

The EU Water Framework Directive – Implementation In Denmark

Odense, Denmark
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History of National Water plans in Denmark

1987 First Water plan in Denmark. Focus at more effective cleaning of outlet from treatment plants and industries.

2009-2015 First Water action plan to implement demands in EU-Water Frame Directive.

2015-2021 Second Water action plan to implement demands in the EU-Water Frame Directive.

2021-2027 Third Water action plan to implement demands in the EU-Water Frame Directive.

1987 First Water action plan in Denmark

General regulation of outlets from Wastewater treatment plants and industries through legislation

Wastewater Treatment plants:

The Act sets limit values for the discharge of wastewater from treatment plants (capacity of 2.000 PE or larger):

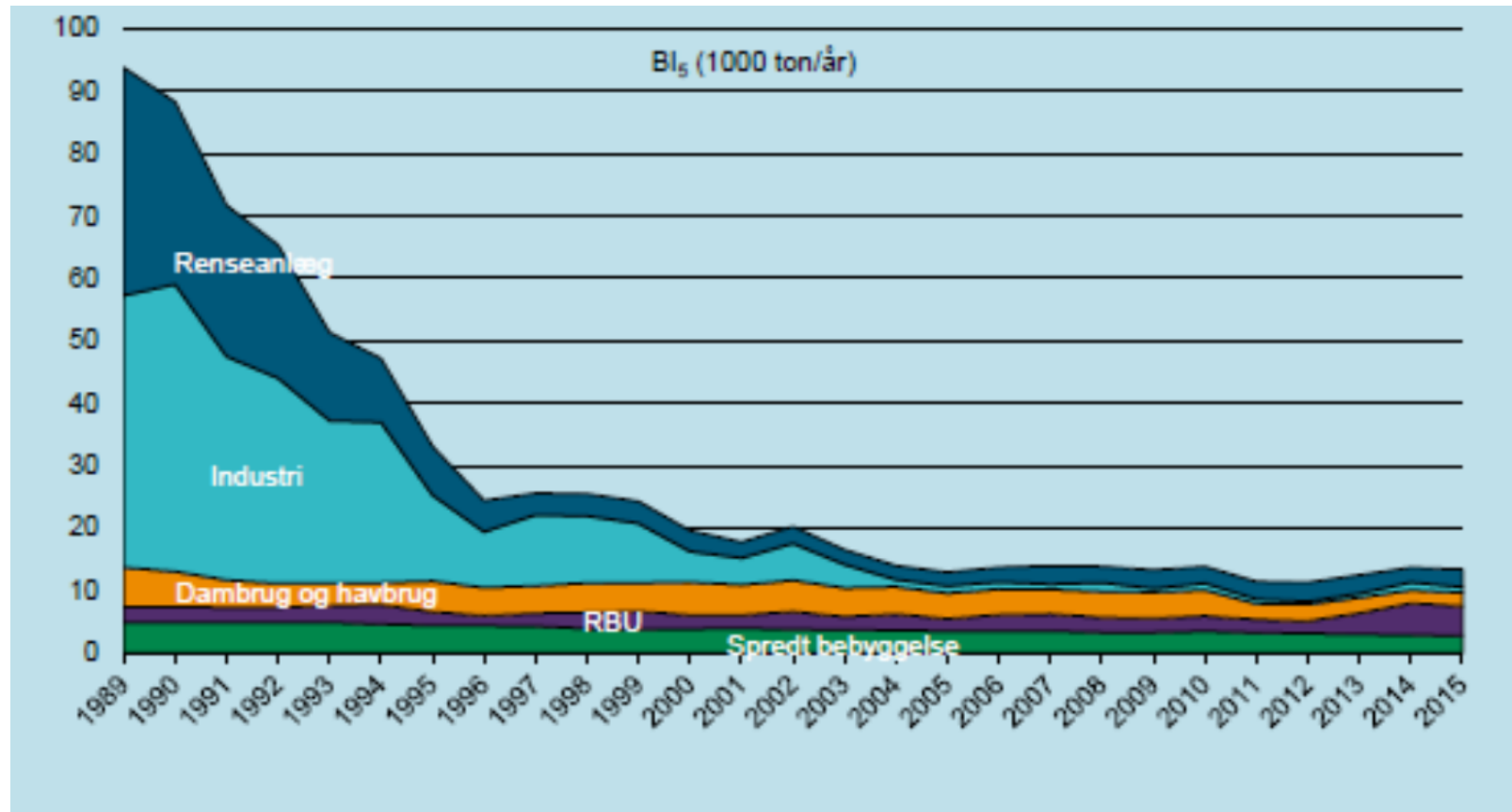
- 1) Organic substance COD <75 mg / l.**
- 2) Organic substance BI₅ <15 mg / l.**
- 3) Total phosphorus P <1.5 mg / l. (>5.000 PE)**
- 4) Total nitrogen N <8 mg / l. (>5.000 PE)**

These are minimum requirements that need to be tightened if necessary to achieve the ambient environmental objectives.

Industries:

