

MareFrame

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Biomass From an Ecosystem Based Fisheries Management Perspective.



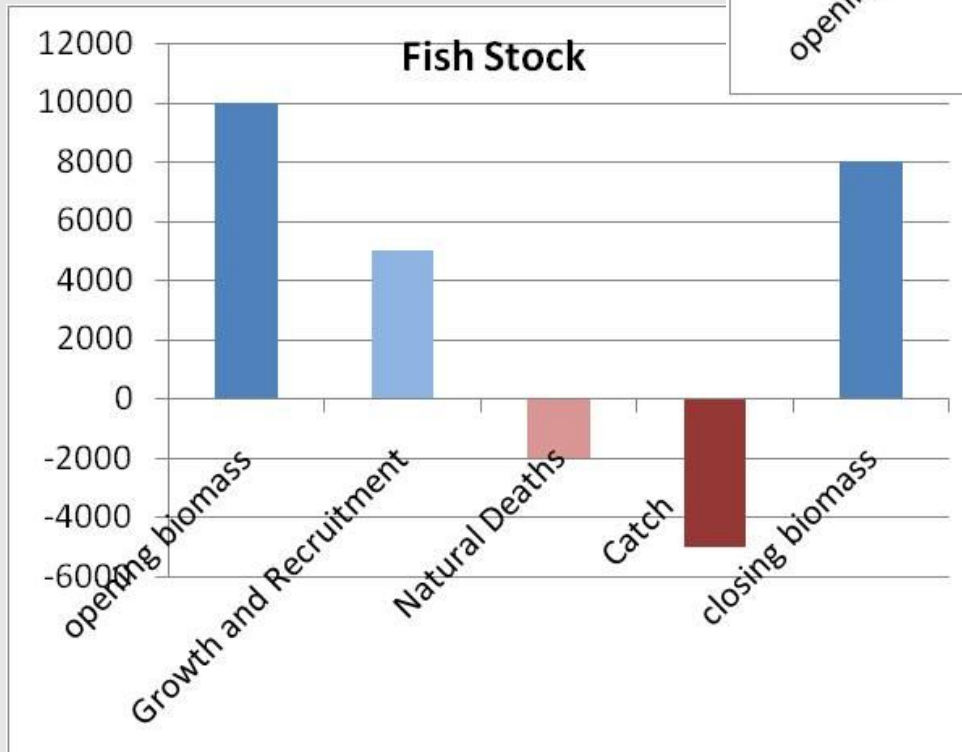
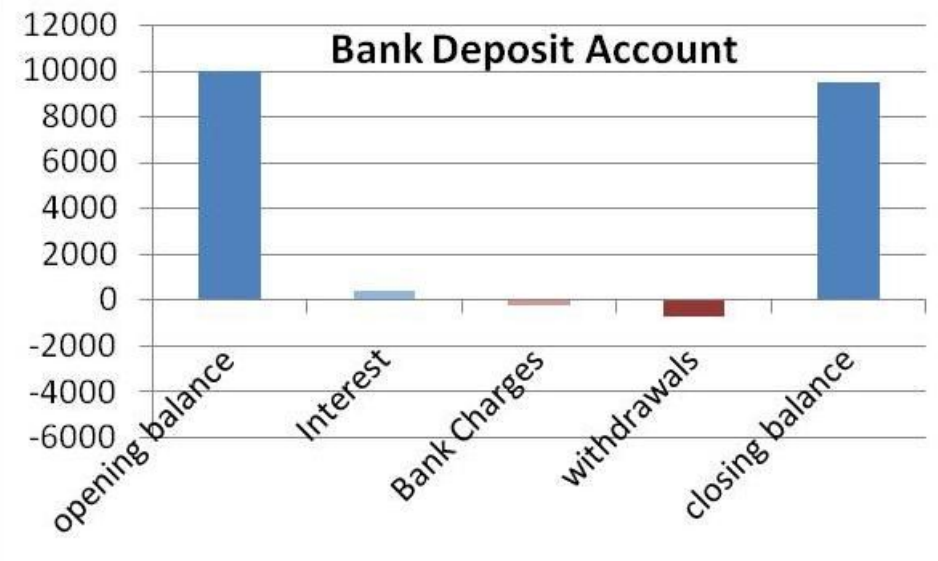
By John Pope
NRC (EUROPE) LIMITED



