Stock SMART Data Dictionary, 8/27/20

Report Output Fields

Assessment Summary Data Report (alphabetical order)

Abundance Data – Used for assessments completed in FY2018 and earlier, this is a categorical classification of the level of abundance data supporting the assessment (as defined in the 2001 Stock Assessment Improvement Plan). This field is similar to the Abundance Input Data field currently used, but the categories differ:

0. No abundance data
1. Relative abundance index from fishery catch per unit effort or an imprecise, infrequent survey. Another Level 1 situation would be a single survey from which an estimate of absolute abundance has been made. At this low level of information there will only be a limited ability to track changes in stock abundance because of uncertainties in the calibration of the index, or a high level of noise in the data relative to the magnitude of the expected changes in stock abundance.
2. Precise, frequent surveys with age composition will provide more accurate tracking of changes in stock abundance and the associated age composition data will enable better estimation of historical and current levels of recruitment.
3. Research surveys with known or estimated catchability, acoustic surveys with known or estimated target strengths, and statistically-designed tagging studies can provide estimates of absolute abundance. This is especially valuable when the time series of the survey is so short that no trend is detectable.
4. Habitat-specific surveys refine the concept of stratified random surveys so that survey results are more closely associated with particular habitats. The result is improved knowledge of the relationship between fish assemblages and habitat features. In addition, these surveys use alternative methodologies to extend survey coverage into all relevant habitats.

Abundance Input Data – Categorical classification describing the availability of abundance data for use in the stock assessment, based on the data actually used in the final version of the assessment model. The classification system for assessments completed in FY2019 and later is described in *Implementing a Next Generation Stock Assessment Enterprise* (see Appendix A; NOAA, 2018):

0. No indicator of stock abundance or trend in stock abundance over time
1. Fishery-dependent catch rates (CPUE) are available, but high uncertainty about their standardization over time; or expert opinion on degree of stock depletion over time
2. Fishery-dependent catch rates (CPUE) are sufficiently standardized to enable their use in full assessments; data from fishery-independent sources are not available or sufficient to estimate abundance trends
3. Limited fishery-independent survey(s) provide estimates of relative abundance; however, the temporal or spatial coverage of the stock is limited or the sampling variability is high
4. Complete fishery-independent survey(s) provide estimates of relative abundance, and the survey(s) cover a large proportion of the spatial extent of the stock with several years of tracking at a level of precision that supports assessments

5. Calibrated fishery-independent survey(s) or tag-recapture provide estimates of absolute abundance

Assessment Frequency – Used for assessments completed in FY2018 and earlier, this is a categorical classification of how frequently the stock is assessed as defined in the 2001 Stock Assessment Improvement Plan:

0. Never – An assessment has never been conducted
1. Infrequent – The most recent assessment was conducted more than three years ago
2. Frequent or Recent – The most recent assessment was conducted within the last three years but is not conducted annually
3. Annual or More – Assessments are conducted at least annually

Assessment Level – Used for assessments completed in FY2018 and earlier, this is a categorical classification of the complexity of assessment methods used to complete the assessment (as defined in the 2001 Stock Assessment Improvement Plan). This field is similar to the Model Category field currently used, but the categories differ:

1. Either:
    a. A time series of a (potentially-imprecise) abundance index calculated as raw or standardized CPUE in commercial, recreational, or survey vessel data, or
    b. A onetime estimation of absolute abundance made on the basis of tagging results, a depletion study, or some form of calibrated survey
2. Simple equilibrium models applied to life history information; for example, yield per recruit or spawner per recruit functions based on mortality, growth, and maturity schedules; catch curve analysis; or length-based cohort analysis
3. Equilibrium and non-equilibrium production models aggregated both spatially and over age and size; for example, the Schaefer model and the Pella-Tomlinson model
4. Size, stage, or age structured models such as cohort analysis and untuned and tuned VPA analyses, age-structured production models, CAGEAN, stock synthesis, size or age-structured Bayesian models, modified DeLury methods, and size or age-based mark-recapture models
5. Assessment models incorporating ecosystem considerations and spatial and seasonal analyses in additional to Levels 3 and 4. Ecosystem considerations include one or more of the following:
    a. One or more time-varying parameters, either estimated as constrained series, or driven by environmental variables
    b. Multiple target species as state variables in the model, or
    c. Living components of the ecosystem other than the target species included as state variables in the model

Assessment Model – Name of the model software package used to complete the final version of the assessment.

Assessment Month – The month of the assessment; as with Assessment Year, this is the month in which the assessment was finalized.

