

**Table I. Examples of the Impacts of Water Shortages**

	<u>Location</u>	<u>Date</u>	<u>Impacts of Water Shortage</u>	<u>Reference</u>
<i>Multiple Impacts</i>	Australia	2006-2007	Drought shaved at least 1% off the country's GDP.	World Economic Forum. 2011. <i>Water Security</i> . Island Press, Washington DC
	Botswana	2013	Due to water shortage, residents drink untreated water from the Thamalakane River, leading to severe diarrhea outbreaks. 5 children died from diarrhea in Maun this August; 19 children died from diarrhea in Ngamiland last year.	Keakabetse, Boniface (19 Sept 2013). "Lack of clean water a result of diarrhea outbreak – cllrs." <i>Mmegi Online</i> . <a href="http://www.mmegi.bw/index.php?sid=1&amp;aid=282&amp;dir=2013/September/Thursday19">http://www.mmegi.bw/index.php?sid=1&amp;aid=282&amp;dir=2013/September/Thursday19</a>
	Brazil	2013	Water shortage in Rio de Janeiro has increased water prices from 900 reais (\$412) to 4,000 reais (\$1,833) for 20,000 liters of water.	Barchfield, Jenny (29 Oct 2013). "Brazil: Water shortage dries Rio de Janeiro taps." <i>Associated Press</i> . <a href="http://www.boston.com/news/world/latin-america/2013/10/29/brazil-water-shortage-dries-rio-janeiro-taps/O0HzaAEKZnunvawEsqD06I/story.html">http://www.boston.com/news/world/latin-america/2013/10/29/brazil-water-shortage-dries-rio-janeiro-taps/O0HzaAEKZnunvawEsqD06I/story.html</a>
	China	2011	Water shortages cost China an estimated \$39 billion a year in lost crops, lower industrial production, and stalled economic output. Because of its water shortages, some estimate that 400,000 people a year in China are forced to relocate.	<i>Facts and Details: Water Shortages in China</i> . Jeffrey Hays. Updated April 2011. <a href="http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;subcatid=66">http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;subcatid=66</a>
		2013	Water shortages cost China 2.3% GDP, largely from health losses (World Bank 2009).	<i>The Economist</i> (12 Oct. 2013). "Desperate measures: Rivers are disappearing in China. Building canals is not the solution." <a href="http://www.economist.com/news/leaders/21587789-desperate-measures">http://www.economist.com/news/leaders/21587789-desperate-measures</a>
	China (Yellow River)	1970s – 1990s	4.7 million hectares of agricultural land affected by water shortages, resulting in loss of 9.86 billion kg of cereal crops and loss of 12.2 billion yuan (\$1.5 billion US). Losses of 1.6 billion yuan per year in 1990s.	Fu, G, S Chen, and C Liu. 2004. <i>Water crisis in the Huang Ho (Yellow) River: Facts, Reasons, Impacts, and Countermeasures</i> . Proceedings of RiverSymposium 2004, Brisbane, Australia. Accessed online 14 May 2012 at URL: <a href="http://archive.riversymposium.com/2004/index.php?element=Fu+Guo+bin">http://archive.riversymposium.com/2004/index.php?element=Fu+Guo+bin</a>