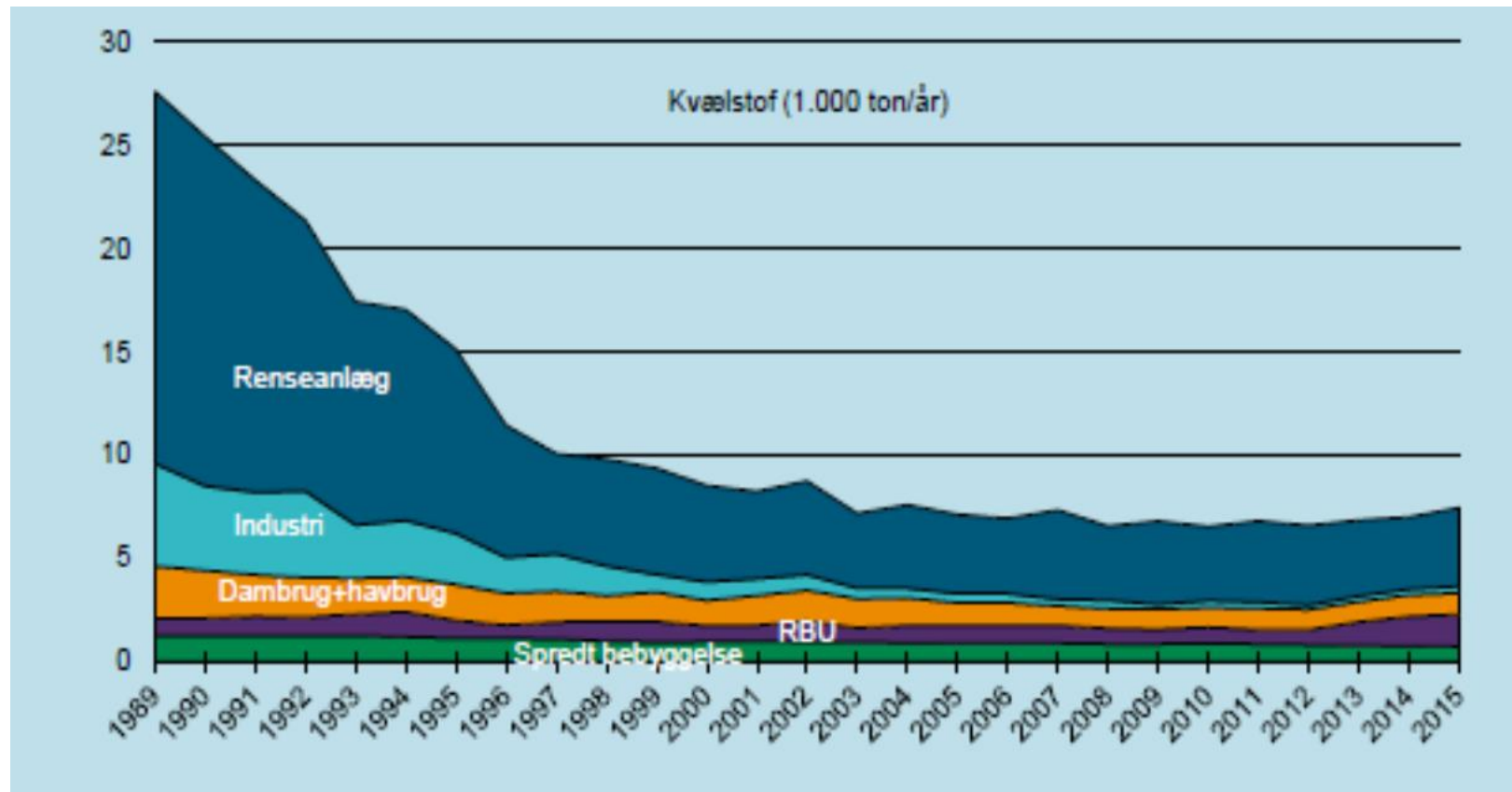
From 22 tons of nitrogen and 7,5 tons of phosphorus and requirements of BAT.

Effect of Water Plan I: Organic matter (BOD₅) (tons per year) discharge from point source pollution 1889-2015



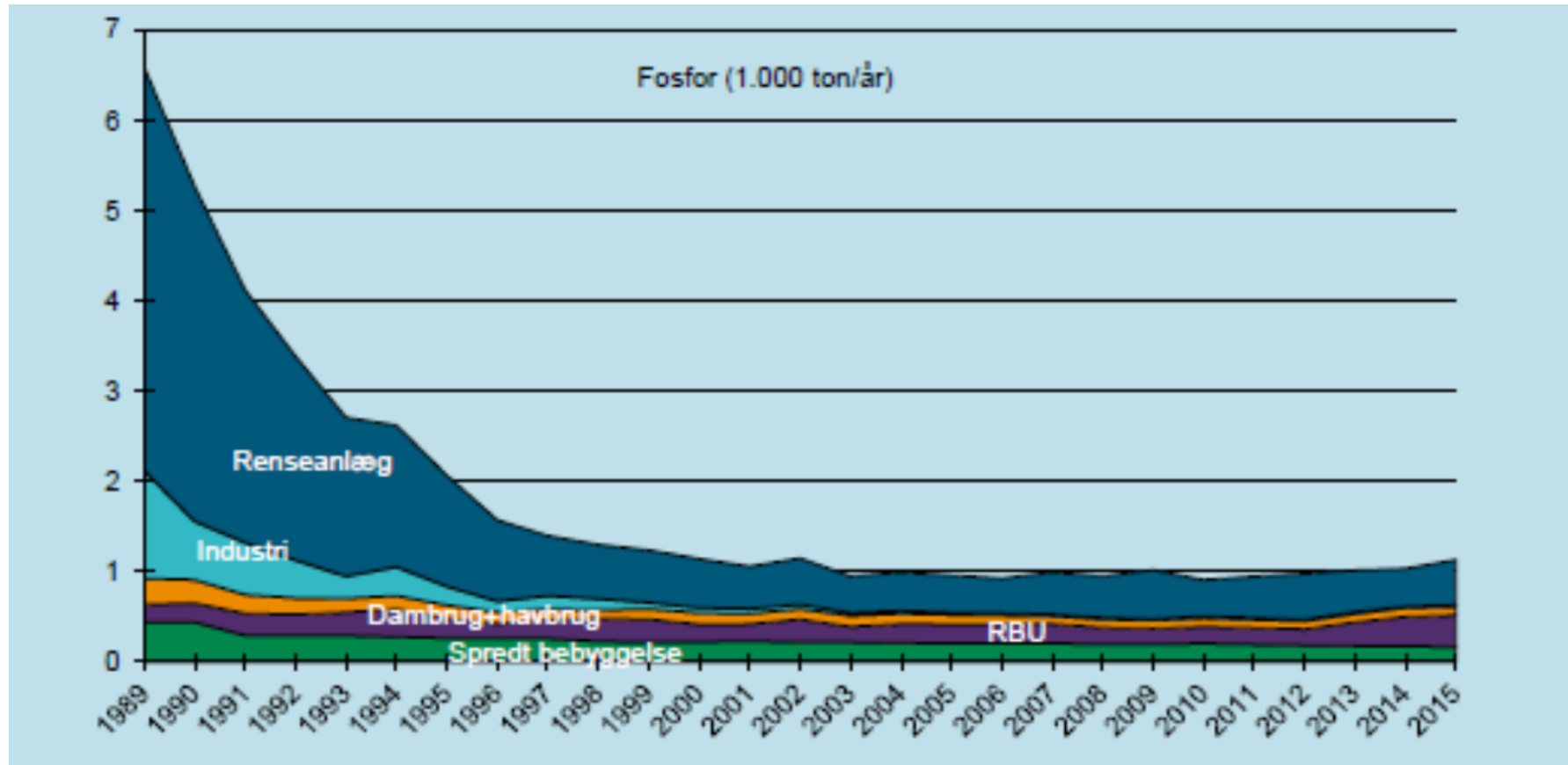
Notes: Renseanlæg: Wastewater treatment plant, Industri: Industry, Dambrug og havbrug: Fresh water and Salt water Fish Farms, RBU: Outlet from Storm Water Sewers, Spredt bebyggelse: Rural houses.