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613571

Biomass is rather like money in a Bank

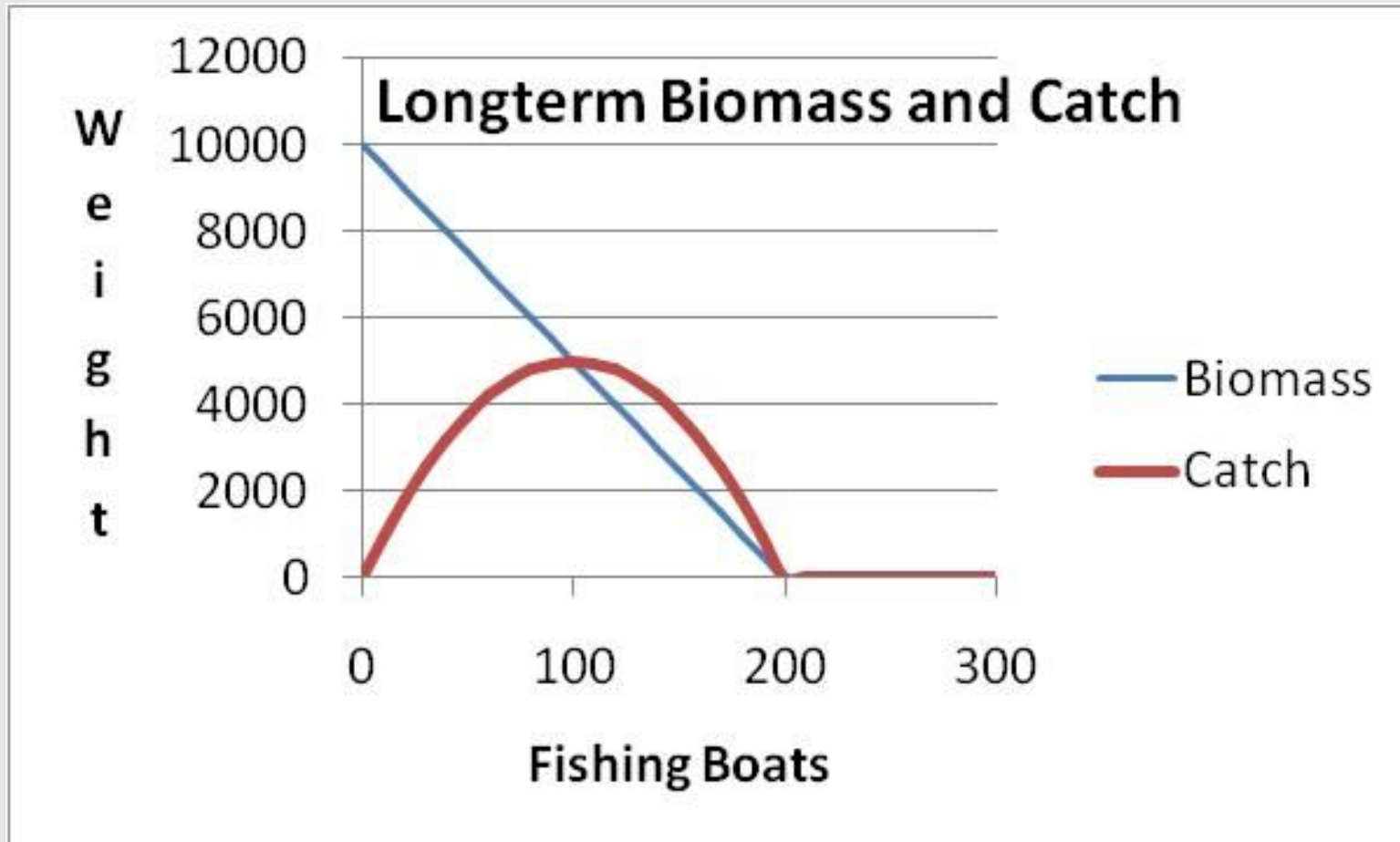
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Basics

In the long run Biomass declines as fishing increases.

