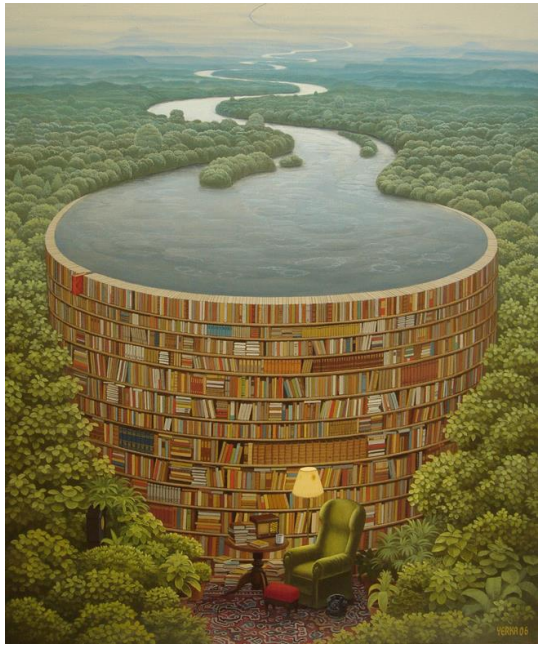


The World Register of dams of ICOLD
&
Large French Dams

Patrick Le Delliou

CFBR Symposium
31 January 2019-Marseille

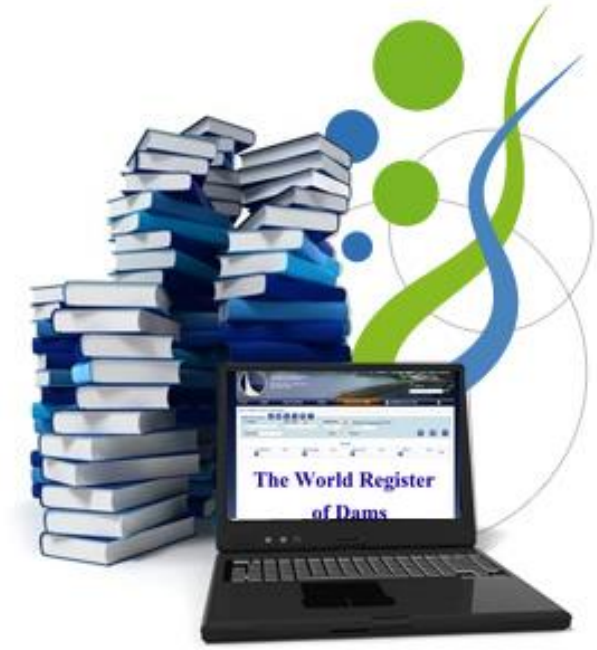
Description

- The Icold register is a database of dams

- Each dam is defined by 46 fields divided into
  - Dam name (+ possible alias)
  - Year of commissioning (or "under construction")
  - Location (continent, country, region, nearest city)
  - Stakeholders (owner, designer, builder)
  - Geometric data (height above foundation, length, volume of the structure, altitude)
  - Characteristics of Structure + Foundations (Type, sealing, type of foundation...)
  - Hydrological characteristics (river, flow and type of spillway)
  - Characteristics of the associated reversoir (volume, surface, name...)
  - Use of the dam (one or more uses + precision for hydropower, irrigation)
  - Coordinates of the middle of the crest
  - Unique Code that identifies the dam unequivocally (including binational dams).
  - Comments

- Reference for a given dam and basis for statistical comparisons

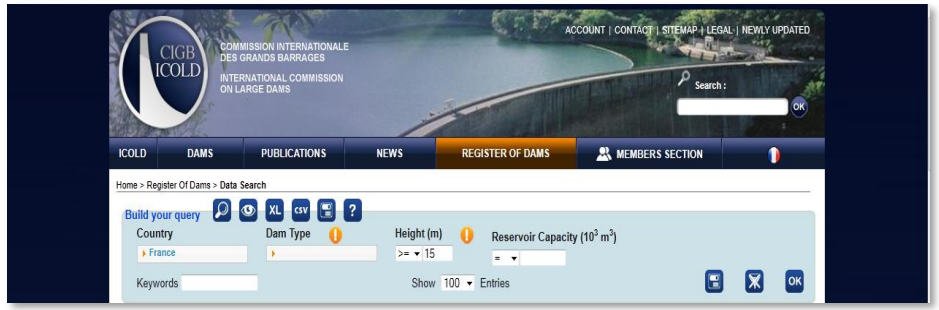
History

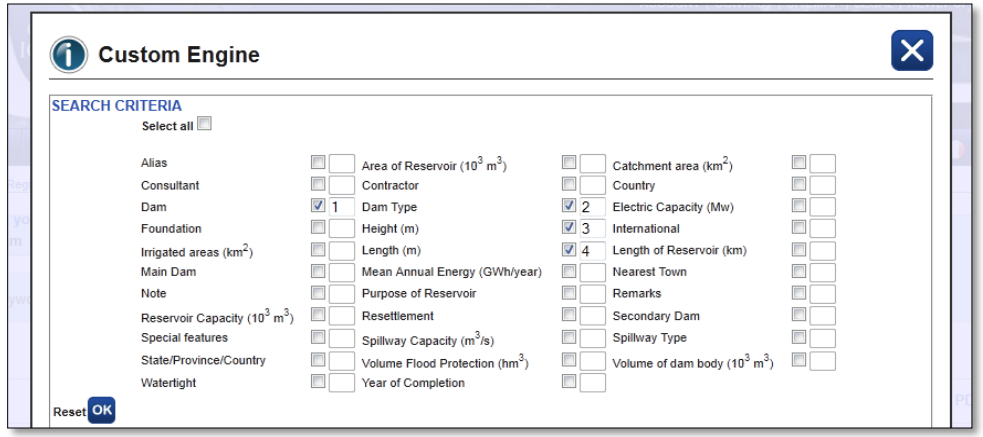


- Edited in book form for the first time in 1964, it concerned at this time 48 countries and 9300 dams.
- The first computerized version (officially the 4th version of the register) is published in 1998 for 80 countries including 20 countries that are not members of the ICOLD. It contains 25,400 dams
- From 2011, the computerized version is available on the ICOLD website and is updated at least once a year.
- The version that will be online at the beginning 2019 will give data for more than 58000 dams in 165 countries (including 100 membes countries of ICOLD)

Access to the Register

- By subscription to ICOLD for a period of 3 years
- On the website of the ICOLD
  - History
  - General statistics
  - Description of the database
  - Search engine (for registered individual users)





- Results table with column selections to be included
- Possibility of exporting results
- Currently no export of geometrical coordinates

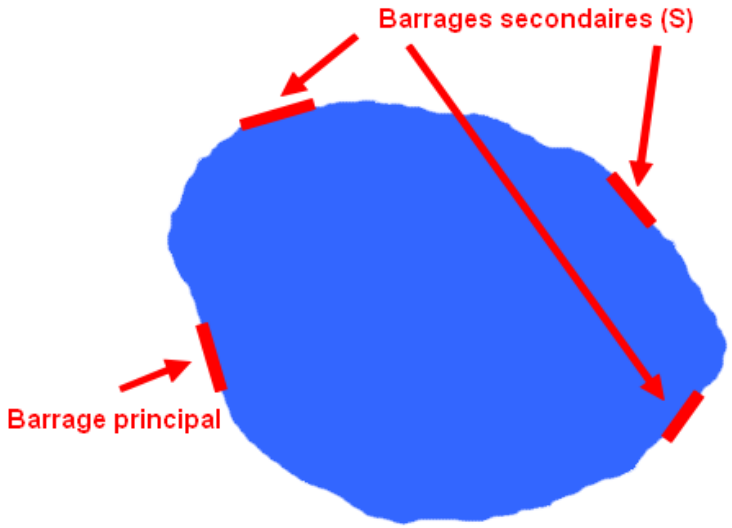
Dams in the database

- All countries of the world (UN definition)
- All large dams according to the definition of the constitution of ICOLD (version 2011):
  - H above foundations ≥ 15 m

    Or
  - 5 m ≥ H > 15 m and Volume of the reservoir ≥ 3 000 000 m^3
- Since 2018, the database also includes tailing dams that were (in theory) excluded until then
- The dams in use and the dams under construction are accessible. The Committee In charge of the register keeps data for broken dams (link to the database of thr Committee of ICOLD on dam safety), abandoned, dismantled, or project.

