Status and Progress of Globlal Lake Database developments

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Background and history

- Global Lake Data Base (GLDB) (Choulga et. al, 2014) v3 is used for parameterization of lakes in many NWP and climate models
- GLDB consists of a list of lakes and mapped (gridded) information on lake depth. For mapping, raster land cover maps are be used.
- List of lakes contains lake coordinates, name, area, mean and maximum depth. List of lakes of GLDB v3 contains ca. 15 000 of lakes (14 470 freshwater and 300 saline)
- For mapping, GLDB v3 uses ECOCLIMAP II (Faroux et. al, 2013) land cover map, with a resolution of 30 arc sec. ($\approx$ 1 km)
- New global better resolution GLDB is being developed, with increased resolution and more data on lake depth.

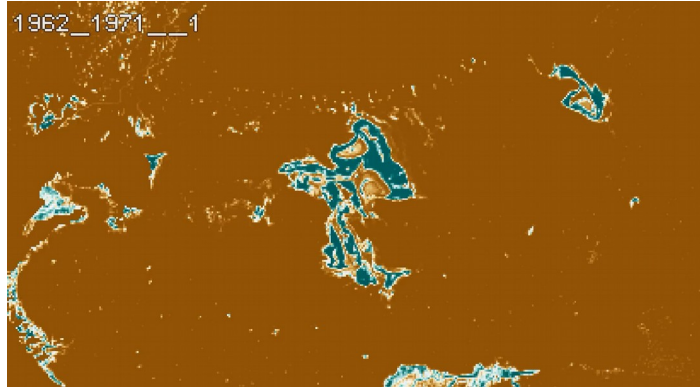- Developments were supported from different sources, until 2024 – by EUMETNET

Coming version of GLDB

- List of lakes was collected and checked by O. Toptunova. It includes information from the database of Institute of Limnology of RAS (Ryanzhin database) and Global Dam Watch (GDW) database.

- Contains information on 23 753 lakes, among them:

  - 22 196 freshwater,

  - 421 saline,

  - 1061 reservoirs (assumed depth),

  - 75 crater lakes (assumed depth).
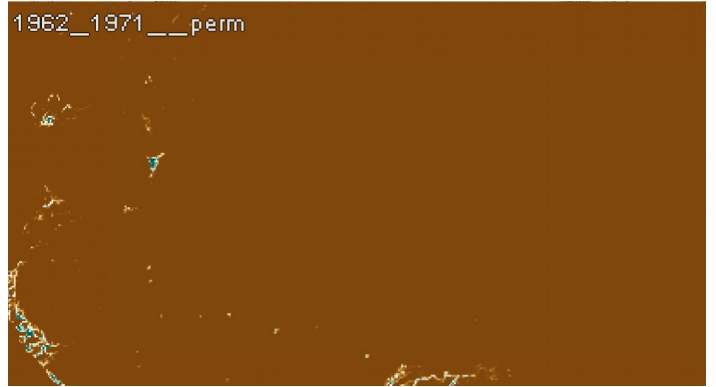
Coming version of GLDB

- For mapping, water coverage information from JRC is used.

- The JRC dataset contains satellite information on water coverage starting from ca. 1960-s with primary resolution of ca. 30m.

- The dataset contains pixels labeled into several water coverage types, according to temporal variation of water. We combined several water coverage types, to consider "permanent" and "time varying" (seasonal variations) water coverage.

- Information was aggregated onto 10 arc sec. ($\approx$ 300 m) resolution map and a combination of "permanent" water coverage fraction and "time varying" water coverage fraction with the weight of 40% was applied to create a land-water mask.