Effect of Water Plan I: Total-nitrogen (tons per year) discharge from point source pollution 1889-2015



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Effect of Water Plan I: Total-phosphorus (tons per year) discharge from point source pollution 1989-2015



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EU Water Framework Directive

The EU Water Framework Directive was adopted in 2000.

By the end of 2015 (final deadline: 2027) all member states must secure good status of:

Surface waters (rivers/streams, lakes and marine waters)

Groundwater

The Danish Act of Water Planning implements the Water Framework Directive (action plans) in Danish legislation.

Member states must prepare Water Action Plans including:

Environmental status of surface waters and groundwater

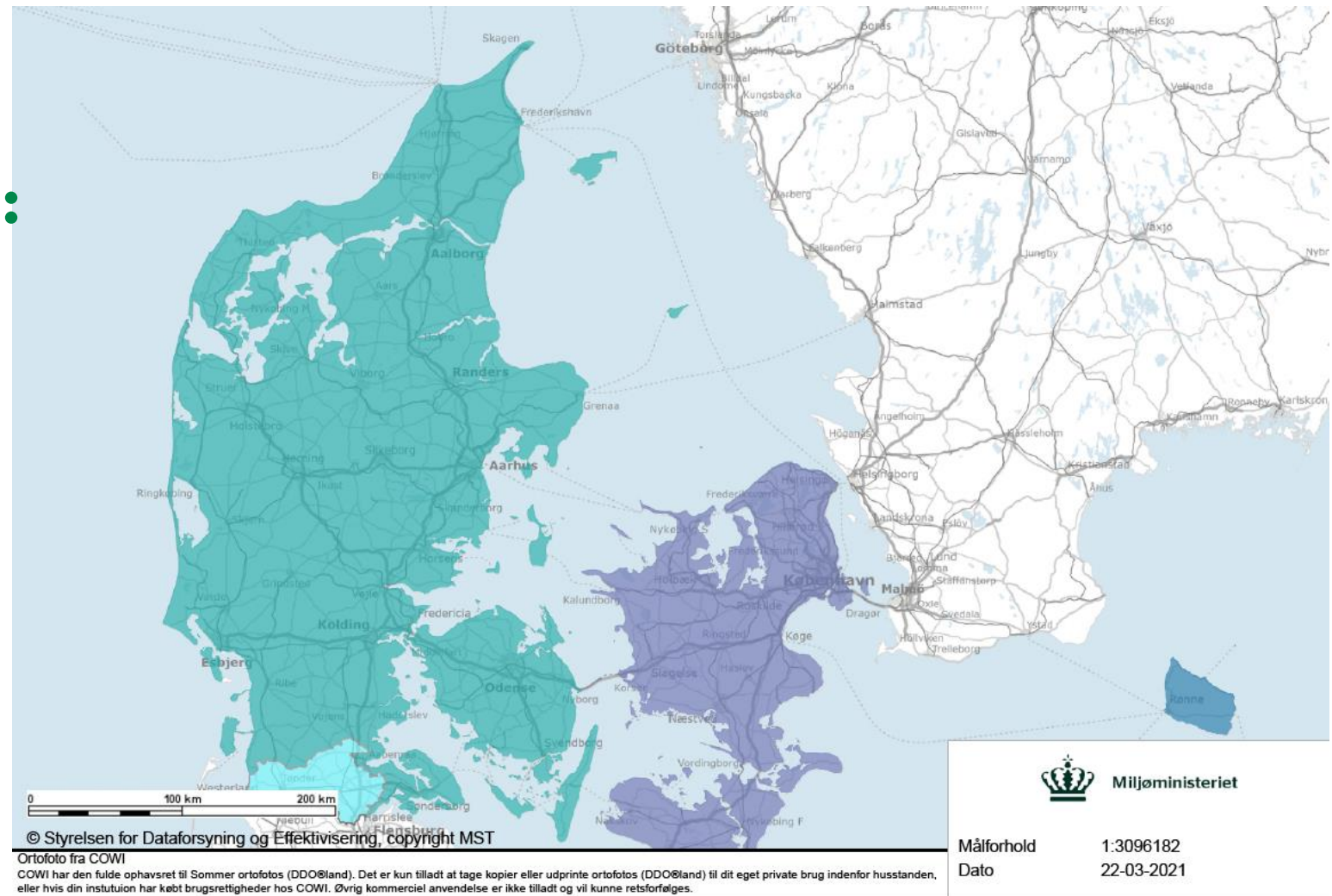
Environmental goals of surface waters and groundwater

Measures to secure goals of surface waters and groundwater.

