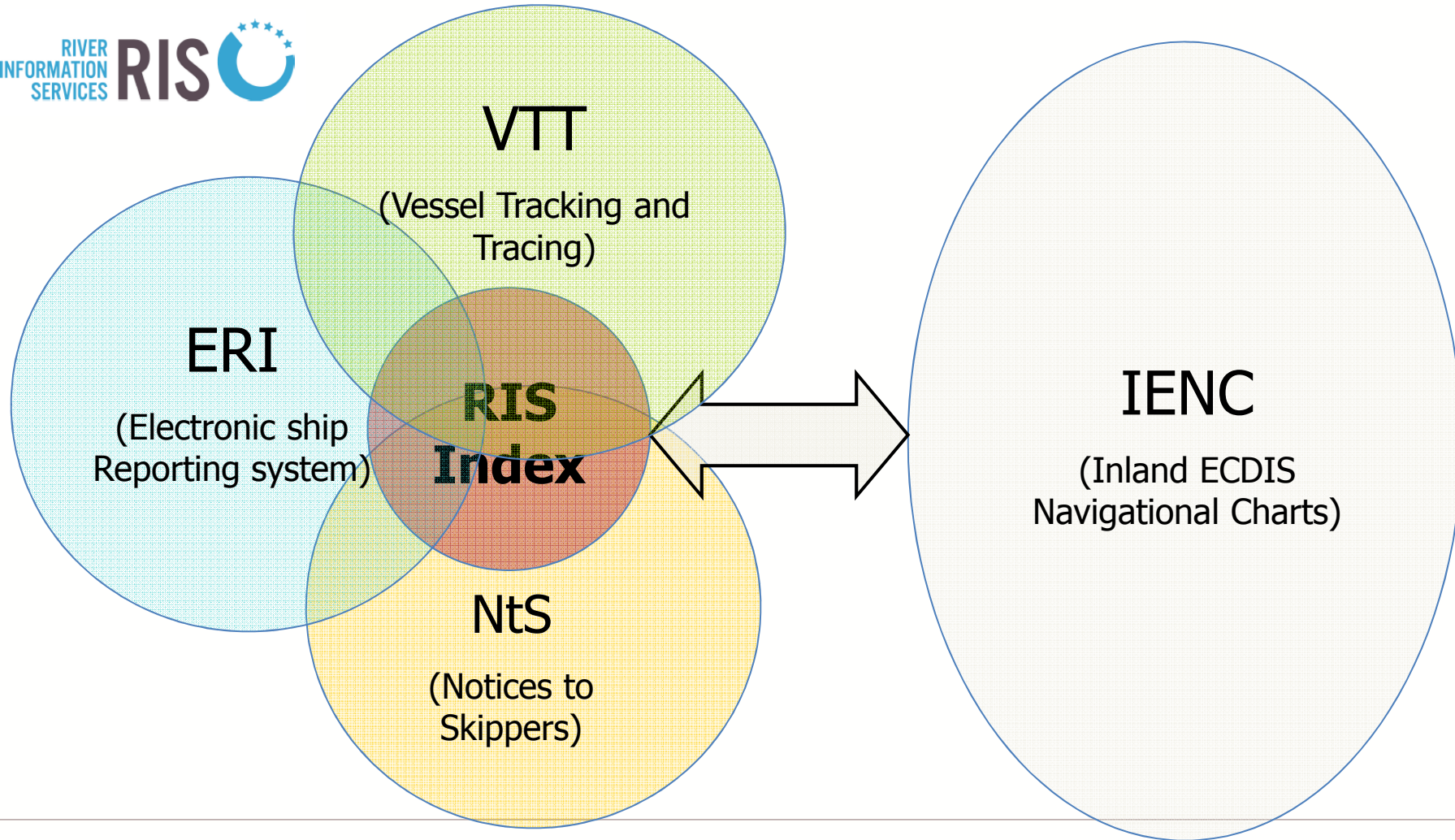
- ECDIS systems will support both systems: maritime ENC and Inland ENC
  - Integrated working environments, which allow the production of ENCs and IENCs, will be available
  - S-100 supports actual GIS and web standards. This opens the use of IENCs also for other applications, beside navigation.

# S-100, a closer approach of maritime and Inland ECDIS

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- S-401 Inland-ECDIS product specification
  - The development of an Inland ECDIS product specification was started in the project CoRISMa, supported by the European Commission
  - We plan to finalize this work within a proposed succeeding project: [RISCOMEX](#)

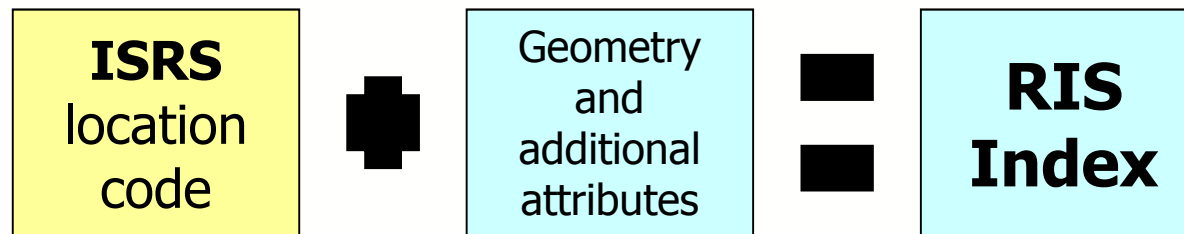
# RIS-Index, the link between the RIS-Services