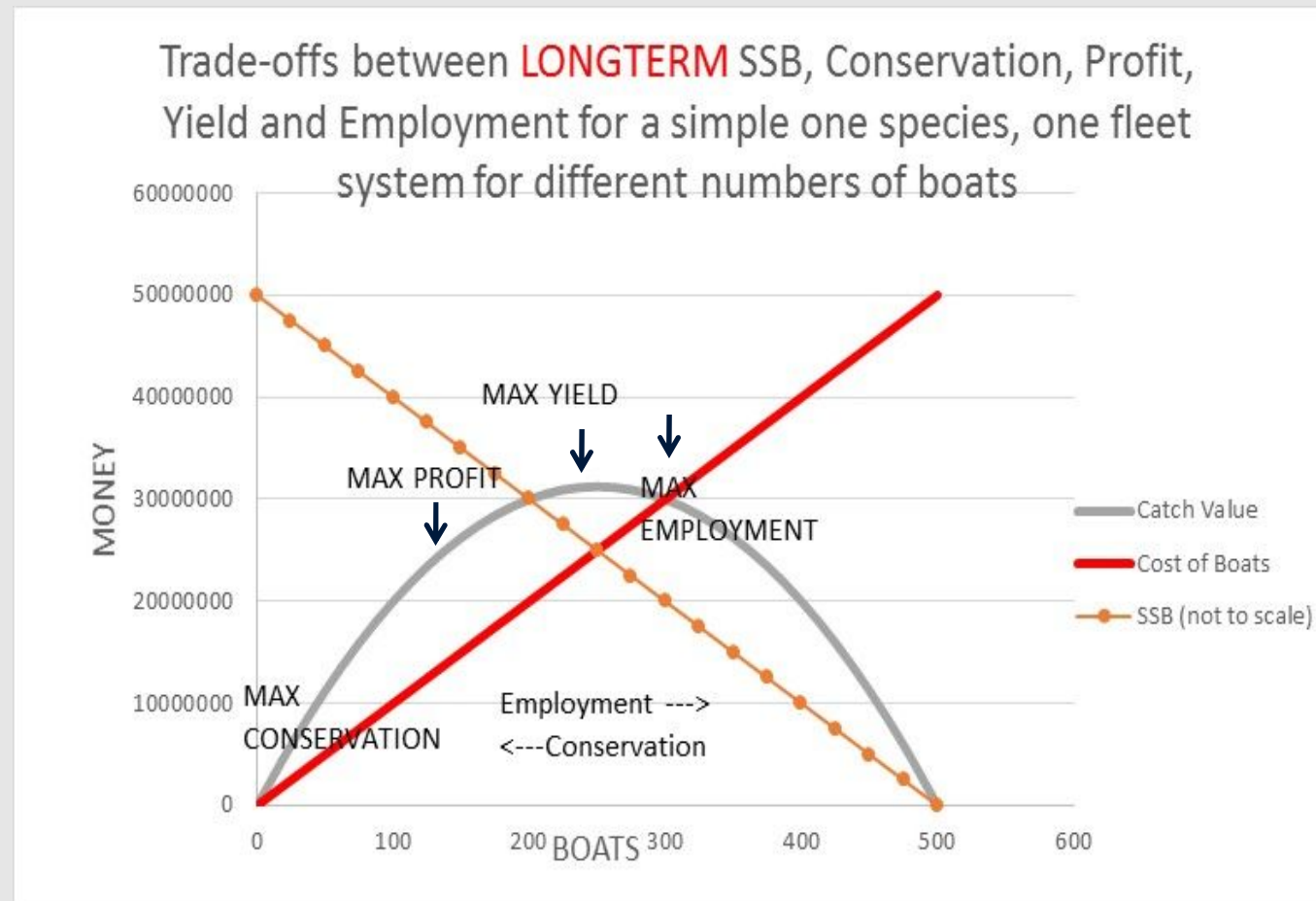


Catch at first increases and then declines as the amount of fishing increases.