4 main (administrative) catchments

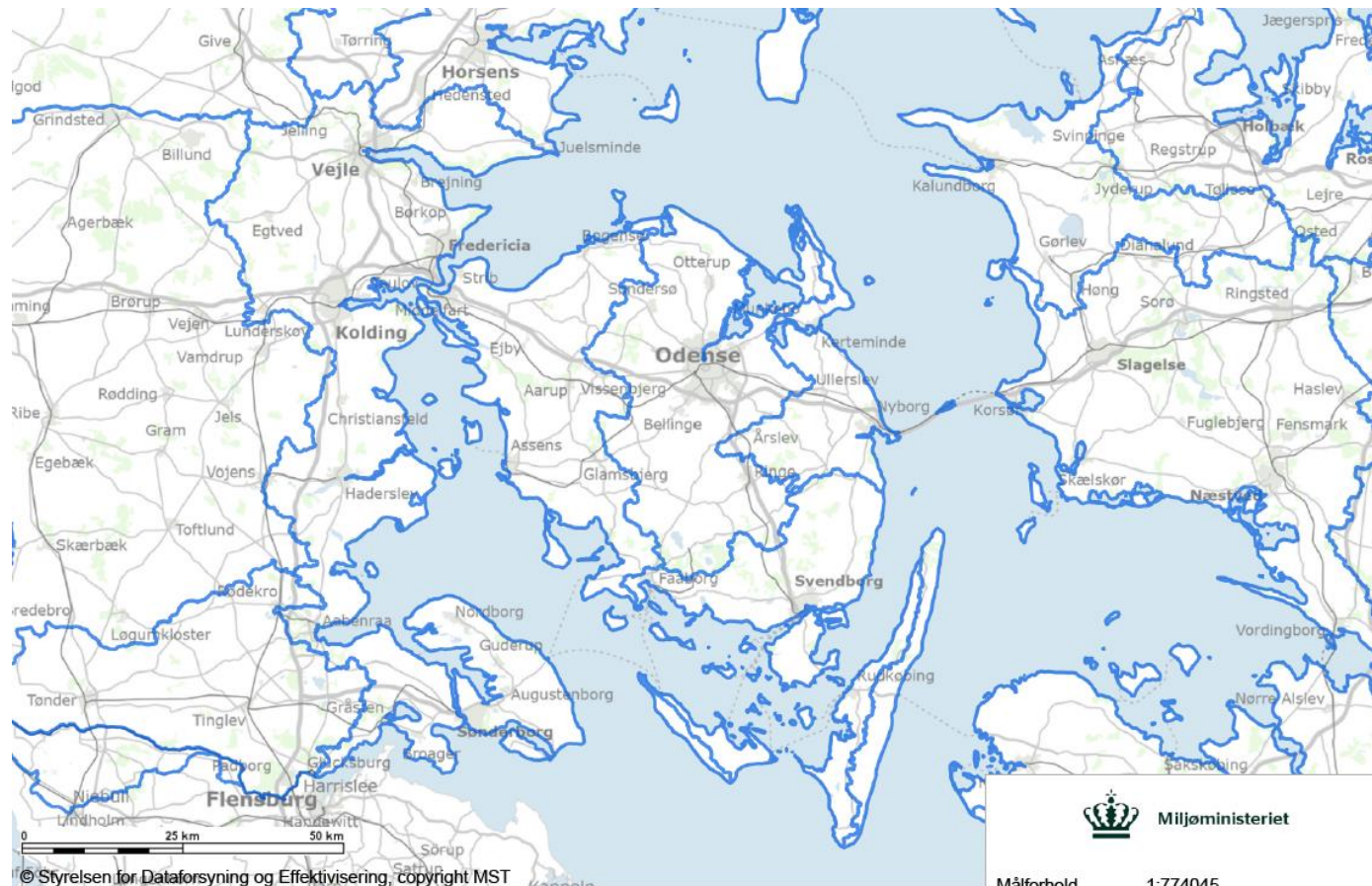
Denmark is divided into four main catchments:

- 1) Jylland og Fyn
- 2) Sjælland
- 3) Bornholm
- 4) International



23 river basin catchments

There are a total of 23 river basins. The catchments delimit the larger watercourse systems.



