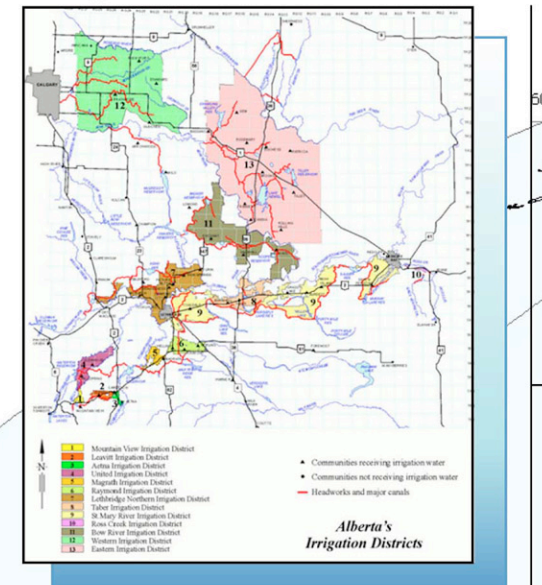
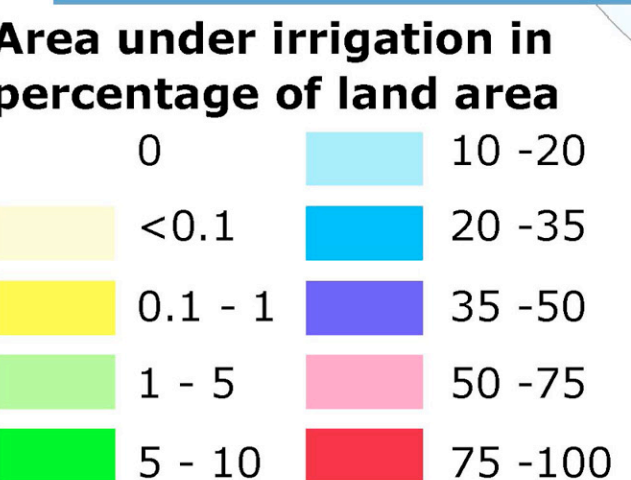
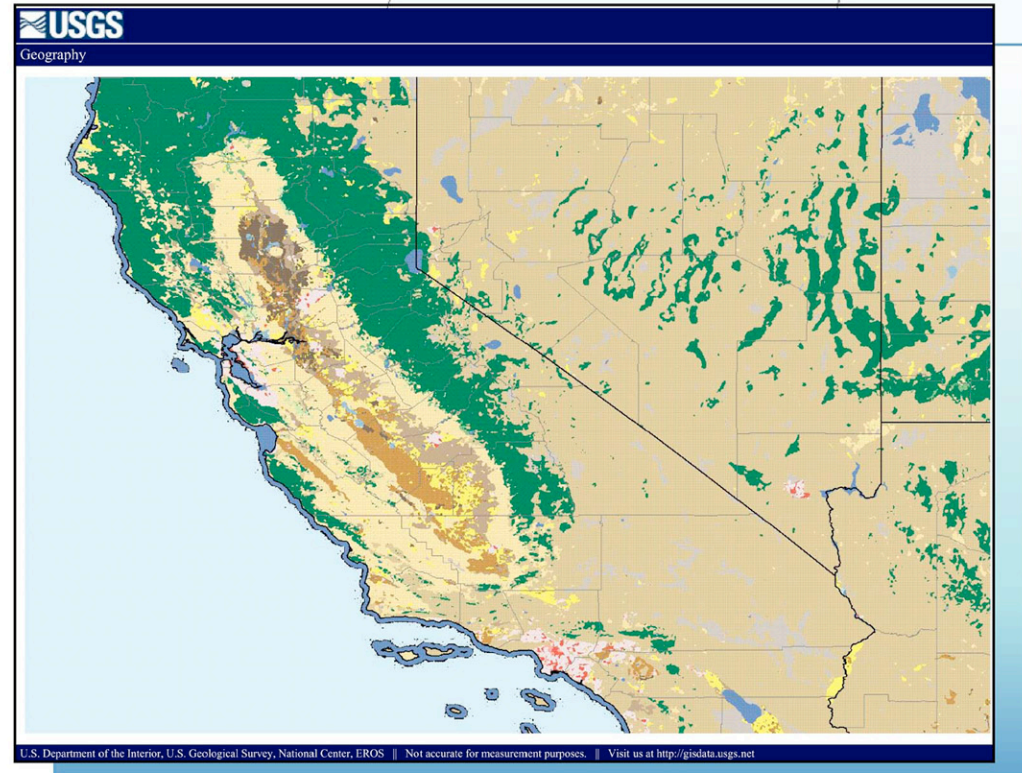