- The weights were chosen experimentally, focusing on 3 problematic areas, found during the preliminary study with ECOCLIMAM SG map. These are the areas on the globe with highly varying water coverage: Run of Kutch Lake (India-Pakistan), Lake Eyre (Australia) and rice fields in Vietnam.
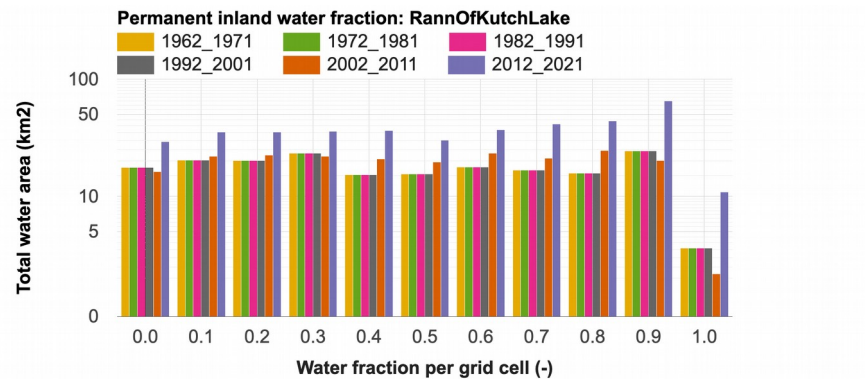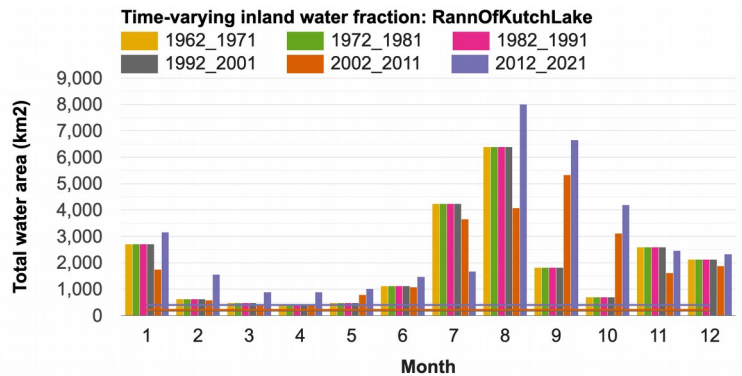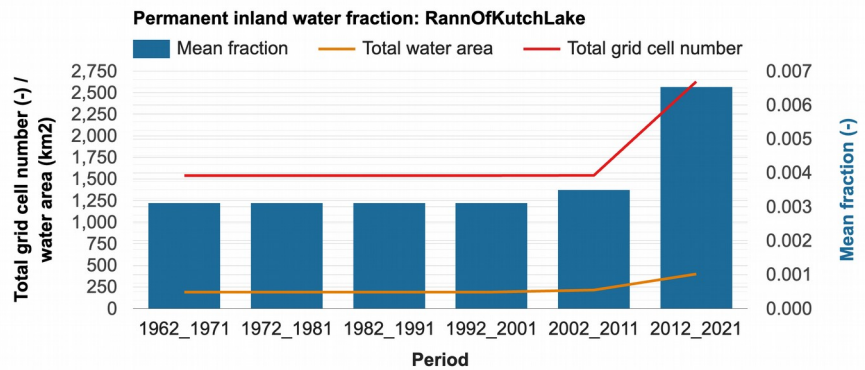
Rann Of Kutch Lake (Pakistan/India)
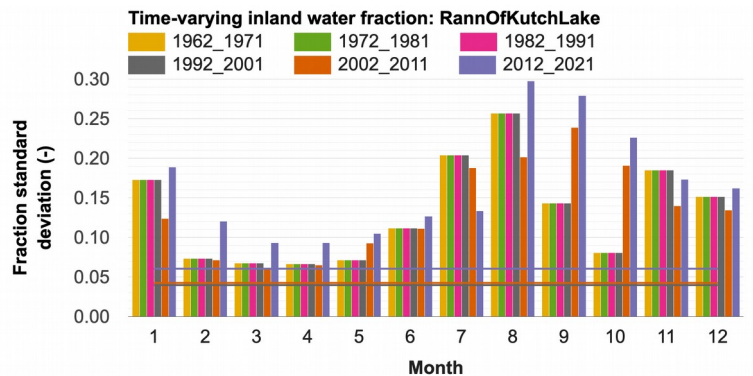
Rann Of Kutch Lake