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Miljøministeriet

Målforshold

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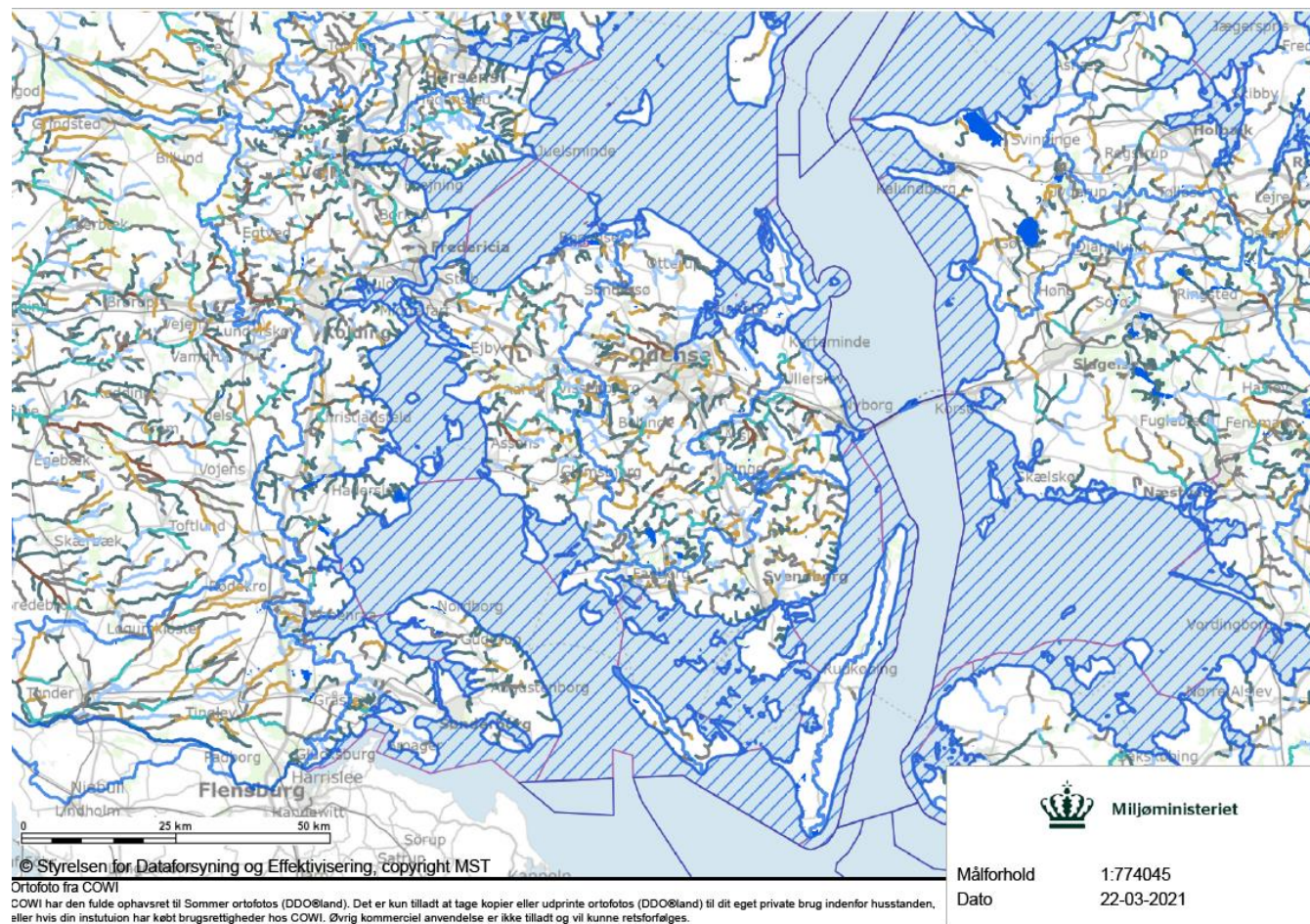
Dato

22-03-2021



Thousands of surface water bodies – coastal waters, lakes and streams

Coastal waters, lakes and streams are divided into thousands of surface water bodies.



Subdivision of main goal – good status

The main goal is to achieve good status of surface waters and groundwater.

Good status in surface waters is subdivided into:

Good ecological (biological) status

Good chemical status

Good status in groundwater is subdivided into:

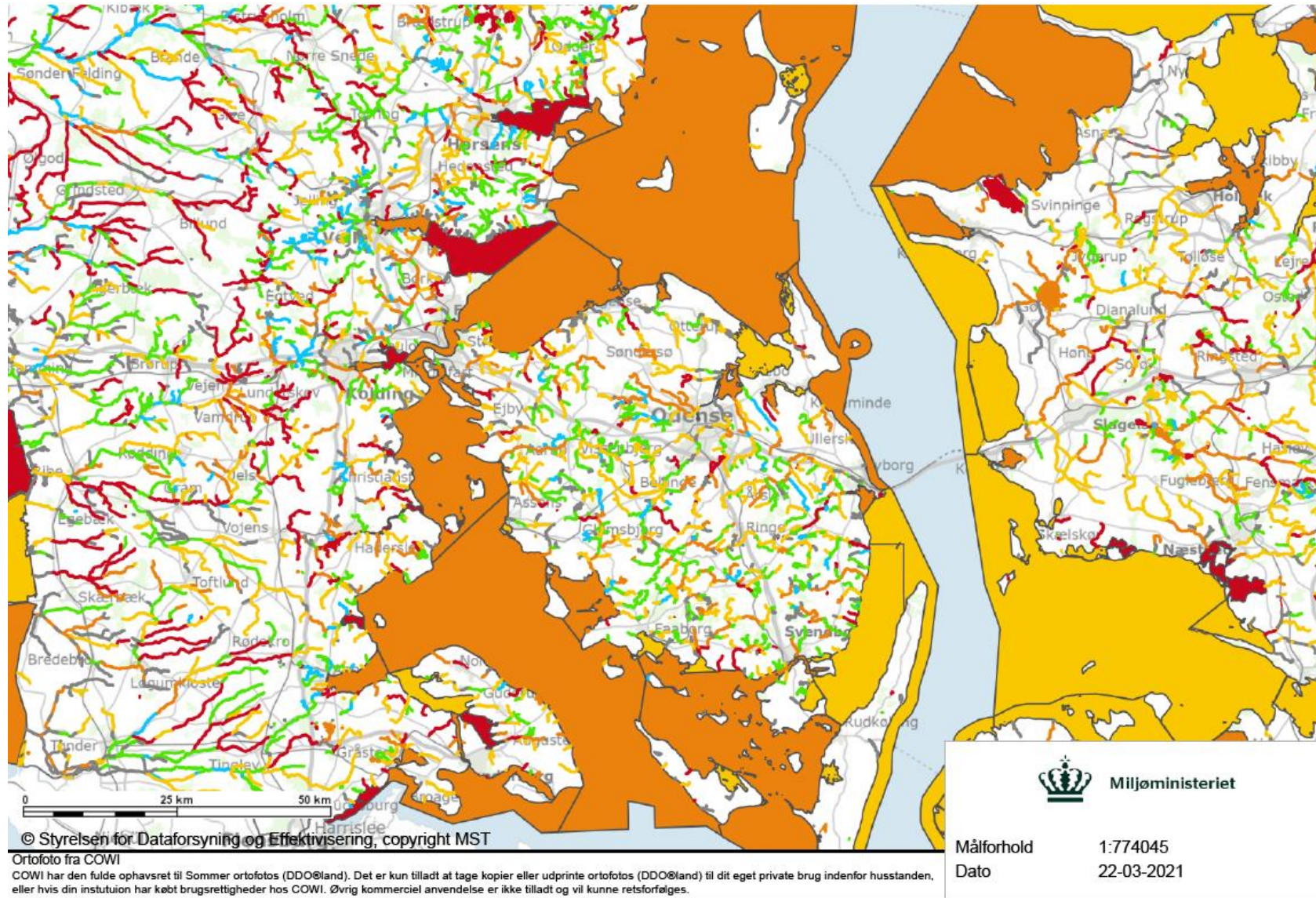
Good chemical status

Good quantitative status

Sub goals must be met to achieve the main goal of good status.

