

NEFSC-Fishery

Emily Markowitz (Emily.Markowitz AT NOAA.gov / EmilyMarkowitz-NOAA)

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- Northeast Commerical Fisheries Productivity Output Tables
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```
PKG <- c(# devtools::install_github("emilymarkowitz-NOAA/FishEconProdOutput", force = TRUE)
        "FishEconProdOutput",

        #Seperating species by taxonomic group
        "taxize", # install.packages("remotes"); remotes::install_github("ropensci/taxize")

        # Data Managment
        "tidyverse",
        "filesstrings",
        "data.table",
        "plyr",
        "rlist",

        # #RMarkdown
        "rmarkdown",
        "ggpubr",
        "kableExtra",

        #Excel File Management
        "xlsx",
        "readxl"
)

for (p in PKG) {
  if(!require(p,character.only = TRUE)) {
    install.packages(p)
    require(p,character.only = TRUE)}
}
```

Northeast Commerical Fisheries Productivity Output Tables

1. Set knowns

```
# Define what regions we are interested in
reg_order = c("Northeast")
reg_order_abbrv = c("NorE")

# Define Category
category0 = "category"

# Define Years
maxyr <- 2018
minyr <- 2007 #of data going into the analysis
baseyr <- minyr
```

2. Set your Directories where you will save everything

```
dir.in<-getwd()
#Local Directories
dir_outputtables<-paste0(dir.in, "/output/")
dir.create(dir_outputtables)

# Folder name for output
folder<-"Northeast"
titleadd = paste0(minyr, "To", maxyr, "_NorE")
counter<-0

# Define Directories
dir_analyses = paste0(dir_outputtables, folder)
dir.create(dir_analyses)
```

3. Load example data

Commercial Data

```
counter<-0
landings_data<-FishEconProdOutput::land
landings_data<-landings_data[landings_data$Region %in% c("New England", "Mid-Atlantic"),]
landings_data$Region<-"Northeast"

knitr::kable(head(landings_data), booktabs = T) %>%
  kable_styling(latex_options = "striped")
```

	Year	Pounds	Dollars	category	Tsn	State	Region	abbvreg
14	2005	15	30	Shellfish	83677	Maryland	Northeast	MA
15	2004	3	2	Shellfish	83677	New Jersey	Northeast	MA
16	2006	37	28	Shellfish	83677	New Jersey	Northeast	MA
17	2004	611	393	Shellfish	83677	New York	Northeast	MA
18	2005	1268	1154	Shellfish	83677	New York	Northeast	MA

	Year	Pounds	Dollars	category	Tsn	State	Region	abbvreg
19	2005	14183	6323	Shellfish	83677	Maine	Northeast	NE

Northeast Data

code	plan	name
23	BF	Bluefish
352	DF	Spiny Dogfish
81	GFISH	Atlantic Cod
120	GFISH	Winter Flounder
122	GFISH	Witch Flounder
123	GFISH	Yellowtail Flounder
124	GFISH	American Plaice Flounder
125	GFISH	Sand Dab Flounder
147	GFISH	Atlantic Haddock
153	GFISH	White Hake
159	GFISH	Atlantic Halibut
240	GFISH	Redfish
250	GFISH	Ocean Pout
269	GFISH	Pollock
512	GFISH	Wolffish
168	HER	Atlantic Herring
12	MONK	Monkfish
710	RCRAB	Red Crab
800	SCAL	Sea Scallop
754	SCOQ	Ocean Quahog
769	SCOQ	Surf clam
121	SF	Summer Flounder
329	SF	Scup
335	SF	Black Sea Bass

code	plan	name
364	SKATE	Rosette Skate
365	SKATE	Skates
366	SKATE	Little Skate
367	SKATE	Winter Skate
368	SKATE	Barndoor Skate
369	SKATE	Smooth Skate
370	SKATE	Thorny Skate
372	SKATE	Clearnose Skate
51	SMB	Butterfish
212	SMB	Atlantic Mackerel
801	SMB	Loligo Squid
802	SMB	Illex Squid
152	SMESH	Red Hake
508	SMESH	Offshore Hake
509	SMESH	Silver Hake
444	TF	Blueline Tilefish
446	TF	Golden Tilefish

Find TSN numbers and categorize

