Package 'catchfunction'

February 10, 2020

Title BSAI catch function

Version 1.6.0

Description contains function which calculates catch in BS, and one that returns TAC estimate on BS/BSAI level as appropriate.

Depends R (>= 3.3.1)

License What license is it under?

Encoding UTF-8

LazyData true

RoxygenNote 7.0.2.9000

Imports systemfit

Suggests knitr,
rmarkdown

VignetteBuilder knitr

R topics documented:

`catch_function` *Catch Function*

Description

This function predicts the BS catch for each species whose ABC is given. It is meant to work with the ACLIM bio models.

If you have any questions, please contact Amanda Faig (e-mail: amanda.faig@noaa.gov, call: X-4281).

This version last updated June 2018

Currently programmed scenarios:
Scenario 1: Status Quo (Log-Linear)
Scenario 2: Whitefish (Pollock and Cod) Political (aka TAC-setting) Preference
Scenario 3: Flatfish Political (aka TAC-setting) Preference

Scenario 4: No Fishing (will return all zeros)
Scenario 5.1: Fiddle with a single species–calculate the rest still taking the ABC of the removed sp. in to account.
Scenario 5.2: Fiddle with a single species–calculate the rest assuming the ABC of the removed sp. does not influence the sp. under the cap at all.
Scenario 5.3: Fiddle with a single species–calculate the rest assuming the ABC of the removed sp. does not influence the sp. under the cap at all and then increase the TAC of all the remaining species until the sum of the tAC = 2mmt
Scenario 5.4: Scenario 5.3, but in this case let catch range from the old predicted catch to TAC. The amount which catch improves from old predicted catch to TAC can be dialed 0 to 1 using "improvs-catchscale".

Usage

```
catch_function(
  scenario,
  Arrowtooth,
  Atka,
  Flathead,
  Greenland,
  Kamchatka,
  Northern,
  Octopus,
  OtherFlat,
  OtherRock,
  PCod,
  Plaice,
  POP,
  Pollock,
  Rock,
  Rougheye,
  Sablefish,
  Sculpin,
  Shark,
  Shortraker,
  Skate,
  Squid,
  Yellowfin,
  spptomult,
  multiplier,
  improvedcatchscale
)
```

Arguments

scenario	The economic scenario number. Current options: 1, 2, 3, 4, 5.1, 5.2, or 5.3
Arrowtooth	Optional. ABC of Arrowtooth Flounder.
Atka	Optional. ABC of Atka Mackerel.
Flathead	Optional. ABC of Flathead Sole.
Greenland	Optional. ABC of Greenland Turbot.
Kamchatka	Optional. ABC of Kamchatka Flounder.

Northern	Optional. ABC of Northern Rockfish.
Octopus	Optional. ABC of Octopus.
OtherFlat	Optional. ABC of Other Flatfish.
OtherRock	Optional. ABC of Other Rockfish.
PCod	Optional. ABC of Pacific Cod.
Plaice	Optional. ABC of Alaska Plaice.
POP	Optional. ABC of Pacific Ocean Perch.
Pollock	Optional. ABC of Pollock.
Rock	Optional. ABC of Rock Sole.
Rougheye	Optional. ABC of Rougheye Rockfish.
Sablefish	Optional. ABC of Sablefish.
Sculpin	Optional. ABC of Sculpin.
Shark	Optional. ABC of Shark.
Shortraker	Optional. ABC of Shortraker Rockfish.
Skate	Optional. ABC of Skate.
Squid	Optional. ABC of Squid.
Yellowfin	Optional. ABC of Yellowfin Sole.
spptomult	Required if running any of the 5-series scenarios. Will be discarded otherwise. Choose a species catch to override with N*ABC. Must be spelt exactly as one of the species parameters, case sensitive. Must be in quotation marks. If you want to replace more than one species, create a vector of strings (e.g. c("Arrowtooth","Atka"))
multiplier	Required if running scenario 5-series scenarios. Will be discarded otherwise. The N which will be multiplied with ABC to override the species designated by spptomult. If you are replacing more than one species, the order of the numbers corresponds to the order of the names in the spptomult string. (e.g. c(1,5) would imply the first species listed in spptomult has its catch replaced with 1*ABC_spp1 and the second is replaced with 5*ABC_spp2)
improvedcatchscale	Required if running scenario 5.4. Will be discarded otherwise. Choose the level to which catch has improved from status quo. If 0, 5.4 collapses to 5.3. If 1, Catch = TAC.

Examples

```
catch_function(1, Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
catch_function(3, Pollock = 2e6, Yellowfin = 2e5, PCod = 1e5)
catch_function(5.1, spptomult = "Arrowtooth", multiplier = 2,
                Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
catch_function(5.1, spptomult = c("Arrowtooth","Yellowfin"), multiplier = c(2,1),
                Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
catch_function(5.2, spptomult = "Arrowtooth", multiplier = 2,
                Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
catch_function(5.2, spptomult = c("Arrowtooth","Yellowfin"), multiplier = c(2,1),
                Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
catch_function(5.3, spptomult="Arrowtooth", multiplier = 2,
                Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
catch_function(5.4, spptomult="Arrowtooth", multiplier = 2, improvedcatchscale=0.5,
                Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
```

TAC_function *TAC Function*

Description

This function predicts the BSAI TAC for each species whose ABC is given.

