DLM Workshop outro

Data-limited methods: General rules/thoughts

- Understanding life history is critical
  - High sensitivity to natural mortality
  - Maturity is a critical reference point
  - Data-borrowing, empirical methods may help
- Selectivity should be understood and not ignored
  - Beware how it is assumed in any given DLM
- Difficult inputs many methods demand:
  - Stock status: allows catches to be interpreted relative to productivity
  - Abundance: gives scale for catch estimation
  - Identify sensitive inputs for each method

Data-limited methods: General rules/thoughts

- Reporting uncertainty is essential
  - Parameter bias and precision
  - Among model variation
    - Beneficial to look across many methods, but
    - Integrated frameworks (e.g., SS) worth consideration
- Risk tolerance (e.g., catch quantile) should be considered when translating uncertainty
  - May create incentive to gather more data
- Risk analysis (e.g., PSA): prioritize stocks & data collection
  - Consider doing this for all stocks
  - Can help establish status

Data-limited methods: General rules/thoughts

- Reference points help interpret status (effort (F); abundance (biomass))
- Harvest control rules (HCRs) link DLM to management
  - Often lacking
  - Need to be thought through
- Testing method can identify most useful methods/HCRs
  - Management Strategy Evaluation (MSE)
    - Start simple and build complexity
    - Sensitive to operating model specification
    - Defining performance metrics is key
  - Best Available Scientific information (BASI) approach
    - Sensitive to "truthiness" of stock assessment
    - Consider adding DLM to any stock assessment

Data-limited methods: General rules/thoughts

- DLM frameworks
  - Decision support systems (e.g., FishPath) can identify most relevant options
  - Promotes stakeholder involvement
- Create your own methods!
  - But if you do, try to make it accessible (code; app)
  - Link it to a HCR so management can use it
- Data/resource limitations are not going away
  - Still need to provide management advice
  - Always consider how to incentivize data collection

What methods/approaches provide

- Risk Analysis: An idea of where you are at (overfishing and possibly stock status). Could identify which DLMs to use.
- Indices (abudance; effort): Used directly in management procedures/HCRs.
- Fishing rate: Can be used to give rate reference point. Need abundance to give you catch. Need HCR.
- Catch estimates: Output control only. Need HCR.
- Testing methods: Which methods best under specific conditions (MSES); which methods approximate stock assessments (BASI)?

Data-limited methods: Tools

- Natural mortality tool Shiny app (weblink and code)
- Productivity-Susceptibility Analysis (PSA module)
- YPR/SPR calculator (Excel spreadsheet)
- DLMtool Shiny app, R code and weblink
  - TAC estimator
  - MSE
- LBSPR (weblink)
- Simple Stock Synthesis (SSS) example (.exe)
- DLM websites and resources
- Others
  - CARE
  - RAPFISH