Several dams and a reservoir

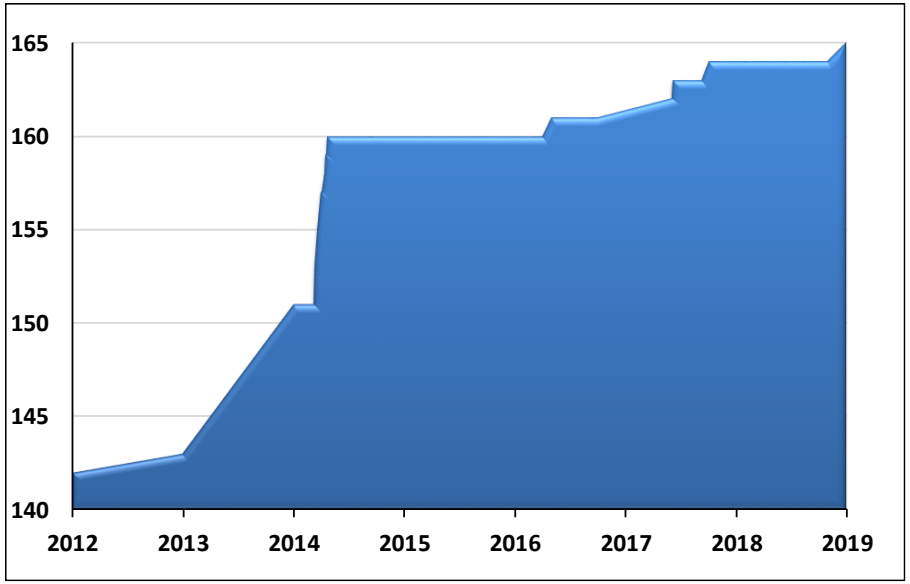
- The database is about dams. So each of the large dams that form one single reservoir (eg. Canada – CANIAPISCAU: 41 dams for a reservoir of 53,8000 hm^3) is the subject of an individual registration
- In order to avoid the risk of counting the same volume of reservoir several times, one of the dams closing the same reservoir is designated as a main dam, the other being considered as secondary dams.



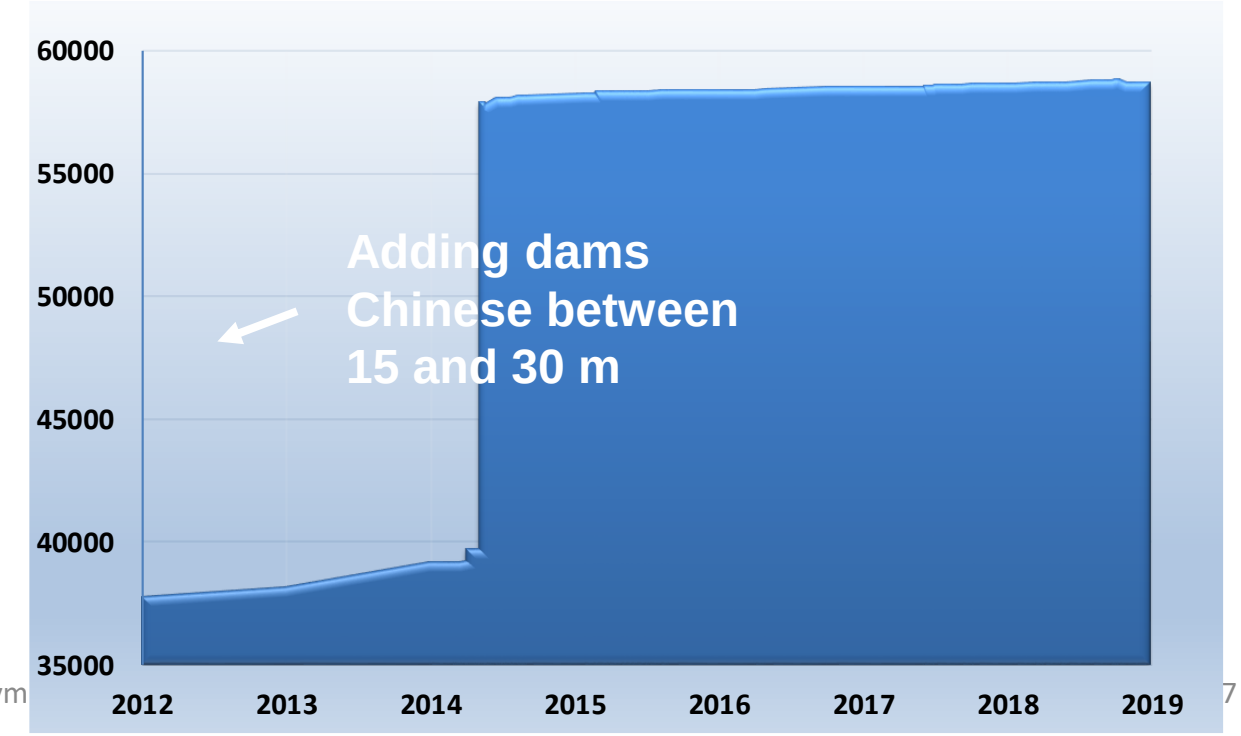
ΣVretenue = 7 500 km^3 ΣVto Each dam = 17 000 km^3

Evolution of the Register

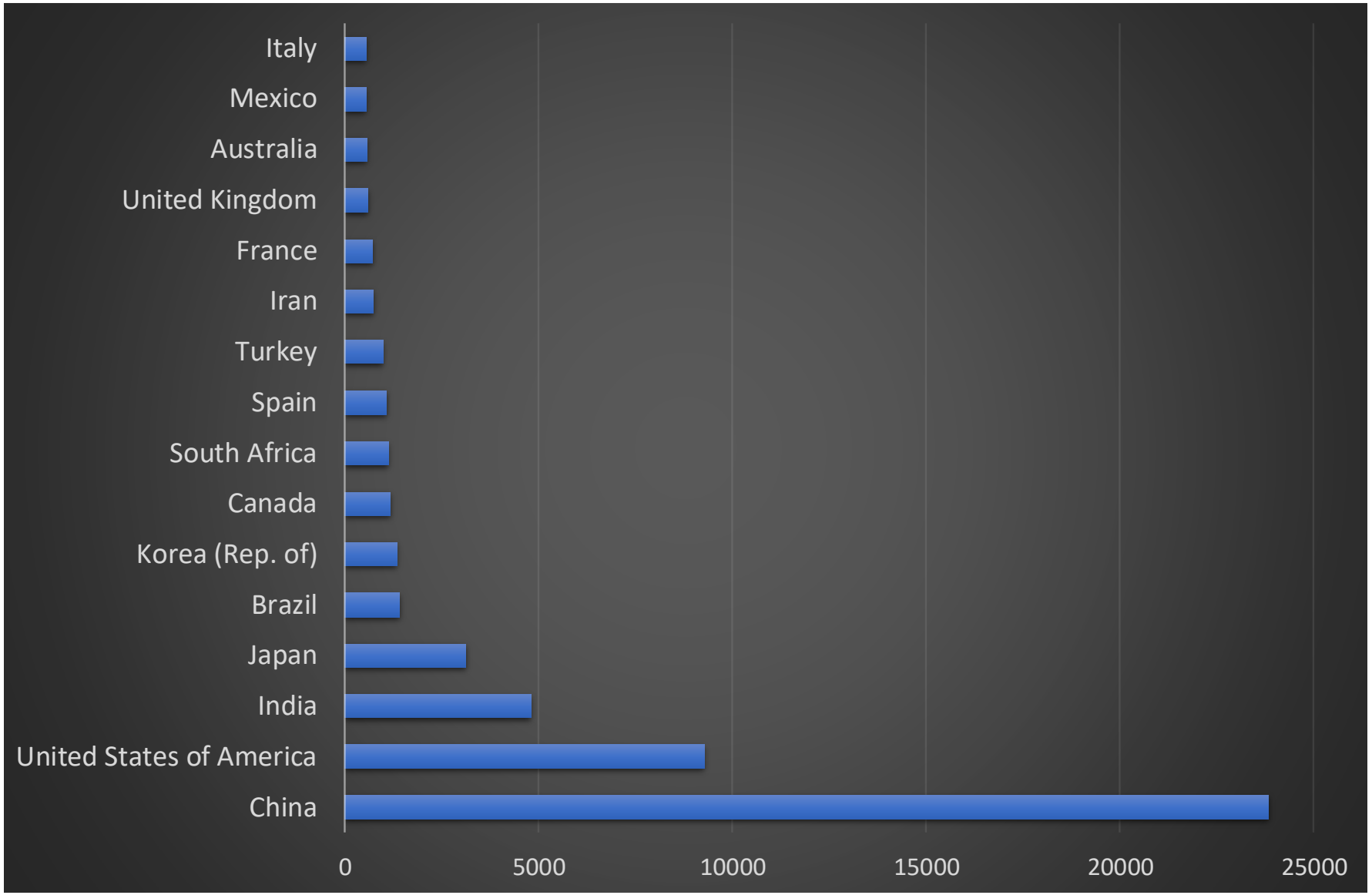
- 165 countries (including 100 member countries)