Assessment Type – Stock assessments may be completed using a range of approaches and techniques and at varying levels of effort and complexity. The document *Implementing a Next Generation Stock Assessment Enterprise* (NOAA, 2018) provides classification categories for

assessments completed in FY2019 and later to offer a consistent language for the types of assessment analyses conducted:

- *Research Stock Assessment*: Development or revision of a stock assessment data type or method, typically subjected to the regional assessment review process.
- *Research/Operational Stock Assessment*: Occasionally, when the stock assessment activity produces both a substantial revision to the assessment method and the new method is applied to provide management advice, the activity would be labeled as both a research assessment and an operational assessment.
- *Operational Assessment*: Analyses conducted to provide scientific advice to fishery managers with particular focus on determining stock status and recommending catch limits. Within the range of operational assessments will be first-time applications of previously researched methods ("new" or "benchmark" assessments); applications with updated data streams and minor revisions to methods within the scope of previously researched themes; and applications that simply update the model with the most recent data.
- *Stock Monitoring Update*: Methods used to provide stock-level advice to fishery managers between stock assessments. These analyses include catch-only updates used to develop new catch advice (e.g. "partial updates"). Stock monitoring updates include no changes to the methods or data series (just updated catch data).

Assessment Year – The year of the assessment, the date reflects when the assessment is considered final (i.e. when it completes its scientific review).

B Basis – Basis for the biomass estimate, if available.

B Unit – Unit of measure corresponding to the biomass estimate, if available; any terminal year adjustments due to retrospective bias patterns are noted here.

B Year – Year of the biomass estimate, if available.

B/B_{limit} – Ratio of current biomass and the overfished level recommended in the assessment.

B/B_{MSY} – Ratio of current biomass and the abundance supporting the maximum sustainable yield.

Biological Input Data – Categorical classification for assessments completed in FY2019 and later describing the availability of biological/life history data for use in the stock assessment, based on the data actually used in the final version of the assessment model. The classification system is described in *Implementing a Next Generation Stock Assessment Enterprise* (see Appendix A; NOAA, 2018):

0. No life history data
1. Estimates of most life history factors not based on empirical data; instead derived using proxies, meta-analyses, borrowed from other species, or without scientific basis
2. Estimates of some life history factors based on stock-specific empirical data, but at least one derived using life history proxies, meta-analyses, borrowed from other species, or without scientific basis. Generally supports data-poor assessments that use life history information
3. Estimates of most life history factors based on stock-specific empirical data
4. Data are sufficient to track changes over time in at least growth

5. No major gaps in life history knowledge, including detailed stock structure, spatial and temporal patterns in natural mortality, growth, and reproductive biology

B_{limit} – The recommended biomass limit from the assessment, below which the stock would be considered to be overfished.

B_{limit} Basis – Basis for the recommended biomass limit, if available.

B_{MSY} – Estimated stock size that would, on average, produce the maximum sustainable yield when it is fished at a level equal to F_{MSY}.

B_{MSY} Basis – Basis for the estimated B_{MSY} value, if available.

Catch Data – Used for assessments completed in FY2018 and earlier, this is a categorical classification of the level of catch data supporting the assessment (as defined in the 2001 Stock Assessment Improvement Plan). This field is similar to the Catch Input Data field used for current assessments, but the categories differ:

0. No catch data
1. Landed catch provides a minimum estimate of fishery removals and is typically obtained from mandatory landing receipts. In some cases, particularly recreational fisheries, a statistical sampling program is used to expand estimates of sampled catch up to the total angling population
2. Catch size composition provides a measure of the sizes of fish being impacted by the fishery, and when tracked over time can provide an index of recruitment to the fishery and total mortality rates
3. Spatial data on catch from logbooks can provide information on range extensions and contractions, and other changes in stock or fleet distribution
4. Catch age composition requires the development of age determination techniques and an investment in the collection and processing of appropriate samples. The result is much greater stock assessment accuracy than can be obtained with size composition data alone
5. Accurate and complete data on total removals (including landed catch, discards, bycatch in other fisheries, and cryptic mortality induced by fishing gear contact) will contributed to accurate stock assessment results. An at-sea observer program can monitor total removals, cross-check logbook data, and collect site-specific biological samples. In many fisheries, the relative merits of observer programs for collecting data on total removals and/or age composition may warrant consideration before or instead of investing in a fishery logbook program

Catch Input Data – Categorical classification used for assessments completed in FY2019 and after describing the availability of catch data for use in the stock assessment, based on the data that was actually used in the final version of the assessment model. The classification system is described in *Implementing a Next Generation Stock Assessment Enterprise* (see Appendix A; NOAA, 2018):

0. No quantitative catch data
1. Some catch data, but major gaps for some fishery sectors or for historical periods such that their use in assessments is not supported
2. Enough catch data establish magnitude of catch and trends in catch for a major fishery sector in order to apply a data-limited assessment method. This includes fisheries that are closed and it is known that negligible catch is occurring.

