

The local fish community, indifferent to the wind farm?

Offshore wind and ecology congress 12-10-2012 Westergasfabriek Amsterdam.

Ralf van Hal & Ben Griffioen



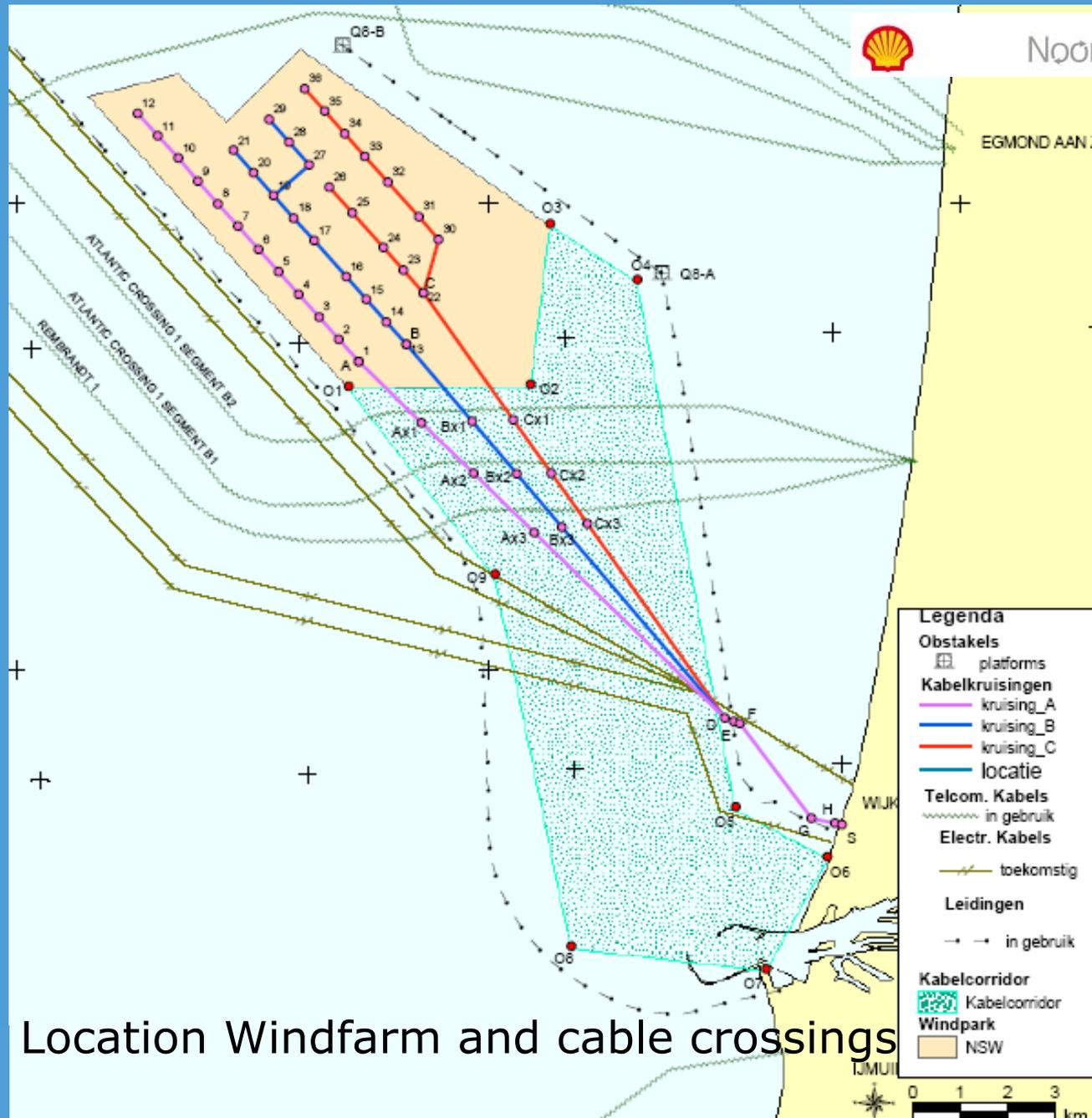
Indifferent?

■ **Yes**, most fish seem indifferent to the wind farm!

■ But always exceptions to the rule.

- Some in this talk
- More in the talk by Erwin Winter





Location Windfarm and cable crossings



Main project data:

- 1 meteo mast, 116 m high
- 36 Vestas V90 windturbines
- 3 MW per turbine
- Hub height 70 m, diameter 90 m
- Project design life 20 years
- Water depth +/- 20 meters
- Grid connection in Velsen
- Renewable electricity for at least 100.000 households