- 58500 dams registered



Dams by country



Recent Changes

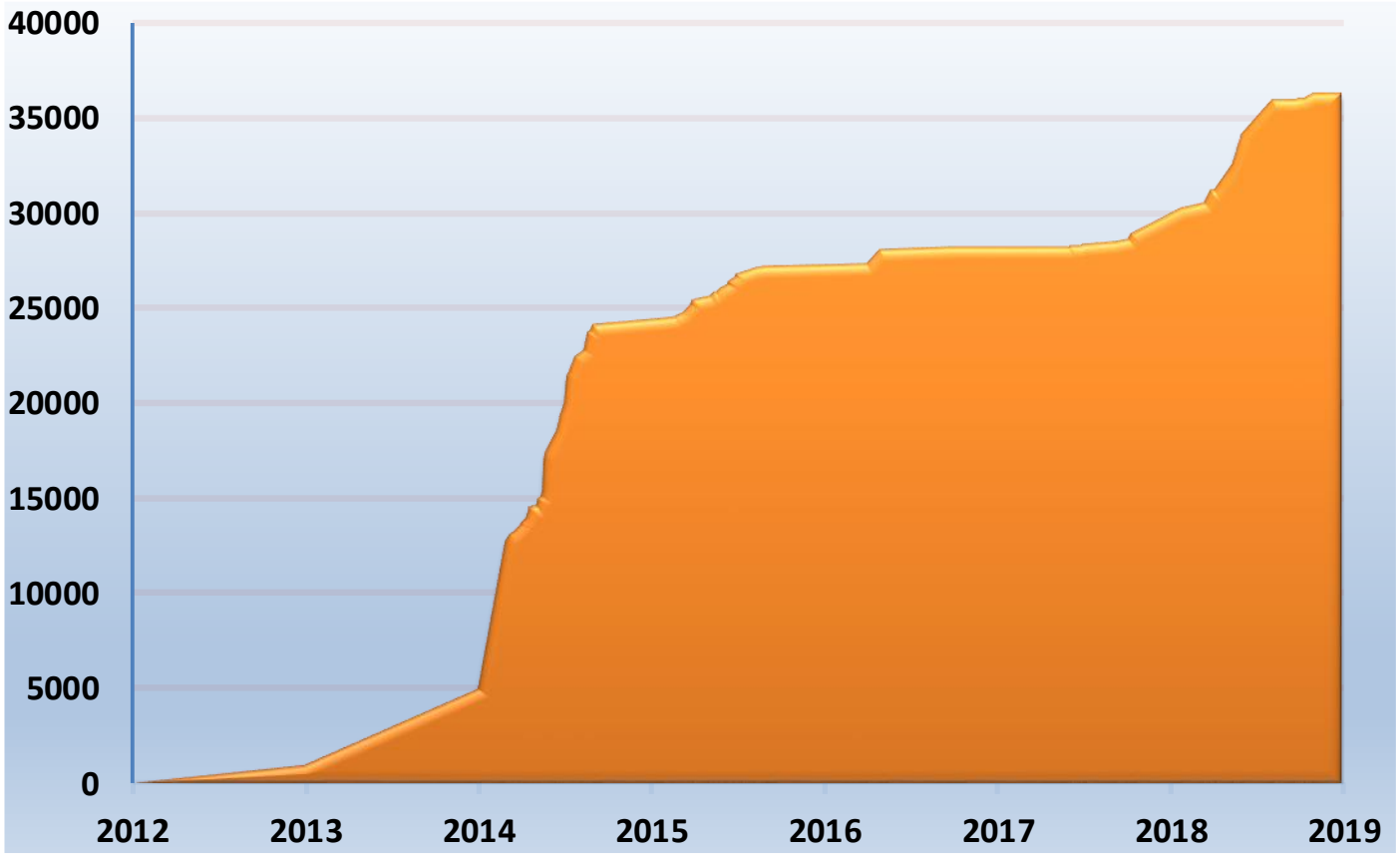
- Georeferencing: in particular to avoid duplicated dams
- Integration of tailing dams
- Data kept for decommissionned, abandoned dams...
- Usage detail (installed hydroelectric power, annual production, irrigated area)
- Detail on the type of dam (under development)

Ex: Type Dam-weight = PG
- Masonry = > GM
- Traditional concrete = > GCC
- Roller-compacted concrete = > GRCC
- In Hardfill » = > FSHD