Permanent water

1962_1971___1

Time-varying water

1962_1971___perm

2012_2021___perm

Rann Of Kutch Lake

Rann Of Kutch Lake
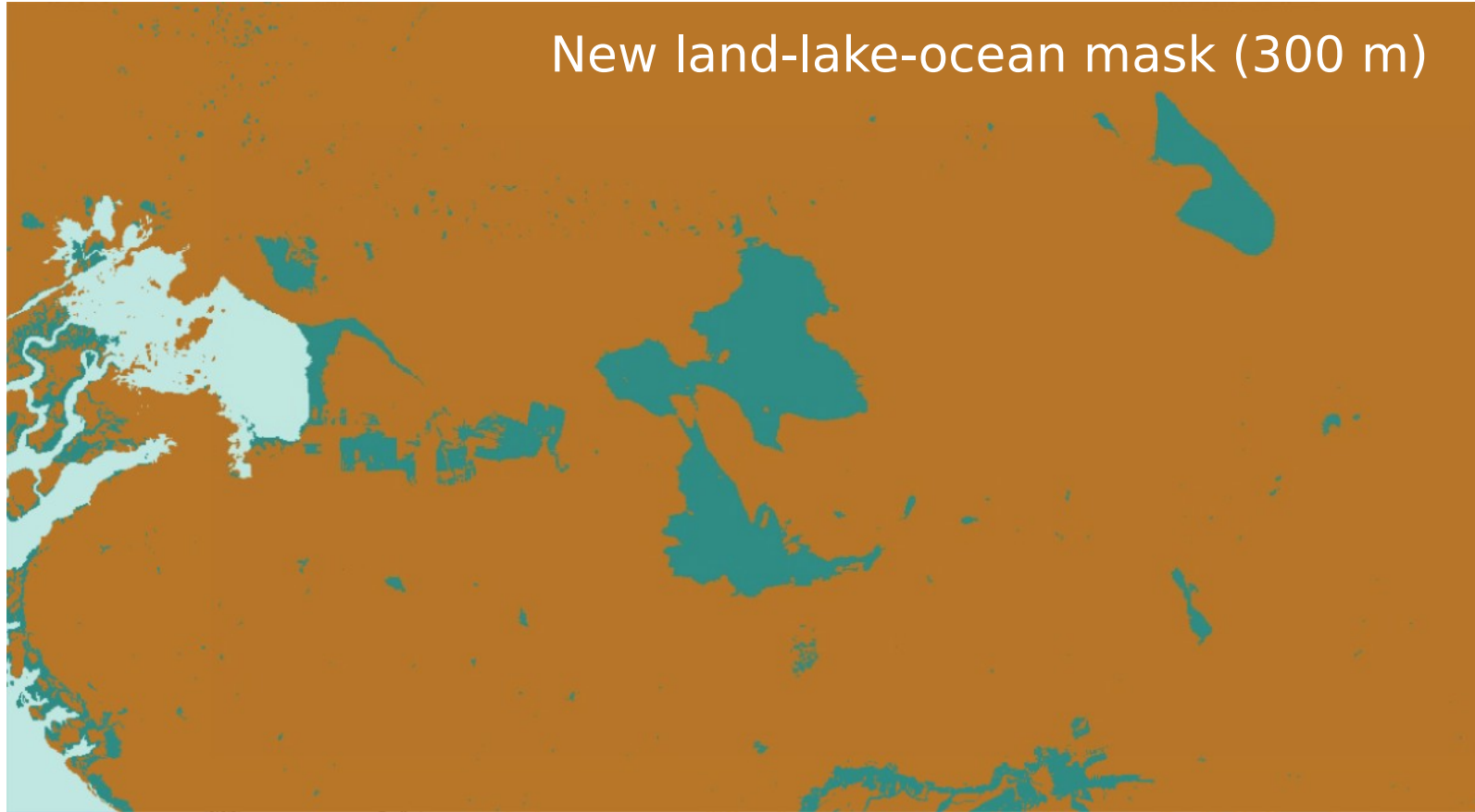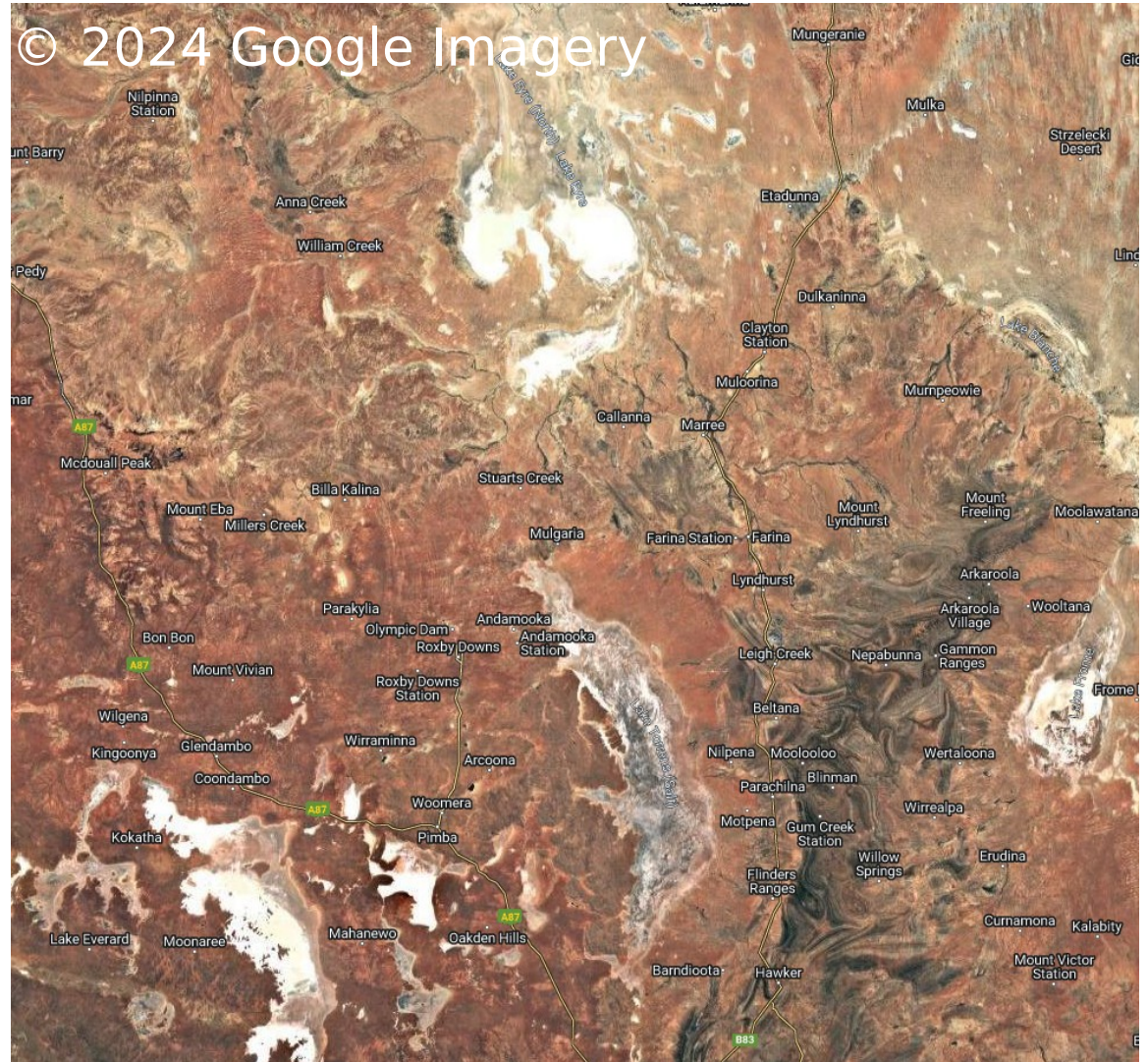
New land-lake-ocean mask (300 m)