The Global Map of Irrigation

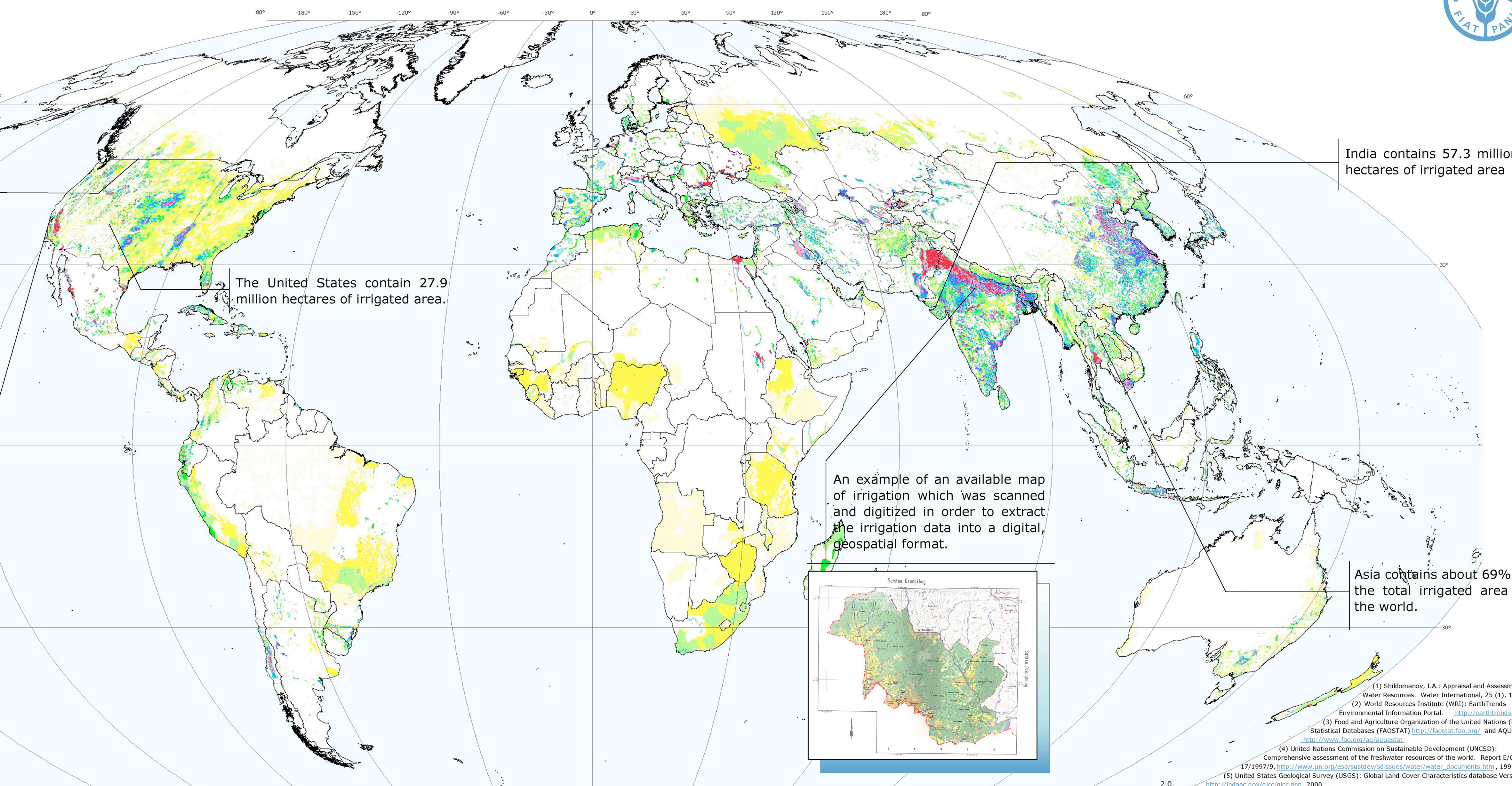
A map of Alberta's irrigation districts, which was used in the making of the Global Map of Irrigated Areas.



National Land Cover Data (NLCD) from 1992 with a 30 meter resolution were obtained from the United States Geological Survey (USGS) website and processed to determine irrigated areas inside of the United States.



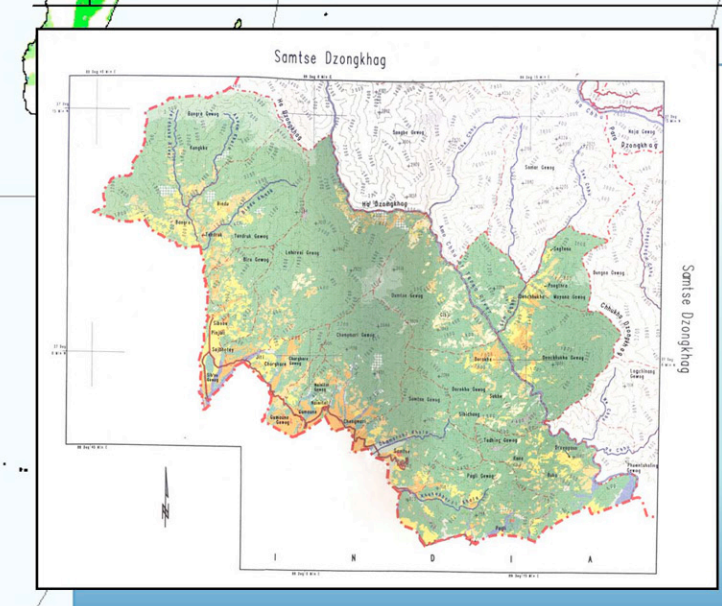
Map Projection: Mollweide



The United States contain 27.9 million hectares of irrigated area.

