ICM

* Good Fits
  + ICES-AFWG\_NEA1-2\_Melanogrammus\_aeglefinus
    - Num: Table 4.13. Northeast Arctic haddock. Estimated stock numbers at age. SAM
    - AM: Table 4.7. Northeast Arctic haddock. Proportion mature at age
    - NM: Table 4.14. Northeast Arctic haddock. Estimated natural mortalities M.
    - WA: Table 4.6. Northeast Arctic haddock. Stock weights at age (kg).
    - Catch: Table 4.4. Northeast Arctic haddock. Catch numbers at age (numbers, ´000)
    - FM: Table 4.12. Northeast Arctic haddock. Estimated fishing mortality at age.
    - BM, SSB: NA
  + NEFSC-SAW\_GOM\_Gadus\_morhua
    - To do, if still struggling with bad stocks
  + NEFSC-GARMIII\_SNE- MA\_Limanda\_ferruginea
    - To do, if still struggling with bad stocks
  + ICES-WGNSSK\_NS 4-7d,20\_Gadus\_morhua
    - Num: Table 4.9. Cod in Subarea 4, Division 7.d and Subdivision 20: SAM final run estimated population numbers at age (start of year; thousands).
    - AM: Table 4.5a. Cod in Subarea 4, Division 7.d and Subdivision 20: Proportion mature by age-group
    - NM: Table 4.5b. Cod in Subarea 4, Division 7.d and Subdivision 20: Natural mortality by age-group
    - WA: Table 4.3c. Cod in Subarea 4, Division 7.d and Subdivision 20: Catch weights at age (kg), also assumed to represent stockweights-at-age.
    - Catch: Table 4.10. Cod in Subarea 4, Division 7.d and Subdivision 20: SAM final run estimated total removals at age (including catches due to unaccounted mortality; thousands).
    - FM: Table 4.8. Cod in Subarea 4, Division 7.d and Subdivision 20: SAM final run estimated fishing mortality at age.
    - BM, SSB: NA
  + ICES-WGCSE\_CS7e-k\_Gadus\_morhua
    - Num: Table 9.9. Cod in Divisions 7.e–k. Final XSA stock number-at-age
    - AM, NM: Could not find AM table or NM (assume taken from text, assume this is fine since this stock worked)
    - WA: Table 9.4. Cod in Divisions 7.e–k. Stock weight-at-age =1st quarter values
    - FM: Table 9.8. Cod in Divisions 7.e–k. Final XSA fishing mortality-at-age.
    - Catch: Table 9.2a. Cod in Divisions 7.e–k. Landings number-at-age (in thousands) (note: 2011 values represent actual catch) - InterCatch outputs
* Bad Fits
  + ICES-AFWG\_DEEP1-2\_Sebastes\_mentella
    - Num: Table 6.20: S. mentella in subareas 1 and 2. Population matrix with numbers-at-age (in thousands) for each year and separable fishing mortality coefficients for the demersal and pelagic fleet, by year (Fy) and age (Sa). Numbers are estimated from the statistical catch-at-age model.
    - AM: Table 6.19: Proportion of maturity-at-age 5 - 30 in Sebastes mentella in Subareas 1 and 2 derived from Norwegian commercial and survey data. The proportions were derived from samples with at least 5 individuals. a50, w1 and w2 are the annual coefficients for modelled maturity ogives using a double half sigmoid of the form 0.5 ((1+tanh(age- a50)/w1)) for age < a50 and 0.5 ((1+tanh(age- a50)/w2)) for age > a50. a50 equals the age at 50% maturity.
    - NM: assumed natural mortality of M = 0.05 (page 300, 2017 doc)
    - WA: Table 6.7. S.mentella in Subareas 1 and 2. Weights at age (kg). **But ages 0-6 are missing (they are in OUR dataset, but I haven’t found the corresponding values in reports)?**
    - Catch: Table 6.6. S. mentella in Subareas 1 and 2. Catch numbers-at-age 6 to 18 and 19+ (in thousands) and total landings (in tonnes). For the period 2012-2016 age data is missing from the pelagic fishery. For the period 2015-2016, age data is missing from all fisheries. The numbers-at-age have been estimated following the method outlined in section 6.2.2. **Ages 2-6 have zeros, but maybe they should be NA?**
    - FM: **FM columns were empty. Entered F values for appropriate ages from:** Table 6.21. Stock summary for S. mentella in subareas 1 and 2 as estimated by the statistical catch-at-age model.