Lake Eyre (Australia)

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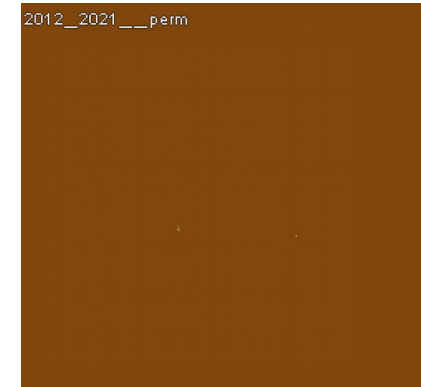
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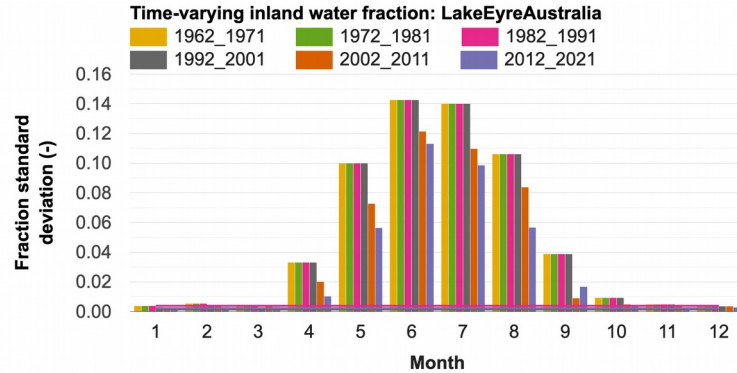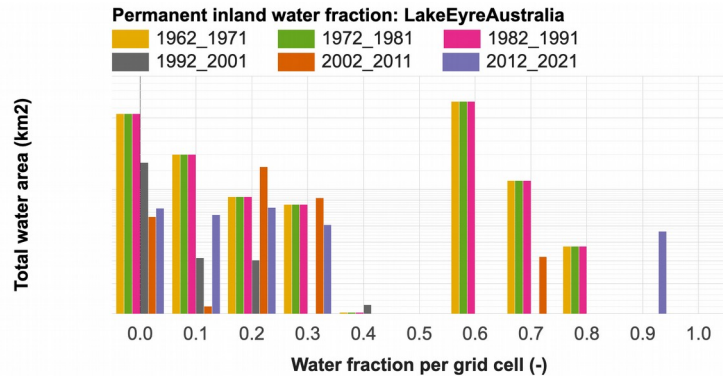