```

spcat.list<-list('Bluefish' = 168559, # Species Pomatomus saltatrix (Linnaeus, 1766) - bluefish, anjova
'Spiny dogfish' = 160617, #Species Squalus acanthias Linnaeus, 1758 - cazón espinoso común, piked dogfish, spiny dogfish, galludo espinoso, aiguillat commun, dogfish, grayfish, spurdog
'Atlantic Cod' = 164712, # Species Gadus morhua Linnaeus, 1758 - morue de l'Atlantique, ba
calao del Atlántico, cod, rock cod, morue franche, Atlantic cod
'Summer flounder' = 172735, #Species Paralichthys dentatus (Linnaeus, 1766) - summer flo
under, fluke, cardeau d'été, Summer Flounder
'Winter Flounder' = 172905, # Species Pseudopleuronectes americanus (Walbaum, 1792) - pli
e rouge, blackback, Georges Bank flounder, Lemon sole, rough flounder, winter flounder, Winter Flounder
'Witch Flounder' = 172873, #Species Glyptocephalus cynoglossus (Linnaeus, 1758) - witch
flounder, gray sole, plie grise, Witch Flounder
'Yellowtail Flounder' = 172909, #Species Limanda ferruginea (Storer, 1839) - limande à q
ueue jaune, rusty flounder, yellowtail flounder, Yellowtail Flounder
'American Plaice Flounder' = 172877, # Species Hippoglossoides platessoides (Fabricius, 17
80) - American plaice, plie canadienne, American dab, Canadian plaice, dab, American Plaice
'Sand Dab Flounder' = 172746, #Species Scophthalmus aquosus (Mitchill, 1815) - windowpane,
brill, sand dab, spotted flounder, turbot de sable, Windowpane
'Atlantic haddock' = 164744, # Species Melanogrammus aeglefinus (Linnaeus, 1758) - haddoc
k, aiglefin
'White hake' = 164732, # Species Urophycis tenuis (Mitchill, 1814) - white hake, mud hak
e, merluche blanche
'Red hake' = c(164730 # Species Urophycis chuss (Walbaum, 1792) - red hake, squirrel ha
ke, merluche-écureuil
),#164729), # Genus Urophycis Gill, 1863 - codlings # Toledo, includes other hake
'Silver hake' = c(164791 #Species Merluccius bilinearis (Mitchill, 1814) - silver hake, m
erlu argenté
), # 164790), # Genus Merluccius Rafinesque, 1810 - hakes # Toledo, includes other hake
'Skates' = 160845, # Family Rajidae Blainville, 1816 - rayas, rays, skates, raies
"Rosette skate" = 564136, # Species Leucoraja garmani (Whitley, 1939) - rosette skate
'Little Skate' = 564130, #Species Leucoraja erinacea (Mitchill, 1825) - raie-hérisson, co
mmon skate, little skate, summer skate
'Winter Skate' = 564145, #Species Leucoraja ocellata (Mitchill, 1815) - raie tachetée, bi
g skate, eyed skate, winter skate
'Barndoor Skate' = 564139, #Species Dipturus laevis (Mitchill, 1818) - grande raie, barndoo
r skate
'Smooth Skate' = 564151, # Species Malacoraja senta (Garman, 1885) - raie à queue de velou
rs, smooth skate
'Thorny Skate' = 564149, #Species Amblyraja radiata (Donovan, 1808) - raie épineuse, star
ry skate, thorny skate
'Clearnose Skate' = 160855, #Species Raja eglanteria Bosc in Lacepède, 1800 - raya naric
ita, clearnose skate
'Loligo squid' = 82370, # Genus Loligo Lamarck, 1798
'Illex Squid' = 82520, # Genus Illex Steenstrup, 1880
'Ocean pout' = 630979, # Species Zoarces americanus (Bloch and Schneider, 1801) - ocean
pout, Loquette d'Amérique
'Atlantic mackerel' = 172414, #Species Scomber scombrus Linnaeus, 1758 - caballa del Atlán
tico, maquereau commun, maquereau bleu, Atlantic mackerel
'Atlantic pollock' = 164727, #Species Pollachius virens (Linnaeus, 1758) - pollock, coalf
ish, carbonero, lieu noir, saithe, goberge
'Atlantic Wolffish' = 171336, # Genus Anarhichas Linnaeus, 1758 - Atlantic wolffishes
'Black sea bass' = 167687, # Species Centropristis striata (Linnaeus, 1758) - black sea
bass
'Scups' = 169181, # Genus Stenotomus Gill, 1865
'Butterfish' = 172567, # Species Peprilus triacanthus (Peck, 1804) - palometa estrecha,
butterfish, stromatée à fossettes
'BlueLine Tilefish' = 168543, # Species Caulolatilus microps Goode and Bean, 1878 - blu
eline tilefish, blanquillo Lucio
'Golden Tilefish' = 168546, # Species Lopholatilus chamaeleonticeps Goode and Bean, 1879
- blue tilefish, tilefish, conejo amarillo
'Monkfish' = 164499, #Species Lophius americanus Valenciennes in Cuvier and Valenciennes,
1837 - goosefish, monkfish, baudroie d'Amérique
'Acadian Redfish' = 166774, # Species Sebastes fasciatus Storer, 1854 - Acadian redfish,
Labrador redfish, Acadian rockfish, sébaste acadien

```