		Industrial enterprises, particularly the oil industry, suffered suspension of production and losses amounting to 40 billion yuan (4 billion yuan per year in 1990s).	
		Urban water supply to De-Zhou city cut in half in 1995, limiting production of 139 plants and factories, resulting in losses of 600 million yuan. Over 100,000 residents of Dong-Yin, Bin-Zhou, and De-Zhou cities could not get enough water, resulting in severe health threats. All factories in Bin-Zhou were closed to provide drinking water.	
Ecuador		Agriculture, drinking water supplies, and hydropower production are all affected by water shortages	Bartolone, Pauline. When the Water Runs Out. Last updated April 2006. <a href="http://www.salon.com/2006/04/07/ecuador2/">http://www.salon.com/2006/04/07/ecuador2/</a>
European Union	2003	A drought in 2003 cost the European Union economy €8.7 billion (\$11.4 billion US). Many crops failed or produced lower yields. The five worst affected countries each sustained agricultural losses between hundreds of millions and 5 billion euros.	Farmer, Andrew; Bassi, Samuela; and Fergusson, Malcolm. <i>Water Scarcity and Droughts</i> . 2008. Economic and Science Policy, European Parliament, Brussels. <a href="http://www.europarl.gr/ressource/static/files/projets_pdf/water_scarcity.pdf">http://www.europarl.gr/ressource/static/files/projets_pdf/water_scarcity.pdf</a>
Fiji	1997-1998	The severest drought in Fiji's history cost the economy over \$130 million.	Lal, Pardeep C. (5 Oct 2013). "Reduce disaster risks." <i>The Fiji Times</i> . <a href="http://www.fijitimes.com/story.aspx?id=247426">http://www.fijitimes.com/story.aspx?id=247426</a>
	2013	Due to water shortage and poor water quality, cases of typhoid have increased from 85 in 2012 to 291 in 2013 (Jan-Aug).	
India	2013	Maharashtra is experiencing one of the worst droughts in nearly 40 years, with the government declaring over 7,000 of the more than 25,000 villages as drought-affected. Villages are facing acute shortage of drinking water, forcing state government to send water tankers by train. State government has sought about Rs32 billion	"Maharashtra facing massive water shortage," by Nithin Belle, <i>Khaleej Time</i> , 5 February 2013: <a href="http://www.khaleejtimes.com/kt-article-display-1.asp?xfile=data/international/2013/February/international_February167.xml&amp;section=international">http://www.khaleejtimes.com/kt-article-display-1.asp?xfile=data/international/2013/February/international_February167.xml&amp;section=international</a>

		as aid for drought from the central government, but the latter has given less than Rs8 billion. Ministers are also engaged in bitter feud, especially over the allocation of funds for drought relief.	
	2013	Due to water shortage and power outages, attendance at educational institutes across Hyderabad dropped by 25%.	TNN (8 Oct 2013). "Seemandhra stir begins to hit Hyderabad hard." <i>The Times of India</i> . <a href="http://articles.timesofindia.indiatimes.com/2013-10-08/india/42828484_1_water-board-j-syamala-rao-greater-hyderabad">http://articles.timesofindia.indiatimes.com/2013-10-08/india/42828484_1_water-board-j-syamala-rao-greater-hyderabad</a>
Kenya	1999-2001	\$2.5 billion in losses in crops, cattle, hydropower and wildlife parks	<i>Overview of Drought and Desertification Situation in Africa</i> . <a href="http://www.uneca.org/eca_resources/publications/books/drought/chap2.pdf">http://www.uneca.org/eca_resources/publications/books/drought/chap2.pdf</a>
		Drought costs totaled to at least \$2.8 billion equal to 16% of GDP. The loss of industrial production arising from inadequate water storage for hydropower generation was estimated at \$1.4 billion, and agricultural losses are estimated at about 370 million. 26% of livestock were lost, valued at over \$75 million.	H Mogaka, S Gichere, R Davis and R Hirji. 2006. <i>Climate Variability and Water Resources Degradation in Kenya</i> . World Bank, Washington DC.
	2013	Shortage of clean water causes 80% of disease and 50% of hospitalizations in Kenya.	Masese, Winsley (28 Oct 2013). "No water, no growth, environmentalists warn." <i>Standard Group Business Beat</i> . <a href="http://www.standardmedia.co.ke/business/article/2000096431/no-water-no-growth-environmentalists-warn?pageNo=3">http://www.standardmedia.co.ke/business/article/2000096431/no-water-no-growth-environmentalists-warn?pageNo=3</a>
Oman	2013	Due to water shortage in the Aflaj (main water source in Oman), families have lost up to OMR 9,805 revenue per year. 27% have lost water flow completely.	Pourmohammadi, Elham (16 Sept 2013). "Aflaj dry out triggers farm crisis." <i>Times of Oman</i> . Muscat Press & Publishing House. <a href="http://www.timesofoman.com/News/Article-22635.aspx">http://www.timesofoman.com/News/Article-22635.aspx</a>
Pakistan	2013	In Cholistan, due to water shortage, 80% of the 1,100 tobas (water reserves) are unsuitable for use. 150,000 people are affected, either through the death of livestock or forced relocation.	<i>The Express Tribune</i> . (15 Sept 2013). "Essential for life: Cholistan severely water stressed." <a href="http://tribune.com.pk/story/604407/essential-for-life-cholistan-severely-water-stressed/">http://tribune.com.pk/story/604407/essential-for-life-cholistan-severely-water-stressed/</a>