India contains 57.3 million hectares of irrigated area

An example of an available map of irrigation which was scanned and digitized in order to extract the irrigation data into a digital, geospatial format.



Asia contains about 69% of the total irrigated area in the world.

(1) Shiklomanov, I.A.: Appraisal and Assessment of World Water Resources. Water International, 25 (1), 11-32, 2000.
 (2) World Resources Institute (WRI): EarthTrends - The Environmental Information Portal. <http://earthtrends.wri.org>
 (3) Food and Agriculture Organization of the United Nations (FAO): FAO Statistical Databases (FAOSTAT) <http://faostat.fao.org/> and AQUASTAT <http://www.fao.org/aquastat>
 (4) United Nations Commission on Sustainable Development (UNCSD): Comprehensive assessment of the freshwater resources of the world. Report E/CN.17/1997/9, http://www.un.org/esa/sustdev/sdissues/water/water_documents.htm, 1997.
 (5) United States Geological Survey (USGS): Global Land Cover Characteristics database Version 2.0. <http://glaac.gov/glaac/glaac.asp>, 2000

Introduction

Agriculture accounts for about 70% of all water withdrawn worldwide from rivers and aquifers. In developing countries, up to 90% of water withdrawal is used for irrigation.²



Although globally only 18% of the cultivated area is irrigated,³ 40% of the global food production comes from irrigated agriculture.⁴

Data and Methods

The global map of irrigated areas was developed by combining irrigation statistics for 10,825 sub-national units (figure 1) and geospatial information regarding the location and extent of irrigation schemes. It shows the percentage of each 5 arc-minute cell that was equipped for irrigation around the year 2000.

Compilation of sub-national irrigation database:

- Geospatial information on position and extent of irrigated areas was derived by digitizing hundreds of irrigation maps available in reports of FAO, World Bank, irrigation associations or national ministries of agriculture or water.
- Several atlases and inventories based on remote sensing, in digital format were utilized.
- As the relevance and reliability of the maps vary, it was necessary to decide which geospatial record should be used for each specific sub-national unit. A priority level (figure 2) was created and applied to each record.

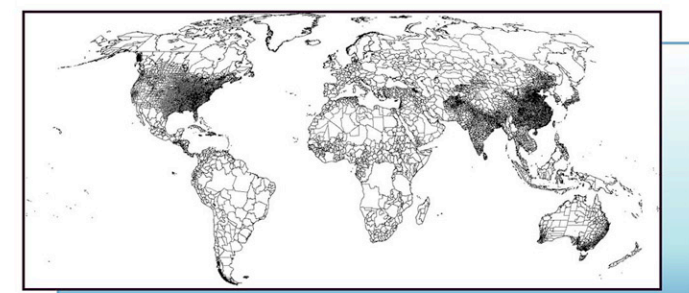


Figure 1. Sub-national units

Distribution over sub-national unit:

- If the extent of all digitized irrigated areas of the highest priority level was smaller than the total irrigated area reported for the specific sub-national unit, records with the second highest priority were considered.
- This distribution process was repeated down to the next lower priority level until the sum of irrigated area in the map was equal to the irrigated area in the sub-national statistics.
- In many sub-national units, lack of geospatial information made it necessary to use indirect information to infer areas where irrigation was probable. (Includes areas where the main irrigated crops are grown, or cultivated areas in very arid regions.)
- For arid regions remote sensing data were additionally used to verify the available maps.

Priority	Geographical Data Type
10	Point records (irrigation projects) with known command area Point records without known command area Polygon records (outlines of large irrigated areas) with known command area Polygon records without command area Any other, less reliable records
1	Areas potentially irrigated as derived from global landcover maps

Figure 2

- If no spatial information about the irrigation within a sub-national unit was available, irrigated area was distributed according to a global land cover data set to all crop, pasture, grass, shrub, savanna and vegetated wetland areas.⁵
- The irrigation density grid (resolution 0.01 x 0.01 degree) at a country level was then aggregated to create the global map of areas equipped for irrigation at a resolution of 5 min. x 5 min.

Conclusions

- The main advantage of the Digital Global Map of Irrigated Areas is that the irrigated area summarized in the sub-national statistical units is equal to the irrigated area as reported by census-based statistics.
- The methodology allows to easily incorporate new information and benefit from advancements made by national census and mapping authorities.
- The map is based on local maps and data sources.
- In our plans to improve the dataset any comments, information or data that might contribute to the effort would be appreciated

<http://www.fao.org/ag/agl/aglw/aquastat/irrigationmap/index.stm>