```

      'Atlantic Herring' = 161722, # Species Clupea harengus Linnaeus, 1758 - Baltic herring, he
rring, hareng atlantique, Atlantic herring

      'Atlantic surf clam' = 80944, #Species Spisula solidissima (Dillwyn, 1817) - Atlantic surf
clam
      'Offshore Hake' = 164793, # Species Merluccius albidus (Mitchill, 1818) - offshore hak
e, offshore whiting
      'Ocean quahog clam' = 81343, # Species Arctica islandica (Linnaeus, 1767) - ocean quahog
      'Red Crab' = 620992, # Species Chaceon quinque-dens (S. I. Smith, 1879) - red deepsea crab
      'Sea scallop' = 79718, #Species Placopecten magellanicus (Gmelin, 1791) - sea scallop
      'Atlantic halibut' = 172933 # Species Hippoglossus hippoglossus (Linnaeus, 1758) - Atlant
ic halibut, flétan atlantique, Atlantic Halibut
)

spcat<-c()

for (i in 1:nrow(ne_spp)) {
  spcat<-c(spcat,
    ifelse(sum(grepl(pattern = ne_spp$name[i], x = names(spcat.list) , ignore.case = T)) == 0,
      NA, grep(pattern = ne_spp$name[i], x = names(spcat.list), ignore.case = T) ))
}

ne_spp$TSN<-as.numeric(unlist(spcat.list[spcat]))

categories<-list()
for (i in 1:length(unique(ne_spp$plan))) {
  categories[i]<-list(ne_spp$TSN[ne_spp$plan %in% unique(ne_spp$plan)[i]])
  names(categories)[i]<-unique(ne_spp$plan)[i]
}

temp<-itis_reclassify(tsn = unique(landings_data$Tsn),
  categories = categories,
  missing_name="Uncategorized")

tsn_id<-temp[1][[1]]

if (sum(tsn_id$category %in% c("Other", "Uncategorized"))>0) {
  tsn_id<-tsn_id[!(tsn_id$category %in% c("Other", "Uncategorized")),
    c("TSN", "category")]
}

landings_data<-dplyr::rename(landings_data,
  TSN = Tsn)

tsn_id$TSN<-as.numeric(tsn_id$TSN)

landings_data<-dplyr::left_join(x = landings_data,
  y = tsn_id,
  by = "TSN")

landings_data<-dplyr::rename(landings_data,
  Tsn = TSN,
  category = category.y)

landings_data<-landings_data[landings_data$Year>=minyr & landings_data$Year<=maxyr,
  c("Year", "Pounds", "Dollars", "category", "Tsn", "State", "Region", "abbrev")]

```

```
landings_data<-landings_data[(landings_data$Pounds>=0), ]
landings_data<-landings_data[(landings_data$Dollars>=0), ]

knitr::kable(head(landings_data), booktabs = T) %>%
  kable_styling(latex_options = "striped")
```

	Year	Pounds	Dollars	category	Tsn	State	Region	abbvreg
7056	2018	18898	17008	GFISH	11272	Rhode Island	Northeast	NE
7057	2018	18898	17008	SCOQ	11272	Rhode Island	Northeast	NE
7058	2018	18898	17008	SF	11272	Rhode Island	Northeast	NE
7059	2018	18898	17008	SKATE	11272	Rhode Island	Northeast	NE
7060	2018	18898	17008	SMB	11272	Rhode Island	Northeast	NE
7061	2018	18898	17008	SMESH	11272	Rhode Island	Northeast	NE

4. Run Analysis

