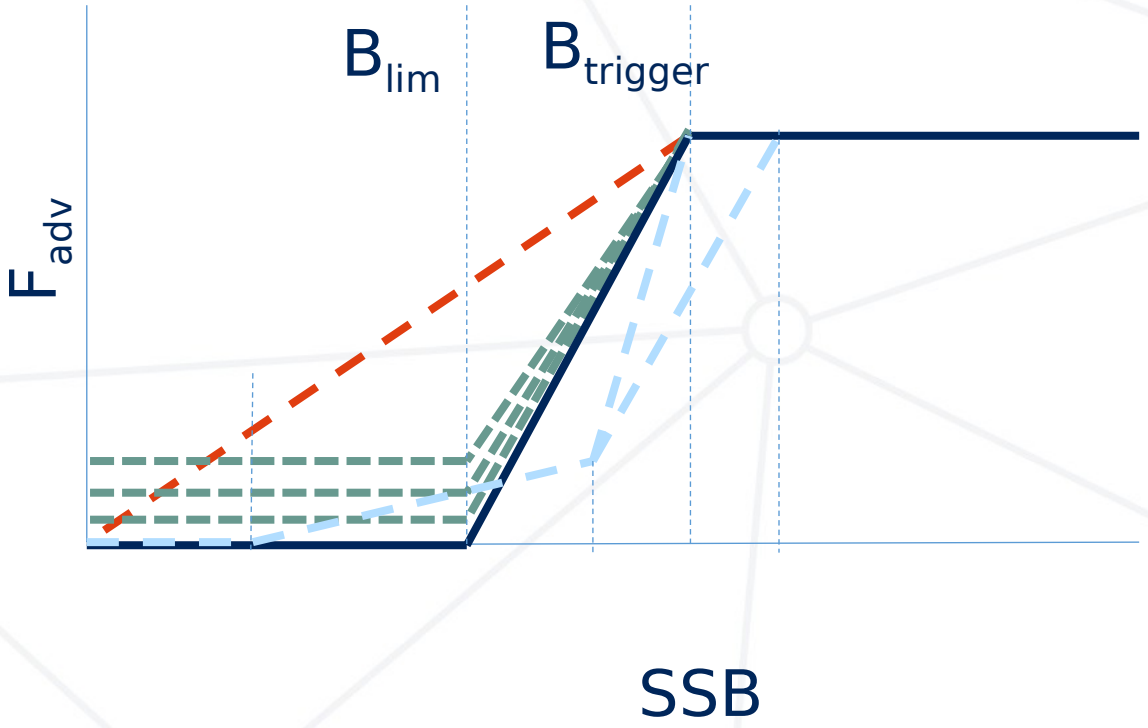
Simulation tool to evaluate Rebuilding Plans ... and define Reference Points

ICES
CIEM
Science for sustainable seas

Harvest Control Rules

- Rebuilding plans are based on fishing mortality (F_{adv}).
- F_{adv} depends on SSB level, as ICES AR, or distance of SSB to Blim/MSYBtrigger.
- Interesting to constraint the catch advice to reach certain SSB level at the end of the advice year ($SSB_y <= SSB_{y+1}$ or $SSB = Blim/B_{???}$) for example.
- A HCR that is a combination of $HCR_{RecPlan}$ and HCR_{MSY}. HCR_{MSY} after *K* years with $p(SSB>B_{lim})$ >95% | $p(SSB>B_{trigger})$ > 95%.



Performance Indicators.

- T_{MIN}*:* the time taken for the stock to rebuild with zero fishing to above Blim, or the agreed rebuilding target with 95% probability, or other level of probability depending on the state of depletion of the stock.
- T_{MAX}*:* the maximum amount of time for rebuilding the stock, is usually specified by managers/requesters but could be expressed as x* T_{MIN} with x > 1.
- T_{MIN} *and* T_{MAX} are use as for the comparison of the performance of management plan.
- T_{MAX} is a constraint for a Management plan to be aceptable.
- *Recovery criteria:*
  - p(SSB>Blim) > 95% for *K* number of years.
  - P(SSB>Btrigger) > 95% for *K* number of years.

Operating model

- Uncertainty conditioning with some default options, like in *eqSim.*
- Option where the user can use whatever she wants (two different functions, conditioning & simulation).
- Several SR models, including steepness parameterization (√, available).

Management Procedure

- *Time lag* between assessment and advice.
- *Observation errors:* Not a default option, not a priority.
- *Full feedback:* Not a default option, not a priority.
  Having the option to call to ‘something’ that returns an FLStock could be good but it would be neccesary to simulate data (índices) (not a priority).
- *Short cut:* Option to modify the ‘real’ FLStock to account for bias in the assessment coming from retrospective or ohter sources. There is something on eqSim.
- *Implementation error*: A multiplier to account for over-shoot/under-shoot of the TAC whatever the reason.