



Geo-referenced database on dams in the Middle East

Notes and References

General notes

A. Quality of data

The references used for the database were: i) International Commission on Large Dams (ICOLD). 2007. *The World Register of Dams*; ii) National Reports; iii) Information obtained from national experts through AQUASTAT national surveys; iv) April 2010 version of Global Reservoir and Dam (GRanD) Database; v) The Internet.

The database, in its present format, is neither complete nor can be considered error-free. It corresponds to the best available information at the time of the study.

B. Coordinates

Coordinates are given in both degrees, minutes, seconds and decimal degrees. Location was obtained through FAO AQUASTAT country profile surveys and geographical information as detailed in the national and other references columns in the database.

C. Large dam

According to ICOLD, a large dam is a dam with a height of 15 metres or more from the foundation. If dams are between 5-15 metres high and have a reservoir volume of more than 3 million m³, they are also classified as large by ICOLD.

While the database concentrates on large dams, in some cases if information on other dams was available, it has also been included, since AQUASTAT considers this information to be valuable.

D. Dam height

All heights are given in metres, with a precision of two decimals (cm), although most of the available figures are given with a precision of 1 metre.

E. Reservoir capacity and sedimentation rate

The reservoir capacity refers to the initial capacity, not taking into consideration the reduction in volume due to sedimentation. The level of sedimentation refers to the percentage of initial capacity lost due to sedimentation. This should be linked to a year, but not always the year is available.

