Presentation of the Fmsy project

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The Fmsy-project – www.fmsyproject.net

- 2017-2019

- Involved some of the best-known fisheries research capacities in biology and fisheries management in the northern hemisphere.

- By far the most comprehensive analysis of Fmsy for North Atlantic fish stocks now available to science. ….if we have missed such a study please let me know 😊 .

Conference 10-11 October 2018 | With managers, stakeholders and scientists

Three basic ideas in the Fmsy-project

- Use of well established <u>Surplus Production Models</u> - they implicitly includes all 4 density dependent elements - on the existing stock assessment time series of catch, F and SSB

- <u>Direct calculations</u> based on established density dependent effects for 9 of stocks

- Multi-variate statistical approach to increase precision of the new Fmsy values by relating Fmsy to life history parameters like growth rate and age-at-50%-maturity

What is Fmsy?
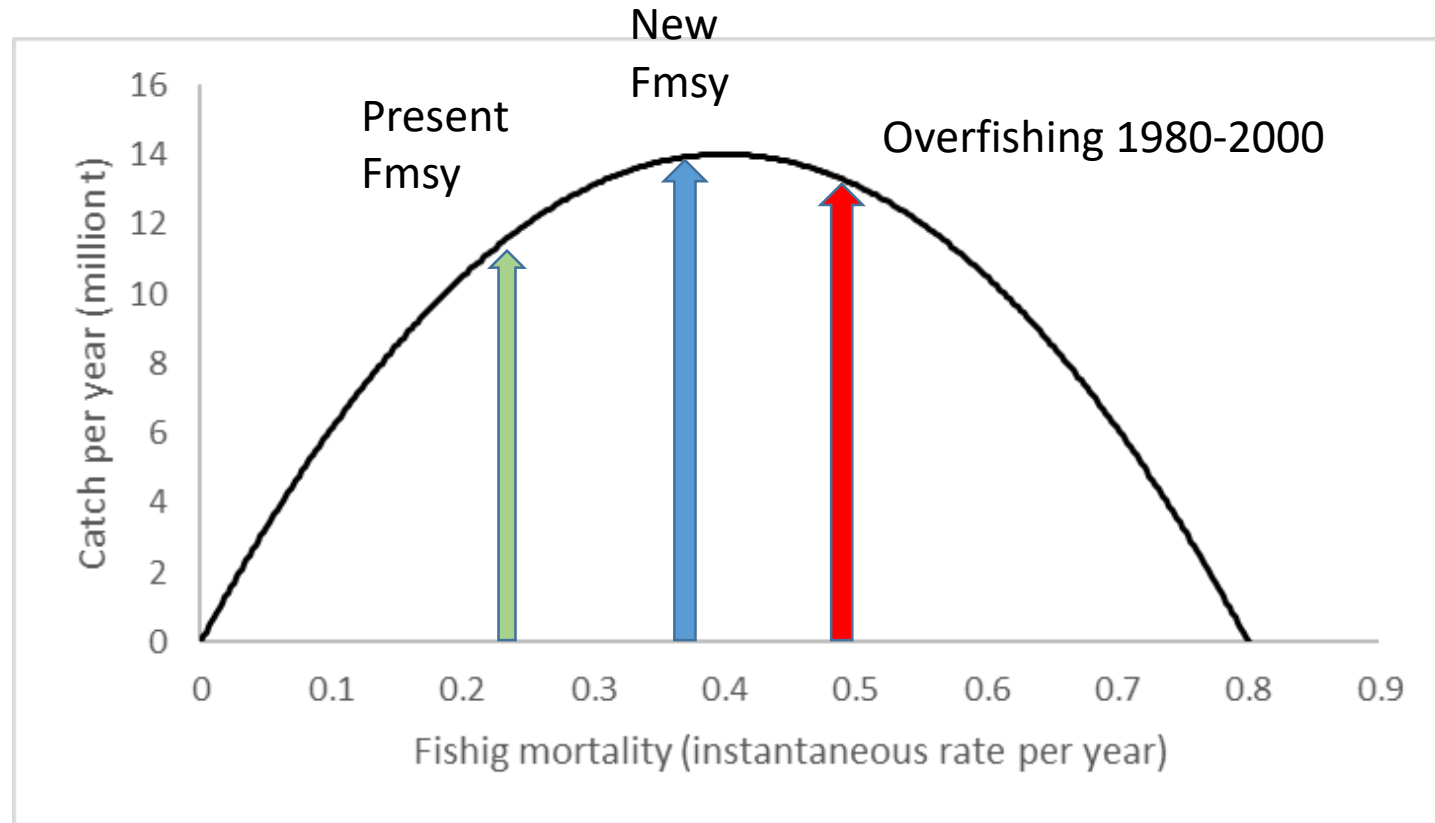
Basic ecosystem concepts

1. The production in an ecosystem is based on primary production.

2. This production is moving up the food web.

3. <u>If fishing is too light:</u> the fish stocks will be too large and burn too much production in metabolic maintenance (convert production to CO_2) - production which could otherwise have been harvested as fish meat.

4. <u>If the fishing is too hard:</u> the fish stocks will be too small and not produce enough juveniles.

Four compensatory mechanisms –

Taken into account in current management?

- Density dependent <u>recruitment</u>

  √

- Density dependent individual fish <u>growth</u>

  Not yet

- Density dependent <u>natural</u> <u>mortality</u>
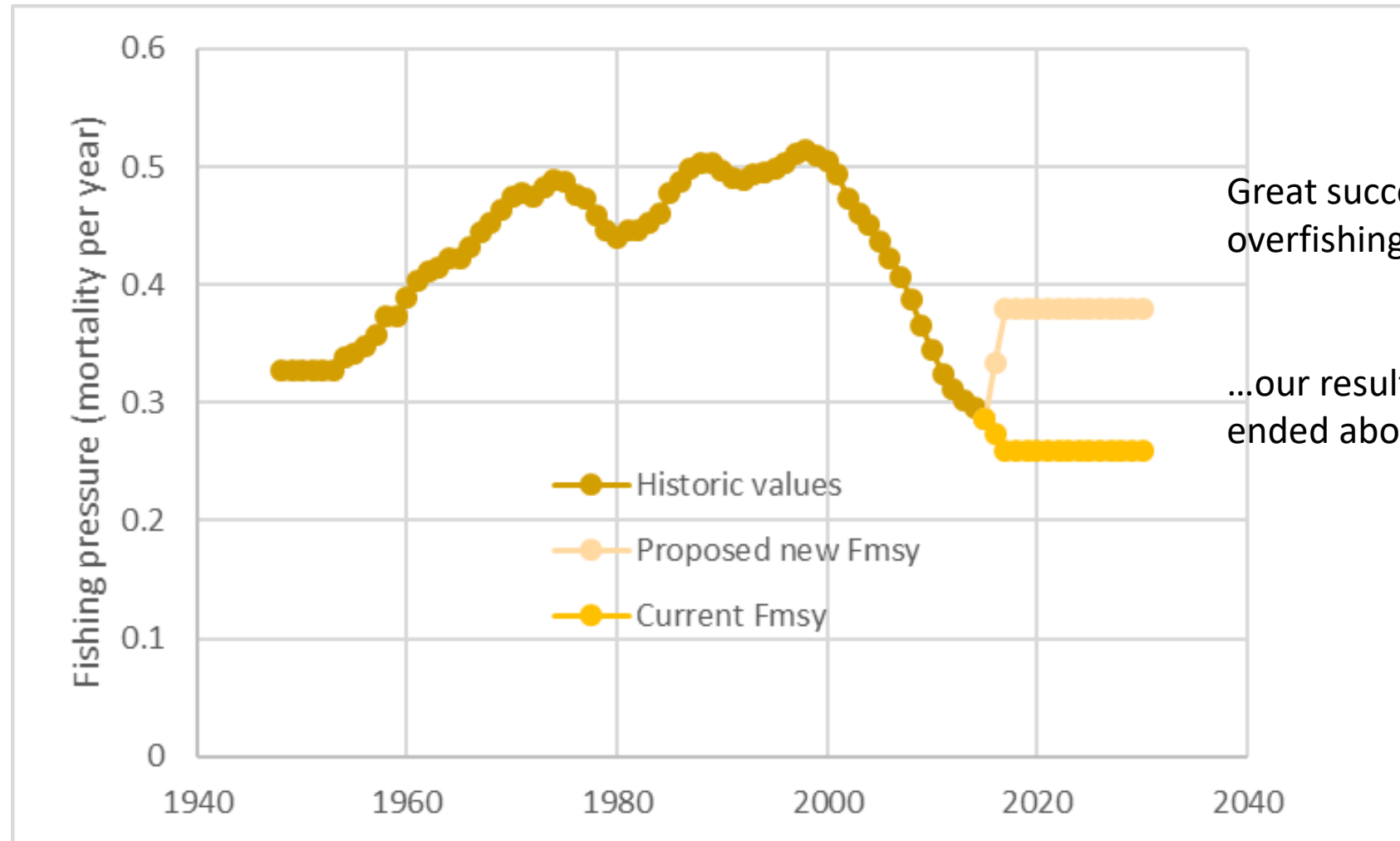
  Not yet