• nacelle

• Turbine tower

• Working platform



• Transition piece

• Scour protection

Wind farm

new habitat, disturbance & no fisheries

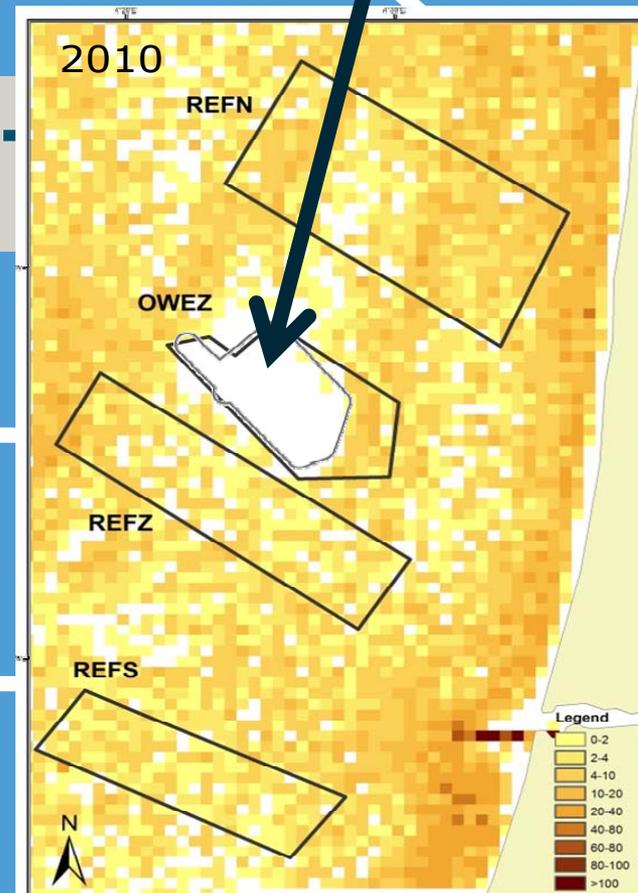
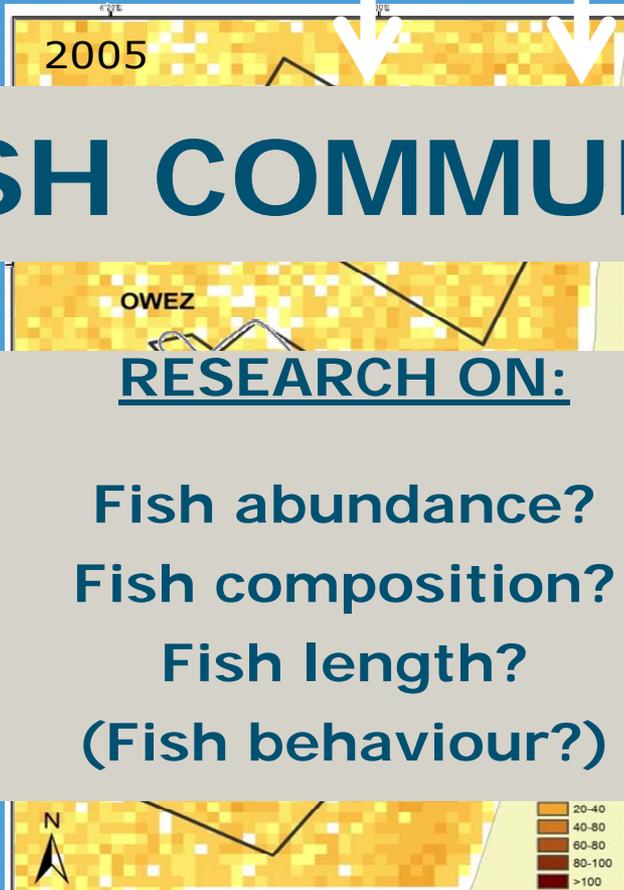
2005

2010

FISH COMMUNITY

RESEARCH ON:

Fish abundance?
Fish composition?
Fish length?
(Fish behaviour?)



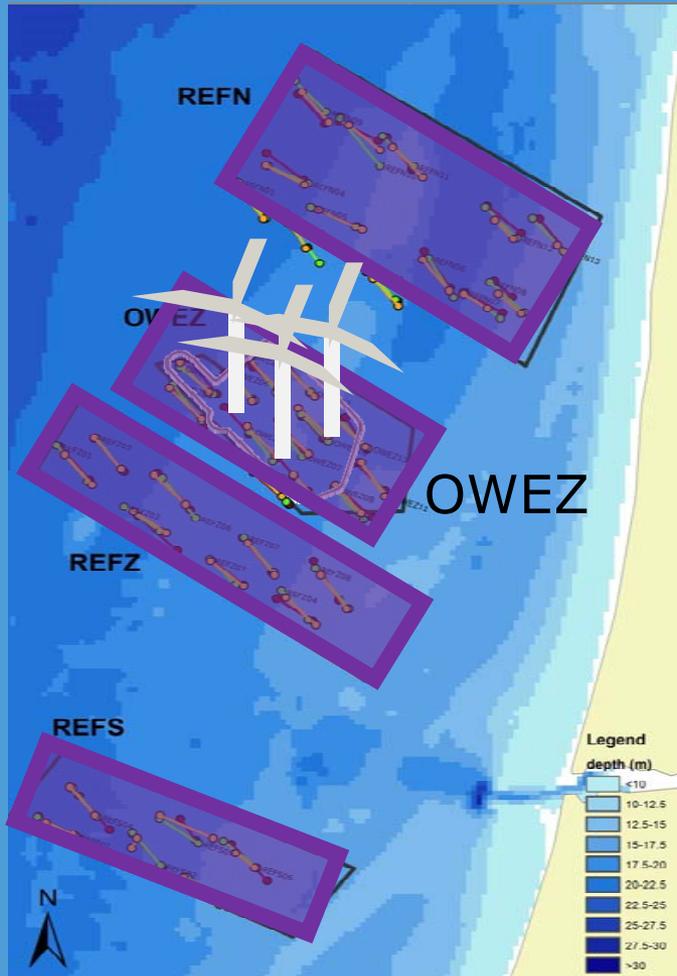
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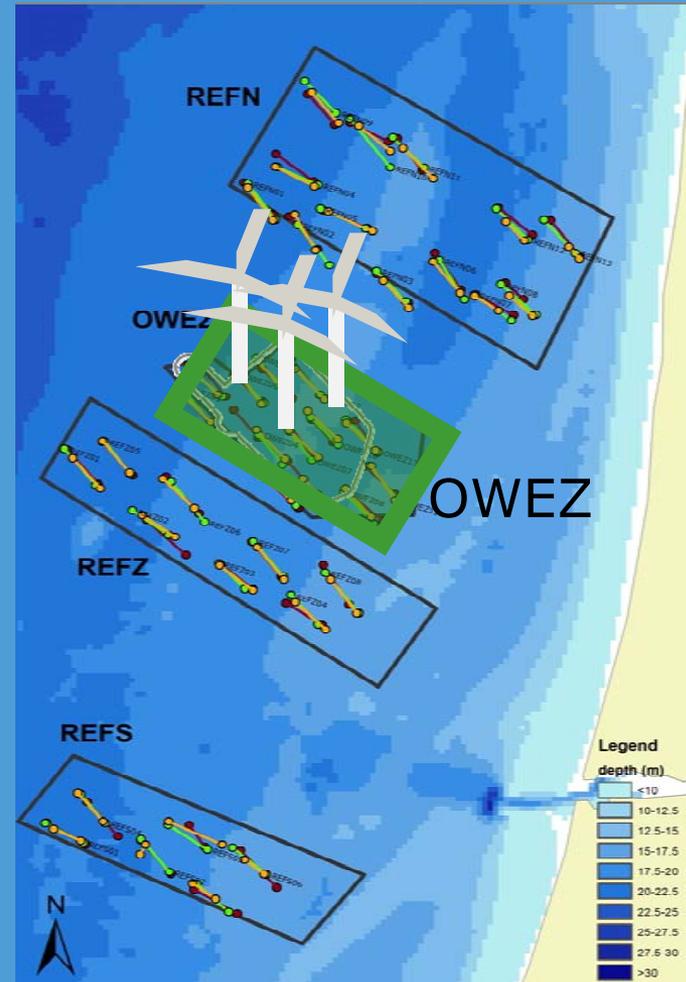
Large scale

