



# Kartverket

Norwegian Mapping Authority Hydrographic Service

## Marine Base Maps in Coastal Norway: A Case for Developing Sustainable Blue Growth in Coastal Communities

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# The Norwegian Coastal Areas

- 422 municipalities in Norway  
**279 COASTAL MUNICIPALITIES**
- Coastal municipal administrative border: 12 nautical miles
- 100 915 km total coastline (with Islands)
- About 80% of the population live in the coastal municipalities



# Government's Aspirations for Blue Growth

*"The government will contribute to the greatest possible overall sustainable value creation and employment in the blue industry"*

*"...increase fivefold the export value of seafood by 2050"*

*"Government facilitates offshore wind farms in Norway"*

*"Norway will create increased international understanding of the ocean's economic importance, for sustainable use of the sea's resources and for clean and healthy seas as a source of increased value creation"*

*"....."*

Sustainable use of the ocean room

- Enhance growth potentials in all marine areas
- Blue jobs through optimal use of marine resources
- Blue technology innovation





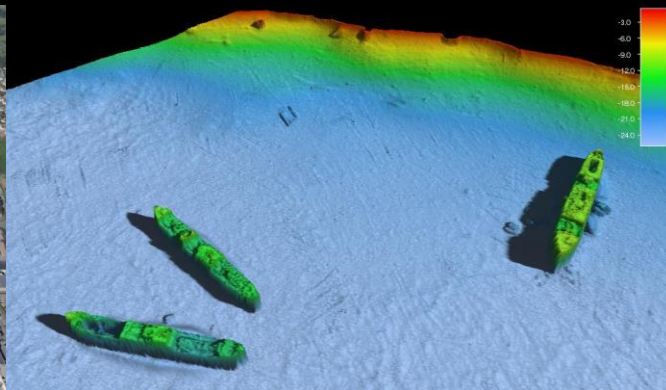
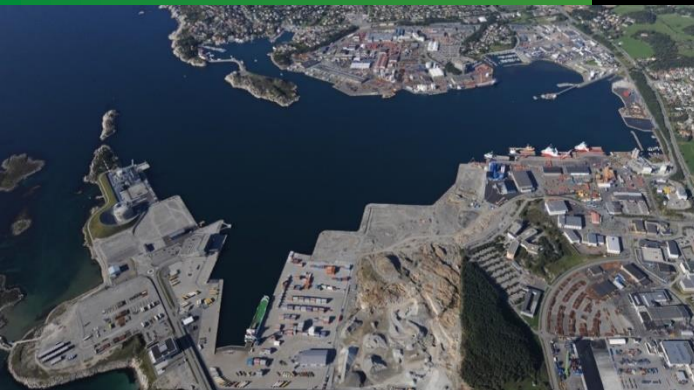