- Density dependent <u>maturity</u>

  Not yet

It is a mathematical fact:
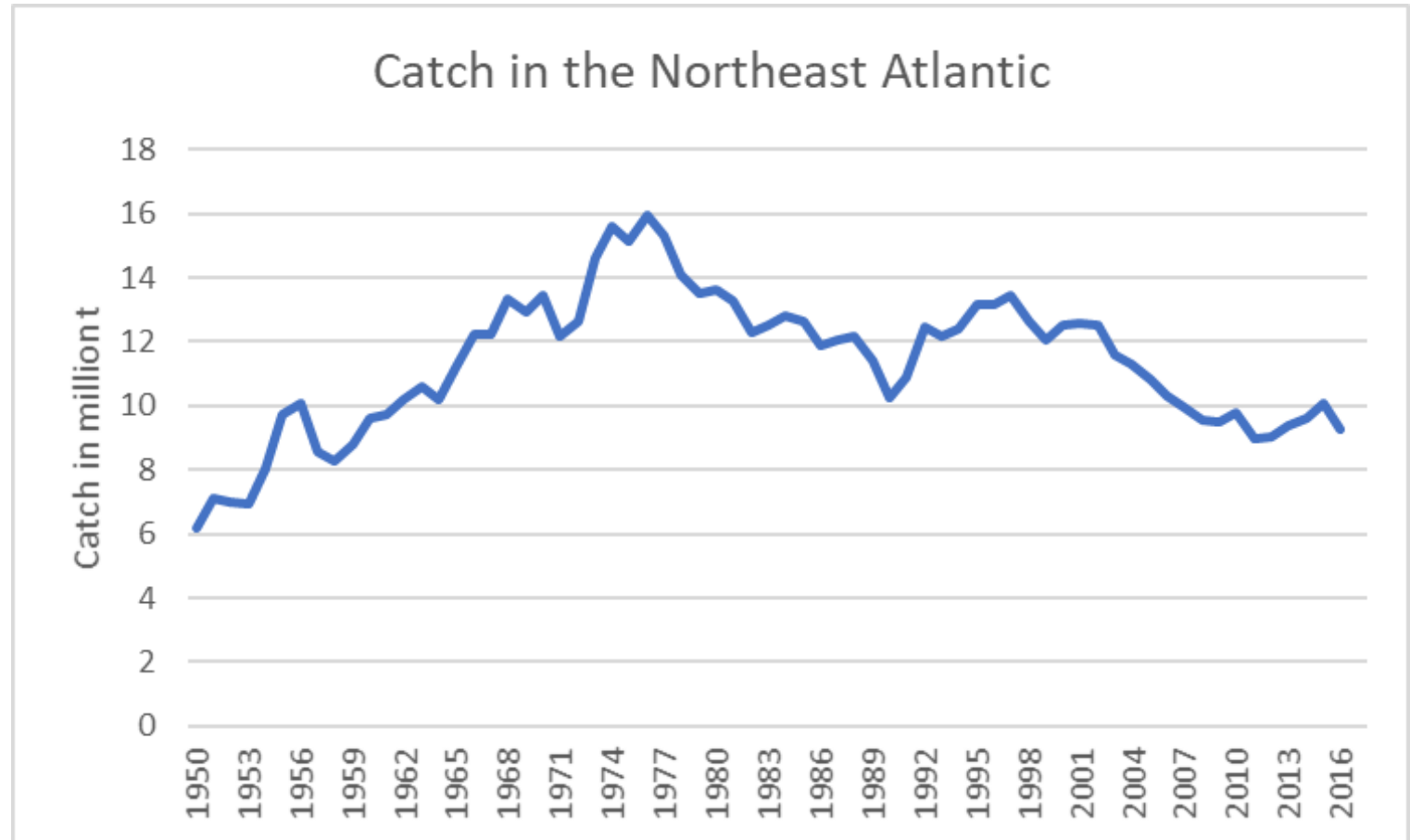missing any of these in Fmsy calculations will give a <u>downward bias</u>!