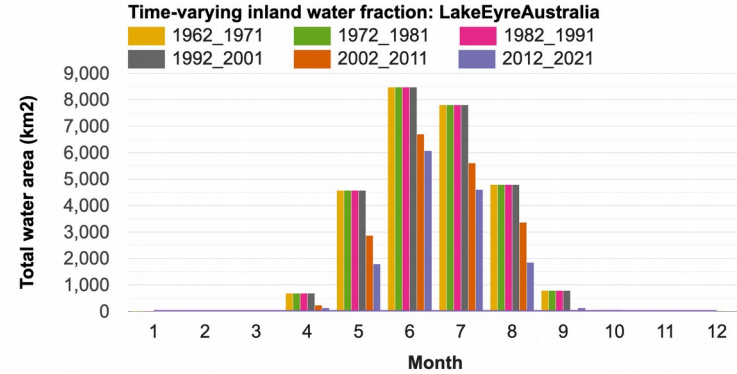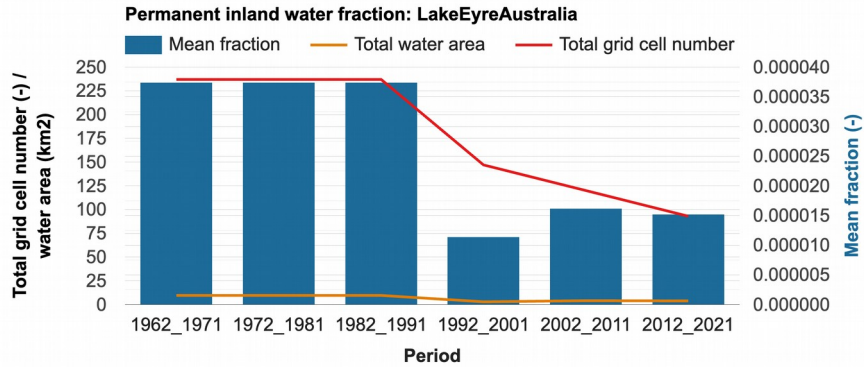
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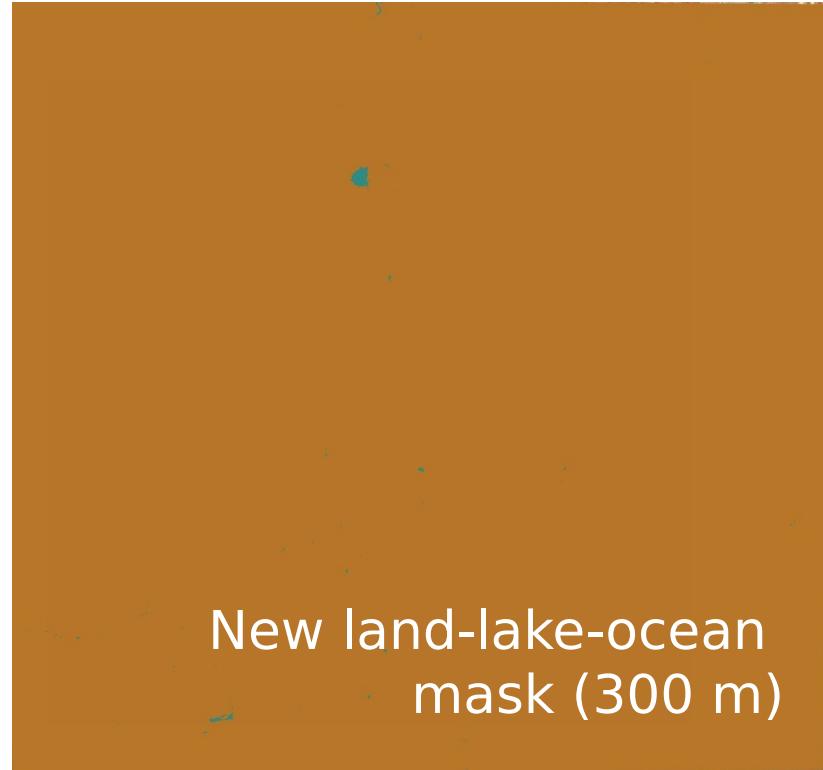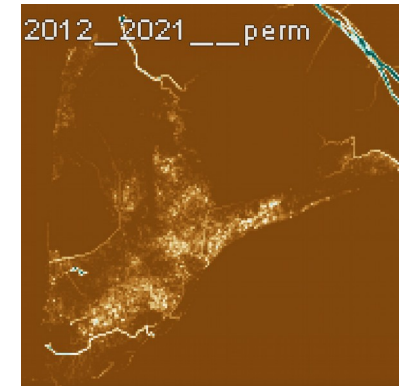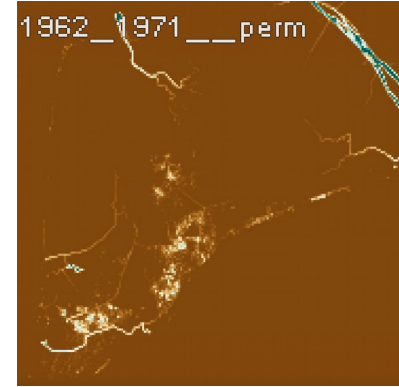