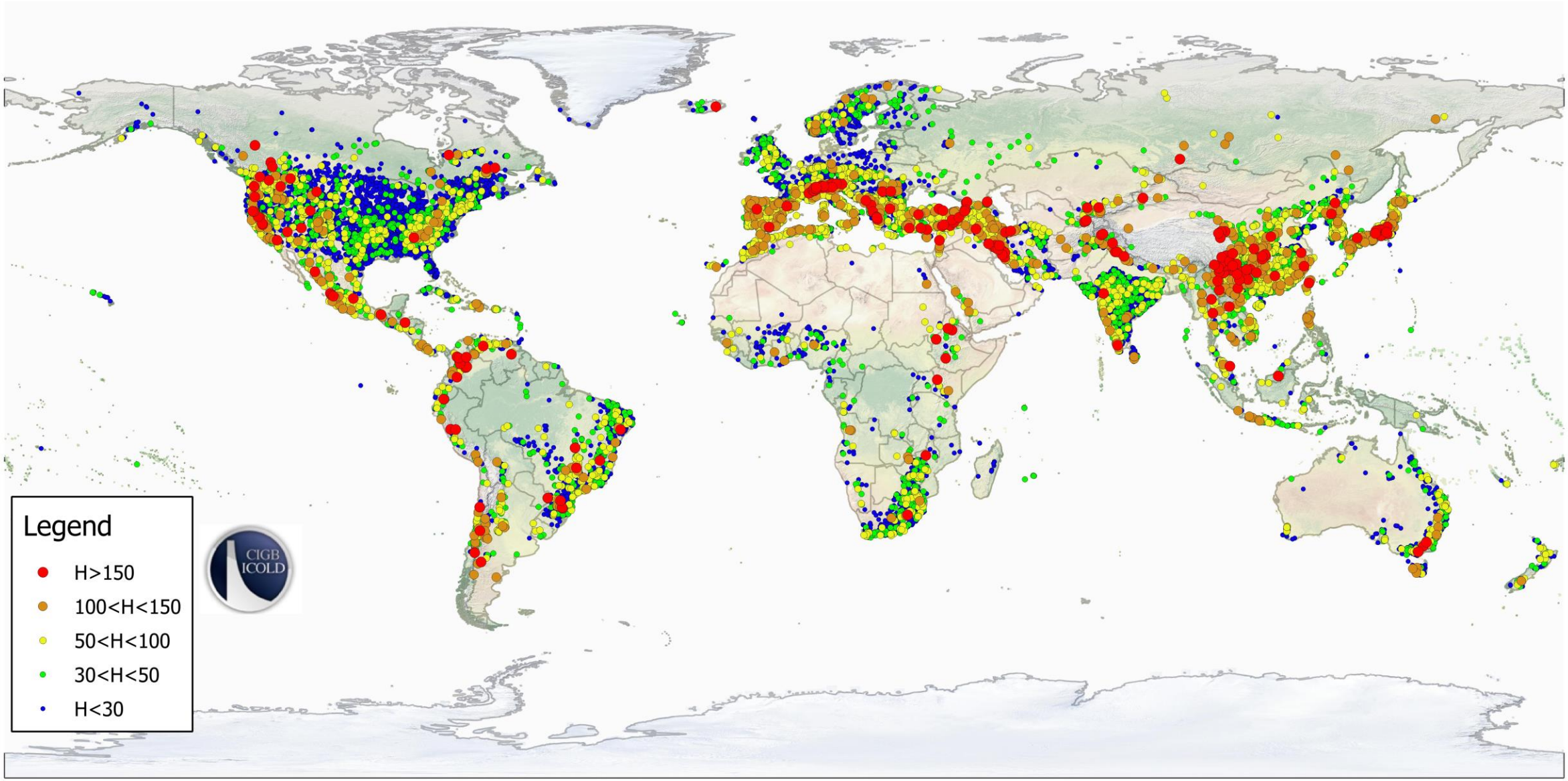
- Measuring the quality of the Register
  - Number of dams
  - Register filling rate
  - Correcting data errors

Georeferencing

- Started in 2012
- Concerns now more than 60% of the Register
- Longitude+Latitude => Estimated altitude