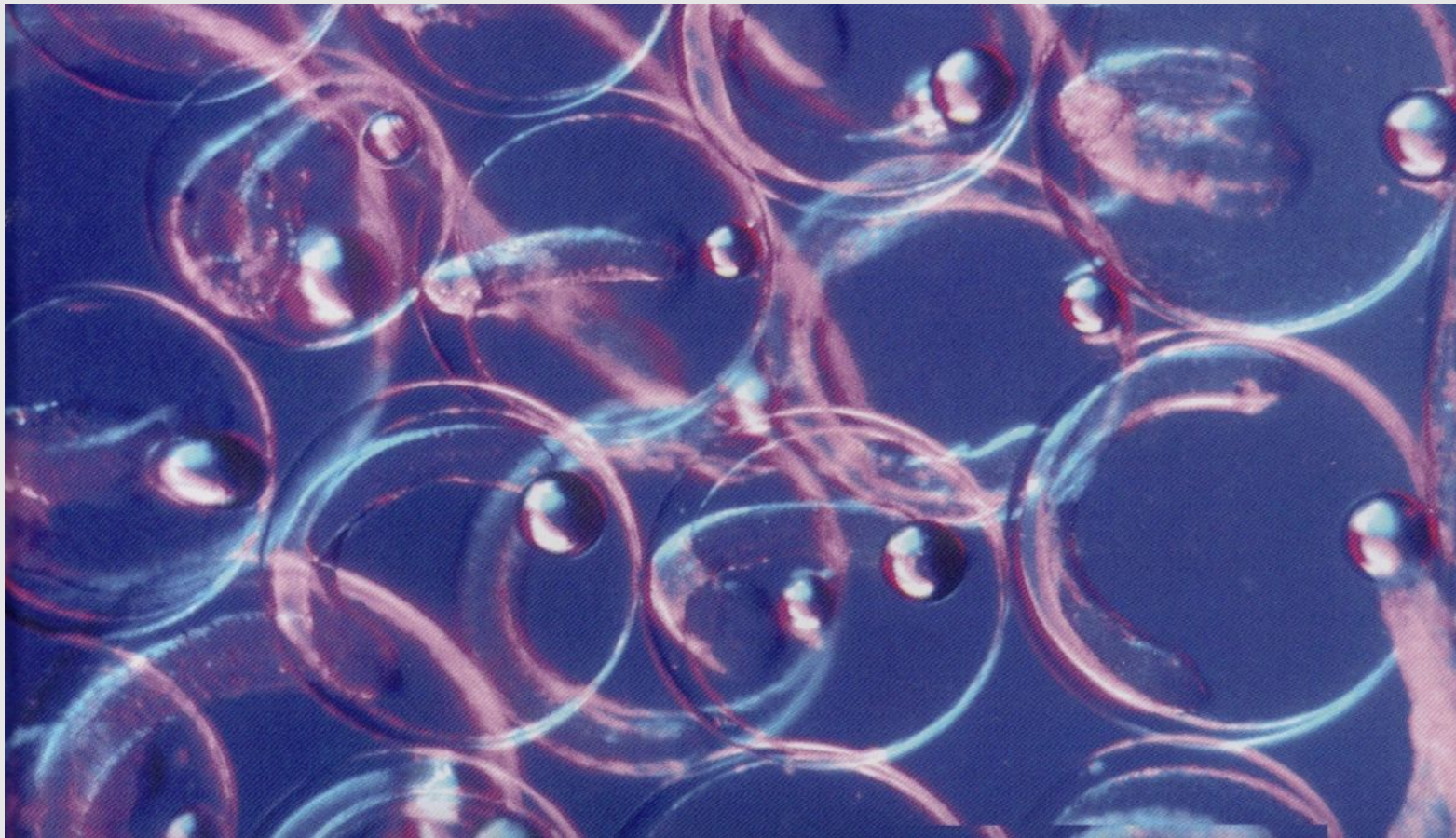


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Note on tradeoffs



We need Spawning stock to spawn the next generation

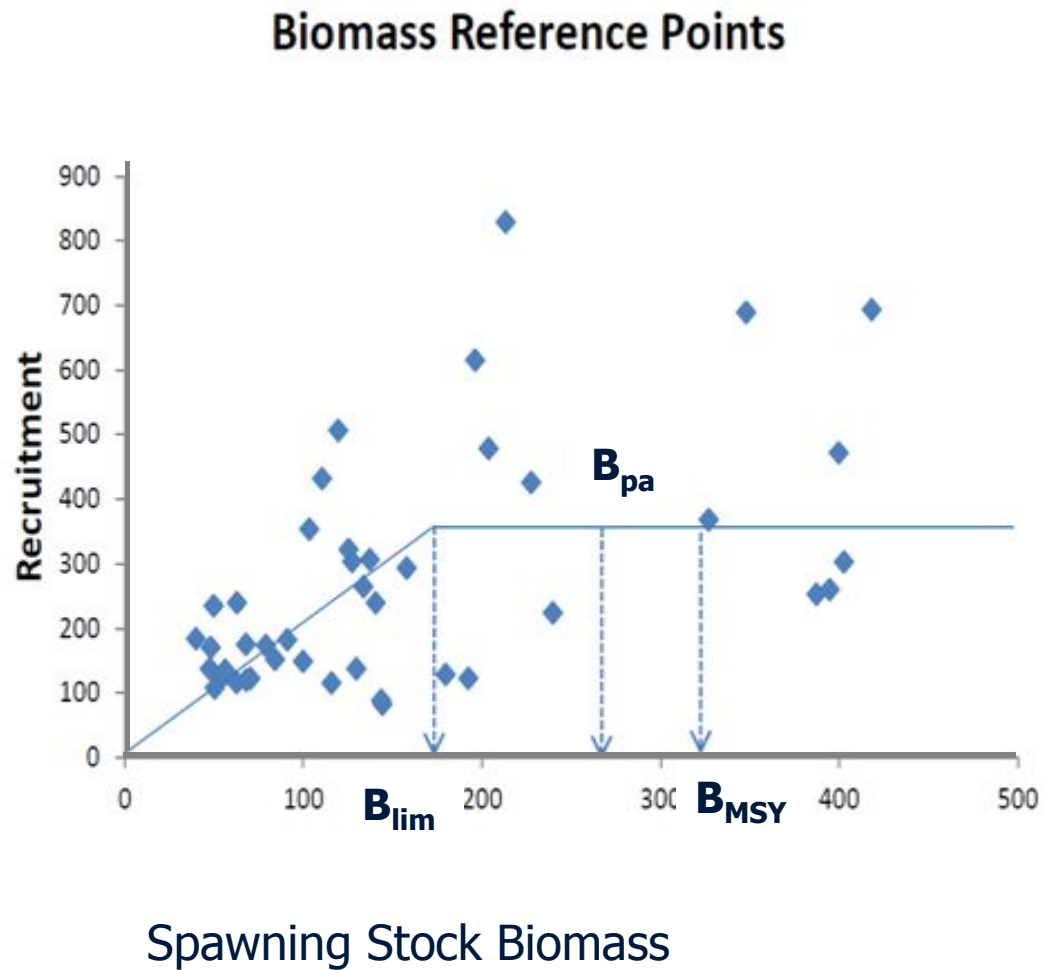


Picture of fish eggs From Cover of Fish Reproductive Biology, Wiley-Blackwell



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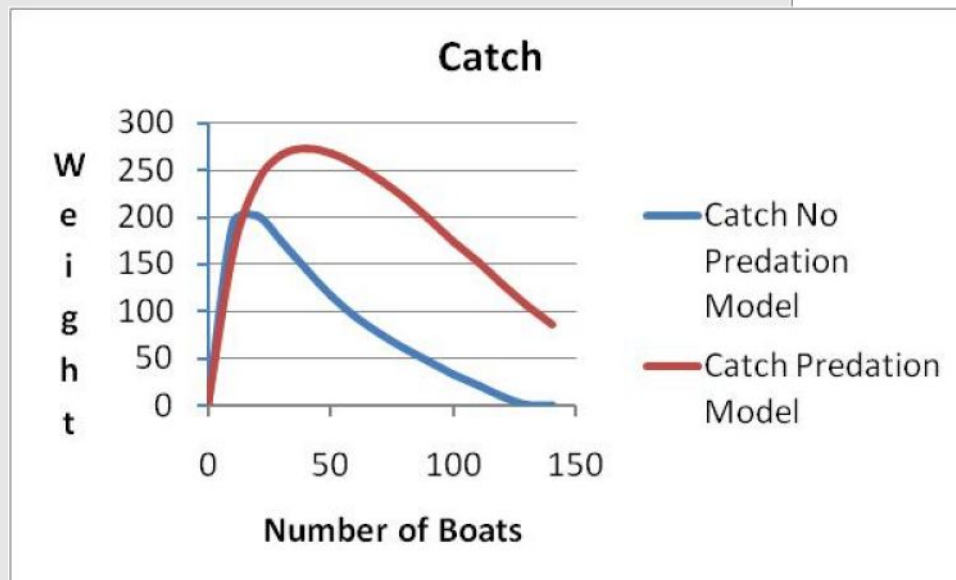
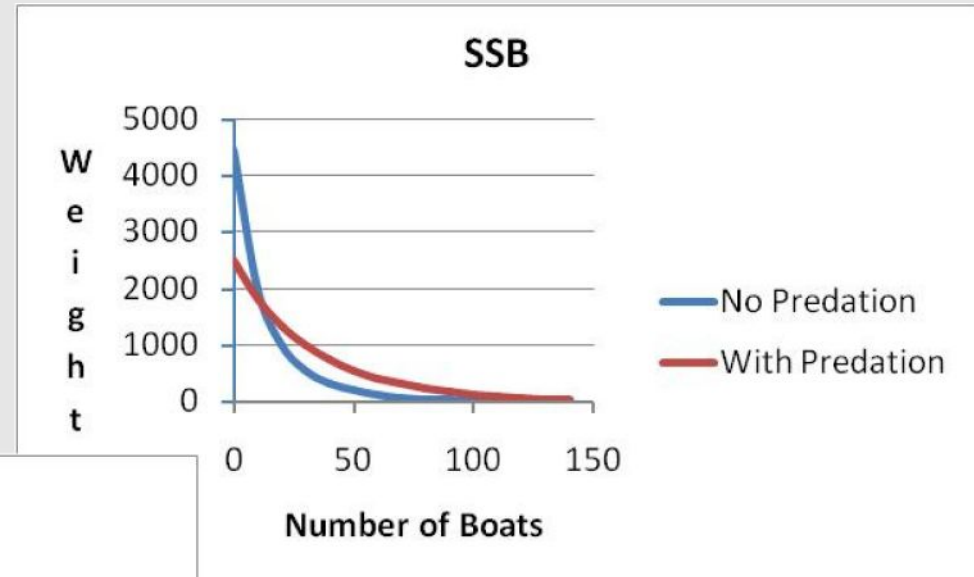
Biomass Reference points (From ICES introduction to advice)