FOTO: MILJØDIREKTORATET



FOTO: STATKRAFT



FOTO: NIVA

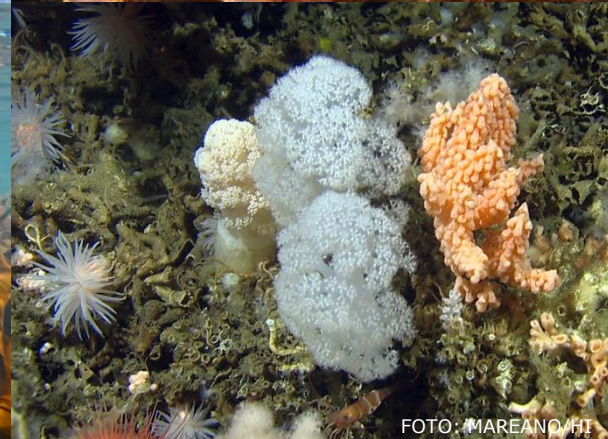


FOTO: MAREANO/HT

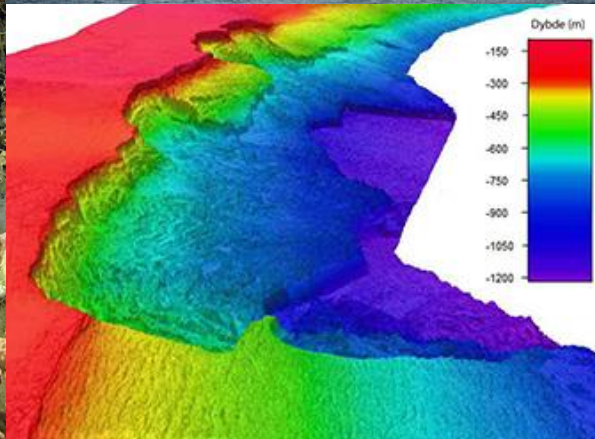


FOTO: TROMS FYLKESKOMMUNE



FOTO: AKER SOLUTIONS



YTTERSTAD FISKERISELSKAP

## Marine Base Maps: Many Users



# A Coastal Area Full of Possibilities



Erik Werenskiold: Vannkikkere, Nasjonalmuseet

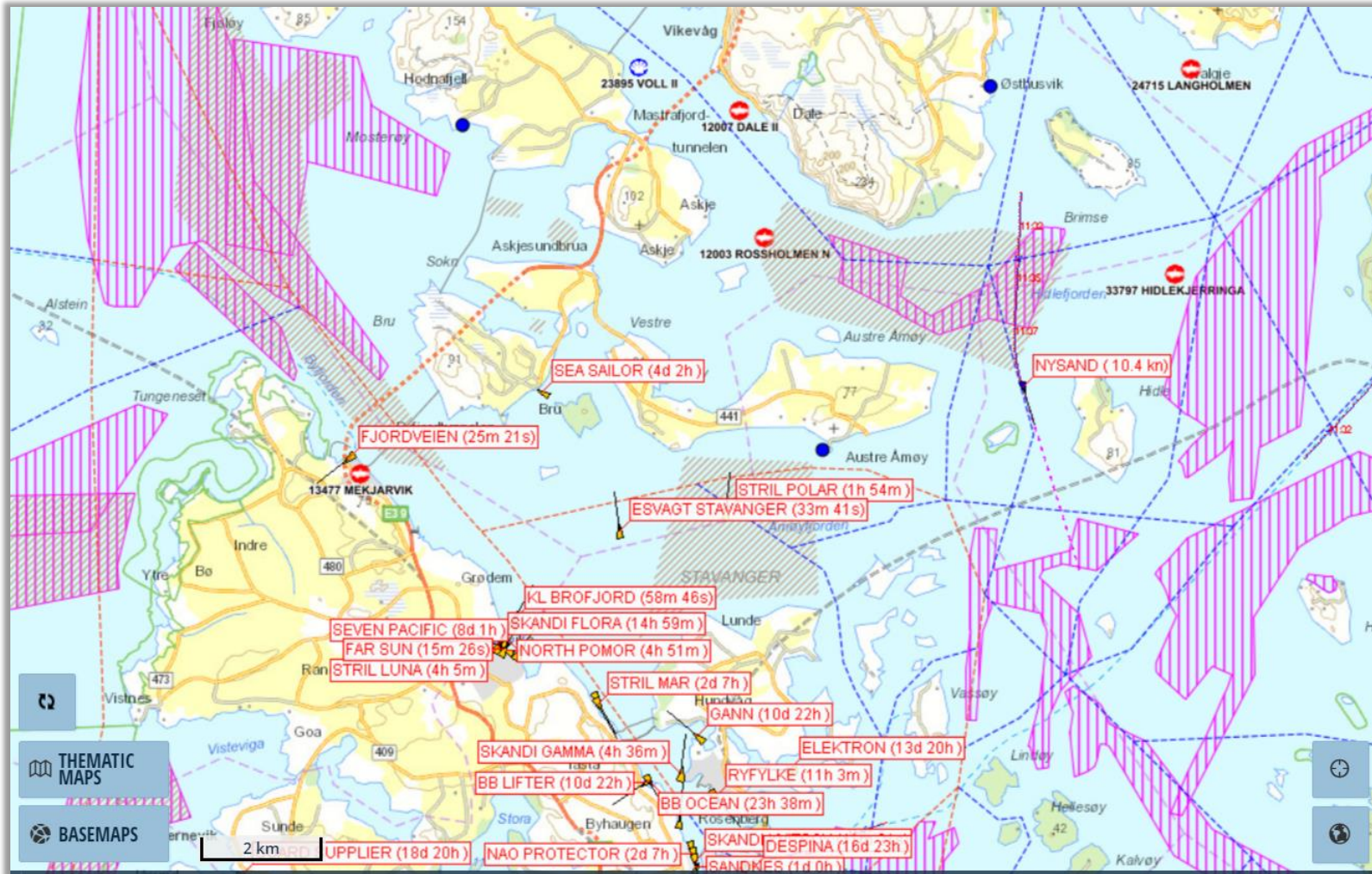
- Many users, many conflicts, growing pressures
- Possibilities. . .
  - for new industry
  - for co-existence

What really lies underneath. . . ?