Figure 1:
Major river basins with sub-basins and dams in the Middle East

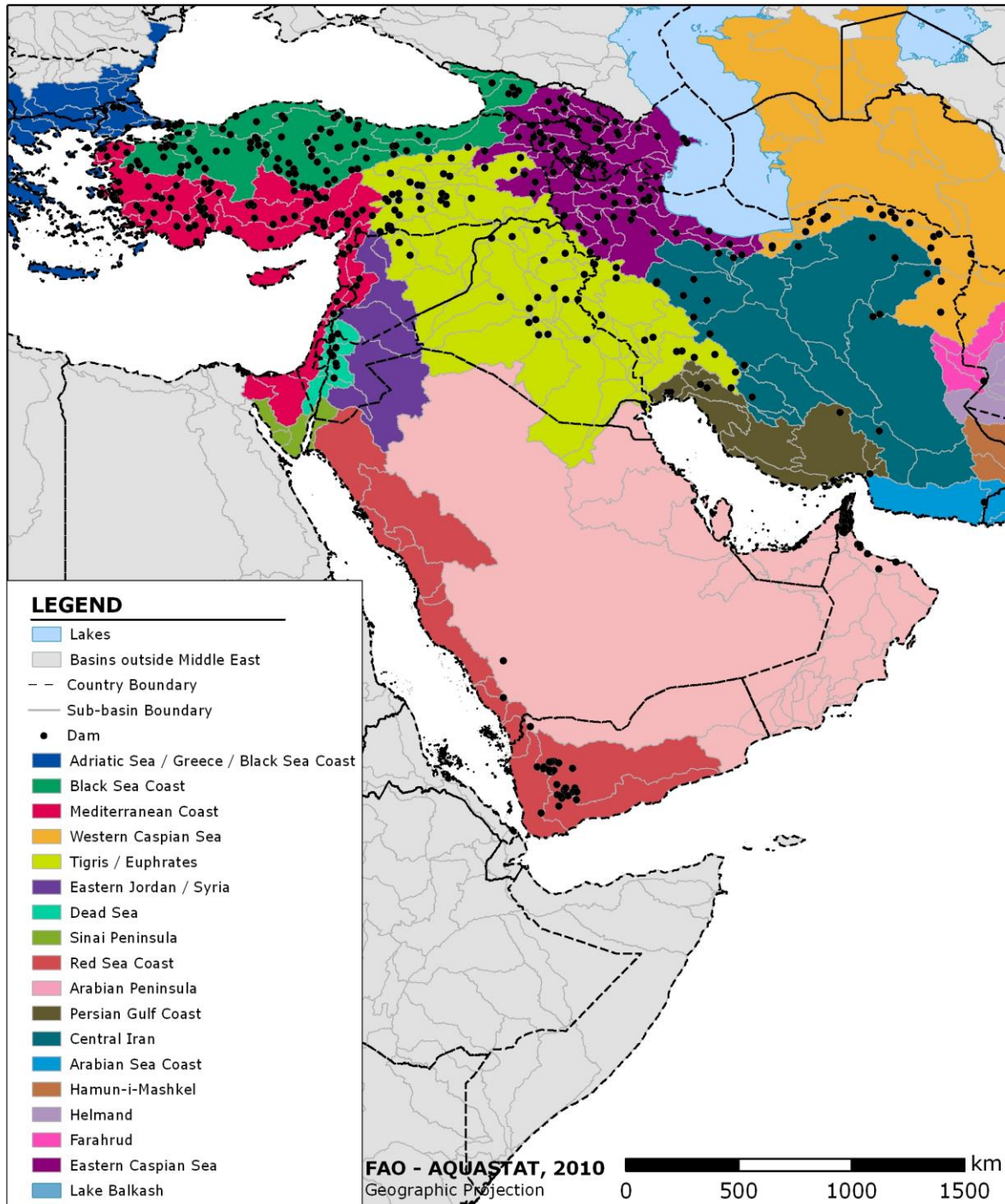
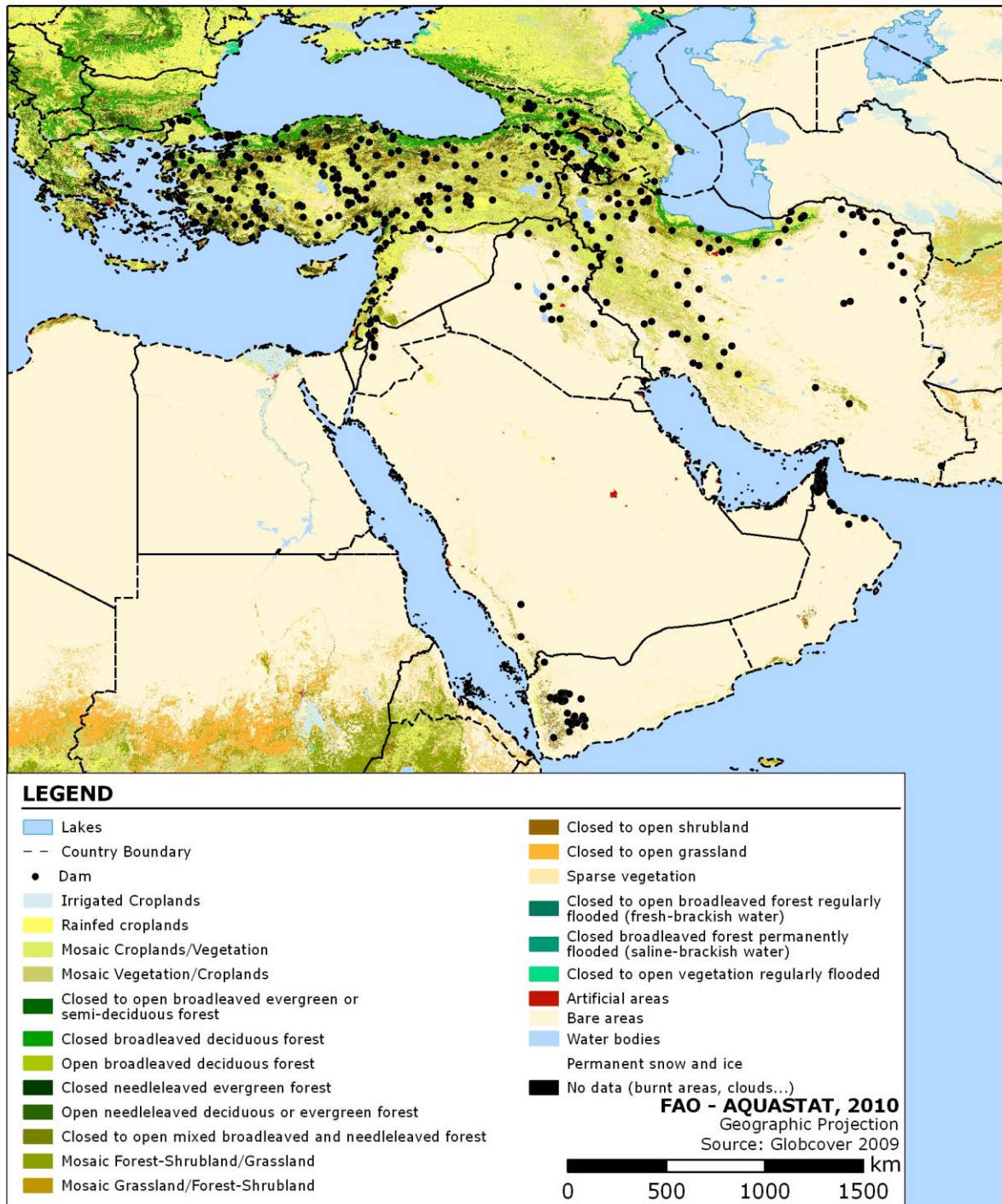