    - BM, SSB: NA
  + ICES-WGNSSK\_NS 4-6a-20\_Melanogrammus\_aeglefinus
    - Num: Table 8.2.10. Haddock in Subarea 4, Division 6.a and Subdivision 20: Numbers-at-age data (thou-sands) for IBC. Ages 0–7 and 8+ are used in the assessment. **Wrong table used for early years. Use following table only. I deleted earlier years**! Table 8.3.4. Haddock in Subarea 4, Division 6.a and Subdivision 20: Estimates of stock numbers at age (thousands) from the final TSA assessment. Estimates refer to January 1st, except for age 0 for estimates refer to July 1st. \*TSA estimated survivors
    - AM: Maturity is assumed to be fixed over time and knife-edged at age 3 (that is, all fish aged 0–2 are assumed to be immature, all fish aged 3 and older are assumed to be fully mature)
    - NM: Table 8.2.16. Haddock in Subarea 4, Division 6.a and Subdivision 20: Estimates of natural mortality from the most recent key run of SMS (ICES-WGSAM 2014).
    - WA: Table 8.2.11. Haddock in Subarea 4, Division 6.a and Subdivision 20: Mean weight at age data (kg) for total catch. Ages 0–7 and 8+ are used in the assessment.
    - Catch: Table 8.2.6. Haddock in Subarea 4, Division 6.a and Subdivision 20: Numbers at age data (thou- sands) for total catch. Ages 0–7 and 8+ and years 1972–2016 are used in the assessment.
    - FM: Table 8.3.3. Haddock in Subarea 4, Division 6.a and Subdivision 20: Estimates of fishing mortality at age from the final TSA assessment. Estimates refer to the full year (January–December) except for age 0, for which the mortality rate given refers to the second half-year only (July–December). The 2017 estimates (\*) are TSA forecasts
    - BM, SSB: NA
  + DFO\_4T\_Scomber\_scombrus
    - Num: Table 10. Population at age (’000) on January 1st of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes).
    - AM: Table 6. Proportions of maturity-at-age of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes). Proportions were calculated from commercial samples collected in June. Given the absence of data, the proportions from 1974 were applied to the years 1968-1973.
    - NM: natural mortality, set to 0.20 (page 2)
    - WA: Table 3. Weight (kg) of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes)
    - Catch: Table 1. Catch-at-age (’000) of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes).
    - **BM:** Table 4. Catch-at-age biomass (t) of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes). **(Should it be this instead? Table 12. Total biomass (t) at age of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes).)**
    - FM: Table 11. Fishing mortality at age of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes).
    - SSB: Table 13. Spawning biomass (t) at age of Atlantic Mackerel in NAFO subareas 3 and 4 from 1968 to 2011 (numbers in bold and underlined represent abundant year-classes).
  + DFO\_4T-4VN\_Gadus\_morhua
    - Num: Table 16a: Beginning of the year population abundance (thousands) by age for the southern Gulf of St. Lawrence cod stock from the VPA model (1971-2015)
    - AM: Table 13: Maturity ogives (proportion mature at age) used in the calculation of spawning stock biomass of southern Gulf of St. Lawrence Atlantic cod. Ogives are shown only for years in which the ogive changes.
    - **NM: Could not find origin of natural mortality values, but they must exist somewhere?**
    - WA: Table 7: Mean weight (kg) at age of southern Gulf cod from research vessel surveys, 1960-2014. Data from 1960 to 1970 are from non-stratifiedrandom surveys
    - Catch: Table 4: Landings at age (numbers, 1000s) of southern Gulf of St. Lawrence cod, 1971-2014. The table includes landings in 4T, 4Vn (Nov.-Apr.), and 4Vs (Jan.-Apr.)
    - BM: Table 14a: Beginning of the year population biomass (t) by age for the southern Gulf of St. Lawrence cod stock from the VPA model (1971-2015). Biomass for ages 3+, 5+ and spawning stock biomass (SSB) are also shown. For 2015, the SSB is calculated based on age 2 abundance in 2015 set equal to the average of the estimates for 2012-2014
    - FM: Table 15a: The instantaneous rate of fishing mortality for the southern Gulf of St. Lawrence cod stock from the VPA model, 1971 to 2014.
    - SSB: NA (but may be in table 14A above?)
  + AFSC\_EEBSAI\_Limanda\_aspera
    - Num: Table 4.18 – Model estimates of yellowfin sole population numbers at age (billions) for 1954-2017. **Females only in our table.**
    - AM: Table 4.10 – **Female** yellowfin sole proportion mature at age **(Combined column)**
    - NM: Natural mortality value in table on page 1 (739). Also on page 9 (747): A natural mortality value of 0.12 is used for both sexes in the base model presented in this assessment.
    - WA: Table 4.9 – Mean length and weight at age for yellowfin sole (unsmoothed). **Females only!**
    - **Catch: cannot find origin of these data. The docs contain catch at age proportions, but applying the proportions (multiplying tonnes by proportions) does not result in these totals. The tables are also split by male and female. Catch-at-age proportions are table 4.4.**
    - FM: Table 4-14. Model estimates of annual average fishing mortality for **male and female** yellowfin sole. **(Females used in table)**