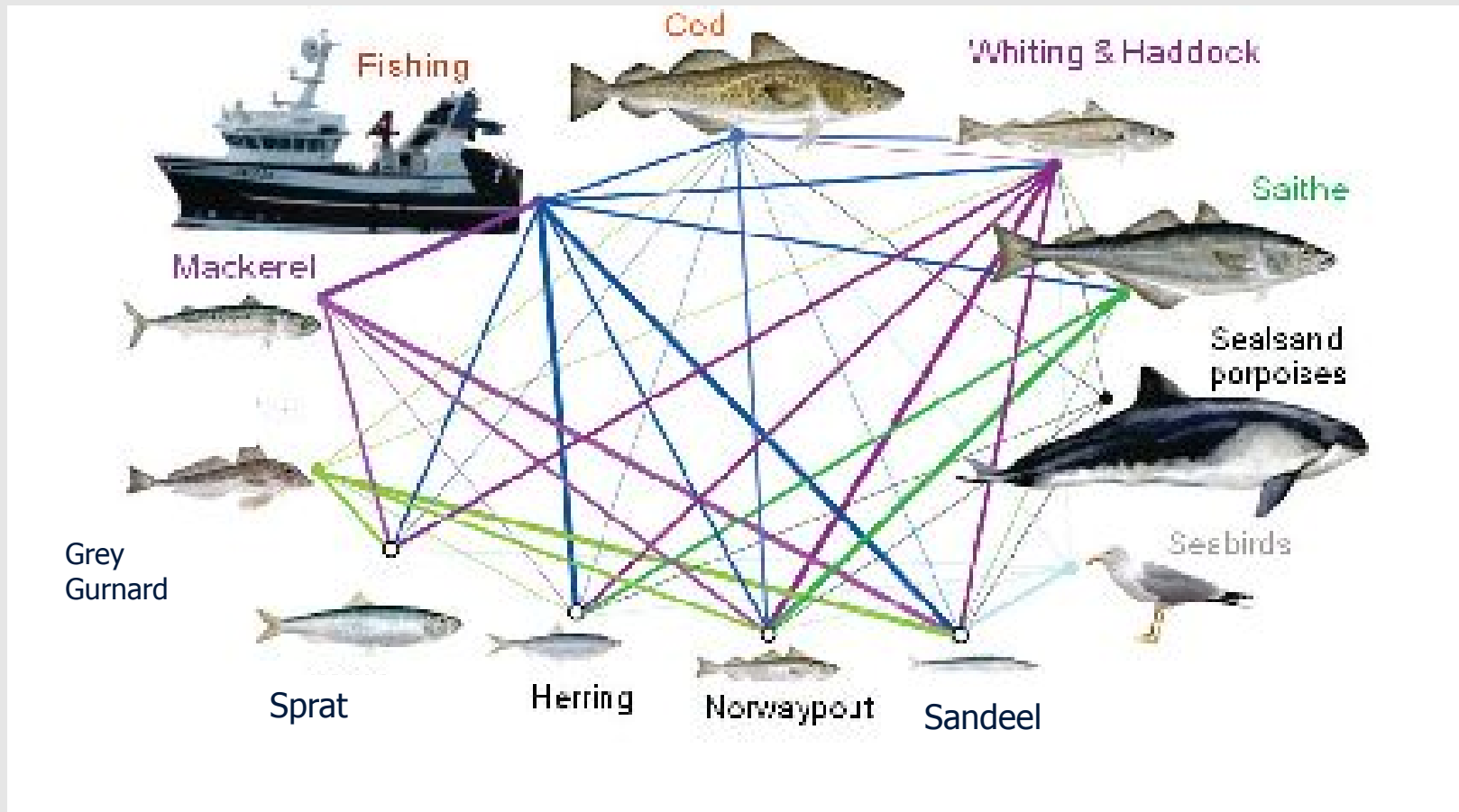
**But Big Fish Eat Little Fish.
Moreover, Little Fish may eat the young of Big Fish**



Contrasting Models with and without Predation



Multispecies concerns



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To Help we have made an interactive multispecies model of the North Sea suitable for stakeholders use.

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We will be holding a decision makers workshop using this in Brussels in June. We hope some of you may be able to attend.



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Main Points

**It is very important to avoid spawning stocks becoming too low
So avoid Blim.**

But big fish eat small fish.