Ecological status is further divided into classes of biological elements, chemical status and hydro morphology.

Ecological status of surface water



Biological classes

Ecological goals in surface waters is further divided into several biological parameters, supporting chemical standards (concentrations) and hydro morphology.

Each biological parameter has 5 status classes:

Bad

Poor

Moderate

Good

High

Good status means that the goal is met. All biological parameters in a surface water body must have good standard to achieve the goal of good ecological status.

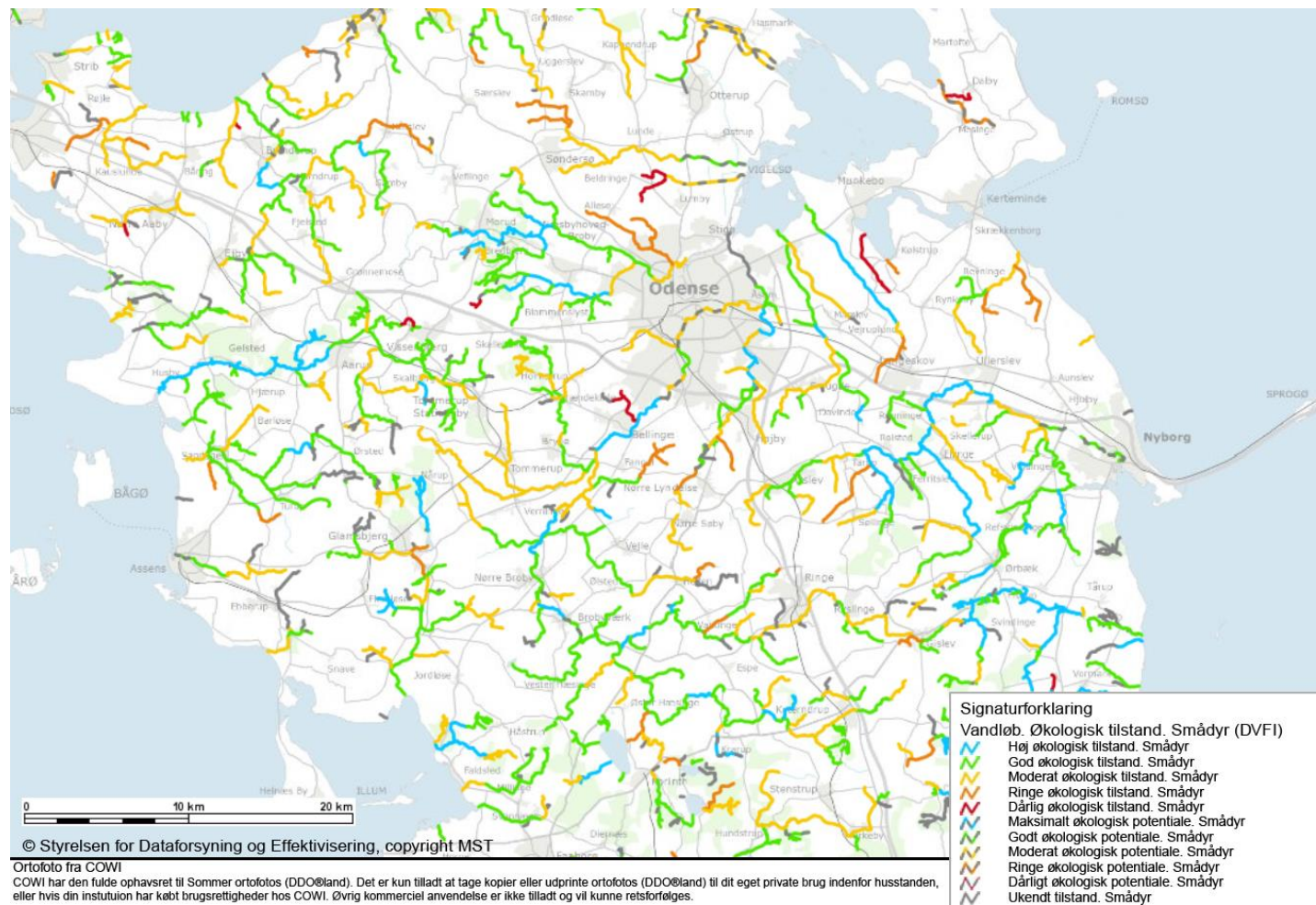
Biological parameter as an indicator of oxygen level in streams – Macro invertebrate fauna

The ecological quality of streams is affected by the oxygen content of the water.

The general oxygen content in streams can be "read" in the composition of the Macro Invertebrate Fauna population. Some species are tolerant to low oxygen levels, and other species are intolerant to low oxygen.

Household waste water (oxidation of organic matter and oxidation of especially reduced nitrogen – NH_4)

Biological status of invertebrate fauna i streams



Action plans

Action plans are implemented in Danish legislation.

1/Action plans contains general provisions that prevent further deterioration in the condition of water bodies.

2/Action plans includes specific measures on wastewater sources.