- Needed
  - new knowledge of the marine environment
  - easy access to this knowledge base

# The Dilemma for Area Planners

- Allocation of “space” for new possibilities
- Optimization of existing “space”
- Knowledge gap



**Many conflicts, growing pressures**



# Why Marine Base Maps?



- Blue growth
- Environmental protection and management

## Coastal Mapping:

- New knowledge of underwater landscape and conditions
- No coordinated data collection and publishing of marine data
- Will take many years to achieve with today's processes

## Knowledge based decision making:

- Conflict reduction / identification of compatible uses
- Improve capacity to plan for new activities
- Efficient allocation and sustainable use of «space»

# Marine Base Maps Project

- Submitted investment proposal to Ministry of Local Government and Modernization
- 3 pilot areas identified – national programme
- Methods development. Will test new technology
- Standardized set of products
  - Themed according to tasks / user type
  - Datasets, digital maps, services (WMS, WFS, WCS) and statistics WPS
  - Self –service: combine and create own unique marine base maps
  - INSPIRE compliant
- Easy access and FREE on national geodata portal
- Easy to use across competence levels and platforms
- 2 years timeline from data collection to products. Product rolled out as it becomes available



Testing new technology at Runde, June 2017.  
Photo: Arild Hareide/Runde Environment  
Centre





# It's a cooperation!

We will map the coast  
from the shoreline out  
to one nautical mile



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GEOLOGICAL  
SURVEY OF  
NORWAY  
- NGU -





Build synergy / streamline processes

Shorter production times

Methods development

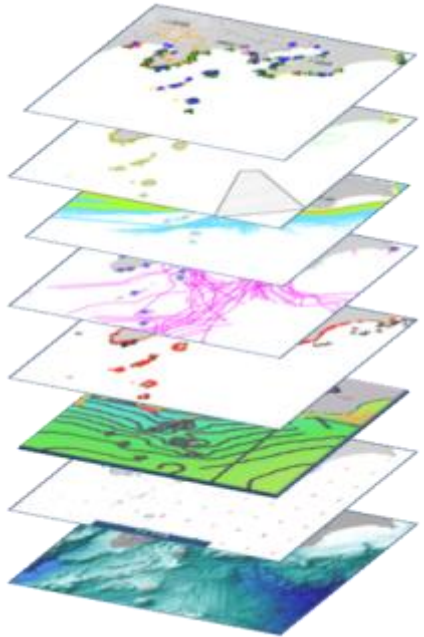
# User Needs Assessment

- Various workshops with stakeholders
- Understand work flow and data needs to accomplish tasks

User 13: Private Sector						
	MY RESPONSIBILITY: Sanfunnskontakt	MY TASKS (GOALS): Goal 1:Lokalitetssøknader Goal 2:Forankring av anlegg Goal 3:Lusebehandling	MY DEPTH INTEREST: 0m - 30m 50m - 200m			
Goals	Actions	Data Used	Not Used But Useful	Pain Points	Access	
Goal 1						
Goal 2						
Goal 3						
User 3: Public Sector						
	MY RESPONSIBILITY: Areal planlegger Plan avdeling	MY TASKS (GOALS): Goal 1:Planlegging småbåt havn Goal 2:Utlegg av akvakultur områder	MY DEPTH INTEREST: 0m - 50m 50m - 200m			
Goals	Actions	Data Used	Not Used But Useful	Pain Points	Access	
Goal 1						
Goal 2			WHY NOT USED:	PROBLEMS WITH DATA	FORMAT:	
					FUTURE FORMAT:	



# Marine Base Maps Project: Some Products



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### Base products:

- Bathymetry
- Backscatter processed
- Water column
- Water level and tidal info

### Derivatives:

- Terrain models
- Shaded relief

## Geological Survey

### Base products:

- Bottom types
- Sediments
- Landscapes and landforms
- Environmental chemistry and pollution