Figure 2:
Countries and dams, with global land cover (Globcover 2009)





Explanation of the fields of the dams database in Excel

Column Title	Explanation
Name of dam	The name of the dam
Country	The name of the country in which the dam is located
ISO alpha-3	Country codes used by United Nations
Administrative unit	The name of the sub-national administrative unit in which the dam is located. Was often determined using the GAUL dataset
Nearest city	The name of the city closest to where the dam is located
River	The name of the river on which the dam is located
Major basin	The name of the major river basin in which the dam is located.
Sub-basin	The name of the sub-basin in which the dam is located
Completed/operational since	Year in which the dam was completed, operational or improved
Dam height	Height of dam in metres. The precision given is two decimals (cm), although most of the available figures are given with a precision of 1 metre
Reservoir capacity	Capacity of reservoir in million (1 000 000) cubic metres (this is equivalent to hm ³). It refers to the initial capacity, not taking into consideration the reduction in volume due to sedimentation
Sedimentation rate	Percentage of initial capacity lost to sedimentation (%). This information is updated to be latest known.
Reservoir area	Surface area of the reservoir in square kilometres
Irrigation	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Water supply	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Flood control	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Hydroelectricity	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Navigation	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Recreation	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Pollution control	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Livestock rearing	An "x" here denotes the dam is used for this purpose. Check the comment for potential additional details.
Other	Purpose of the dam other than the 8 above. Check the comment for potential additional details.
Decimal Degree Latitude	Latitudinal coordinate of the dam, expressed in decimal degrees.
Decimal Degree Longitude	Longitudinal coordinate of the dam, expressed in decimal degrees.
National Reference(s)	Number of reference providing information on the dam, coming from a national source. The references are given in Notes and References of the regional file.
Other Reference(s)	Number of reference providing information on the dam, coming from a global or general source (for example ICOLD). The references are given in Notes and References of the regional file
Notes	In this column specific comments of importance to the dam are given



References and notes by country

Note: the reference numbers below correspond to the numbers in the columns "National Reference(s)" and "Other reference(s)" of the database

General/Other

1. Information provided by national experts through the AQUASTAT survey.
3. Global Lakes and Wetlands Database (GLWD), Lehner, B. and Döll, P. 2004. *Development and validation of a global database of lakes, reservoirs and wetlands*. Journal of Hydrology 296/1-4: 1-22.
4. Lehner, B; Reidy Liermann, C; Revenga, C; Fekete, B; Vörösmarty, C; Crouzet, P; Döll, P; Endejan, M; Frenken, K; Magome, J; Nilsson, C; Robertson, JC; Rödel, R; Sindorf, N; and Wisser, C. 2010. *High resolution mapping of global reservoirs and dams and their impact on downstream rivers* (submitted). (Global Reservoir and Dam Database, GRanD).
5. University of Yamanashi, Japan, Global dams database.
6. International Commission on Large Dams (ICOLD). 2007. *The World Register of Dams*. ICOLD, Paris. Available at <http://www.icold-cigb.net>.
8. Wikipedia.