Outside & inside wind farm



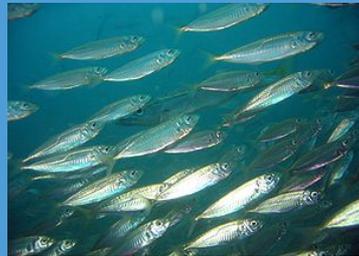
Local scale

Only inside wind farm

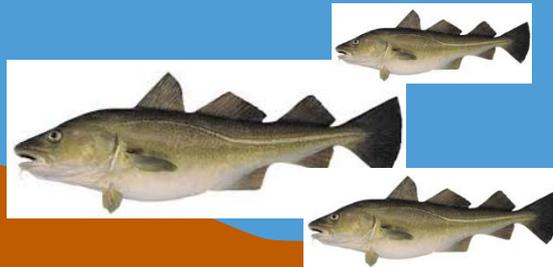
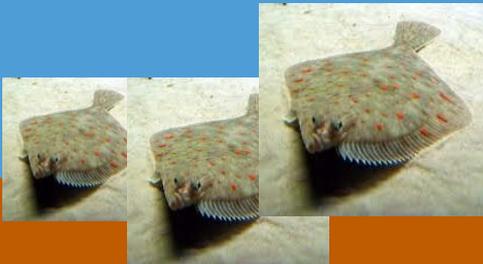