New land-lake-ocean
mask (300 m)

Rice fields (Vietnam)

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Rice fields (Vietnam)

Permanent water

1962_1971___1
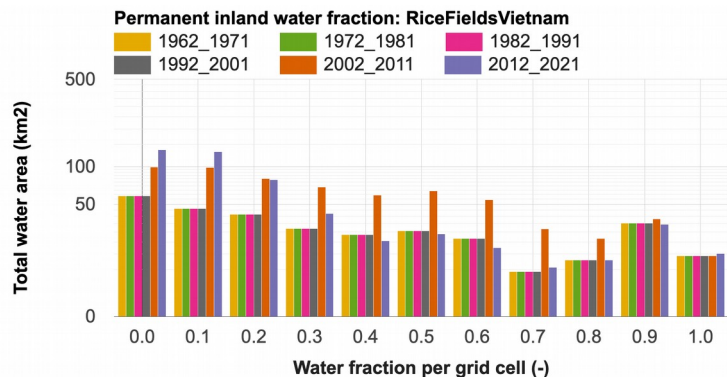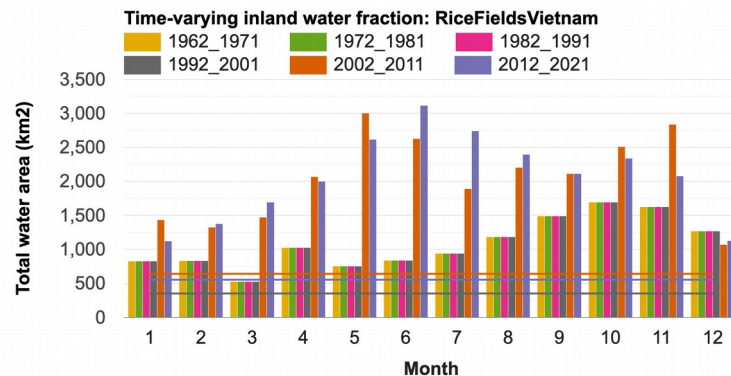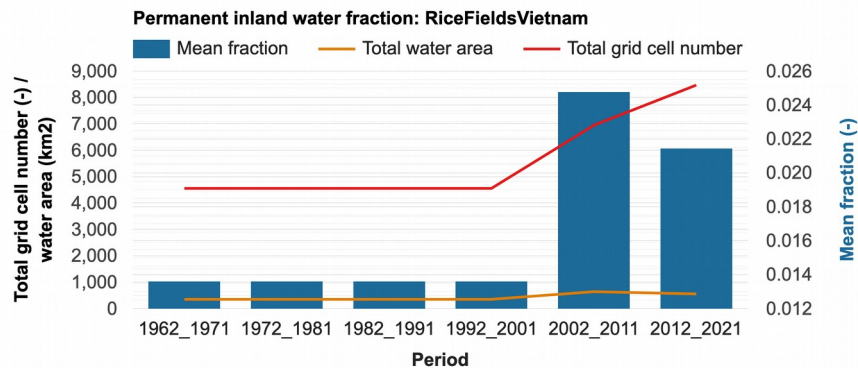