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## RIS Index, structure:



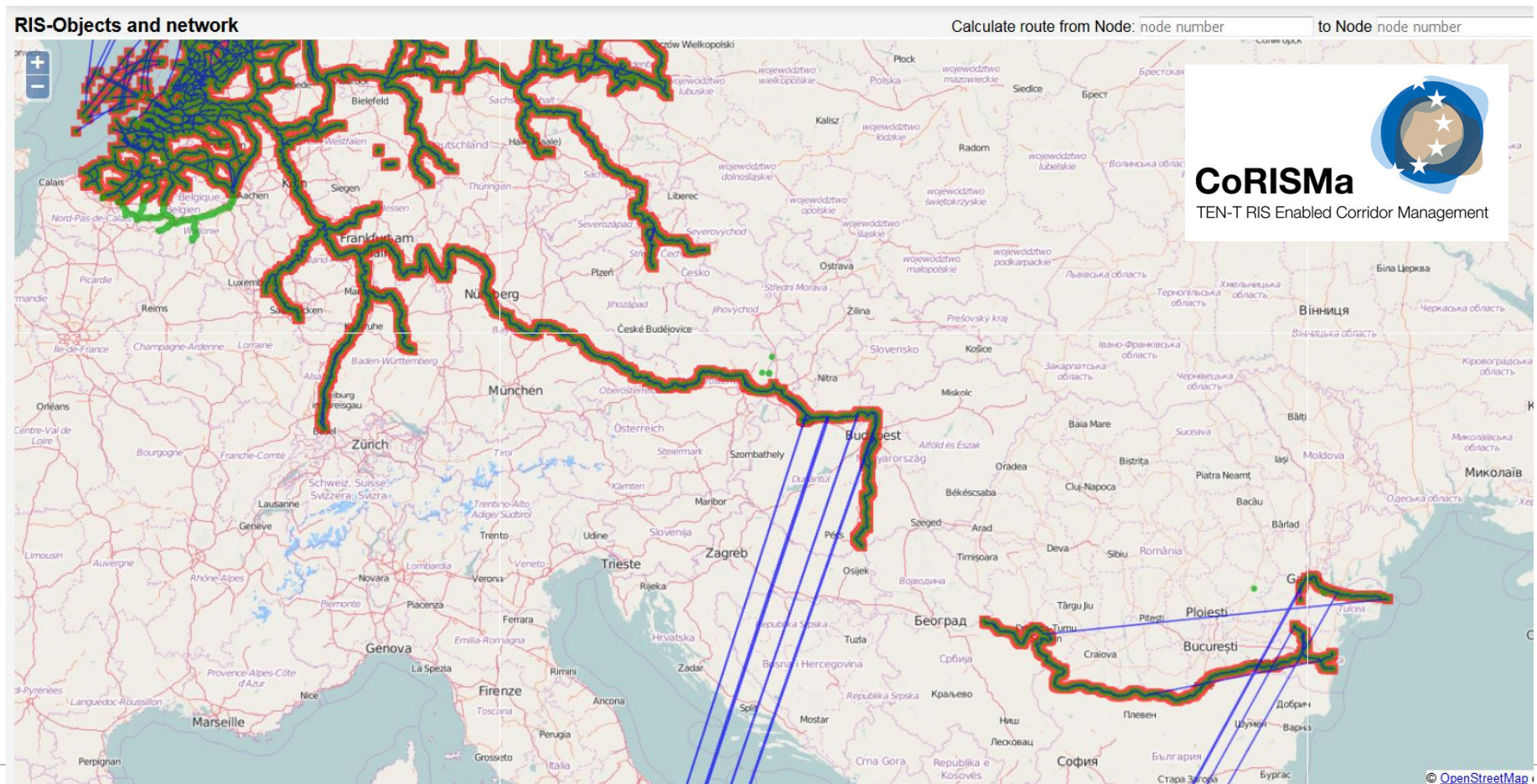
## ISRS (International Ship Reporting System) location code:

- UN Country code (2 char, 1-2)
- UN Location code (3 char, 3-5)
- Fairway section code (5 char, 6-10)
- Object Reference Code (5 char, 11-15)
- Fairway section hectometre (5 char, 16-20)