3. Catch data is generally available for all fishery sectors to support quantitative stock assessment, but some gaps exist such as low observer coverage, high levels of self-reported catch, or weak information on discard mortality
4. No data gaps substantially impede assessment, but catch is not without uncertainty (e.g. recreational catches estimated from surveys)
5. Very complete knowledge of total catch

Citation – A complete citation for the final assessment report, including a web link if available. This field is no longer maintained for assessments after FY2018.

Common Name – Vernacular name for the species; common names displayed in Stock SMART are based on lists published by the American Fisheries Society.

Composition Input Data – Categorical classification for assessments in FY2019 and after describing the availability of size/age composition data for use in the stock assessment, based on the data actually used in the final version of the assessment model. The classification system is described in *Implementing a Next Generation Stock Assessment Enterprise* (see Appendix A; NOAA, 2018):

0. No composition data collected
1. Some size or age composition data has been collected, but major gaps in coverage, and not used in stock assessment
2. Enough size or age composition data has been collected to enable data-limited assessment approaches
3. Enough size or age composition data is collected over a sufficient time series to be informative in age/size structured assessment models
4. Enough age composition data has been collected over a sufficient time series to enable assessment methods that need age composition data from the fishery
5. Very complete age and size composition data, including, as needed on stock-specific basis, knowledge of ageing precision, spatial patterns or other issues

Ecosystem Linkage – Categorical classification for assessments in FY2019 and after describing the usage of ecosystem linkage data in the stock assessment, based on the data actually used in the final version of the assessment model. The classification system is described in *Implementing a Next Generation Stock Assessment Enterprise* (see Appendix A; NOAA, 2018):

0. No linkage to ecosystem dynamic or consideration of ecosystem properties (environment, climate, habitat, predator-prey, etc.) in configuring the assessment (i.e. equilibrium conditions assumed for ecosystem)
1. Ecosystem-based hypotheses inform the assessment model structure (e.g. defining the stock boundaries and/or spatial or temporal features) and/or are used for processing assessment inputs (e.g. abundance index), but no explicit linkage to any ecosystem drivers (environment, climate, habitat, predator-prey, etc.)
2. The assessment includes some form of variability or effect to explicitly account for unidentified ecosystem dynamic(s) (e.g. time/space "regimes", random variation, or other approaches to changing features without direct inclusion of ecosystem data)
3. One or more assessment features is linked to a dynamic (i.e. data) from at least one of the following categories: environment, climate, habitat, predator-prey data (e.g. covariate)
4. The assessment model is linked to at least one ecosystem dynamic, and one or more process studies directly support the manner in which environmental, climate, habitat,

and/or predator-prey dynamics are incorporated (e.g. consumption rates measured and covariate informed by results)

5. The assessment approach is configured to be coupled or linked with an ecosystem process (e.g. multispecies, coupled biophysical, climate-linked models)

Estimated B – Best available point estimate of current biomass (B) from the final, accepted version of the stock assessment.

Estimated F – Best available point estimate of fishing mortality (F) from the final, accepted version of the stock assessment.

F Basis – Basis for the fishing mortality estimate, if available.

F Unit – Unit of measure corresponding to the fishing mortality estimate, if available; any terminal year adjustments due to retrospective bias patterns are noted here.

F Year – Year of the fishing mortality estimate, if available.

F/F_{limit} – Ratio of current fishing mortality and the overfishing threshold recommended in the assessment.

F/F_{MSY} – Ratio of current fishing mortality and the estimate of fishing mortality at MSY.

F/F_{target} – Ratio of current fishing mortality and the target fishing mortality rate recommended in the assessment.

F_{limit} – The recommended fishing mortality limit from the assessment, above which the stock would be considered to be experiencing overfishing.

F_{limit} Basis – Basis for the recommended fishing mortality limit, if available.

F_{MSY} – The estimated fishing mortality rate that, on average, would produce the maximum sustainable yield from a stock at B_{MSY}.

F_{MSY} Basis – Basis for the estimate of F_{MSY}, if available.

Final Assessment Report – A link, when available, to a PDF of the final report for the stock assessment.