```
out <- OutputAnalysis(landings_data = landings_data,
  category0 = "category",
  baseyr = baseyr,
  titleadd = titleadd,
  dir_analyses = dir_analyses,
  skipplots = TRUE,
  reg_order = "Northeast",
  reg_order_abbrv = "NorE",
  save_outputs_to_file = TF)
#> [1] "Northeast"
#> [1] "Create spreadsheets"
#> [1] "Create plots"
names(out)
#> [1] "warnings_list"      "editeddata_list"  "index_list"      "spp_list"
#> [5] "figures_list"      "gridfigures_list"

for (jjj in 1:length(out)) {
  assign(names(out)[jjj], out[[jjj]])
}
```

5. Show Tables

```

result <- lapply(index_list, "[", , c("Year", "cat", "PI_CB", "Q_CB", "V"))
a<-result$Northeast
a<-a[a$Year %in% minyr:maxyr, ]

a<-dplyr::rename(a,
                 PI = PI_CB,
                 Q = Q_CB,
                 V = V)

# temp_code
a.pi<-spread(a[!(names(a) %in% c("V", "Q"))], cat, PI)
names(a.pi)[-1]<-paste0(names(a.pi)[-1], "_PI")
a.q<-spread(a[!(names(a) %in% c("PI", "V"))], cat, Q)
names(a.q)[-1]<-paste0(names(a.q)[-1], "_Q")
a.v<-spread(a[!(names(a) %in% c("PI", "Q"))], cat, V)
names(a.v)[-1]<-paste0(names(a.v)[-1], "_V")

b<-left_join(a.pi, a.q, by = c("Year"))
b<-left_join(b, a.v, by = c("Year"))

b<-b[,match(x = c("Year",
                 names(b)[grep(pattern = "_V", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "_PI", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "_Q", x = names(b), ignore.case = T)]),
          names(b))]

b<-b[,match(x = c("Year",
                 names(b)[grep(pattern = "fin", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "Shell", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "Total", x = names(b))]),
          names(b))]

b<-b[b$Year %in% minyr:maxyr, ]
temp_code<-b
temp_code$Footnotes<-NA

# temp_print
b<-a
b$PI<-round(x = b$PI, digits = 2)
b$Q<-prettyNum(x = round(x = b$Q/1e6), digits = 2, big.mark = ",")
b$V<-prettyNum(x = round(x = b$V/1e6), digits = 2, big.mark = ",")

b.pi<-spread(b[!(names(b) %in% c("V", "Q"))], cat, PI)
names(b.pi)[-1]<-paste0(names(b.pi)[-1], "_PI")
b.q<-spread(b[!(names(b) %in% c("PI", "V"))], cat, Q)
names(b.q)[-1]<-paste0(names(b.q)[-1], "_Q")
b.v<-spread(b[!(names(b) %in% c("PI", "Q"))], cat, V)
names(b.v)[-1]<-paste0(names(b.v)[-1], "_V")

b<-left_join(b.pi, b.q, by = c("Year"))
b<-left_join(b, b.v, by = c("Year"))

b<-b[,match(x = c("Year",
                 names(b)[grep(pattern = "_V", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "_PI", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "_Q", x = names(b), ignore.case = T)]),
          names(b))]

```



```

names(b))]]

b<-b[,match(x = c("Year",
                 names(b)[grep(pattern = "fin", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "Shell", x = names(b), ignore.case = T)],
                 names(b)[grep(pattern = "Total", x = names(b))]),
        names(b))]

b<-b[b$Year %in% minyr:maxyr, ]
temp_print<-b
temp_print$Footnotes<-NA

ProdOutputUS_Raw<-temp_code
if (TF) {
  write_csv(x = ProdOutputUS_Raw, file = paste0(dir_analyses, "/ProdOutputNorE_Raw.csv"))
}

ProdOutputUS_Print<-temp_print
if (TF) {
  write_csv(x = ProdOutputUS_Print, file = paste0(dir_analyses, "/ProdOutputNorE_Print.csv"))
}

ProdOutputUS_Print$Footnotes<-NULL
knitr::kable(ProdOutputUS_Print, booktabs = T) %>%
  kable_styling(latex_options = "striped")