Armenia

9. Chilingaryan, L., Mnatsakanyan, B., Aghababyan, K., and Tockmajyan, H. 2002. *Hydrography of rivers and lakes of Armenia (in Armenian)*. Yerevan, Armenia.
10. United Nations Development Programme (UNDP)/ Swedish International Development Cooperation Agency (SIDA). 2005. *The preliminary technical analysis of Kura-Araks river basin within the limits of Armenia* (in Russian). Yerevan, Armenia.
11. National Statistical Service, Republic of Armenia. 2004. *Environment and Natural Resources in the Republic of Armenia for 2003*(in English). Yerevan, Armenia.

Azerbaijan

12. Ahmadzade, A. 2003. *Water of Azerbaijan*. Baku, Azerneshr. (p 216).

Georgia

13. Iordanishvili, I.K. 2004. *Inter-reservoir Process Dynamic of Mountain Reservoir in Georgia*, Institute of Water Farm of Academy of Sciences of Georgia.
14. Chogovadze, G., Chikhladze, N., Kiasashvili, G. 1998. *The History of Electroenergetics of Georgia*.
15. Tevzadze, T.V. 1992-1994. *Report About Complex Research of Irrigation Hydro-Technical Buildings Engineer-Ecological Reliability in Condition Seismic Active Regions of Georgia*. v.1, v.2.

Iran (Islamic Republic of)

16. Water Resources Management Company. 2006. *Rainfall, surface water and reservoirs capacities*. Ministry of Energy.
17. Water Resources Management Company. *Database*. Bureau for Operation and Maintenance of Dams, Ministry of Energy.

Iraq

18. Water Resources Development. 2004. *Development and Management of the Euphrates-Tigris Basin*. Vol. 20, No.1, 15-33.
19. United Nations Environmental Programme (UNEP). 2001. *The Mesopotamian marshlands: Demise of an ecosystem. Early Warning and Assessment Technical report No. 3*. UNEP / DEWA / TR.01-3. Geneva, Switzerland.
<http://www.grid.unep.ch/activities/sustainable/tigris/mesopotamia.pdf>
20. UNEP's Division of Early Warning and Assessment/GRID. 2000.
http://www.grid.unep.ch/product/map/images/tigris_damb.gif. Geneva, Switzerland.
(See Map below)



Jordan

21. Department of Dams and Water Harvesting. 2006. Files of Dams Projects in Jordan, MWI-JVA.

Oman

22. Ministry Of National Economy (MONE). 2005. *Facts and Figures 2005*. Information and Publication Center.

Saudi Arabia

23. Ministry of Agriculture. 2000. *Dams in Saudi Arabia (in Arabic)*.
24. Ministry of Water and Electricity. 2005. *Water Projects in Saudi Arabia (in Arabic)*.
25. Ministry of Agriculture and Water, Abdel Baset Alkhateeb. 1982. *Seven Green Spikes*.

Syrian Arab Republic

26. Central Bureau of Statistics (CBS). 2006. *Statistical abstract 2005*. Damascus.
27. Central Bureau of Statistics [CBS]. 2008.
<http://www.cbssyr.org/yearbook/2009/chapter1-EN.htm>

Turkey

28. General Directorate of State Hydraulic Works (DSI). 2006. *Enerji ve Tabii Kanaklar Bakanlığı, DSİ Genel Müdürlüğü*. Turkey. <http://www.dsi.gov.tr>
29. General Directorate of State Hydraulic Works (DSI). Turkey.
<http://www.dsi.gov.tr/baraj/detayeng.cfm?BarajID=223>
30. Agrin Co. Ltd.. 2000. *Aslantas Dam and related aspects of the Ceyhan River Basin, Turkey, A WCD case study prepared as an input to the World Commission on Dams*. Cape Town. http://www.dams.org/images/maps/map_aslantas.htm



United Arab Emirates

31. Ministry of the Environment and Water. 2006. *United Arab Emirates Water Resources Statistics*.

Yemen

32. General Department of Irrigation (GDI). 2004. *Steps on the way part (1): Dams and water structures*. Ministry of Agriculture and Irrigation (MAI).
33. Melka Wakena dam. From: The World Conservation Union (IUCN). 2002. *The Ethiopian wolf*. <http://www.canids.org/PUBLICAT/EWACTPLN/ewaptoc.htm>. Page 21, Chapter 2, was geo-referenced and used to pin point the dam's location in respect to the reservoir (lake).