**Monday, November 13, 2017**

1. [Collinearity among survey time-series](https://github.com/ices-eg/mgwg/wiki/Collinear-surveys) (N Hintzen)

* Problem not clear because multiple survey series not explanatory variables, as in a regression. Different surveys are independent observations. (C. Berg)
* There may be collinearity to be concerned with if different surveys share process errors, but probably needs to be better fleshed out before we can proceed (D. Hart).

1. [Appropriate level of model complexity](https://github.com/ices-eg/mgwg/wiki/Complexity)

* Perhaps tie into appropriateness of production models. L. Brooks has done some work, and results suggest relative stock status similar, but scale different and projections very different. Accounting for age structure, recruitment lags, selectivity, etc. may be necessary, implying death of surplus production whenever possible.
* Perhaps difficult to draw general conclusions (D. Hart).
* Prediction ability of models should also be considered. Matching time series estimates not enough (A. Nielsen).
* Maybe check with Brodziak.

1. [Data-limited stock assessment](https://github.com/ices-eg/mgwg/wiki/Data-limited)

* Lots of work ongoing in truly data-limited situations, but…
* What happens when data-rich stock assessment gets rejected because of poor diagnostics and then the fall back plan is a data-limited option? The data-rich assessment fails because of inconsistent data, but then you throw away information to use data-poor? Is data-poor better than bad diagnostics in data-rich? This may be where a research gap exists (Legault, Hart).
* Pressure to always provide TAC, which seems to force advice when poor data may preclude providing such advice.
* Still many ad hoc approaches that may benefit from evaluation (Craig).

1. [Incorporating data uncertainty](https://github.com/ices-eg/mgwg/wiki/Data-uncertainty) (N Cadigan)

* Ageing error
* Sampling error/covariance of observations
* Inputting annual survey (catch) CVs versus estimating observation variance as in state-space. Costs and benefits of each approach? Could you use something like annual CVs as a relative weight of observations among years. (Anders). Check recent CAPAM meeting on data weighting.
* If you have information on relative weights among years then you should likely use it, but still estimate some amount of observation variance (Anders, Berg).
* Inputting empirical weights at age and some other data sources are often assumed known without error, but estimating these may change imprecision estimates (T. Miller).

1. [Fitting models to unaggregated data](https://github.com/ices-eg/mgwg/wiki/High-resolution)

* We could be fitting models to individual observations (at an extreme to fish by fish observations) as opposed to some annual mean. Could also incorporate spatial observations rather than combine among space.
* GADGET modelers are doing some of this, modeling station by station observations (Arni). SS can do conditional length at age, which is a type of less aggregated data.
* Does all data need to be disaggregated to same scale (Brooks)? If survey data can be precisely recorded in space and time, does that help if fishery data cannot be resolved at that same level?

1. [Fitting models to length data](https://github.com/ices-eg/mgwg/wiki/Length-data)

* Maybe worthwhile just because some processes are length-based (Hart).
* Ono et al. 2015 ICES JMS for a relevant paper.

1. [M in a state-space assessment model](https://github.com/ices-eg/mgwg/wiki/M-process-error) (N Cadigan)

* Often need extra information (tagging; Anders)? Requires well-designed tagging data (Hart) so not confounded with tagging mortality, etc.
* No need to constrain to state-space.
* Kelli J. has done some work on this. Time and age invariant. (ICES 2015).
* Maunder et al. have done some too (2011), with comment by Francis (i.e., Maunder was estimating M and fixing steepness).
* If M does not change through time, but you model time varying M, does that permit M to account for other mis-specification.
* Necessity of contrast in scale and among years between F and M (Arni)?
* See also Deroba and Schueller 2013 Fisheries Research.

1. [Methods to evaluate MPAs](https://github.com/ices-eg/mgwg/wiki/MPA) (R Hilborn)

* Should focus on methods of accounting for MPAs as opposed to case studies about their effectiveness (Arni).
* MPAs result in violation of spatial homogeneity (Hart). Several papers on this (Hart, McGilliard). Can’t use fishery CPUE data because it not longer reflects average N (no samples in MPA; Hart). Could you use fleets as areas approach to account for this heterogeneity (Deroba)?
* MPAs beneficial only if areas outside MPAs is heavily fished. If fishing not heavy outside MPA then MPA adds nothing.
* Consequences of movement rates (Deroba)?
* Is the question about their effectiveness for management or how to deal with them in assessments?
* Literature is complete garbage on this topic (D. Hart). Perhaps review literature and write a critique and suggestions (Arni).

1. [Management strategy evaluation](https://github.com/ices-eg/mgwg/wiki/MSE)

* This is a tool that can be used to evaluate some aspect of assessment methods, but is not likely needed as a focus itself (Deroba, Gaichas, et al.).
* Uninteresting until we understand the predictive ability of models (Anders).