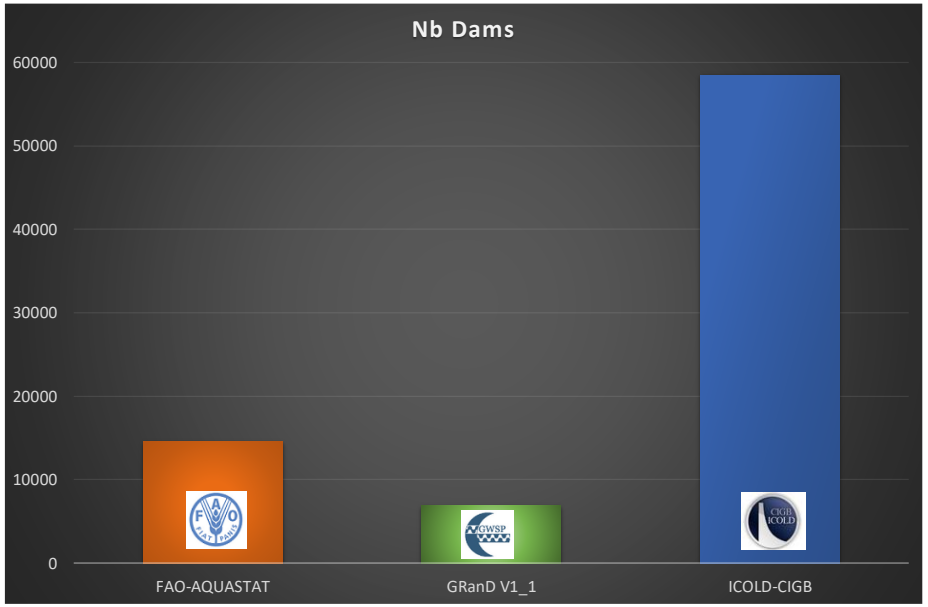


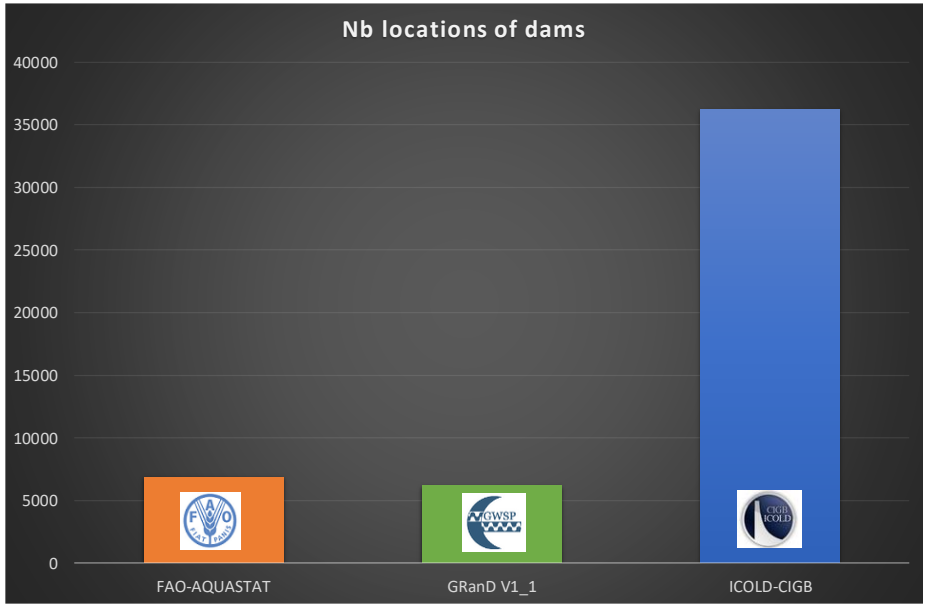
Georeferencing

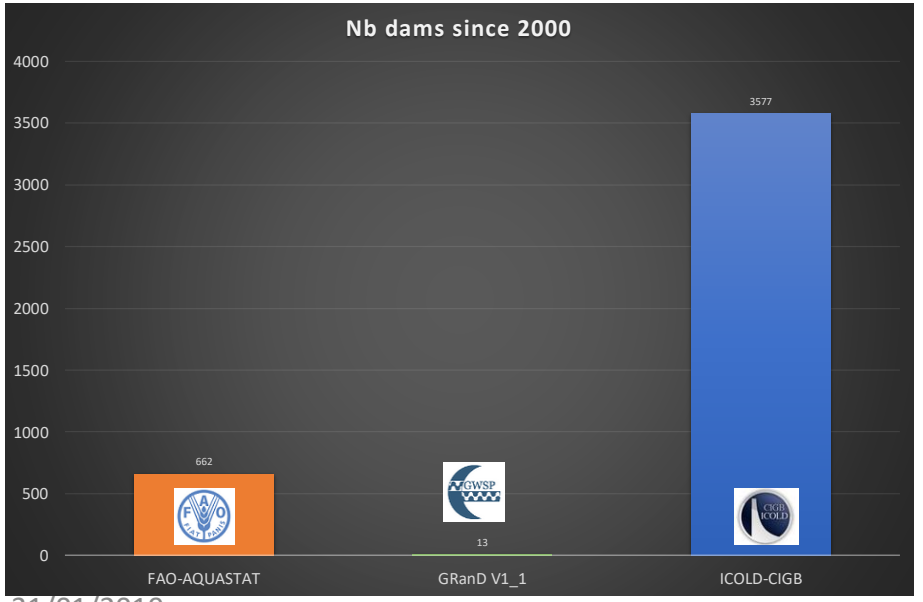


Other databases

- FAO/AQUASTAT
- Great
- Nacse
- ....
- Wikipedia

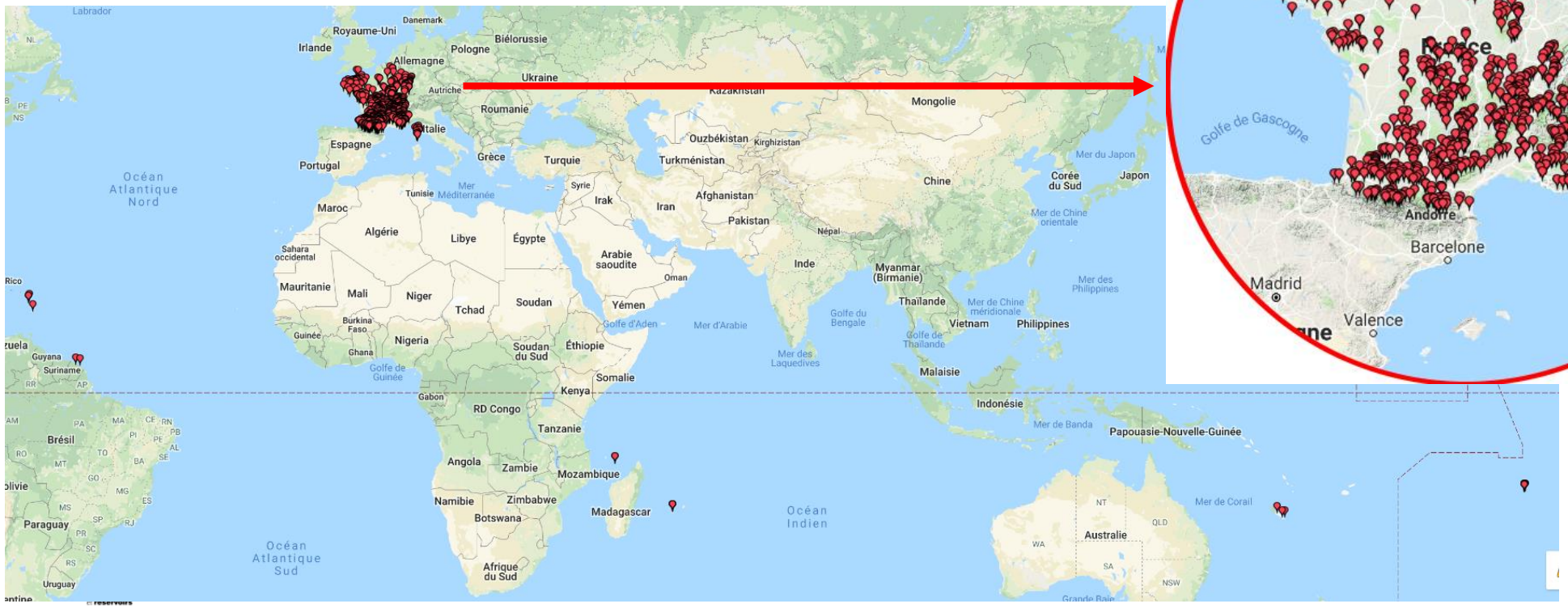




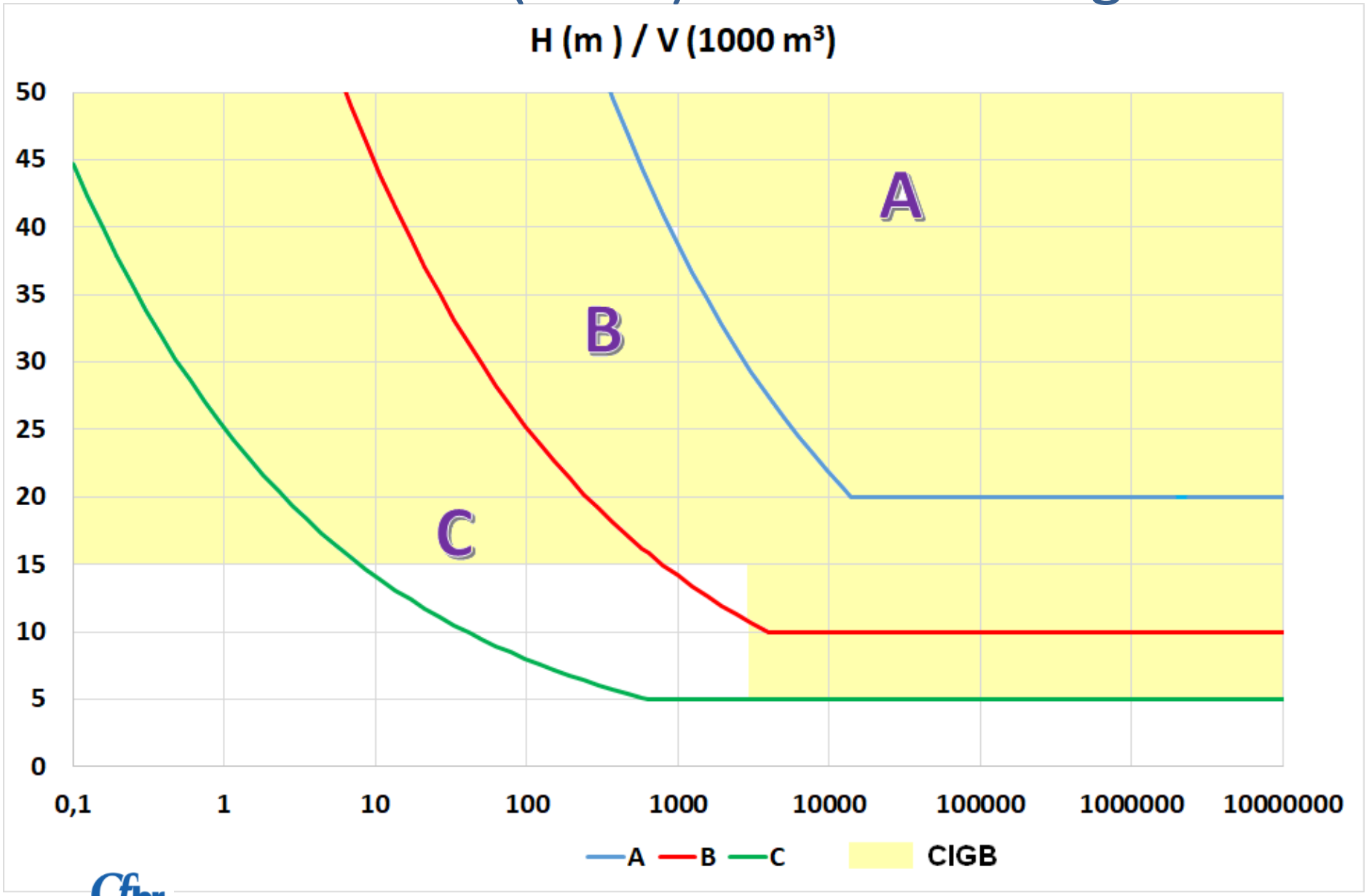


French Large Dams

- 709 large dams (ICOLD) – 13th country
- Highest: Tignes (180 m)/Jinping I (305 m) – Rogun (U/C 335 m)
- Oldest: Saint Ferréol (1675)
- Most recent: Moreau (Guadeloupe) – 2017