Large scale

Outside & inside wind farm



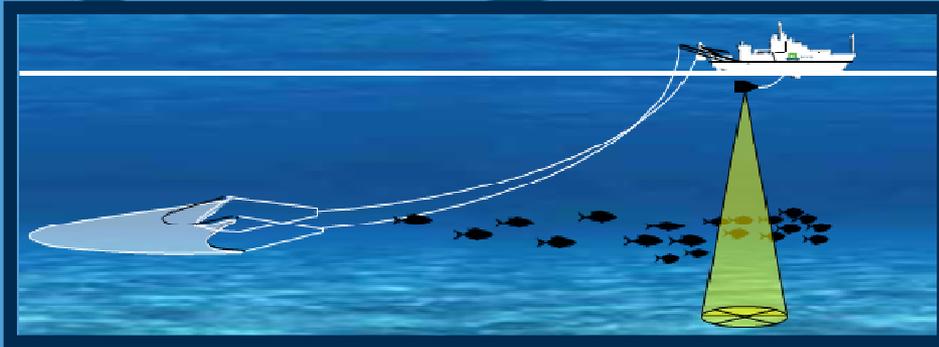
Pelagic
e.g. herring, sprat,
mackerel



Demersal 54 species
e.g. cod, whiting,
flatfish

Large scale

Outside & inside wind farm



Pelagic fishing
Pelagic trawl +
acoustic



Demersal fishing
Beam trawl

Large scale
Outside & inside wind farm

Baseline: T0 2003/2004

Construction OWEZ

One year after: T1 2007/2008

Five years after: T5 2011

SUMMER

WINTER

Operational phase