FMP – The Fishery Management Plan the stock is managed under.

FSSI Stock? – Is this stock included in the Fish Stock Sustainability Index (FSSI)? The FSSI is a quarterly index used by NOAA Fisheries to measure the performance of U.S. federal fisheries. The FSSI includes fish stocks selected because of their importance to commercial and recreational fisheries.

F_{target} – The target fishing mortality rate recommended from the assessment.

F_{target} Basis – Basis for the recommended target fishing mortality rate, if available.

ITIS Taxonomic Serial Number – A unique, persistent, non-intelligent identifier for each species used in the Integrated Taxonomic Information System.

Jurisdiction – The Fishery Management Council (FMC) or other group (e.g. Regional Fishery Management Organization) responsible for management of this stock.

Last Data Year – The most recent year of data included as input in the assessment analyses. The final year of time series data for the assessment may be different if projections are presented.

Lead Lab – NOAA Fisheries Science Center/Lap or outside agency with lead responsibility for the stock assessment analyses.

Life History Data – Used for assessments completed in FY2018 and earlier, this is a categorical classification of the level of life history data supporting the assessment (as defined in the 2001 Stock Assessment Improvement Plan). This field is similar to the Biological Input Data field used to categorize current assessments, but the categories are different:

0. No life history data
1. The size composition of harvested fish provides a simple index of a stock's growth potential and vulnerability to overharvesting
2. Basic demographic parameters such as age, growth, and maturity rates provide information on productivity and natural mortality
3. Seasonal and spatial patterns of mixing, migration, and variability in life history characteristics, especially growth and maturity, provides improved understanding of how a population responds to its environment
4. Food habits information defines the predator-prey and competitive relationships within the fish community, thus providing a first step towards direct estimation of natural mortality rates and ecologically-based harvest recommendations

Model Category – Categorical classification for assessments in FY2019 and after describing the type of model used to complete the stock assessment. The classification system is described in *Implementing a Next Generation Stock Assessment Enterprise* (see Table 5.1; NOAA, 2018). Categories range from 1-6 (outlined below) and focus on the population dynamics structure, data requirements, and types of management advice provided. Stock analyses that do not meet the minimum definition of one of the categories listed below likely do not qualify as a 'stock assessment' for the purposes of national assessment tracking:

1. Data-Limited (example methods: DB-SRA, DCAC, Surplus Production MSY, Egg Escapement, Mean Length Estimation)
2. Index-Based (example methods: basic linear models and time series analyses, AIM)
3. Aggregate Biomass Dynamics (example methods: Schaefer or Pella-Tomlinson Production Models (ASPIC), delay-difference models)
4. Virtual Population Analysis (VPA; example methods: VPA, Dual Zone VPA, ADAPT, VPA-2BOX)
5. Statistical Catch-at-Length (SCAL; example methods: SCALE, SS, MultifanCL, crustacean models)
6. Statistical Catch-at-Age (SCAA; example methods: SS, ASAP; AMAK, BAM; MultifanCL, CASAL)

Model Version – Version (if available) of the model software package used to complete the assessment.

MSY – Estimate of the maximum sustainable yield, or the maximum long-term average catch that can be achieved from the stock.

MSY Unit – Unit of measure for the MSY estimate.

Point of Contact – Name of the person to contact with questions regarding the assessment; this may be the lead assessment author, or a regional NOAA Fisheries stock assessment point of contact within the Science Center.

Regional Ecosystem – The U.S. Regional Ecosystem where the stock is found; the physical boundaries of regional ecosystems are based on bathymetry, hydrography, productivity, and trophic relationships. There are eight regional ecosystems defined around the coastal margins of the United States; Stock SMART adds categories for Atlantic and Pacific Highly Migratory Species.

Review Result – Describes the final results of the scientific review process:

- *Not Reviewed*: The assessment was not subject to a scientific/technical review.
- *Accept Previous Approach, Remand New Attempt*: The results of a new assessment were rejected for management use, but the review panel agrees that the previously accepted approach is still valid. In this situation, the assessment results reflect the portion of the assessment accepted for management use, not the rejected attempt.
- *Full Acceptance*: The assessment was accepted as the best scientific information available and is now available to support resource management decisions.
- *Partial Acceptance, Fishing Mortality Estimates*: The review panel determined that only the fishing mortality estimates (but not biomass estimates) from the assessment results are acceptable for providing advice to managers.
- *Partial Acceptance, Biomass Estimates*: The review panel determined that only the biomass estimates (but not fishing mortality estimates) from the assessment results are acceptable for providing advice to managers.
- *Partial Acceptance, Status Determinations Only*: The review panel determined that the assessments results may be used qualitatively to support stock status determinations, but not be used quantitatively for management.
- *Reject, Data Insufficient for Assessment*: The assessment was rejected by the review panel because data for the stock is currently insufficient to support a stock assessment.
- *Reject, Results Too Uncertain To Be Considered Adequate*: The assessment was rejected by the review panel because of high levels of uncertainty in the results.
- *Remand*: The review panel requested changes to the assessment or a re-evaluation of the assessment results.