So Predation Mortality increases at high predator biomass

Hence MSY Biomass estimates may be unrealistically high

**For the long term we need to start managing the whole ecosystem
rather than single stocks.**

**For Ecosystem Based Fishery Management MSY is probably not a
sensible societal objective.**

**My Acknowledgements are due to DG RESEARCH for funding and to
ICES, MAREFRAME and to the North Sea and
Pelagic Advisory Councils for help, advice and
encouragement.**

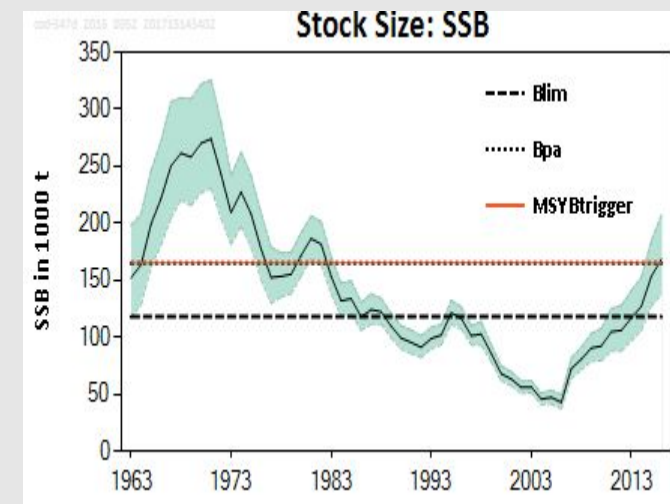
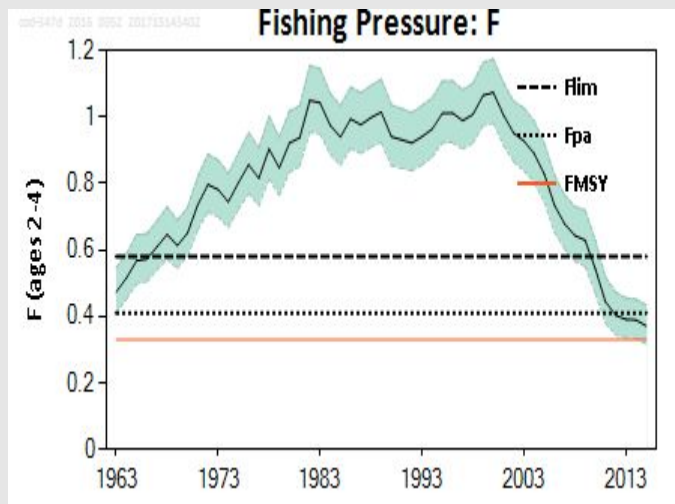
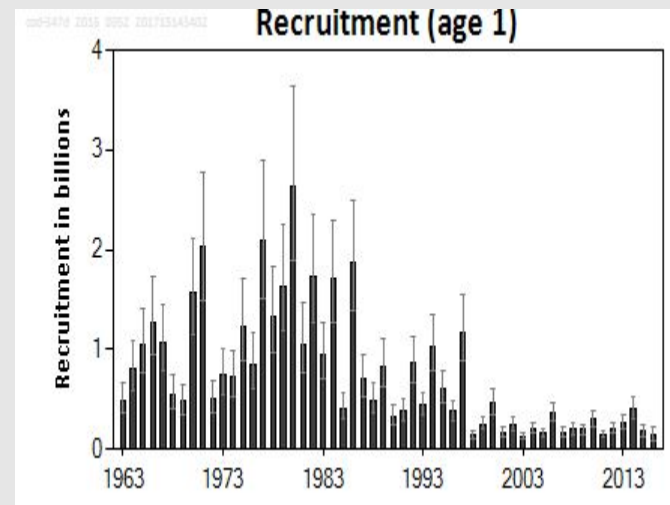
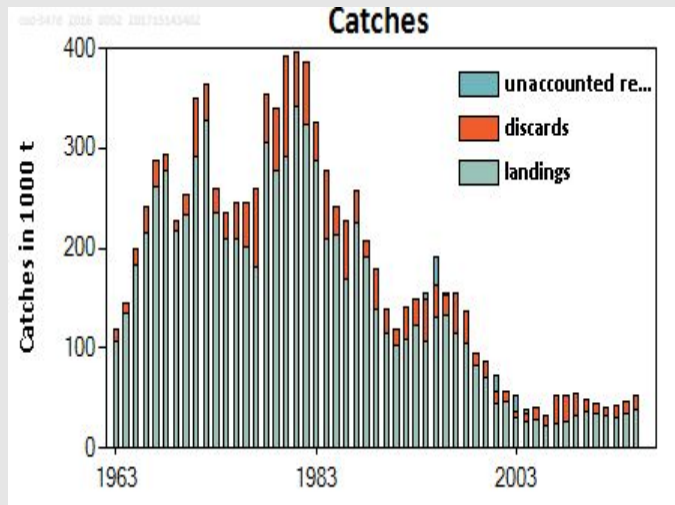