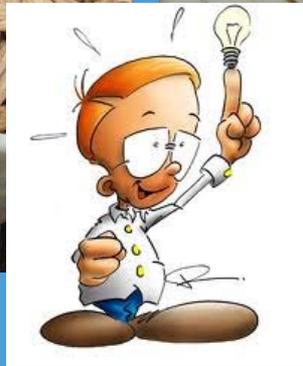
Large scale

Outside & inside wind farm

Expectations when positive effect of the wind farm

in the wind farm

outside the wind farm

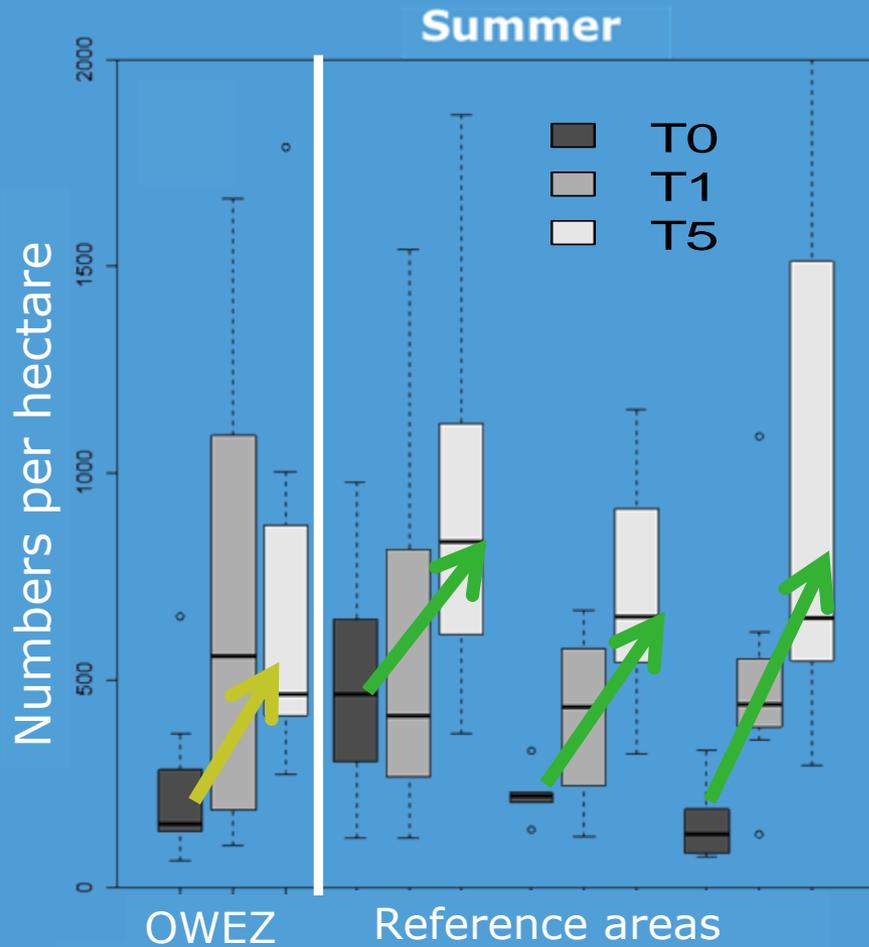


Large scale

Outside & inside wind farm



Total abundance in demersal catches

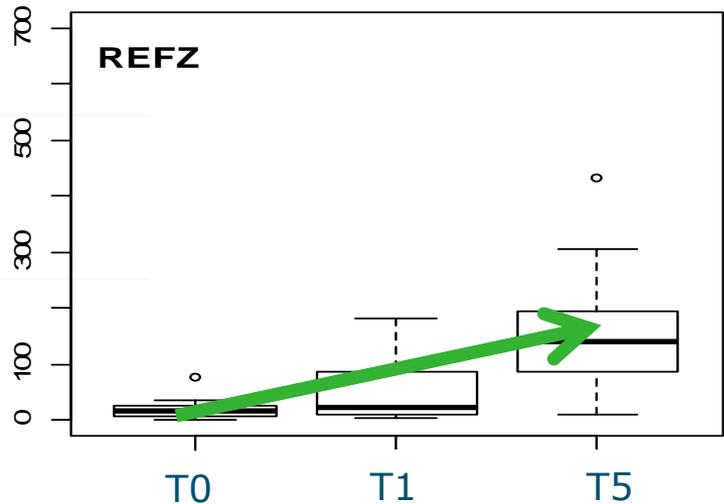
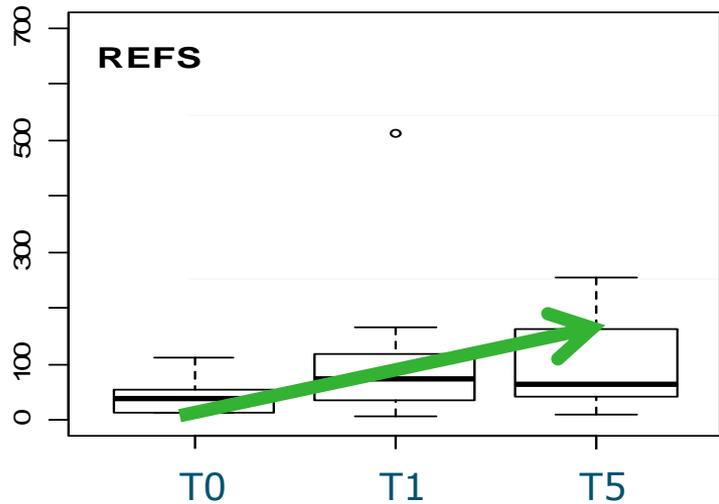
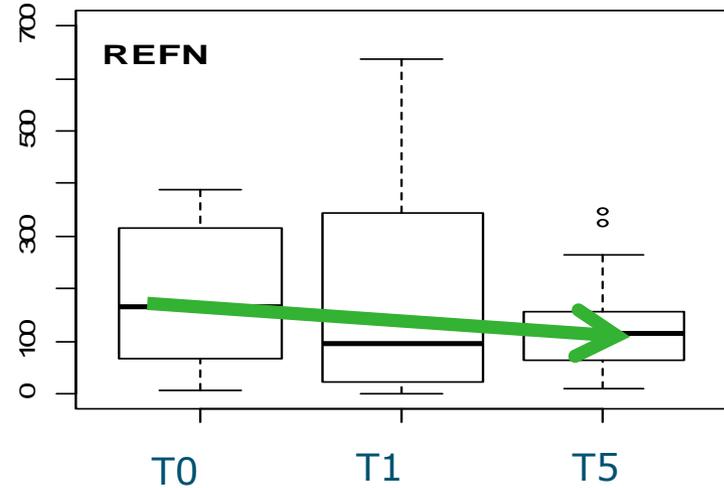
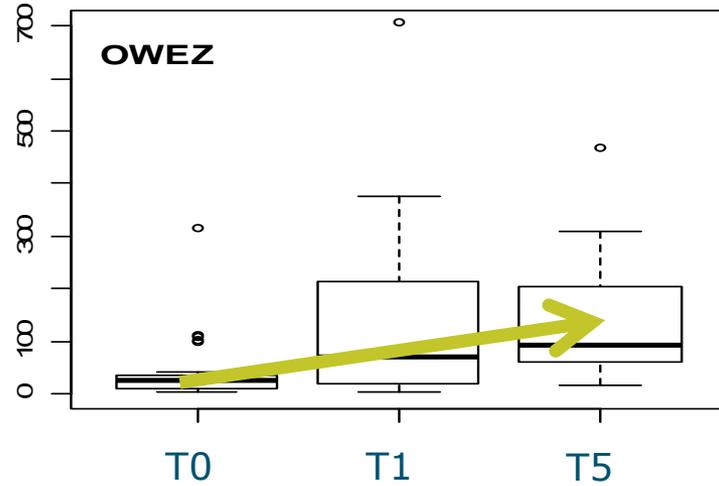


