**BSAI Octopus 2023 Update Assessment**

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All the files and coded needed to run the assessment can be found in the ***2023*** folder.

This is a Tier 6 assessments which means it uses an alternative assessment method. This assessment used Pacific cod (P.cod) diet data to calculate the annual total octopus consumption of P.cod. Then it uses the geometric mean over all the years is to determine a conservative estimate of the total natural mortality. The total natural mortality calculations were conducted by Kerim Aydim ([kerim.aydin@noaa.gov](mailto:kerim.aydin@noaa.gov)). The results from his work can be found in ***data\user\_inputs\Kerim results***. The new total natural mortality value is found in **Predation\_Estimates\_2016a\_2023.xlsx** under the **NEW ESTIMATE 2023** section. Below is the list of steps to get the catch data, survey data and prepare the figure and tables for the SAFS file.

**Step 1: Obtaining Catch and Survey Data**

The data is pulled and organized in **2023\_analysis-LCF.R** located in the ***R*** folder.

Under the **Manual Inputs** section there are four inputs that the user needs to make decisions on.

* *query\_dat* - a True/False statement for whether you want to query the data .
  + If *query\_dat* is false, the data will be read in from the ***data/raw*** folder. In this folder the catch data is in **fsh\_catch\_data.csv** and survey data is **survey\_biomass.csv**.
* *export\_dat* - a True/False statement for whether you want to export the data and figures produced by the R code (T = export, F = don’t export).
* *pres\_pl* – a True/False statement that if True prints presentation versions of the figures. False just doesn’t produce the presentation figure versions. The figures are saved in ***figs/Presentations***.
* *year* – the current assessment year. This plays a role in many things and should be set to the current year.

The R code requires **specs.csv** located in ***data/user\_inputs*** folder. This file has the historical ABC, TAC and OFL values. These files needs to be manually updated with new values and should have ABC’s, TAC’s and OFL’s up to and including the current year. New and old values can be found here (<https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications>). From the linked page go to the desired year and click on “Bering Sea and Aleutian Islands”. Then click on the “Table 2” to get the total and area specific values.

Below is a list of files and figures produced.

Files produced and stored in ***data/raw***.

* **fsh\_catch\_data.csv** – raw catch data
* **survey\_biomass.csv** – raw survey data

Files produced and stored in ***data/output***. If the file name begins with **year** then **year** is the actual year of the assessment in number form.

* **year-** **octopus\_bts\_biomass.csv** – total biomass estimates from AI, shelf and slope surveys
* **year-** **octopus\_AI\_survey.csv** – biomass estimate by species in AI survey
* **year-** **octopus\_AI\_survey\_sub.csv** – biomass estimate by most common species in AI survey
* **AI\_species.out** – names of all species in the AI survey
* **year-** **octopus\_EBS\_shelf\_survey.csv** – biomass estimate by species in EBS shelf survey
* **year-** **octopus\_ EBS\_shelf \_survey\_sub.csv** – biomass estimate by most common species in EBS shelf survey
* **EBS\_shelf \_species.out** – names of all species in the EBS shelf survey survey
* **year-** **octopus\_EBS\_slopef\_survey.csv** – biomass estimate by species in EBS slope survey
* **year-** **octopus\_ EBS\_slope \_survey\_sub.csv** – biomass estimate by most common species in EBS slope survey
* **EBS\_slope \_species.out** – names of all species in the EBS shelf survey survey
* **year- octopus\_total\_catch\_by\_target.csv** – the total catch of octopus included the total catch by different fisheries.

Figures produced and stored in ***figs***. If the figure name begins with **year** then **year** is the actual year of the assessment in number form.

* **year-** **Octopus\_surveys.png**– Figure showing the survey biomass time series for all three surveys
* **year-** **Octopus\_catch\_specs.png**– Figure of the total catch, ABC and TAC time series.

**Step 2: Modify SARA document**

The SARA file are located in the ***SARA file*** folder under the name **OCTOPUSBSAI2023\_HQ.dat**.

The R code for updating the file is called ***2023-update\_SARA\_file\_octopus.R***. It has one manual input

* *cur\_yr* – the current year

It requires the following file from ***SARA files***

* **OCTOPUSBSAI2023\_HQ.dat**

From the ***data/output*** it requires

* **year-** **octopus\_total\_catch\_by\_target.csv** – Table with the total catch by each bycatch fleet.

From the ***data/user\_inputs***, it requires

* **specs.csv** – Table with OFL, ABC and TAC