The Remaining Slides are for discussion points



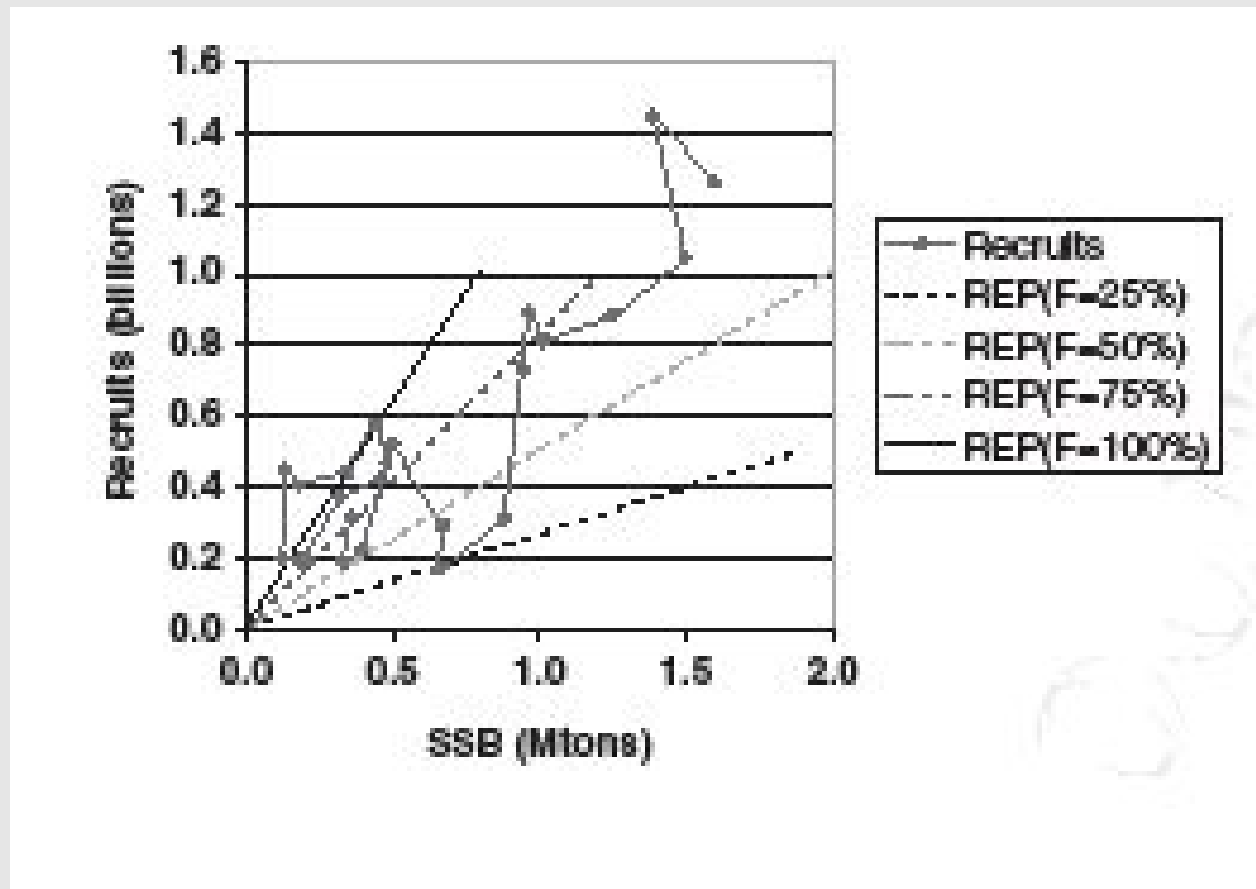
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Results for North Sea Cod from ICES Website