Large scale

Outside & inside wind farm

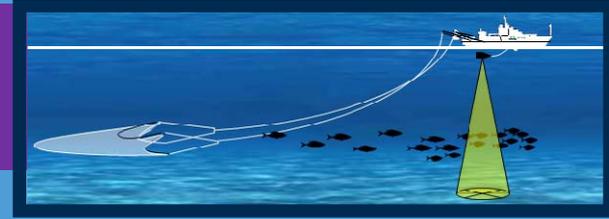


Numbers per hectare

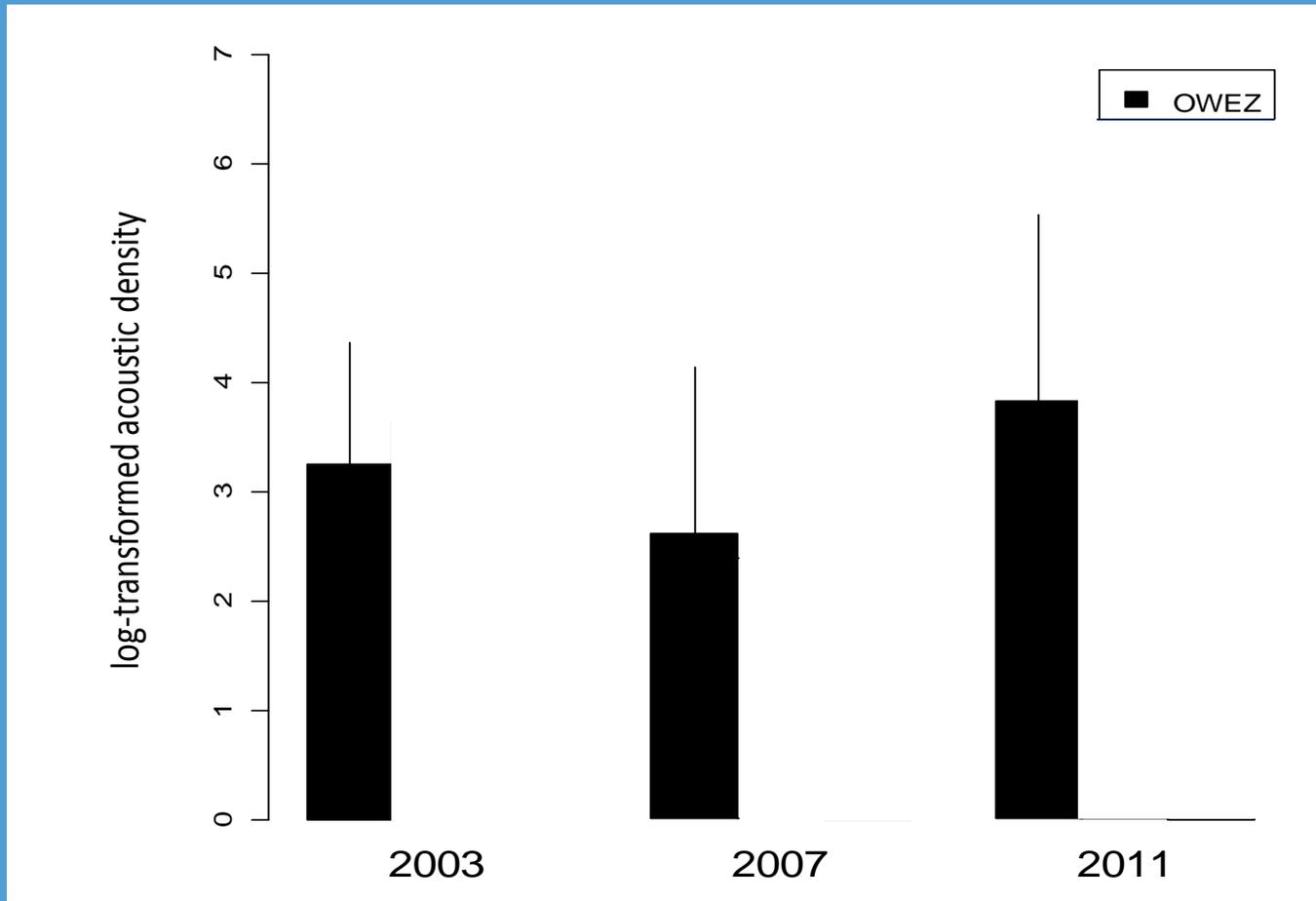


Large scale

Outside & inside wind farm



Acoustic densities of pelagic fish



Large scale

Outside & inside wind farm

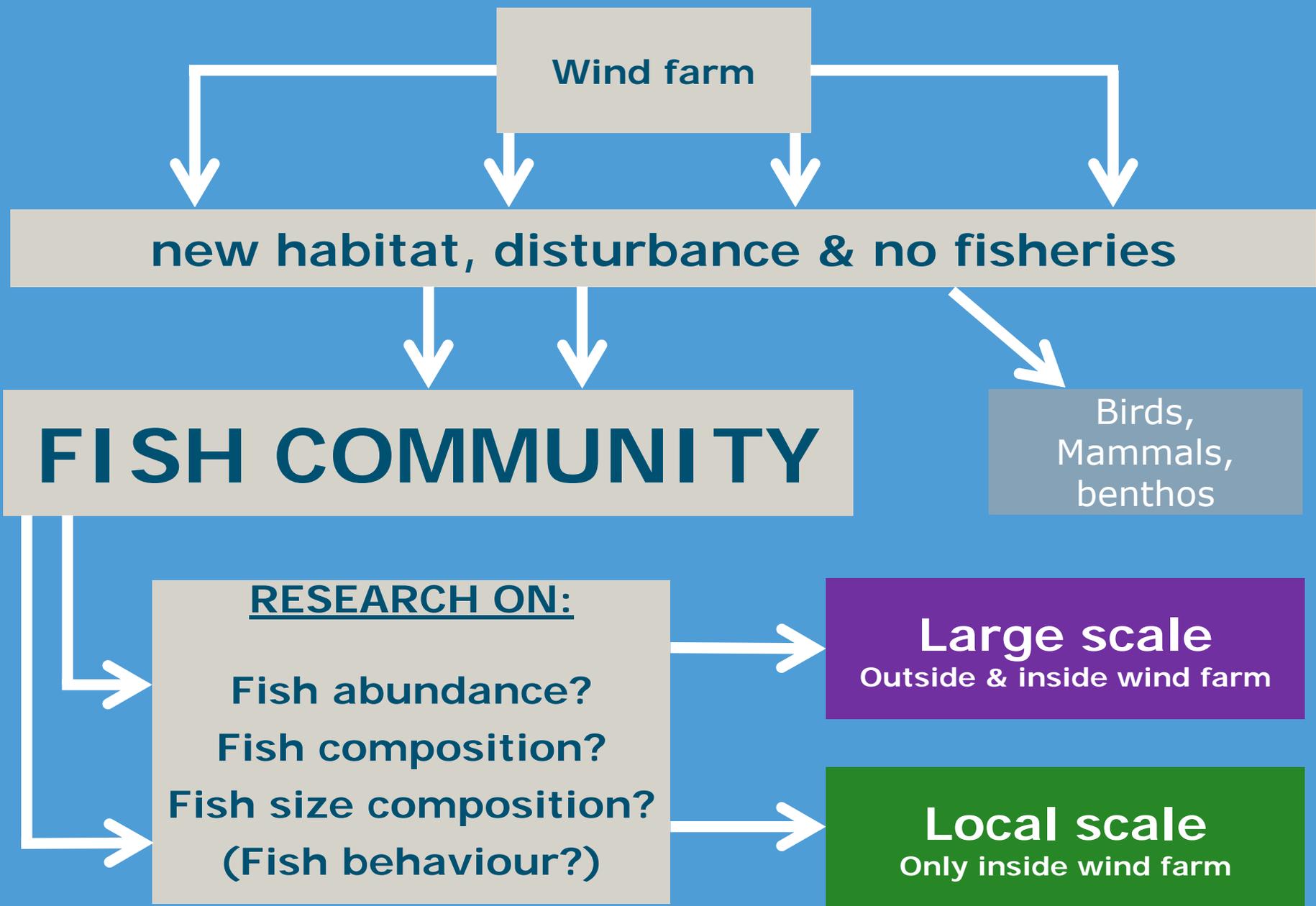
- Large spatial, seasonal and temporal variation.



- Baseline Power-analysis a potential to detect:

- increase of 40% 
- Decrease of 30% 

No such effects found



Wind farm

new habitat, disturbance & no fisheries

FISH COMMUNITY

Birds,
Mammals,
benthos

RESEARCH ON:

Fish abundance?

Fish composition?

Fish size composition?
(Fish behaviour?)