Science Center – The NOAA Fisheries Science Center with regional responsibility for supporting management of the stock with scientific information.

Scientific Name– The binomial or Latin name for the species.

Stock Area – The name of the region or area where the stock is principally found.

Stock Name – The common name of the stock, along with the stock area where it is found.

Update Type – Used for assessments completed in FY2018 and earlier, this field describes the level of assessment effort and is analogous to the Asmt Type field used currently, although the categories differ:

- *New*: The stock has never been assessed before

- *Benchmark*: The assessment is substantially different from the previous effort (e.g. uses a new or significantly updated model, or includes new data sources), and has undergone a complete scientific review
- *Full Update*: The assessment reruns an existing and previously reviewed/accepted model with updated data to update status determinations and/or quota recommendations; only minor model changes are made and the interpretations of the results does not differ from previous iterations
- *Partial Update*: Brief summaries that include updated assessment projections using the most recent year of catch data only

Assessment Time Series Data Report

Assessment Year – The year of the assessment, the date reflects when the assessment is considered final (i.e. when it completes its scientific review).

Description – Describes the time series data.

Parameter – Describes the category of time series data presented, including:

- *Abundance:* Time series of either total or spawning stock abundance.
- *Recruitment:* Time series of recruitment into the stock, usually recruitment estimated from the assessment model, although occasionally observed or survey-derived metrics are provided.
- *Fmort:* Time series of estimated fishing mortality (not catch).
- *Catch:* Time series of catch – modeled total catch or other output estimates of catch, when available, although catch data inputs may be provided.

Stock Name – The common name of the stock, along with the stock area where it is found.

Unit – Identifies the units of the time series data, including any scale modifiers used to transform the data (e.g. million metric tons, number x 1,000).

Year – Year of the time series value.

Assessment Counts Report

Assessment Total – The total number of assessments completed in each fiscal year (beginning October and ending the following September). For the purposes of tracking performance of the assessment enterprise, assessments are tallied by region (Northeast, Southeast, Alaska, West Coast, and West Pacific) instead of by Science Center or Regional Ecosystem.

Level of Abundance Data Supporting Stock Assessments – A categorical classification of the level of abundance data supporting assessments. The classification categories changed at the end of FY2018:

- For more information on the categories in FY2018 and earlier, see Abundance Data
- For more information on the categories in FY2019 and later, see Abundance Input Data

Level of Life History Data Supporting Stock Assessments – A categorical classification of the level of life history data supporting assessments. The classification categories changed at the end of FY2018:

- For more information on the categories in FY2018 and earlier, see Life History Data
- For more information on the categories in FY2019 and later, see Biological Input Data

Level of Catch Data Supporting Stock Assessments – A categorical classification of the level of catch data supporting assessments. The classification categories changed at the end of FY2018:

- For more information on the categories in FY2018 and earlier, see Catch Data
- For more information on the categories in FY2019 and later, see Catch Input Data

Level of Size/Age Data Supporting Stock Assessments – A categorical classification of the level of size/age composition data supporting assessments. Classification for this type of input data was

not in use prior to FY2019. For more information about the categories, see Composition Input Data.

Level of Ecosystem Linkage Included in Stock Assessment – A categorical classification of the level of ecosystem linkages included in assessments. Classification for this type of data was not in use prior to FY2019. For more information about the categories, see Ecosystem Linkage.

Assessment Model Complexity – Categorical classification describing the type of model used to complete the assessment based on population dynamics structure, data requirements, and the types of management advice provided. The classification categories changed at the end of FY2018:

- For more information on the categories in FY2018 and earlier, see Assessment Level
- For more information on the categories in FY2019 and later, see Model Category

Assessment Type – Categorical classification for the type of assessment analyses conducted, based on the level of effort and complexity. The classification categories changed at the end of FY2018:

- For more information on the categories in FY2018 and earlier, see Update Type
- For more information on the categories in FY2019 and later, see Asmt Type