Saudi Arabia	2013	In Madinah, due to water cuts, the price for a water truck (normally SR48) has risen to SR250-SR300 and reaches SR500 if demand is high enough.	<i>Arab News</i> . (29 Oct 2013). "Madinah faces water shortage." <a href="http://www.arabnews.com/news/469186">http://www.arabnews.com/news/469186</a>
(former) Soviet Union (Aral Sea)	1960-1987	<p>By the early 1980s, 20 of 24 native fish species disappeared and the commercial catch (48,000 metric tons in 1957) fell to zero. Employment directly and indirectly related to the Aral fishery, reportedly 60,000 in the 1950s, has disappeared</p> <p>Native plant communities have degraded and disappeared. Habitat deterioration has harmed delta fauna, which once included muskrat, wild boar, deer, jackal, many kinds of birds, and even a few tigers. At one time 173 animal species lived around the Aral, mainly in the deltas; 38 have survived (26, 30). Commercial hunting and trapping have largely disappeared.</p> <p>The reduction of river flow, salinization and pollution of what is left, and lowering of groundwater levels has caused drinking water supply problems for communities around the sea. The declining quality of drinking water is cited as the main factor increasing intestinal illnesses, particularly among children, and throat cancer incidence.</p> <p>Annual economic damages in the were 92.6 million rubles with the following distribution: agriculture, 42%; fisheries, 31%; hunting and trapping, 13%; river and sea transport, 8%; and living and working conditions, 6%</p>	Micklin, P. P. 1988. Dessication of the Aral Sea: A water management disaster in the Soviet Union. <i>Science</i> 241: 1170-76

Spain	2011	Geologists have found that massive extraction of groundwater helped to generate an earthquake near Lorca in south-eastern Spain last year that killed nine people, injured over 100 and left thousands homeless. The Alto Guadalentin basin's groundwater levels have fallen by 250m between 1960 and 2010, records show.	<i>Water21 Global News Digest</i> , 30 October 2012. IWA Publishing.
Taiwan (Taipei)	2013	Recent rains 15 to 60 millimeters rained over NW Taiwan; this still falls short of the necessary rainfall to affect the already depleted reservoirs. Water reserves actually fell from 42.95 percent to 42.67 percent.	Recent rainfall of little help in easing water shortage: official <a href="http://focustaiwan.tw/news/asoc/201303310007.aspx">http://focustaiwan.tw/news/asoc/201303310007.aspx</a> . 31 March 2013.
United States (Arizona)	By 2016	The state of Arizona dependent on the Colorado River for water could face pulling out less water starting in 2016 if the Rocky Mountain snowpack does not improve. The snowpack supports 40 million users in seven western states, including Arizona.	Arizona may get less water from Colorado River. Cross, J., 17 April 2013. <a href="http://ktar.com/22/1627517/Arizona-may-get-less-water-from-Colorado-River">http://ktar.com/22/1627517/Arizona-may-get-less-water-from-Colorado-River</a>
United States (California)	By 2020	Water shortages will cost taxpayers an estimated \$1.6 billion per year	World Economic Forum. 2011. <i>Water Security</i> . Island Press, Washington DC
	2013	In Montecito, water rates increased by 16% September 1 <sup>st</sup> due to acute water shortages. The average monthly water bill is \$213. In 1988-1989, the average monthly water bill was \$35 with \$1.5 million district expenses. In the 2012-2013 fiscal year, district expenses totaled \$11 million, 44% for state water.	Burns, Melinda (14 Nov 2013). "Montecito's Scary Scarcity of Water: Conserve or else, district warns." <i>Mission &amp; State: Narrative Journalism from the Heart of Santa Barbara</i> . <a href="http://www.missionandstate.org/features/montecitos-scary-scarcity-water/">http://www.missionandstate.org/features/montecitos-scary-scarcity-water/</a>
United States (Florida)	2011	More than 1200 water rights were suspended due to water shortages. Outdoor water use restrictions were put into place in 1000 public water systems, including 626	L'Oreal Stepney, Office of Water, Texas Commission on Environmental Quality. Presentation to "Water for People and the Environment Conference" in Austin TX on April 27, 2012