1962_1971___perm

Time-varying water

2012_2021___perm
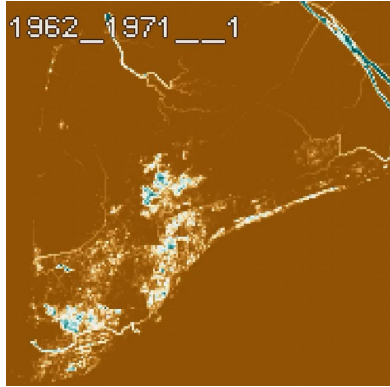
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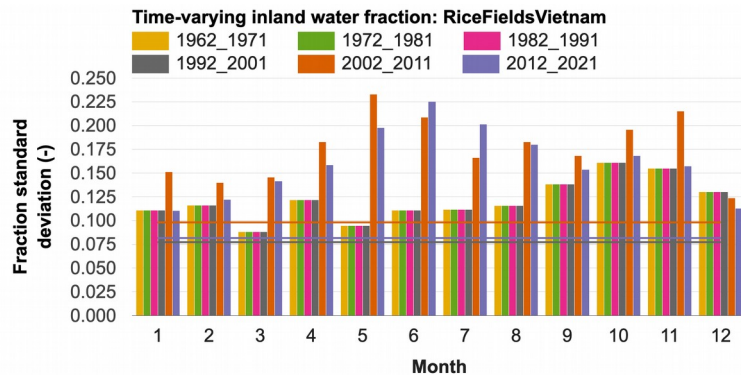
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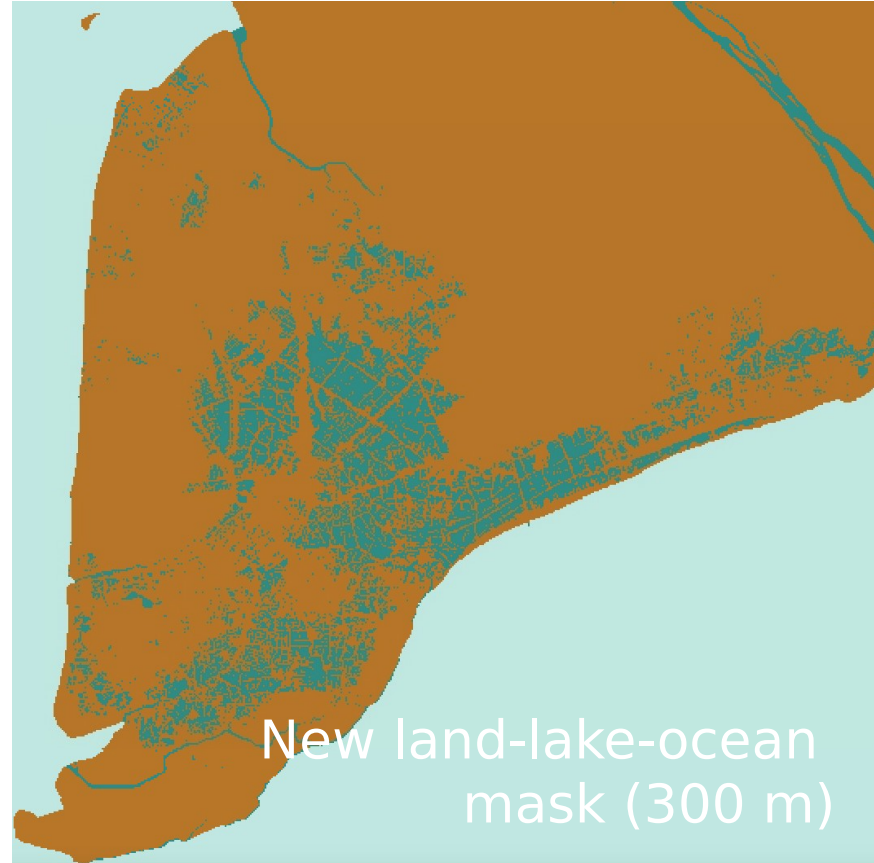
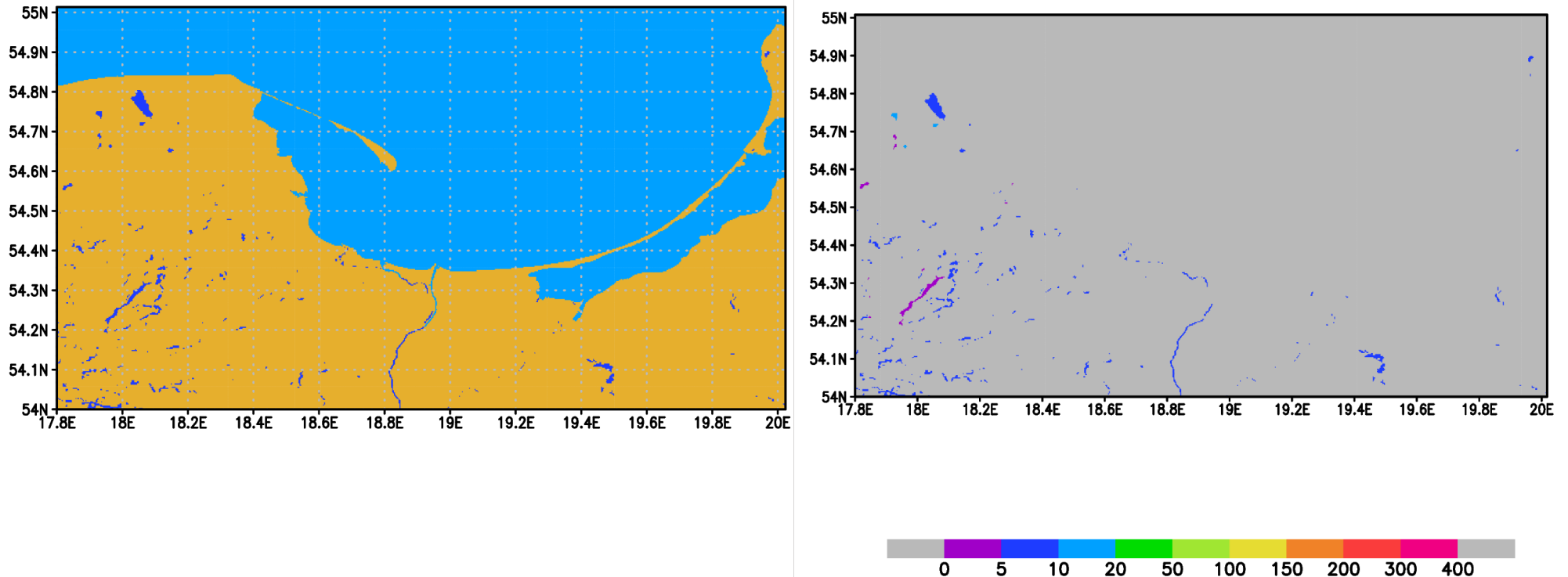# Coming version of GLDB

Example of processing data over Poland

Coming version of GLDB

- All data are on the table
- Processing is ongoing