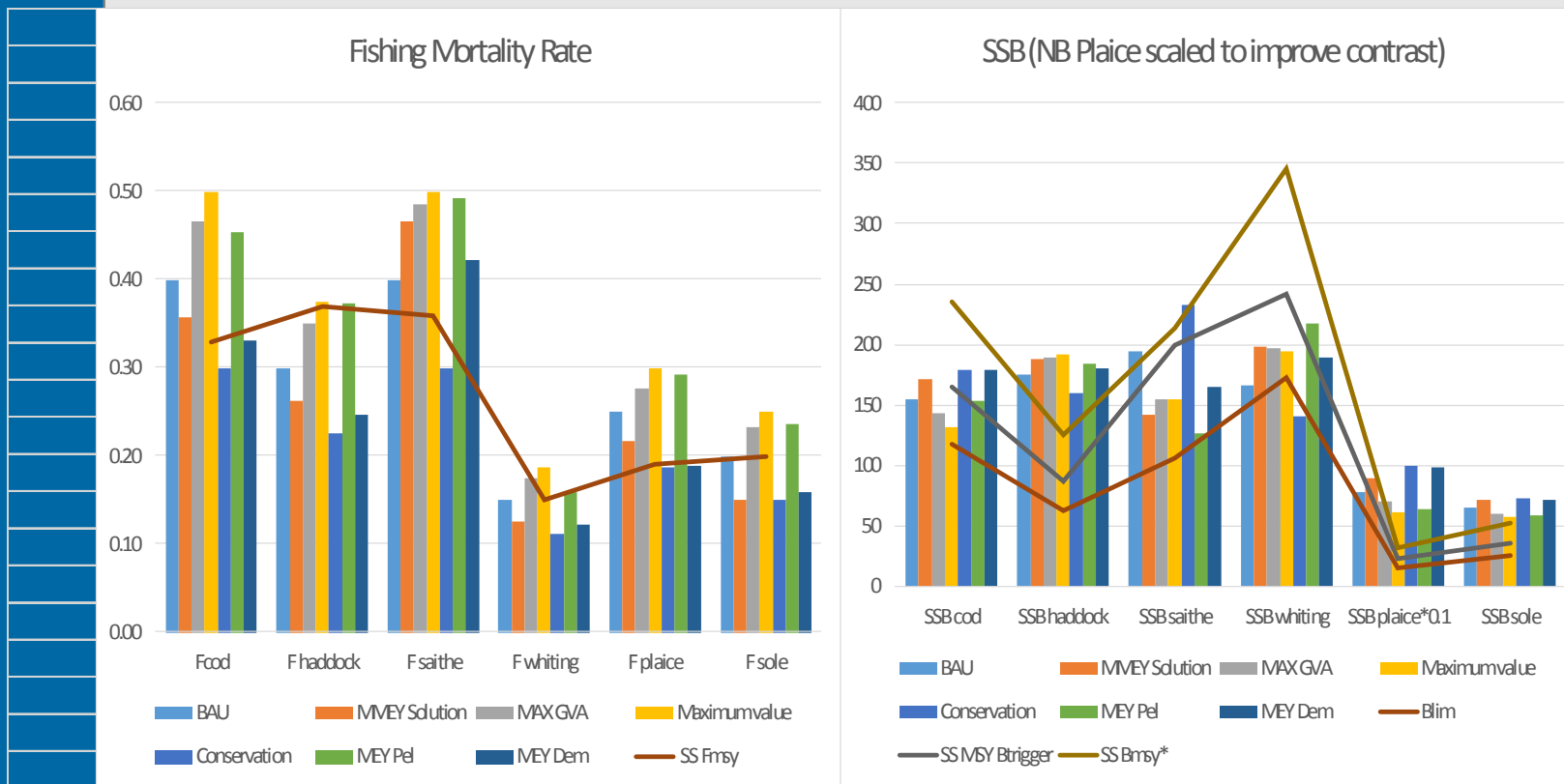


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Decline in Recruitment of the Newfoundland Cod

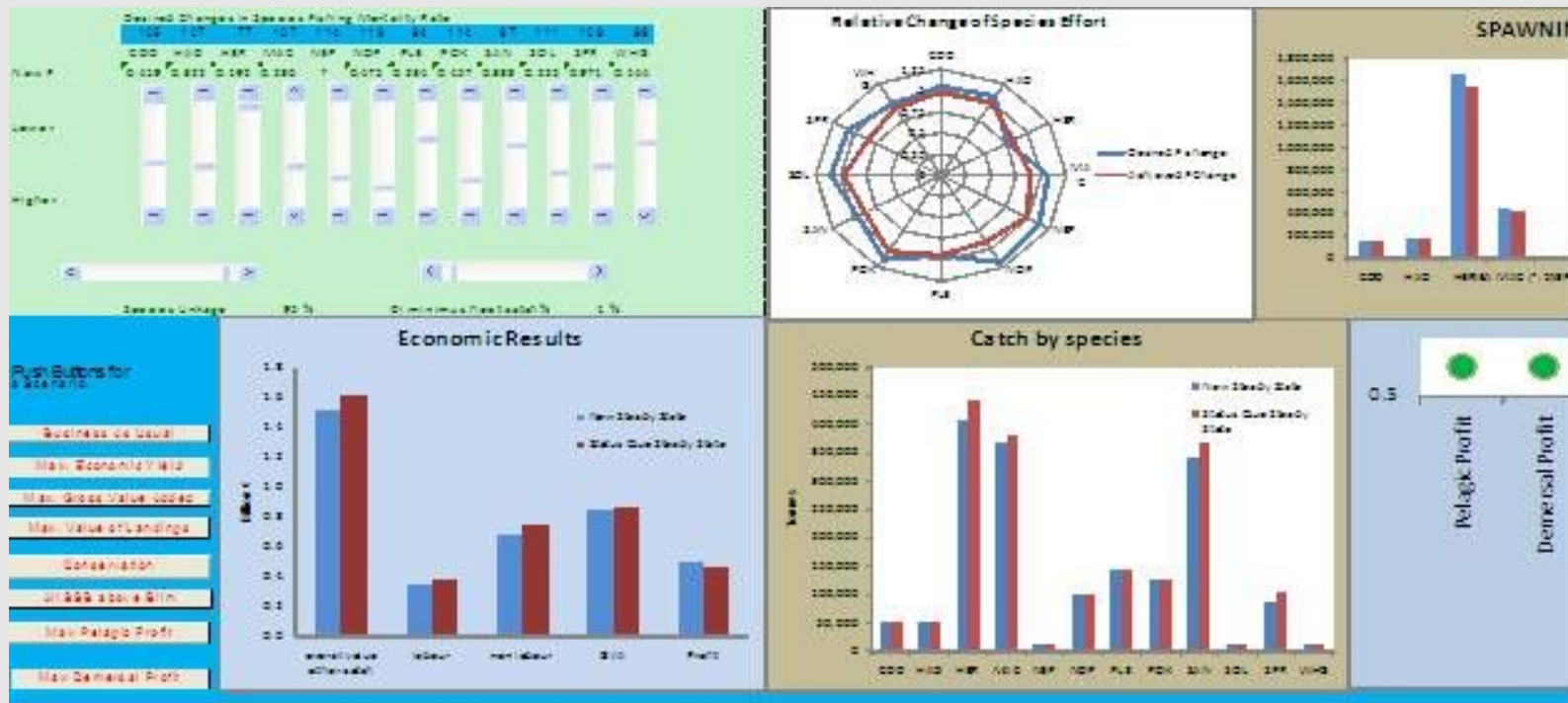


Demersal CFP Compliant criteria



Note These are all compared to the existing single species reference points. It is possible that some future CFP might use Multispecies reference points.

NORTH SEA GREEN MODEL



Spawning Stock Biomass (SSB) and Total biomass