1. [Online stock assessment environments](https://github.com/ices-eg/mgwg/wiki/Online-environment)

* Intended for data repository or potential software repository. Increases transparency and duplicity.
* Stockassessment.org as an example. NEFSC SASINF as an example (Legault).
* Useful for tracking source code and accounting for who did what and when (Anders).
* Is there something that is relevant here for this WG, or is this better left to individuals or their institutions?

1. [Profile diagnostics and likelihood](https://github.com/ices-eg/mgwg/wiki/Profile-and-likelihood) (N Cadigan)

* Different platforms may give different profile results (e.g., suggest different optimal Ms), and so exploring what profiles suggest may be interesting (Deroba).
* Difficult in state-space because Laplace approximation integrates over all data sources and so can’t do “Piner” plot where the likelihood for each data source is examined. Might be able to be resolved, however (Anders).
* Both total likelihood profile or individual data source likelihoods (Piner) could be examined (some complication with state-space, see above).
* Are there problems with traditional likelihood profile approach, for example, to inform uncertainty in a given parameter (K. Johnson; Miller)?

1. [Spatial smoothing of catch and survey data](https://github.com/ices-eg/mgwg/wiki/Spatial-smoothing)

* Individual observations could be run through a spatial model (perhaps accounting for spatial covariance) in assessment model fit.
* Thorson’s spatial method claims to provide more accurate measures of precision from US west coast rockfish trawl surveys. The efficiency gain, however, was not huge and may not be generalizable (Hart).
* This issue crosses over into survey design and another WG may be on this one.

1. [Spatially explicit stock assessment](https://github.com/ices-eg/mgwg/wiki/Spatial-assessment) (JJ Poos)

* NOAA group working on this: data type, quality, and quantity effect on ability to estimate spatial quantities and movement; mis-specified boundaries; mis-specified stock structure. (Deroba). Might make code and documentation public, but far off.
* Could address MPAs via this type of work.
* Alternative methods to “box style” movement (Craig) we typically do in these models?
* The more dis-aggregate the noisier the data and that my limit our spatial abilities (Knut).
* Dvora suggests essentially continuous space spatial simulation model.
* Hoki is a two region two stock model.
* Johnson has done spatially standardized survey indices. Thorson and Berg both have packages to do this.

1. [State-space vs. traditional models](https://github.com/ices-eg/mgwg/wiki/State-space) (T Miller)

* Needs to be honed into specific questions, likely examining systematic differences in behavior (Miller).
* Expertise in room to do something here and likely should.

1. [Internal vs. external stock recruitment](https://github.com/ices-eg/mgwg/wiki/SR-estimation) (N Cadigan)

* External estimates often don’t use same underlying SR structure as assessment model, which will create bias.
* RAM database doesn’t document the SR curve of assessment model or the legacy database uses mostly VPA, which is no better.
* ICES often does this, but focus usually on Blim as opposed to steepness; does this matter (Brooks, Arni).

1. [Evaluating uncertainty](https://github.com/ices-eg/mgwg/wiki/Uncertainty)

* Arni published a paper on this.
* MCMC, bootstraps, etc., are all conditioned on a model, but how to use model uncertainty (Legault)?
* How are measures of uncertainty used (by managers) throughout the world? Is it ignored? MAFMC essentially ignores our quantitative measures, but ICES is using some aspect of the uncertainty distributions in management quantities (Deroba, Arni, Knut).
* Harvest rules in ICES often don’t use measures of uncertainty, however (Arni). Just plug-in point estimate.

1. [Stock recruitment cyclic dynamics for small pelagics](https://github.com/ices-eg/mgwg/wiki/sr-smallpelagics) [(E Jardim)](https://github.com/ices-eg/mgwg/wiki/Uncertainty)

* Need Ernesto here to elaborate
* Great variance in recruitments, challenges to predicting recruitments
* How to simulate the process rather than dealing with it in management strategy. L. Brooks' interpretation of the suggestion.
* Negatively correlated recruitment process when there is cyclic recruitment?

1. [Missing data/short term forecast best practices](https://github.com/ices-eg/mgwg/wiki/data-imputation) (E Jardim)

* Seems specific to non-state-space models where some catch information is needed in each year.
* Data asynchrony a problem also for king crab in Chile

1. [Retrospective patterns and process variability](https://github.com/ices-eg/mgwg/wiki/Retrospective) (A Nielsen)

* Are state-space models helpful for dealing with/understanding source of model mis-specification.
* Felipe-Hurtado et al.: wrong fix to retro gives bad catch advice.
* North Sea cod: catch multiplier estimated to extra catch. Not for retro.
* Could be sub-item of comparison of state-space and traditional SCAA models.
* There was once a competition with simulated data to determine the source of model-misspecification.

1. Selectivity

* Can we inform optimal selectivity for meeting different fishery objectives?
* Why are some fisheries using sub-optimal selectivity (Hart’s scallop ITQ example)?