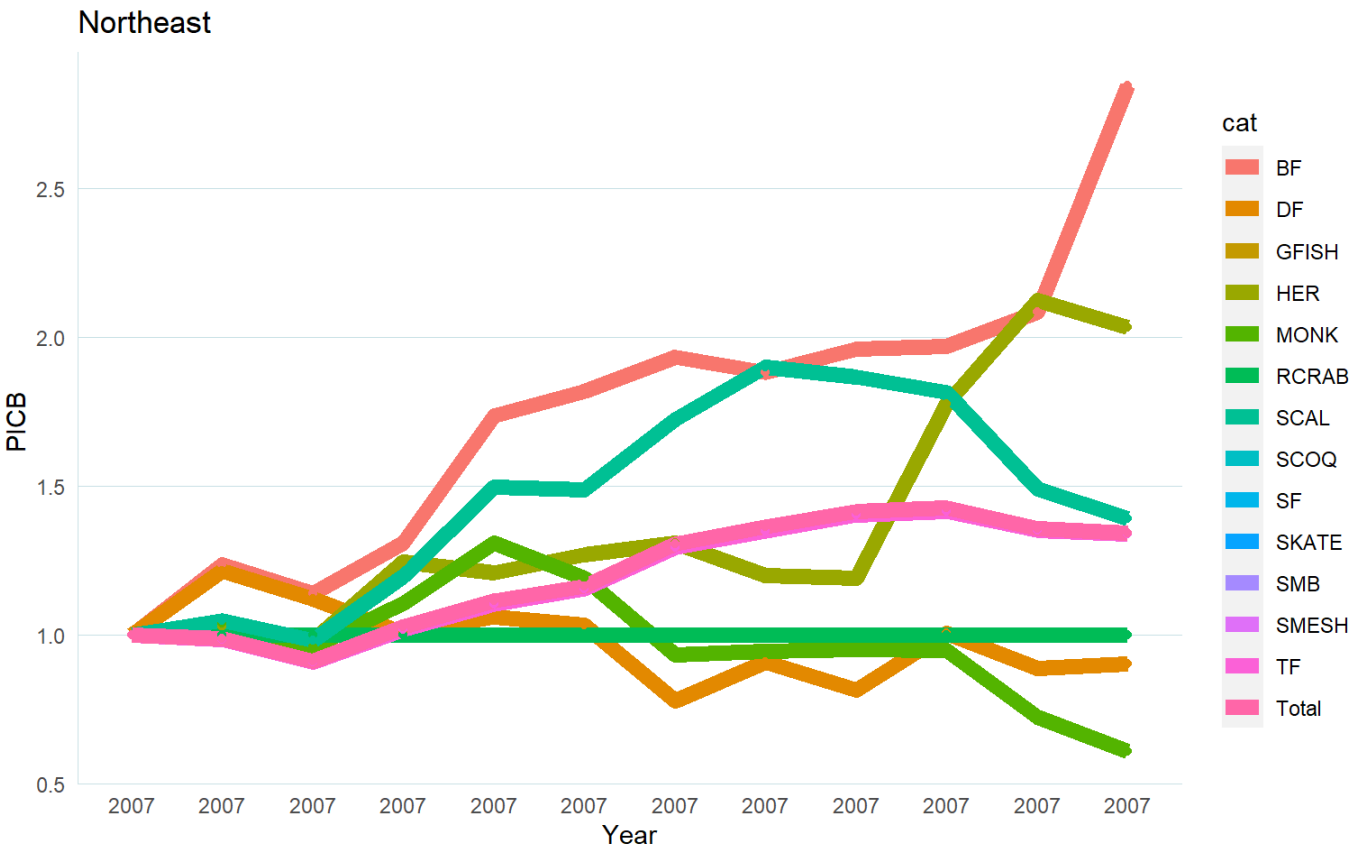
```

	Year	Total_V	Total_PI	Total_Q
	2007	11,372	1.00	11,372
	2008	10,839	0.99	10,976
	2009	10,678	0.91	11,710
	2010	12,639	1.03	12,318
	2011	14,398	1.12	12,903
	2012	14,946	1.16	12,833
	2013	13,720	1.31	10,508
	2014	14,128	1.36	10,366
	2015	14,524	1.42	10,257
	2016	15,294	1.43	10,718
	2017	14,700	1.36	10,833
	2018	15,014	1.34	11,189

6. Figures

Here are a few figures that come out of this analysis!

figures_list\$Northeast__PI_CB_PI



figures_list\$Northeast__Q_CB_CatTot_QCatTot