Mean fishing pressure in the Northeast Atlantic – indexed by the 53 ICES stocks in the Fmsy project.

Great succes story – overfishing has ended!!

…our results says it ended about 8 years ago

...missing several million t per year at present

Catch in the Northeast Atlantic

Catch in million t

Urgently need to change
– loosing 2 -3 million t in foregone catch per year!

Catch which cannot be taken the following years because:

- the fish have been eaten by larger fish;

- reduced individual fish growth due to food competition cannot be compensated in later years because wild fish are on average always semi-starving (eat on average only 30%-40% of what they can eat).

With an average price of about 1 Euro per kg, 2-3 million t is equal to 2-3 billion Euros

...the price tag for inertia in reacting is huge.

Conclusion

1. The new Fmsy values are without any bias known to science.

2. More ecosystem functions are included

3. It can be implemented now.

4. There is a longterm gain for yield.

5. There is also a shortterm gain for yield.

General:

Avoid 2-3 million t of foregone catch per year by applying the new Fmsy values.

Global fisheries catches can be increased after rebuilding of fish populations

PROJECT: ECOSYSTEM BASED FMSY VALUES IN FISHERIES MANAGEMENT

The study is published here:

- http://norden.diva-portal.org/smash/get/diva2:1316583/FULLTEXT02.pdf

- …and detailed data and analysis here: www.fmsyproject.net and here:

- www.norden.org/en/publication/report-1st-working-group-meeting-optimization-fishing-pressure-northeast-atlantic

- www.norden.org/en/publication/report-2nd-working-group-meeting-optimization-fishing-pressure-northeast-atlantic

- www.norden.org/en/publication/report-3rd-working-group-meeting-optimization-fishing-pressure-northeast-atlantic-rhode

Implementation – suggested fast track:

For the 2020 TACs, stakeholders might prefer to use the Fmsy from the Fmsy-project because:

1. They are:
    a) without any bias known to science;
    b) consistent with available science on ecosystem functioning and multispecies interactions;
    c) based on a "clean" definition of the scientific concept of Fmsy, without any precautionary elements. Precaution will be dealt with in point 3 below.

2. The default Harvest Control Rule with the present MSY Btrigger values should still apply.

3. For those stocks where the risk level is more than 5% for SSB to get below Blim at the end of the TAC-year, reduce the TAC so that it is 5%.

Thank you !