Analyses co-occurrence grand dauphin et activités humaines

Olivier Gimenez

28/09/2020

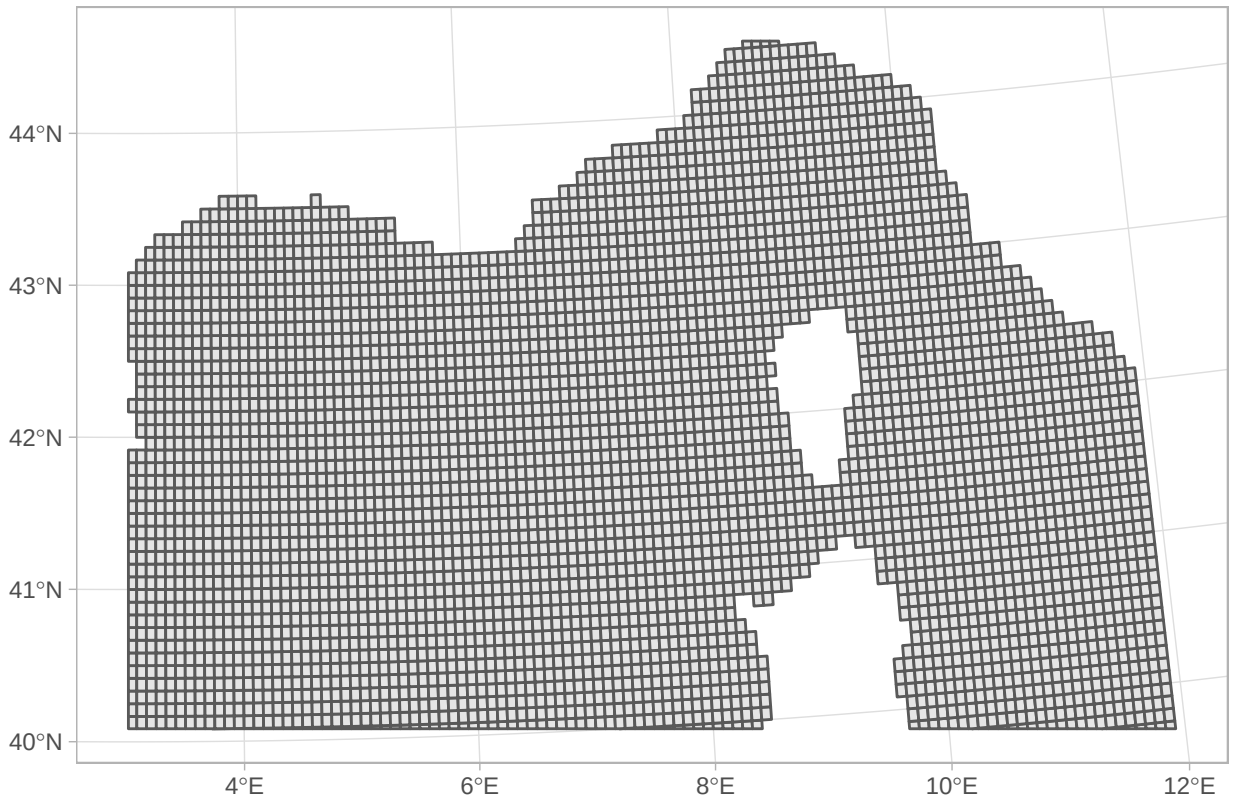
Lecture et nettoyage des données

La grille.

```
grid <- st_read("Grid/grid.shp")
```

```
## Reading layer ‘grid’ from data source ‘/Users/oliviergimenez/Dropbox/OG/GITHUB/human-tursiops-twospe
## Simple feature collection with 4356 features and 3 fields
## geometry type:  POLYGON
## dimension:      XY
## bbox:           xmin: 701000 ymin: 5886622 xmax: 1467639 ymax: 6390000
## proj4string:    +proj=lcc +lat_1=44 +lat_2=49 +lat_0=46.5 +lon_0=3 +x_0=700000 +y_0=6600000 +ellps=G
```

```
grid %>%
  ggplot() +
  geom_sf()
```



Les dauphins.

```
load("20180914_SAMM_data_LauretValentin.RData")
```

Les données été et hiver.

```
dauphins_summer <- summer
dauphins_winter <- winter
```

Les données transect uniquement.

```
transect_summer <- dauphins_summer$segdata %>%
  as_tibble() %>%
  select(date = date,
         transect = Transect.Label,
         eastings = X,
         northings = Y,
         counts = n,
         effort = Effort,
         id = Sample.Label) %>%
  add_column(season = "summer")

transect_winter <- dauphins_winter$segdata %>%
  as_tibble() %>%
  select(date = date,
         transect = Transect.Label,
         eastings = X,
         northings = Y,
         counts = n,
         effort = Effort,
         id = Sample.Label) %>%
  add_column(season = "winter")

transect <- bind_rows(transect_summer, transect_winter)
```

