

File descriptions:

1. "CMS-Flux-NBE-2020.2010-2018.nc.zip" is compressed file "CMS-Flux-NBE-2020.2010-2018.nc". The metadata inn "CMS-Flux-NBE-2020.2010-2018.nc" :

netcdf CMS-Flux.monthly.grid.2010-2018 {

dimensions:

```
latitude = 46 ;
longitude = 72 ;
nmon = 108 ;
n3hours = 26296 ;
nhours = 78888 ;
```

variables:

```
float post-NBE(nmon, latitude, longitude) ;
  post-NBE:missing_value = -999.f ;
  post-NBE:units = "gC/m^2/day" ;
  post-NBE:long_name = "posterior NBE,2010-2014 constrained by GOSAT, 2015-2018
constrained by OCO2" ;
```

```
float post-OCN(nmon, latitude, longitude) ;
  post-OCN:missing_value = -999.f ;
  post-OCN:units = "gC/m^2/day" ;
  post-OCN:long_name = "posterior ocean fluxes ,2010-2014 constrained by GOSAT,
2015-2018 constrained by OCO2" ;
```

```
float fossil(nmon, latitude, longitude) ;
  fossil:missing_value = -999.f ;
  fossil:units = "gC/m^2/day" ;
  fossil:long_name = "Monthly fossil fuel from ODIAC" ;
```

```
float fossil-hourly(nhours, latitude, longitude) ;
  fossil-hourly:missing_value = -999.f ;
  fossil-hourly:units = "gC/m^2/day" ;
  fossil-hourly:long_name = "Hourly fossil fuel from ODIAC. The monthly fossil fuel is
from ODIAC, and the temporal downscaled based on Nassar et al., 2013" ;
  fossil-hourly:time = "hourly interval with starting time at 00Z01Jan2010" ;
```

```
float NBE-OCN-prior-3hourly(n3hours, latitude, longitude) ;
  NBE-OCN-prior-3hourly:missing_value = -999.f ;
  NBE-OCN-prior-3hourly:units = "gC/m^2/day" ;
  NBE-OCN-prior-3hourly:long_name = "3-hourly NBE and and ocean fluxes with
monthly mean equal to zero for each month" ;
  NBE-OCN-prior-3hourly:times = "3hourly interval starting at 00Z01Jan2010" ;
```

```
float prior-NBE(nmon, latitude, longitude) ;
  prior-NBE:missing_value = -999.f ;
  prior-NBE:units = "gC/m^2/day" ;
```

```

    prior-NBE:long_name = "Prior monthly NBE generated by CARDAMOM" ;
float prior-OCN(nmon, latitude, longitude) ;
    prior-OCN:missing_value = -999.f ;
    prior-OCN:units = "gC/m^2/day" ;
    prior-OCN:long_name = "Prior monthly ocean fluxes generated by ECCO-Darwin." ;
float area(latitude, longitude) ;
    area:missing_value = -999.f ;
    area:units = "km^2" ;
    area:long_name = "area of each 4x5 grid box" ;
float LandMask(latitude, longitude) ;
    LandMask:missing_value = -999.f ;
    LandMask:units = "unitless" ;
    LandMask:long_name = "Land Mask (1:land,0:ocean)" ;
float latitude(latitude) ;
    latitude:units = "degrees_north" ;
    latitude:long_name = "Latitude" ;
float longitude(longitude) ;
    longitude:units = "degrees_east" ;
    longitude:long_name = "Longitude" ;
float nmon(nmon) ;
    nmon:units = "months since 2010-01-01" ;
// global attributes:
:Title = "CMS-Flux-NBE 2020 dataset" ;
:Creation date = "20-Sep-2020" ;
:Version = "CMS-Flux V3 monthly mean posterior NBE" ;
:Description = "Monthly mean prior and posterior NBE and Ocean fluxes, and fossil fuel
emissions;The detailed method is documented in Liu et al., ESSD, 2020" ;
:Contact = "Junjie Liu (Junjie.Liu@jpl.nasa.gov)" ;
}

```

2. "Uncertainty.ensemble.2010-2018.zip" includes two files:
 - a. "Uncertainty.ensemble.2010-2014.NBE.Ocean.monthly.nc": ensemble fluxes that can be used to calculate uncertainties for monthly NBE and ocean fluxes between 2010 and 2014. We assume the same monthly posterior flux uncertainty between 2010 and 2014.
 - b. "Uncertainty.ensemble.2015-2018.NBE.Ocean.monthly.nc": ensemble fluxes that can be used to calculate uncertainties for monthly NBE and ocean fluxes between 2015 and 2018. We assume the same monthly posterior flux uncertainty between 2015 and 2018.

3. "CMS-Flux-NBE-2020.Monthly.region.tar" includes three files:
 - a. "Monthly_NBE_Transcom_region.csv": monthly NBE and uncertainties at 11 TransCom regions over land.
 - b. "Monthly_NBE_PFT_region.csv": monthly regional NBE and uncertainties at 28 regions based on PFT distribution and continents.

- c. "Monthly_NBE_PFT_region.csv": monthly regional NBE and uncertainties at 13 regions based on latitudes and continents.
- 4. Figures3-8.zip: the data that were used to generate Figures 3 to 8 in Liu et al., 2020, ESSD.