Trajectories

- 43 States
  - from Atlantic Ocean till Black Sea
  - from Norway to Morocco
- 32,000 Flights per day (May 2019)
- 4,27 Million flights in the last 12 months

- 20 years of civil flights in Europe

- statistical analysis via performance indicators in order to highlight best practices (fuel burnt, $CO_2$ and noise reduction, no ATCO overload):
  - time/distance in the Terminal Area airspace/apron
  - continuous descent operations
PRU Portal

- data dissemination
- methodology
- attempt to move towards reproducibility
- built with blogdown, served by Netlify, hosted on GitHub (but we use also Google Charts/Studio/Spreadsheets, D3, MS Excel)

Portal @ https://ansperformance.eu
Source @ https://github.com/euctrl-pru
Packaging and sharing

- **nvctr**: n-vector approach to geographical position calculations using an ellipsoidal model of Earth
- **ectrlplot**: ggplot2 style (inspired by BBC's bbplot 📦)
- **trrrj**: analysis facilities for flight trajectories

Everything @ https://github.com/euctrl-pru
trrrj - read

Supported file formats:

- S06: segment based description
- CPR: radar position reports
- ALL_FT+: mix of radar and flight plan
trrrj - plot
trrrj - export from DB

export from EUROCONTROL DB (internal feature):

- trajectories: dataframe of
  - flight ID
  - timestamp
  - longitude, latitude, altitude
  - ... (aircraft type, ADEP, ADES, ...)
- airspaces: polygon and min/MAX flight level
trrrj - trj/airspace intersections

No much help 😞 from sf or other spatial ☹️s

if you know/can help us, please reach out
Examples
Average time flown level per flight

- Climb (2016)
- Descent (2016)

2015 values
Density

FR24 Flights on 2017-08-97 @ 11:00 - 12:00
R can fly!

Questions?

Or drop me an email: enrico.spinielli@eurocontrol.int
Thank you