Quelques statistiques, avec le nombre de détections par transect.

```
transect %>%
  count(transect, wt = counts, sort = TRUE)
```

```
## # A tibble: 1,780 x 2
##    transect     n
##    <chr>    <dbl>
##  1 522          5
##  2 4495         4
##  3 2846         3
##  4 3769         3
##  5 4278         3
##  6 5625         3
##  7 2025         2
##  8 2032         2
##  9 2059         2
## 10 2061         2
## # ... with 1,770 more rows
```

Le nombre total de dauphins.

```
transect %>%
  count(transect, wt = counts, sort = TRUE) %>%
  select(n) %>%
  sum()
```

```
## [1] 105
```

Et l'effort par transect.

```
transect %>%
  group_by(transect) %>%
  summarise(nb_detections = sum(counts),
            effort_total = mean(effort)) %>%
  arrange(desc(nb_detections))
```

```
## # A tibble: 1,780 x 3
##    transect nb_detections effort_total
##    <chr>            <dbl>        <dbl>
##  1 522                  5        12.6
##  2 4495                 4         7.21
##  3 2846                 3        10.3
##  4 3769                 3         9.78
##  5 4278                 3        10.6
##  6 5625                 3        10.2
##  7 2025                 2        13.6
##  8 2032                 2         9.37
##  9 2059                 2        10.4
## 10 2061                 2        10.0
## # ... with 1,770 more rows
```

L'effort total.

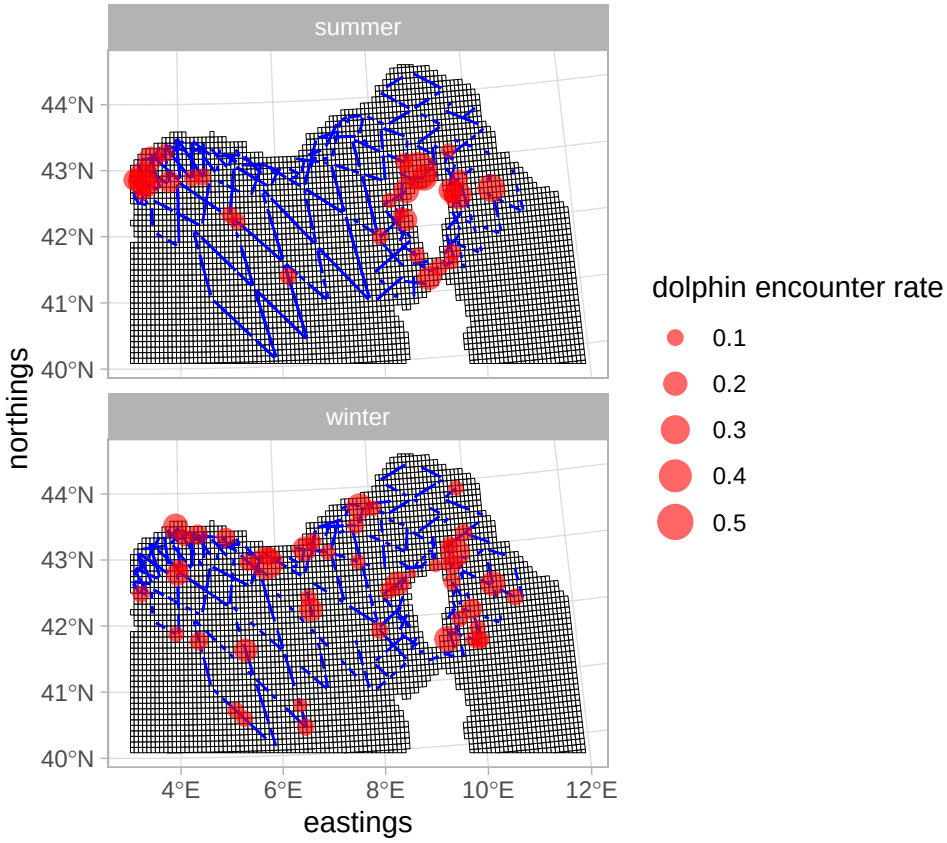
```
transect %>%
  group_by(transect) %>%
  summarise(effort_total = max(effort)) %>%
  select(effort_total) %>%
  sum()
```

```
## [1] 15353.45
```