Large scale

Outside & inside wind farm

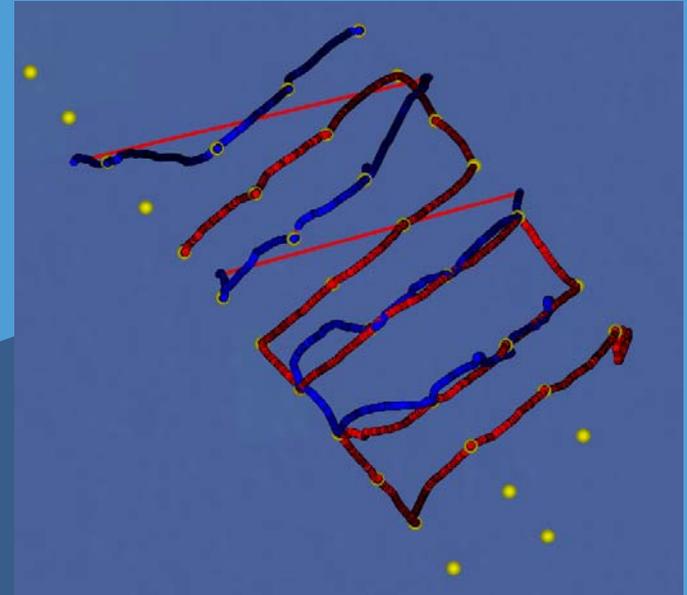
Local scale

Only inside wind farm

Local scale

Only inside wind farm

Acoustic camera



Viewers perspective parallel with the seabed

m
o
n
o
p

seabed / sa

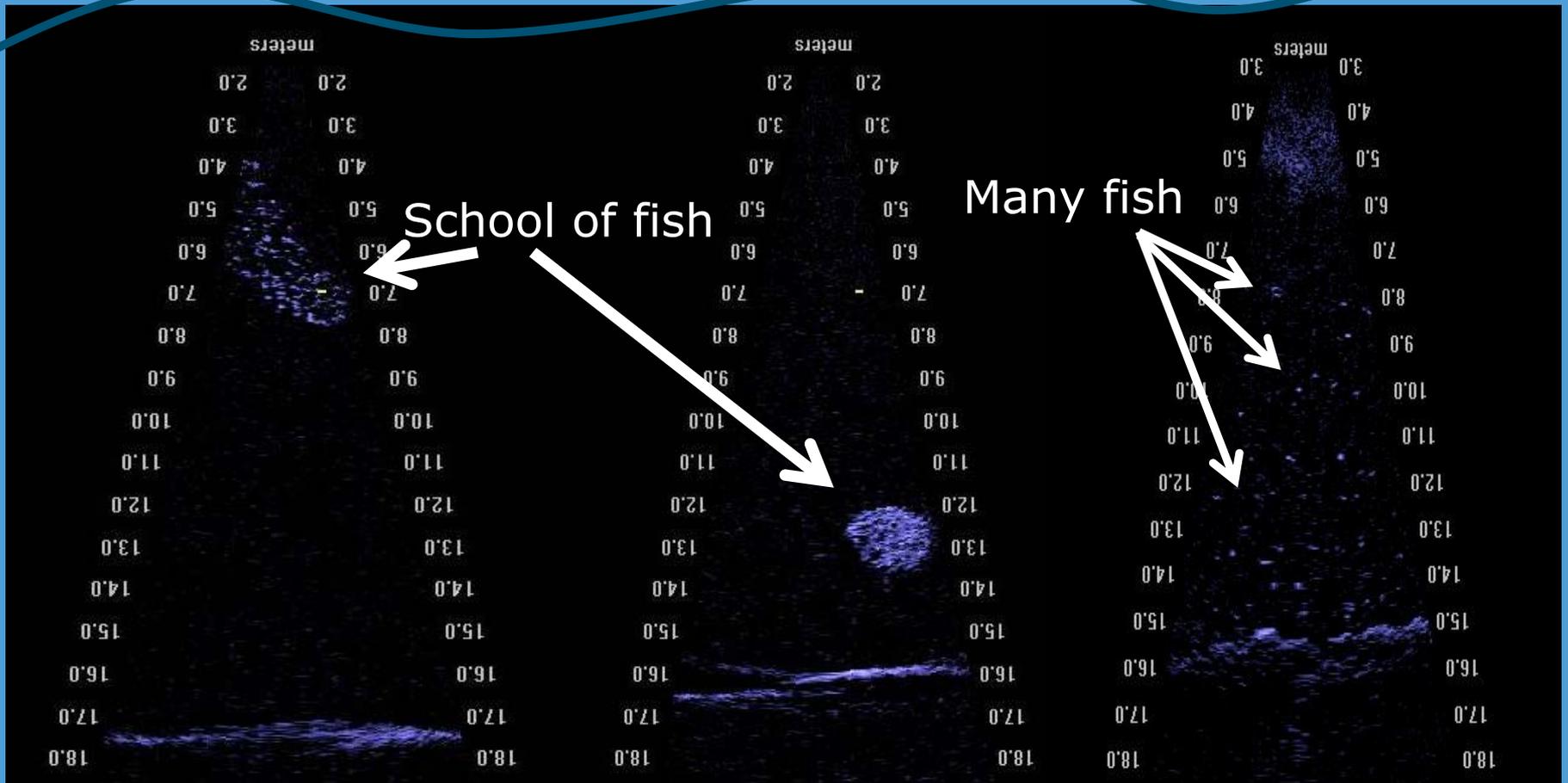
Lead weights

Multi-mesh gillnet

Local scale

Only inside wind farm

Stills from the films made with the acoustic camera



Local scale

Only inside wind farm

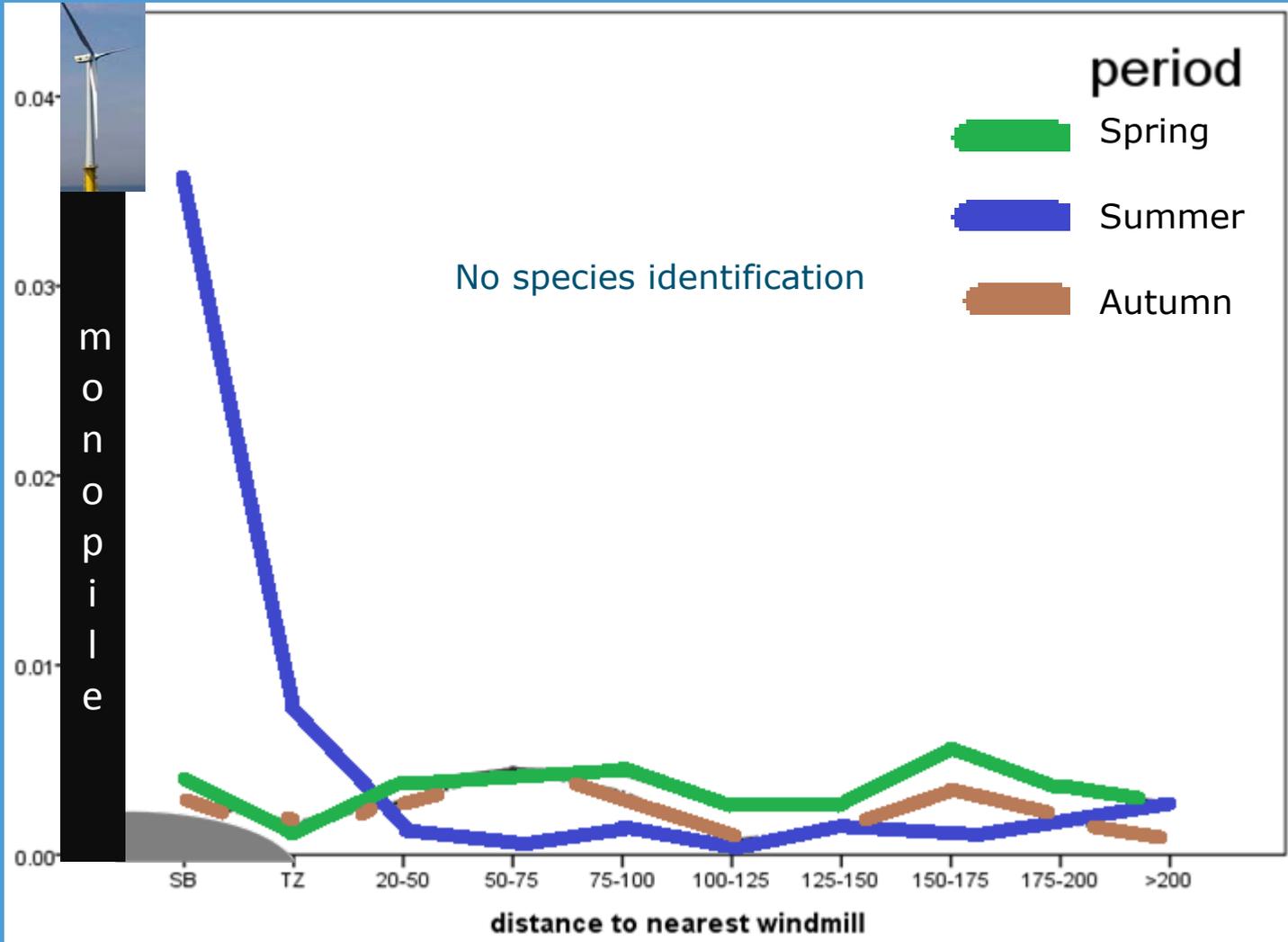


Species
identification

Local scale

Only inside wind farm

Fish density

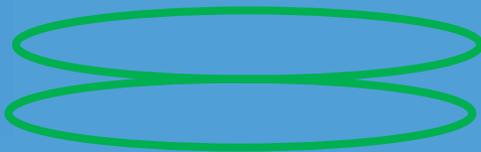


Local scale

Only inside wind farm

Species identification;
Gillnet near the monopiles vs. gillnet on sandy bottom

English name	Spring	Summer	Autumn

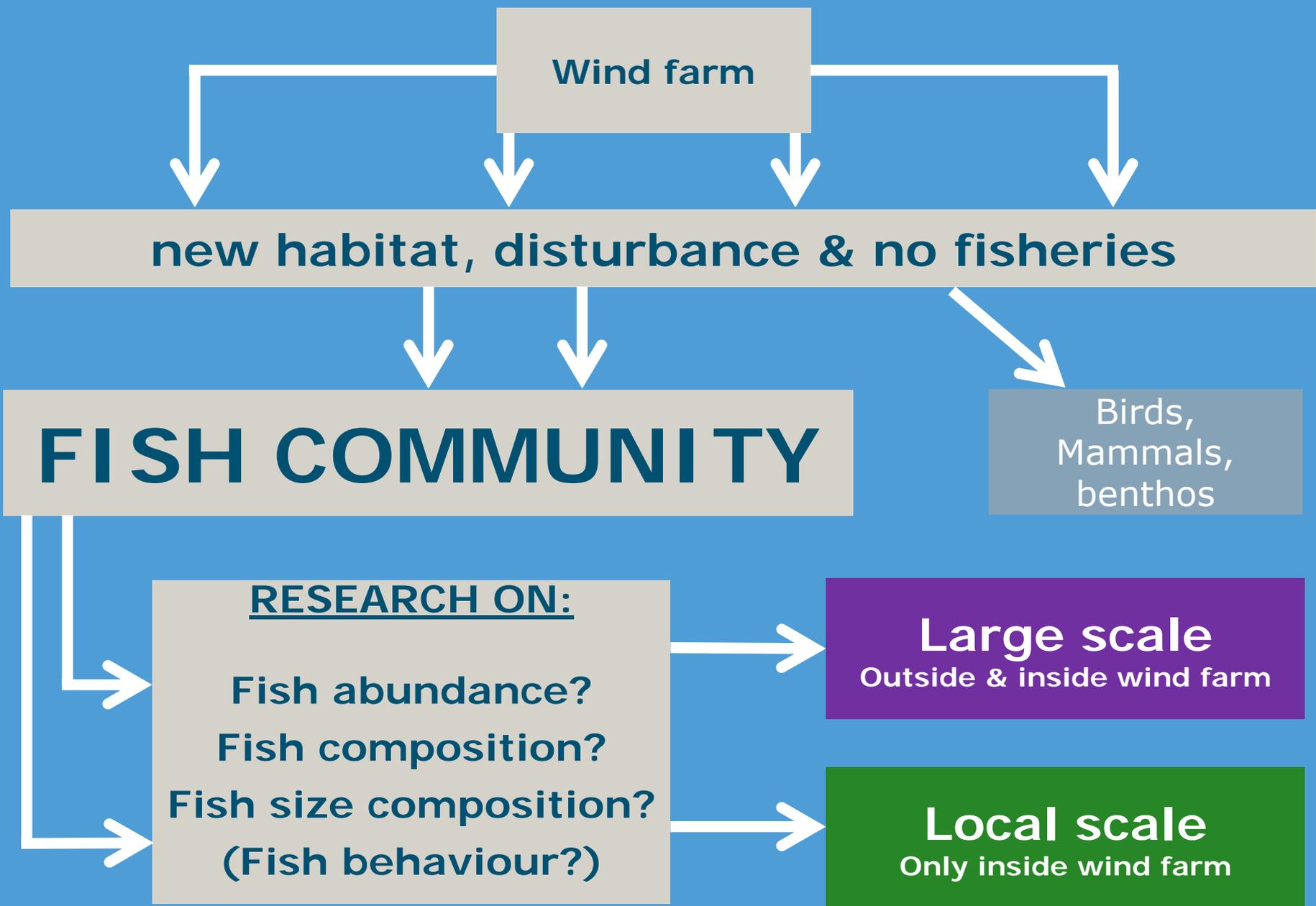


Local scale

Only inside wind farm

- Higher abundance near the monopiles in summer.
- The new hard-substrate:
 - Higher abundance of:
 - Cod; edible crab; bib; bullrout, sea scorpion and common dragonet.
 - Lower abundance of:
 - Whiting; sole; dab; solenette (plaice)
- Two "new" species:
 - goldsinny wrasse and grey triggerfish





Wind farm

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Large scale
Outside & inside wind farm

Local scale
Only inside wind farm

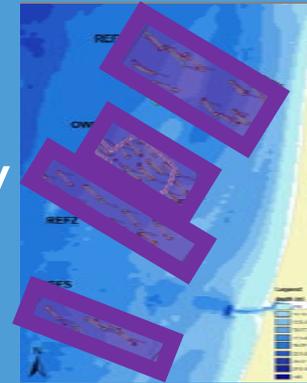
Conclusions

**new habitat, disturbance &
no fisheries**

Large scale

Outside & inside wind farm

- No detectable effect on the fish community
- Most fish seem indifferent
- Role as refugium and/or as MPA limited



Local scale

Only inside wind farm

- Hard substrate attracted some species.
- Potential positive effect for these species
- Depends on life-history, behaviour and residence time.

Acknowledgements

Discussion after talk by Erwin Winter

- The Offshore wind Farm Egmond aan Zee has a subsidy of the Ministry of Economic Affairs under the CO2 Reduction Scheme of the Netherlands.