### Derivatives:

- Bottom field maps
- Anchorage conditions
- Marine - Diggability

## Institute of Marine Research

### Base products:

- Marine habitats
- Waves and Currents
- Salinity & Temperature

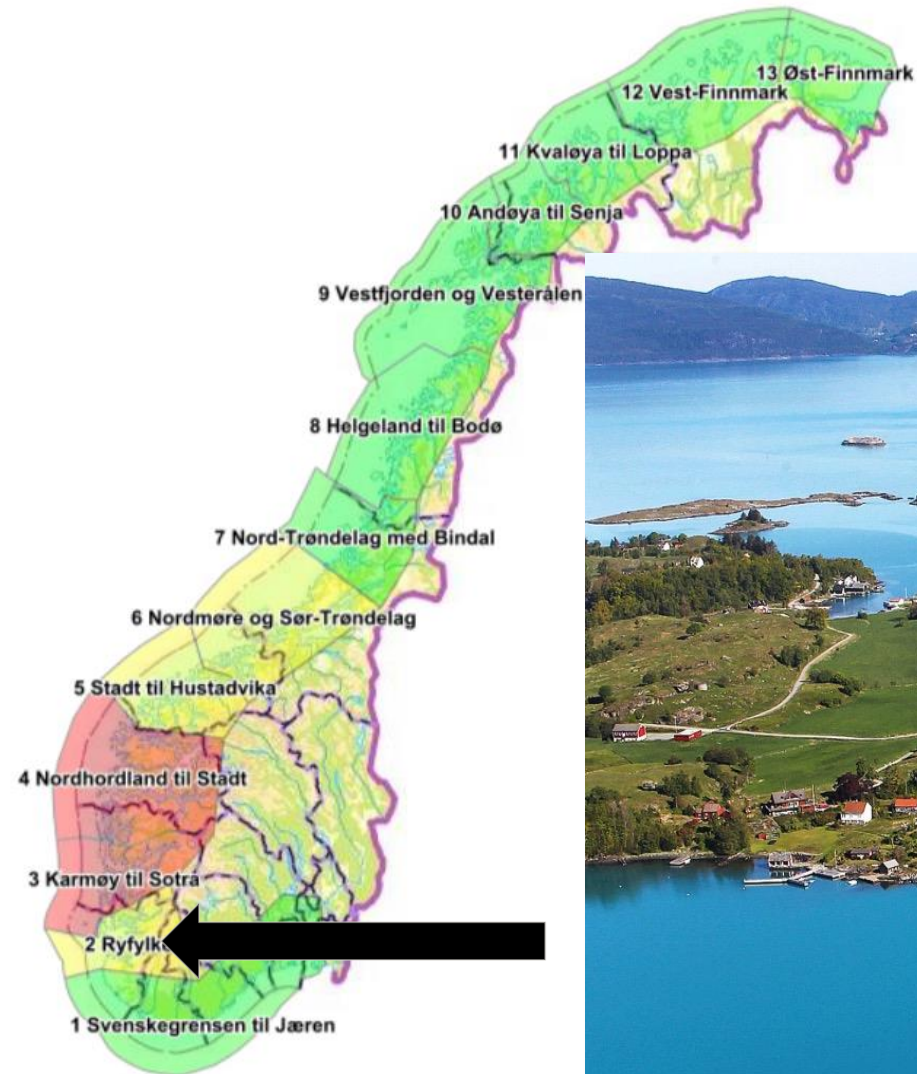
### Derivatives:

- Marine protected areas

# Pilot Area: New Stavanger Municipality

Goal: Increase seafood production

Reduce existing conflicts/opportunities for co-existence/new areas for seafood production



New Stavanger Municipality. Photo: Jon G. Ingemundsen, Stavanger Aftenblad



# Pilot Area: North Sunnmøre

Goal: Blue jobs

Inter-municipality coastal zone planning /identify potential areas for job creation



Wave power plant located in Herøy municipality was officially opened in September 2017. Photograph courtesy of Waves4Power AB, Sweden

# Pilot Area: Troms- Skjervøy/Kvænangen Municipalities

Goal: Maintain lead in seafood production and export  
Sustainable growth / new knowledge of area's suitability for fishing, aquaculture and other seafood



Photo: Troms County



# Socio-economic Effects

- The baseline for increased employment and value creation along the coast
- Knowledge-based management, better quality in decisions
- Baseline for targeted, sustainable environmental protection - fewer conflicts in the coastal zone
- Fewer accidents at sea - saved lives and costs for society
- Socio economic analysis of the 3 pilot areas shows NOK 80 mil investment will yield NOK 150 mil in benefits + 250 new jobs (1300km<sup>2</sup>)

# Other Examples



- Inter-municipal planning - Hareid, Herøy, Ulstein, Vanylven and Sande municipalities. Cost savings:  
Saved one year's man hours in each municipality
- Attracted blue tech and research companies to the region
- The Rovdefjord project. An interregional coastal highway between Bergen and Ålesund in western Norway replacing two ferry connections across the fjord. Cost savings:
  1. Feasibility phase: NOK 1 mil.
  2. Project execution: NOK 2 mil.



Thank you for your attention.

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Investing In The Future