Dam Classes (2017) and ICOLD large dams

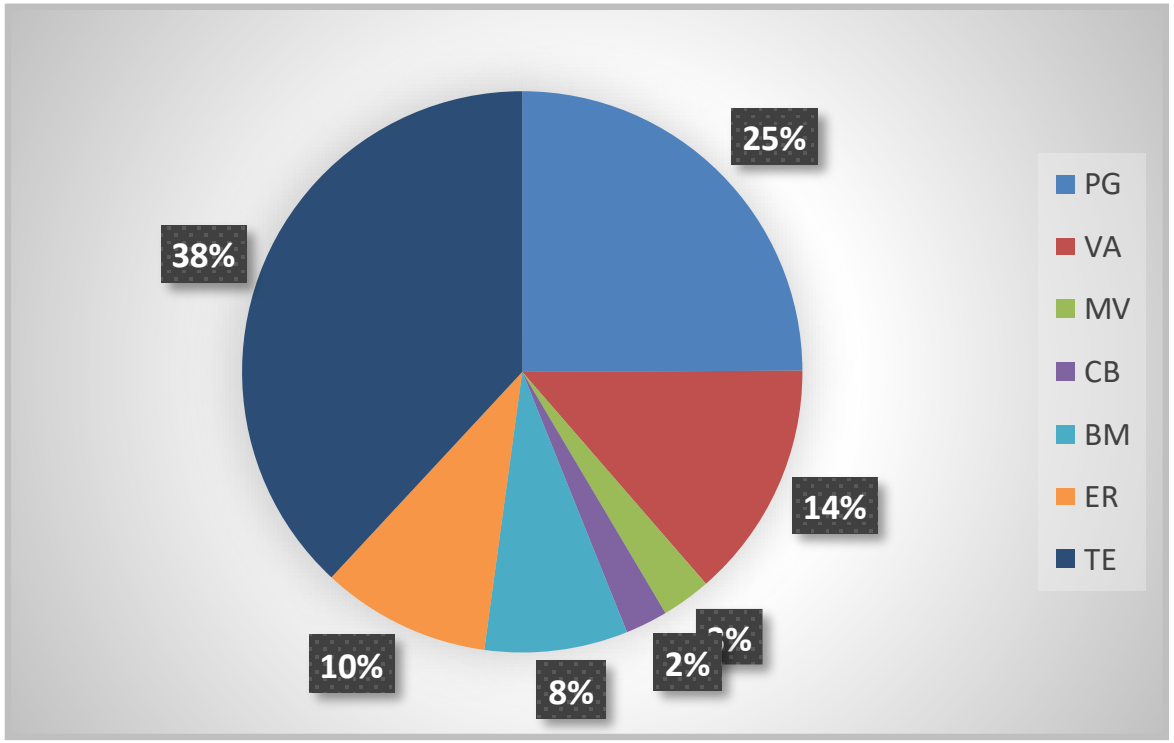


Note

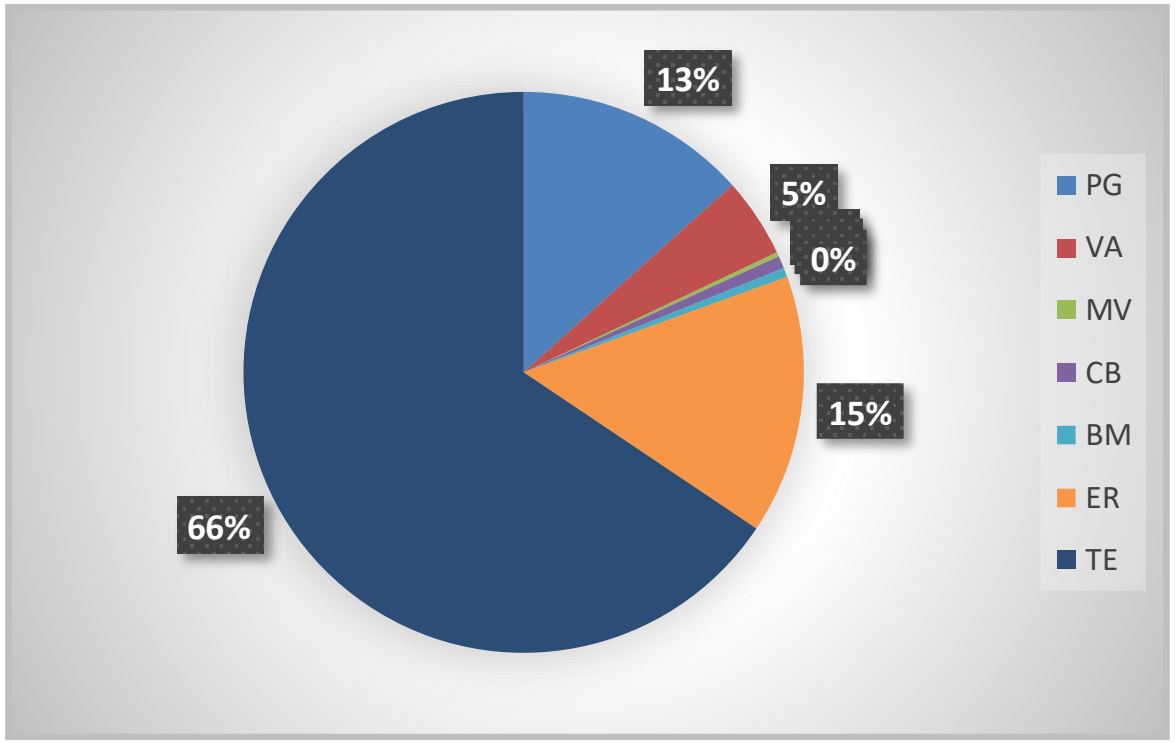
Htn < Hfond

Some statistics: Type of Dam

France

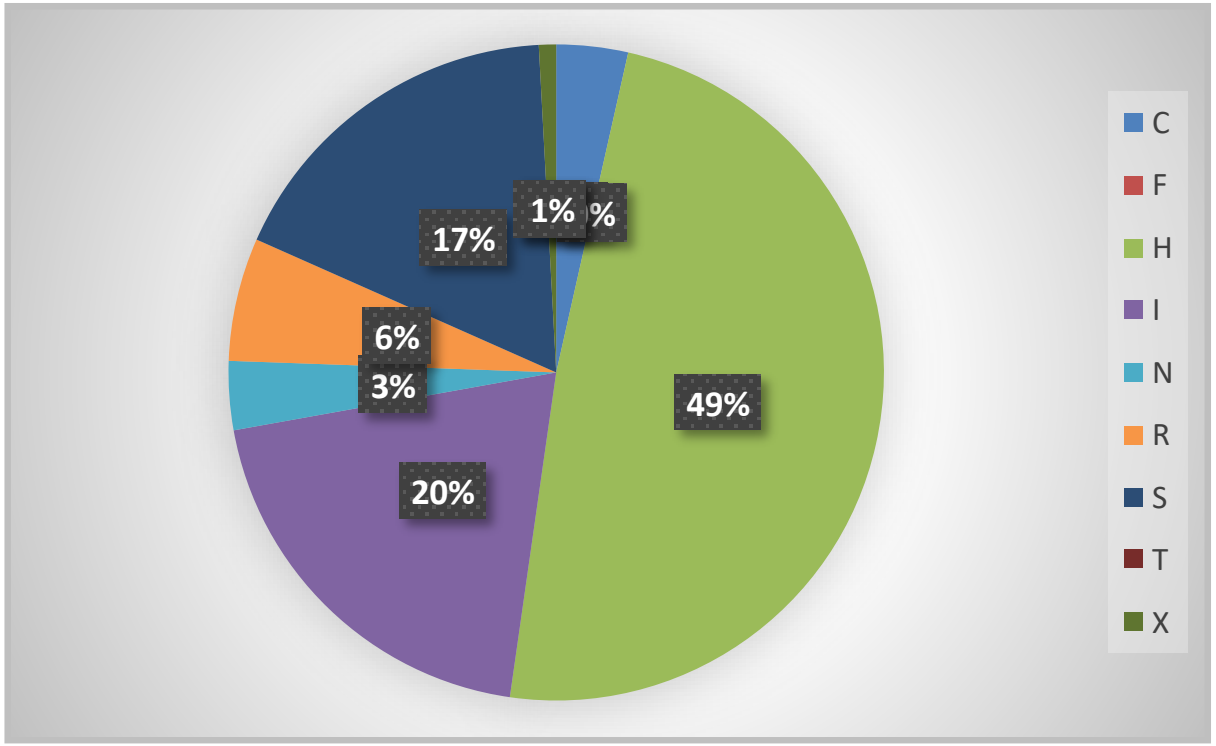


World