NOTE: TAC IS BSAI FOR ALL SPECIES EXCEPT THE FOLLOWING: Pollock, Greenland Turbot, Sablefish, Pacific Ocean Perch, and Other Rockfish. This is because these are the only species for which TAC is set at the BS level, all other species are set at the BSAI level.* *Pacific Cod is the exception–it is currently set at the BS level, however this is a new change so our model at the moment does not model PCod TAC at the BS level.

Scaling it to BS is in progress.

If you have any questions, please contact Amanda Faig (e-mail: amanda.faig@noaa.gov, call: X-4281).

This version last updated Feb 2018

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Scenario 2: Whitefish (Pollock and Cod) Political (aka TAC-setting) Preference
Scenario 3: Flatfish Political (aka TAC-setting) Preference
Scenario 4: No Fishing (will return all zeros)
Scenario 5.1: Fiddle with a single species–calculate the rest still taking the ABC of the removed sp. in to account.
Scenario 5.2: Fiddle with a single species–calculate the rest assuming the ABC of the removed sp. does not influence the sp. under the cap at all.
Scenario 5.3: Fiddle with a single species–calculate the rest assuming the ABC of the removed sp. does not influence the sp. under the cap at all and then increase the TAC of all the remaining species until the sum of the tAC = 2mmt

Usage

```
TAC_function(
  scenario,
  Arrowtooth,
  Atka,
  Flathead,
  Greenland,
  Kamchatka,
  Northern,
  Octopus,
  OtherFlat,
  OtherRock,
  PCod,
  Plaice,
  POP,
  Pollock,
  Rock,
  Rougheye,
  Sablefish,
```

```
  Sculpin,
  Shark,
  Shortraker,
  Skate,
  Squid,
  Yellowfin,
  spptomult,
  multiplier
)
```

Arguments

scenario	The economic scenario number. Current options: 1, 2, 3, 4, 5.1, 5.2, or 5.3
Arrowtooth	Optional. ABC of Arrowtooth Flounder.
Atka	Optional. ABC of Atka Mackerel.
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Kamchatka	Optional. ABC of Kamchatka Flounder.
Northern	Optional. ABC of Northern Rockfish.
Octopus	Optional. ABC of Octopus.
OtherFlat	Optional. ABC of Other Flatfish.
OtherRock	Optional. ABC of Other Rockfish.
PCod	Optional. ABC of Pacific Cod.
Plaice	Optional. ABC of Alaska Plaice.
POP	Optional. ABC of Pacific Ocean Perch.
Pollock	Optional. ABC of Pollock.
Rock	Optional. ABC of Rock Sole.
Rougheye	Optional. ABC of Rougheye Rockfish.
Sablefish	Optional. ABC of Sablefish.
Sculpin	Optional. ABC of Sculpin.
Shark	Optional. ABC of Shark.
Shortraker	Optional. ABC of Shortraker Rockfish.
Skate	Optional. ABC of Skate.
Squid	Optional. ABC of Squid.
Yellowfin	Optional. ABC of Yellowfin Sole.
spptomult	Required if running any of the 5-series scenarios. Will be discarded otherwise. Choose a species catch to override with N*ABC. Must be spelt exactly as one of the species parameters, case sensitive. Must be in quotation marks. If you want to replace more than one species, create a vector of strings (e.g. c("Arrowtooth","Atka"))
multiplier	Required if running scenario 5-series scenarios. Will be discarded otherwise. The N which will be multiplied with ABC to override the species designated by spptomult. If you are replacing more than one species, the order of the numbers corresponds to the order of the names in the spptomult string. (e.g. c(1,5) would imply the first species listed in spptomult has its catch replaced with 1*ABC_spp1 and the second is replaced with 5*ABC_spp2)

Examples

```
TAC_function(1, Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
TAC_function(3, Pollock = 2e6, Yellowfin = 2e5, PCod = 1e5)
TAC_function(5.1, spptomult = "Arrowtooth", multiplier = 2,
                  Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
TAC_function(5.1, spptomult = c("Arrowtooth","Yellowfin"), multiplier = c(2,1),
                  Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
TAC_function(5.2, spptomult = "Arrowtooth", multiplier = 2,
                  Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
TAC_function(5.2, spptomult = c("Arrowtooth","Yellowfin"), multiplier = c(2,1),
                  Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)
TAC_function(5.3, spptomult="Arrowtooth", multiplier = 2,
                  Pollock = 2e6, Arrowtooth = 2e5, Yellowfin = 2e5)#'
```

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