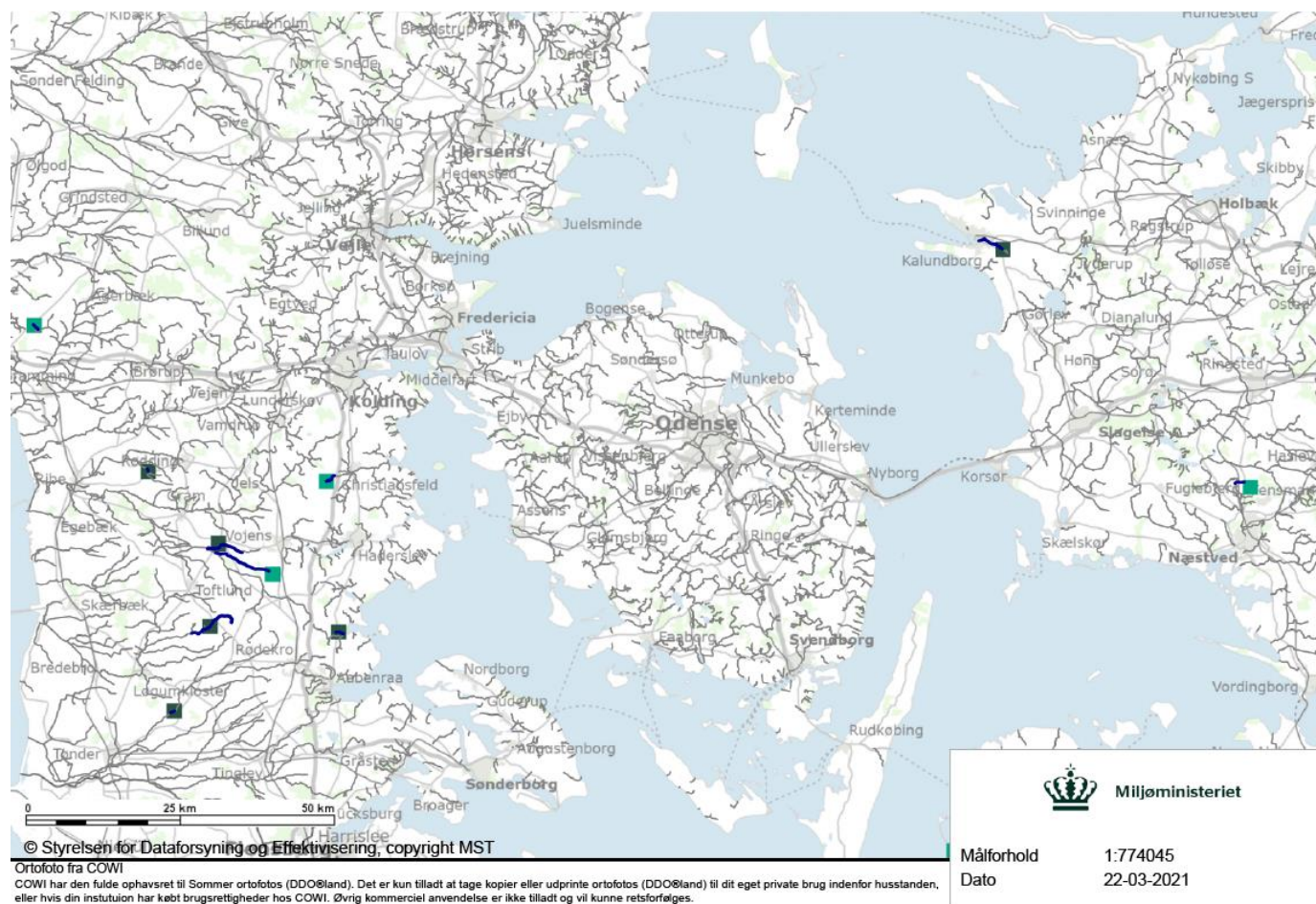
Waste water:

Specific efforts on wastewater sources include measures on on treatment plants, storm water induced overflows and outlet from houses in rural areas.

Wastewater sources must reduce the discharge of organic matter into watercourses.