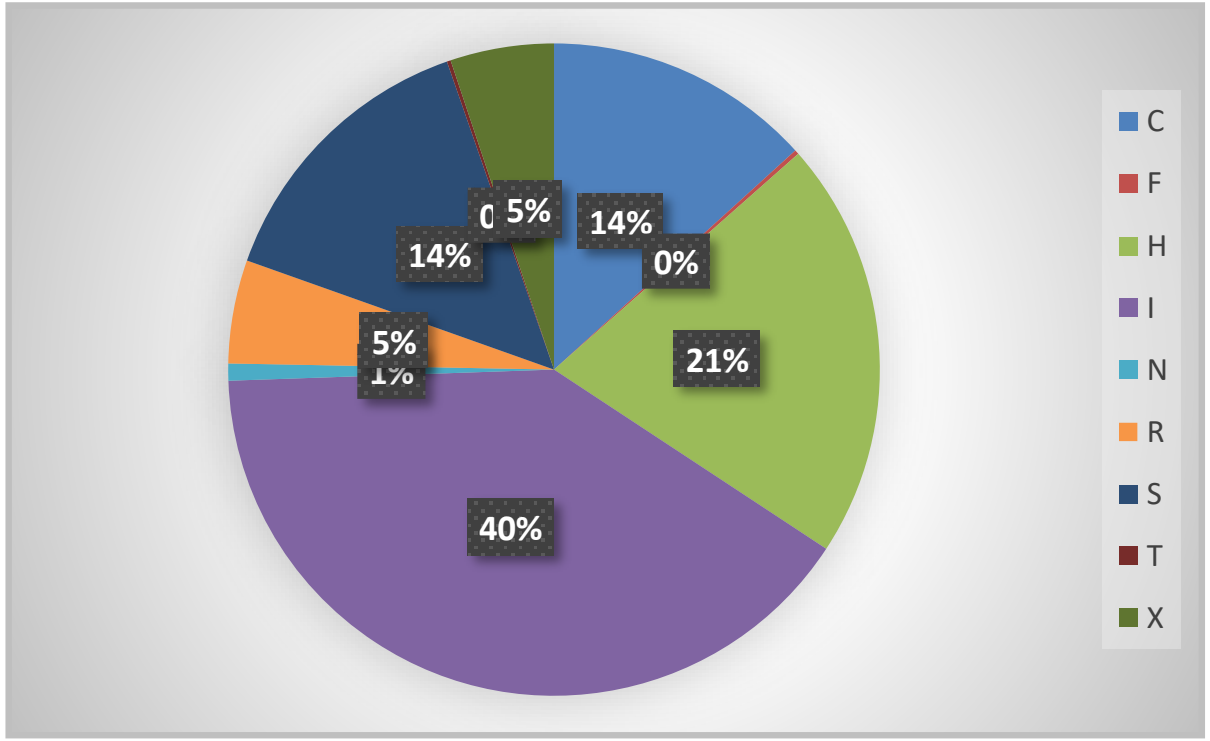


Some statistics: Main use

France

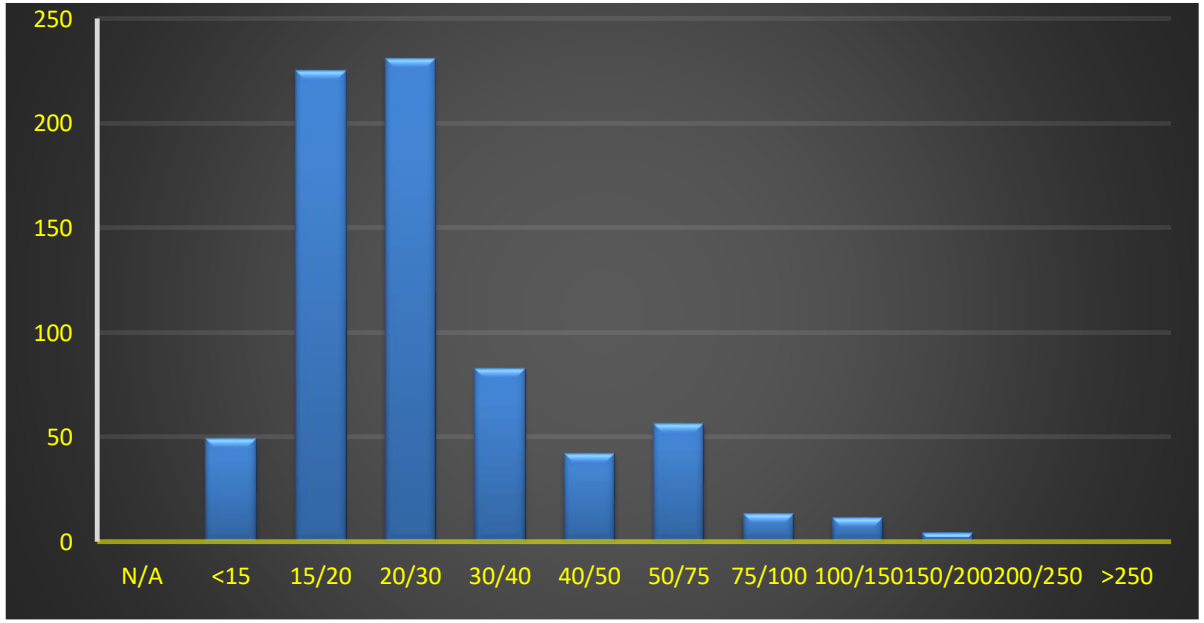


World

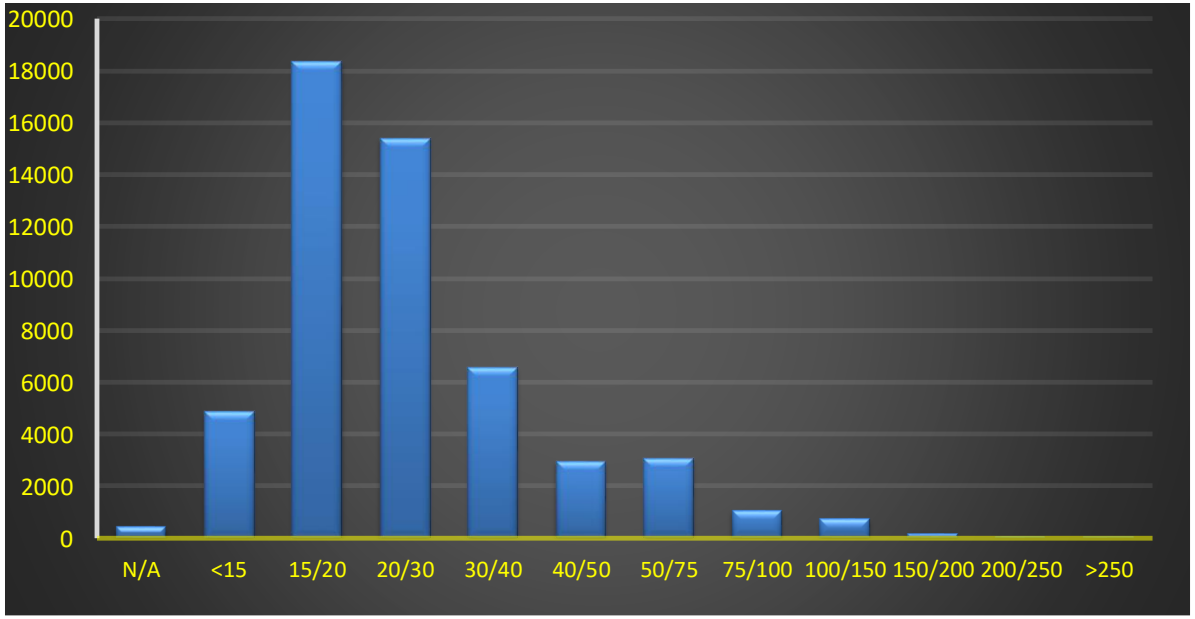


Some statistics: Height

France

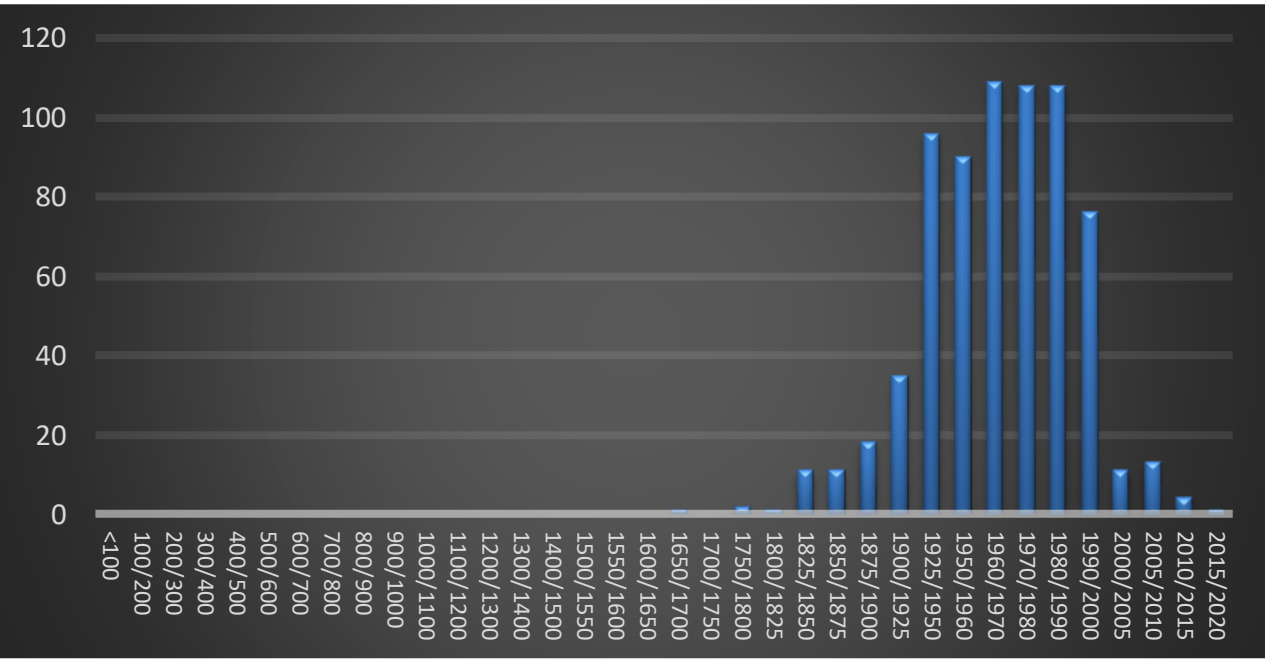