Visualisation.

```
grid %>%
  ggplot() +
  geom_sf(lwd = 0.1, color = "black", fill = "white")  +
  geom_line(data = transect, color = "blue",
            aes(x = eastings, y = northings, group = transect)) +
  coord_sf(xlim = st_bbox(grid)[c(1,3)],
           ylim = st_bbox(grid)[c(2,4)]) +
```

```
  geom_point(data = transect %>% filter(counts > 0),
             aes(x = eastings, y = northings, size = counts / effort),
             color = "red", alpha = 0.6) +
  labs(size = "dolphin encounter rate") +
  facet_wrap(~season, ncol = 1)
```



Les activités.

```
load("20200928_SAMM_data_Pressure.RData")
```

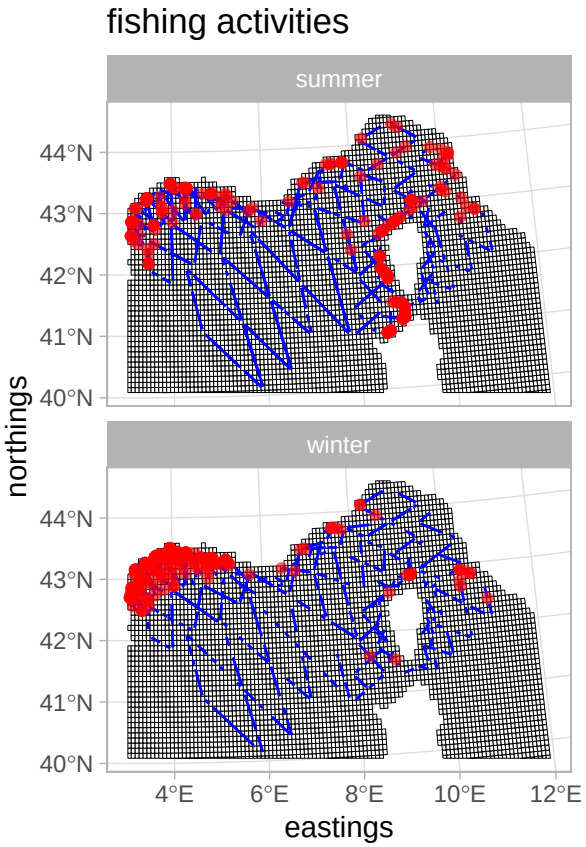
On récupère les activités par saison en les regroupant dans une catégorie unique *pêche*. Il y a le détail : “Bouee de peche”, Bateau art dormant (fileyeur, caseyeur)“,”Bateau chalutier“,”Bateau de peche pro“,”Bateau senneur, bolincheur".

```
activ_summer <- transect %>%
  filter(season == "summer") %>%
  mutate(id = as.numeric(id),
         dolphins = if_else(counts>0, 1, 0)) %>%
  select(date, id, eastings, northings, effort, dolphins, transect) %>%
  full_join(summer_fishingactivities$obsdata, by =  c("id" = "Sample.Label")) %>%
  select(date,
         eastings,
         northings,
         dolphins,
         what,
         effort,
```

```
         id,
         transect) %>%
  mutate(peche = if_else(!is.na(what), 1, 0)) %>%
  add_column(season = "summer") %>%
  select(date, eastings, northings, dolphins, effort, peche, season, id, transect)

activ_winter <- transect %>%
  filter(season == "winter") %>%
  mutate(id = as.numeric(id),
         dolphins = if_else(counts>0, 1, 0)) %>%
  select(date, id, eastings, northings, effort, dolphins, transect) %>%
  full_join(winter_fishingactivities$obsdata, by =  c("id" = "Sample.Label")) %>%
  select(date,
         eastings,
         northings,
         dolphins,
         what,
         effort,
         id,
         transect) %>%
  mutate(peche = if_else(!is.na(what), 1, 0)) %>%
  add_column(season = "winter") %>%
  select(date, eastings, northings, dolphins, effort, peche, season, id, transect)

#summer_fishingactivities$obsdata %>%
#  st_as_sf()
#  st_transform( crs= st_crs(grid))

activ <- bind_rows(activ_summer, activ_winter)
```

Visualisation.

```
grid %>%
  ggplot() +
  geom_sf(lwd = 0.1, color = "black", fill = "white")  +
  geom_line(data = activ, color = "blue",
            aes(x = eastings, y = northings, group = transect)) +
  coord_sf(xlim = st_bbox(grid)[c(1,3)],
           ylim = st_bbox(grid)[c(2,4)]) +
  geom_point(data = activ %>% filter(peche > 0),
             aes(x = eastings, y = northings),
              color = "red", alpha = 0.6) +
  facet_wrap(~season, ncol = 1) +
  labs(title = "fishing activities")
```


fishing activities
summer
winter
44°N
43°N
42°N
41°N
40°N
northings
4°E
6°E
8°E
10°E
12°E
eastings