# RIS-Index, the link between the RIS-Services

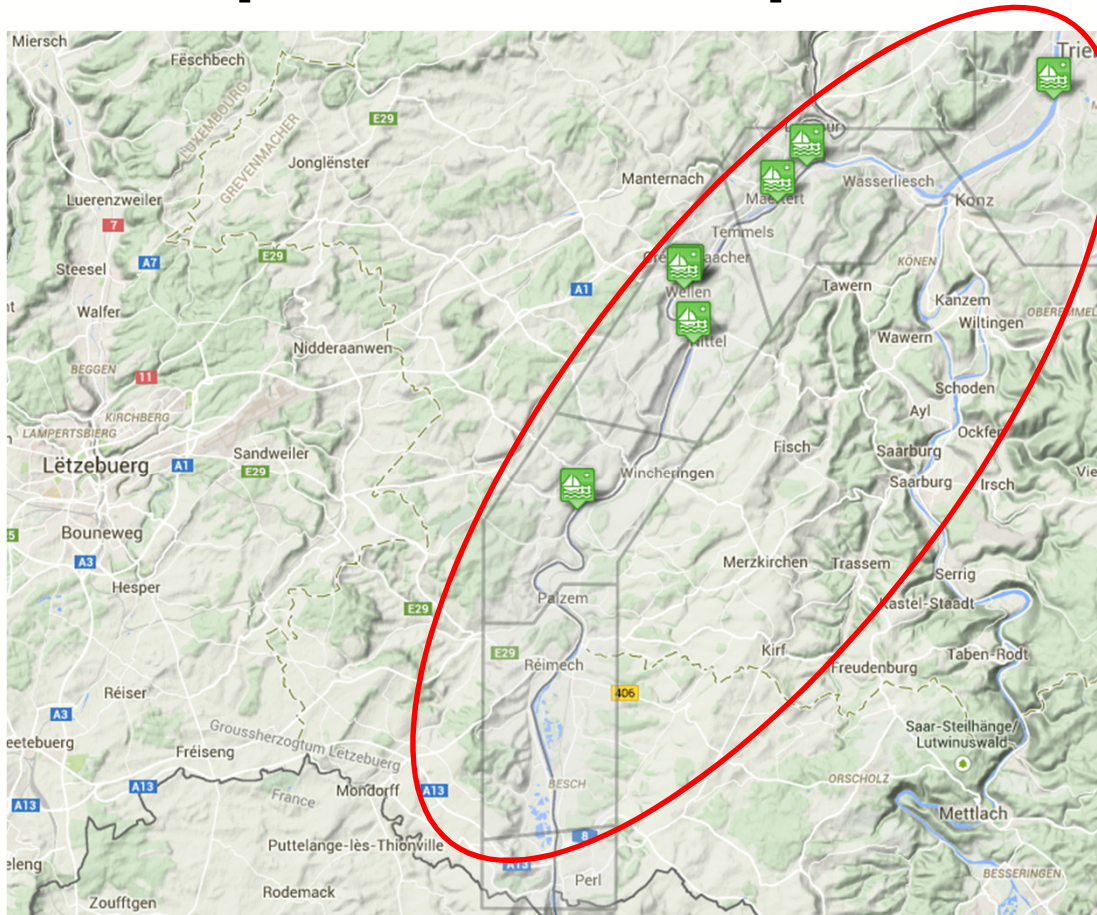
## CoRISMa pilot: Digital Waterway Network



# Inland ECDIS charts as base maps in FIS portals

## CoRISMa pilot: Berth occupation

Mosel  
(Trier – Luxembourg)



**CoRISMa**  
TEN-T RIS Enabled Corridor Management



# Inland ECDIS charts as base maps in FIS portals

## CoRISMa pilot: Berth occupation

<http://lux.d4d-portal.info/>



# Inland ECDIS charts as base maps in FIS portals

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- ◉ D4D-Portal, a product of the GIS-Forum Danube, developed within several EU projects:  
<http://de.d4d-portal.info/>
- ◉ Proposal in **RISCOMEX**:  
Use this product as a common IENC-map-client for RIS related topics in Europe

# Inland ECDIS in **navigation** mode

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- Aim: Digital environment for the skipper to support safe navigation, helping to directly steer the vessel
  - Standardized and detailed software and hardware
  - Basic map: IENC
  - Combined with radar for identifying moving and static objects at bad sight conditions
  - Substantial investment is necessary
- Focus:
  - Large scale view, especially at bad sight conditions
  - Keep track of the situation ahead, information with lower priority is suppressed to avoid overloading of the screen
  - AIS messages can be visualized



# Inland ECDIS in **information** mode

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- Aim: Digital environment for the skipper to support safe navigation in any way, however not in accordance with Inland ECDIS in navigation mode
  - Only yet standardized at a minimum level
  - Minimum requirements are defined along the Rhine by CCNR
  - At European level we have proposed as a first step “Minimum requirements in information mode”
  - Basic map: IENC best choice
  - It is not necessary to be combined with radar. In case of bad sight conditions, radar has to be used separately
  - For all these reasons a low cost solution is possible

# Inland ECDIS in **information** mode

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- Focus:
  - Often mentioned in combination with AIS
  - Small scale view is caused by the information purpose
  - As the name suggests: An information portal for the skipper on board
- Fact: More and more European Countries plan to oblige AIS with Inland ECDIS in information mode
- In order to ensure that skippers can still use their equipment when they cross the border to an European neighbour state a common proposal of “Minimum requirements in information mode” is part of the package “**Inland ECDIS Standard Edition 2.4**” which was submitted to the EC for standardization.

# Thank you for your attention!

Wieland Haupt, chair of Inland ECDIS Expert Group

