**Purpose:** This function replaces **FishMonth\_year** and **ObsTripEffort.r**. Function for calculating fishing effort and CPUE on user specified bank or nafo divisions by month, from various seedboxes, and from observer trips. The CPUE calculations are split between 3 main parts, calculation of Monthly data, calculation of Seedbox CPUE’s, and finally the calculations for the Observer data. The data from any of these can optionally be exported to flat files or simply return an object with these data. This function relies on output of the **logs\_and\_fishery\_data** function.

Notes

* This function can pull multiple years of data and multiple Observer trips, but defaults to obtaining the current years data.

**Version Control:** First version of this function.

**Librarys**: RODBC, splacns

**Function Arguments Summary**

1. **CPUE**: CPUE to calculate, CPUE by month/bank/nafo, Default is "Month". Options are
   * “month": Calculate CPUE by month, area or nafo region
   * "obs": Caluculate CPUE for Observer trips only
   * "both": Calculate both the Observer trips and CPUE by month.
2. **bank**: Which bank to select from using abbreviated bank id. Default is GBa (Georges Bank a).

The options are:

* + "GBa": Georges a
  + "GBb": Georges b
  + “GB": all of Georges Bank
  + "GBBB": all of Georges and Browns banks.
  + "BBn": Browns north
  + "BBs": Browns south
  + "BB": all of Browns Bank
  + “Ger": German
  + "Mid": Middle
  + "Sab": Sable
  + "Ban": Banquereau
  + "SPB": St. Pierre Bank

1. **year**: The year of interest. Anything from 1955-current works (other than 1960),

default = current year

1. **fleet**: Subsample between the Freezer and wet fleet. Default is ‘ALL’
   * “ALL”: total fleet
   * “FT”” freezer trawlers
   * “WF”: wet fishery trawlers
2. **boxes**: Summarize the data for the seed boxes? Default is NULL, Current options include
   * "GB": All active Georges Bank seedboxes
   * "BB": All active Browns Bank Seedbox
   * "ALL": All active Seedboxes (currently just BB and GB)
3. **print**: Print the results to the screen. (T/F), default = F
4. **output**: Return the results as r objects. (T/F), default = T
5. **nafo.div**: The nafo division. This needs to align with the Bank choice as well, what is produced is the amount landed on bank X NAFO division y. If nafo division crosses multiple banks this will only pull out part of NAFO division data. Default is NULL. This option won't work great for the data before 2008 without careful attention as these data have some different division names.
6. **export.logs**: Do you want to export the log and fishery data. This does not include these monthly tables. (T/F) default is F See **logs\_and\_fishery\_data.r** for details
7. **export.tables:** Do you want to export the monthly CPUE tables. (T/F), default is F
8. **months**: Select the months of interest. Numeric, default is all months, c(1:12), all combinations of numeric months is acceptable.
9. **obs.vnum**: The vessel numbers for the observer trips, multiple trips are allowed BUT MUST BE PAIRED WITH APPROPRIATE obs.land.date argument. If CPUE = "obs" or "Both" and this is = NULL this will read in a flat file with observer trip information in it. Default is NULL
10. **obs.land.date**: The landing date of the Observer trip(s), multiple trips are allowed BUT THIS MUST BE PAIRED WITH APPROPRIATE obs.vnum. If CPUE = "Obs" or "Both" and this is = NULL this will read in a flat file with observer trip information in it. Default is NULL
11. **obs.export**: Export the observer CPUE data? (T/F), default =F
12. **un:** your SQL username. default = un.ID (if set in your r.Profile this will run automatically)
13. **pw:** Your SQL password. default = pwd.ID (if set in your r.Profile this will run automatically)
14. **db.con**: Database to connect to. Default is "ptran"

**Section 1**

Section 1 starts with calling in the log data needed from the function logs\_and\_fishery\_data\_DK.r. Two objects of interest are called in from this, new.log.dat (data dating back to 2009), and old.log.dat (data from 1955-2008). The remainder of section 1 is only run if we are looking for monthly CPUE data. The first part of this is making some headers for our data objects later along with selects the trawlers from the specified fleet and the nafo/bank boundaries chosen. Once completed we initialize a few variables and run a for loop across all years of interest.

The data from before 2008 has a slightly different set up than the more recent data thus extracting the information from these data is done separately and first. There may be some quality issues with these data, and one needs to be careful with the bank specifications as they have changed over time (e.g. GBa and GBb didn’t always exist). Specifying the banks as “BB”, “GB”, or “GBBB” will get all the data for the banks that have been subdivided but will lose the smaller scale resolution, conversely specifying something like “GBa” will exclude all data from before the banks were split.

The majority of this section is rather straightforward calculations of the monthly CPUE related metrics, including effort (hours, hour-meters-crew-hour-meters) and CPUE (kg/hr, kg/(hr-m), and kg/(cr-hr-m) for the old and new log objects, also the yearly totals for the selected months are calculated. These are created as data-frames, turned into lists, and after the for loop finished turned back into data-frames.

Similarly these same metrics can be obtained for the seedboxes. Currently the only seedboxes are found in Georges and Browns Banks so these are the only options for “boxes”, given the potential positive effect of these seedboxes this section may need tweaking to include seedboxes on other banks. Once the data from within seedboxes are obtained (see **splacns** function **inout**) the seedbox monthly information is obtained in much the same way as outlined in the previous paragraph.

Once the data requested is obtained in may be printed to the screen, exported as a series of csv files, and/or returned for use in other functions within R.

**Section 2**

This part of the function is an automated version of the **ObsTripEffort.r** function. Now all observer trips we have documented can have effort and CPUE calculation performed automatically (currently the flat file storing this information needs to be updated manually). The observer trip information is located in Observer\_trips.csv. From these data the effort and CPUE metrics are calculated in a similar fashion to Section 1 for each trip in which there was an observer present. Alternatively if interested in a specific Observer trip the Vessel Number (obs.vrnum) and the Date Landed (obs.date.land) can be manually input into the function to select the trip of interest. Note that these must align with ‘year’, so ensure the trip you are interested in matches the “year” call to this function. These data can optionally be exported (obs.export) or returned to other functions within R.

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