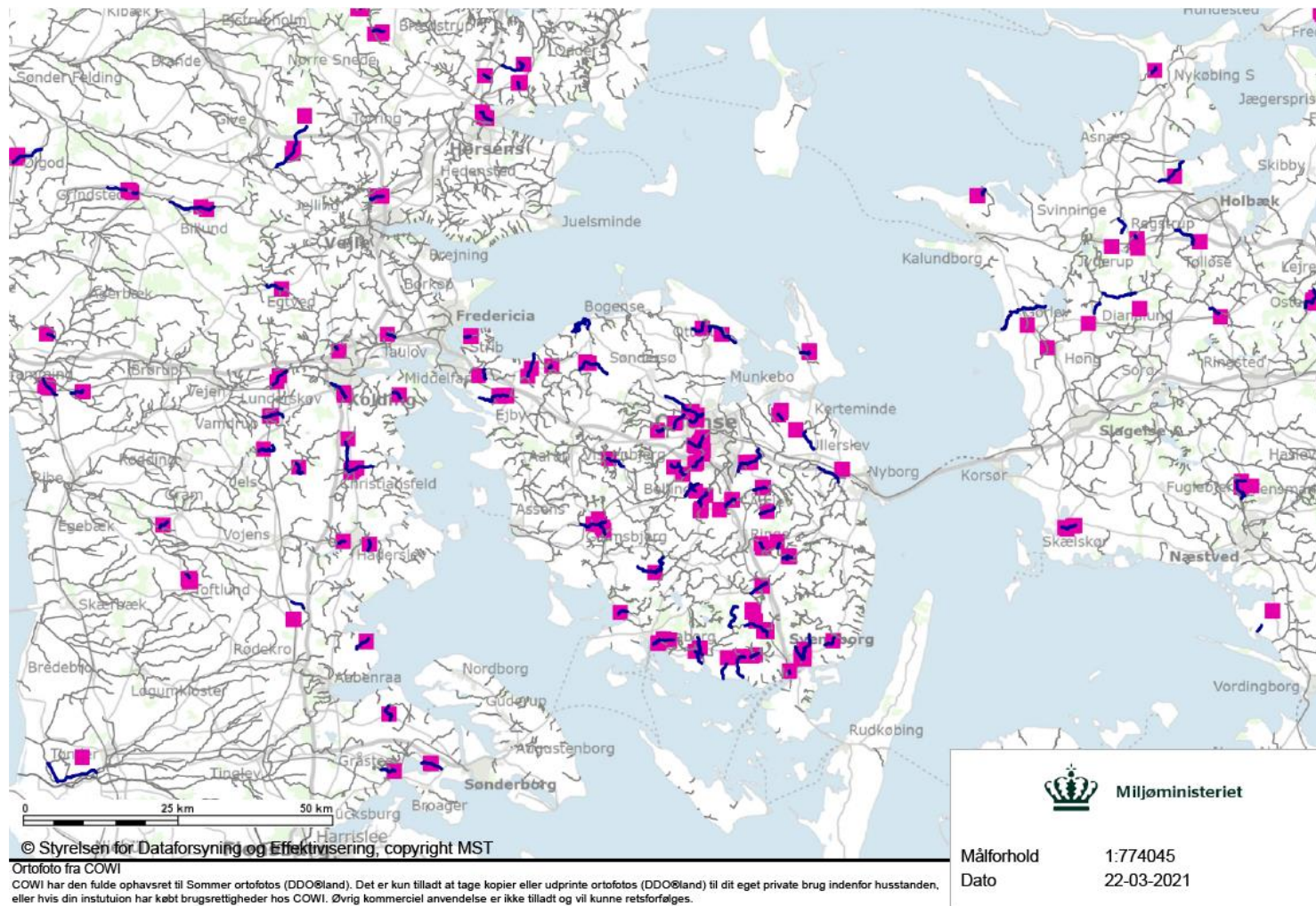
Measures on Wastewater treatment plants

Measures are shown as a specific point source and the surface water body of interest.



Measures on storm water overflows

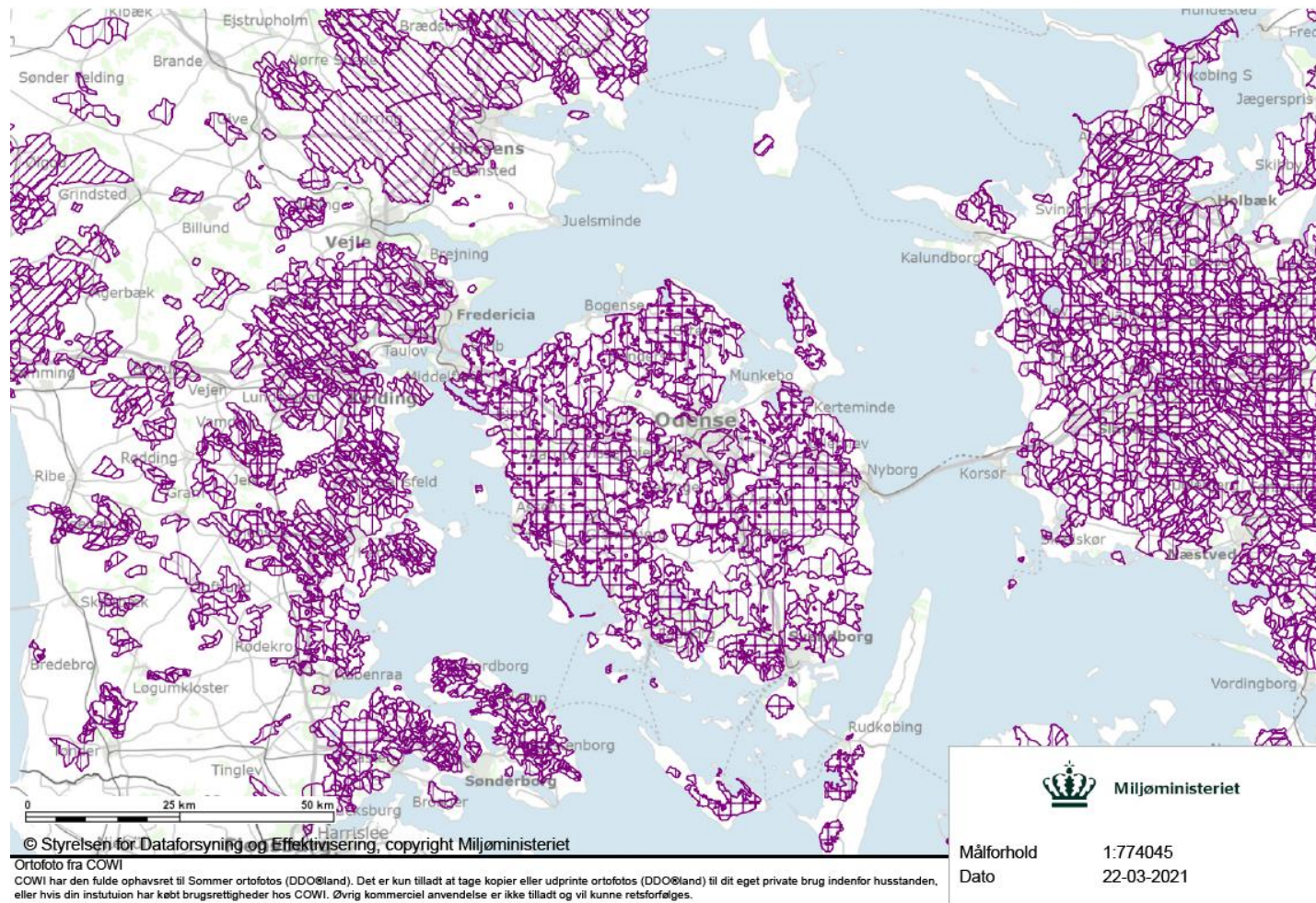
Measures are shown as a specific point source and the surface water body of interest.



Measures: Houses in rural areas

Measures are shown as areas in rural areas where the wastewater treatment must meet special requirements

Cleaning classes	BI5 (mod.) (mg/l)	Or COD (mg/l)	NH3+NH4 -N (mg/l)	Total-P (mg/l)
SOP	10	75	5	1,5
SO	10	75	5	
OP	30	125		1,5
O	30	125		



Realization of water plans through Municipal wastewater plans

Measures in water action plans are implemented in municipality wastewater planning.

Measures on treatment plants and storm water overflows are funded/realized by the utility companies.

Measures on houses in rural areas are funded/realized mostly by the house owners.