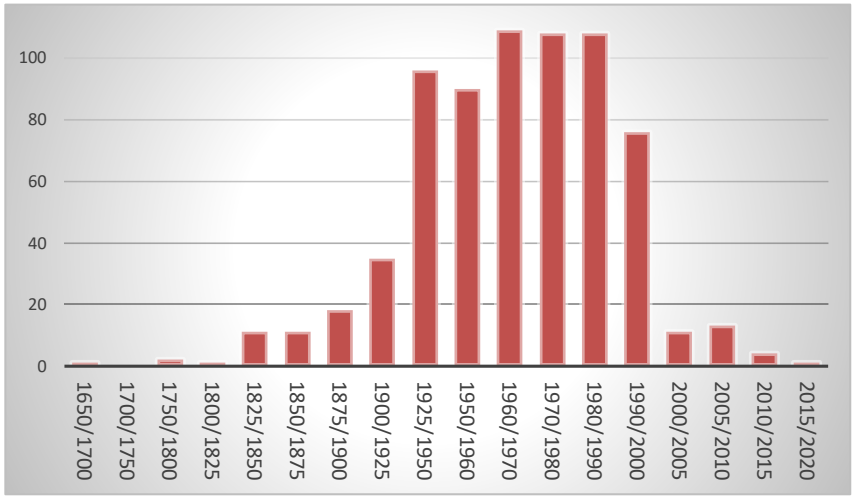
World



Some statistics: Year of commissioning

France





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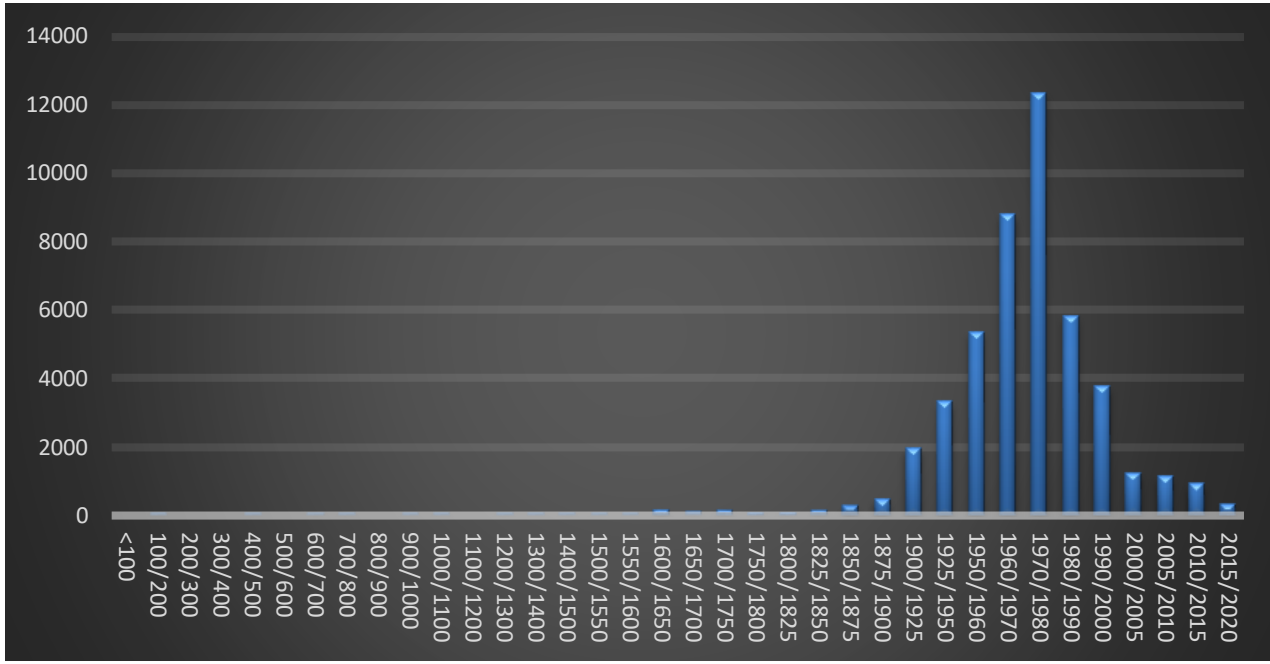

Large Dams: French references