Craig’s notes when looking into the IBM

Code flow and structure

The class responsible for defining agents and their characteristics are defined in fishes.hpp

There are two C++ classes defined in this source file **Fish** and **Fishes**

Current Model dimensions

Region, Sex, Ages, Lengths

TODO – add lat and long for preference function

Fish

**Attributes**

Home region

Time of birth

time of death

Sex

growth parameters

current length

current age

maturity

current region

tag

**Accessors**

which just return attribute information

if this fish dead? How heavy is it etc

**Prcocesses**

This class is also responsible for moving

Fishes

responsible for the population of ‘Fish’

**Population functions**

responsible for Creating fishes

seed initial population in initialisation phase

Calculate spawning biomass

Recrutiment

Writes to file outputs

Sequence in annual time step

-Ageing (this is implicit, age = current\_year – birth\_year) this means they start at year = 0,

This will need some consideration

-Recruitment

-mortality

-growth

-maturity

-movement

-shedding

Questions as I get stuck into this beast.

Find out if the scalar object scales weight or numebers?

So the scalar is a weight conversion so numbers in the model are arbitary

**Getting down and dirty**

I have quite nailed it down yet, but I think there is an in consistency with the concept of ageing and growing.

Currently age is an implicit character of an agent, that is (current\_year – birth\_year), so in effect ageing occurs between annual cycles/time\_steps.

How ever growth occurs in the middle of dynamics, which implies an annual increment (which can be thought of as ageing), this configuration is difficult to allign with an age based CASAL model. What I propose is we add an explicit age characteristic and increment in in the growth dynamic, thus alligning these two concepts.

IBM dynamics

* ageing (implicit)
* Calculate spawners – age based process (onotgenetic Maturity)
* Calculate recruits
* M
* Growth
* maturtation -> this is when we calcualte if they are mature or not.
* movement
* shedding
* Tag releases
* F + tag scanning

Comparable models

* I have added age based selectivity’s for testing purposes.
* In order to line up time frame I have started the IBM in 1899 and set catches to zero, why this is important is that because the IBM starts recruitment at age 0 and the casal2 starts at age 1 then there needs to be an offset, and there would forever be an inconsistency for that first year of catch which CASAL would not do like the IBM. You could have started casal2 in 1901 but I and set catch = 0 in 1900 in the IBM but much to there own.
* Because the way casal2 associates Derived quantities with mortality blocks I had to add an extra time step essentially a null time step so that it could calculate SSB’s before applying ageing. Perhaps a better way to go about this but that is currently what I am settling for.
* You also want to have to set growth props = 1 for that null time step because it you haven’t aged yet but in the IBM they have the accrued growth as if you have aged. The reason this is annoying is because Casal2 calculates SSB on the fly age->length->weight, where as the ABM does an age based maturity process and so they just sum up the mature partition lengths->weight and don’t worry about age in the weight calculation, this makes the timing of ageing significant. A cheeky subtlety.
* The other thing I did, was make the plus group further in the Casal2 model. This was important because your k, and L\_inf and t0 meant the growth curve never reached l\_inf for the plus group so Casal2 would always underweight the plus group, whereas the ABM kept growing fish up until L\_inf.