with mandatory restrictions

United States (Texas)	1997-1998	Droughts and floods associated with an El Nino period caused \$2.6 billion in property damage and \$2 billion in crop losses. The overall hit to the US economy was \$25 billion.	Whitaker, Bill. "El Nino Threatens to Return: Cost US \$25B 15 Years Ago." CBS Evening News online, June 8, 2012.
United States	1980, 1988, 2011, 2012	Drought impacts on US economy were estimated at \$56B (1980), \$78B (1988), \$12B (2011), and >\$12B (2012)	Raasch, Chuck. "How the drought is changing business," USA Today, July 30, 2012
Zimbabwe	2008-2009	Similarly, water shortage leading to contaminated water caused a cholera outbreak with 4,000 deaths and 100,000 infections.	Moyo, Nomalanga (12 Sept 2013). "Govt's failure to provide hospitals with water 'irresponsible.'" <i>SW Radio Africa</i> . <a href="http://www.swradioafrica.com/2013/09/12/govts-failure-to-provide-hospitals-with-water-irresponsible/">http://www.swradioafrica.com/2013/09/12/govts-failure-to-provide-hospitals-with-water-irresponsible/</a>
	2013	From January to November, there have been 1,472 typhoid cases, six cholera cases, 432 deaths from diarrhea, and 59 deaths from dysentery, all stemming from Harare's water shortage.	IRIN (26 Nov 2013). "Conditions favorable for cholera in Zimbabwe." <i>The Zimbabwe Mail</i> . <a href="http://www.thezimbabwemail.com/zimbabwe/19429-conditions-favourable-for-cholera-in-zimbabwe.html">http://www.thezimbabwemail.com/zimbabwe/19429-conditions-favourable-for-cholera-in-zimbabwe.html</a>
<b><i>Agricultural Impacts</i></b>			
Afghanistan	1995-2003	Years of drought and armed conflict have reduced the level of surface water in canals by up to 70 percent, causing a 60 percent drop in irrigated land. More than 36 percent of wells had dried up altogether and the water supply from those remaining was cut by up to 83 percent, causing an 81 percent decrease in irrigated land. Afghanistan requested \$76 million in aid because 2.5 million people face "imminent food crisis" due to water shortages.	Running Dry: the Humanitarian Impact of the Global Water Crisis." IRIN Humanitarian News and Analysis, 8 Sept 2006, UN Office for the Coordination of Humanitarian Affairs, Nairobi <a href="http://www.irinnews.org/InDepthMain.aspx?InDepthId=13&amp;ReportId=60533">http://www.irinnews.org/InDepthMain.aspx?InDepthId=13&amp;ReportId=60533</a>

Australia (Murray-Darling basin)	2001-2008	As drought and associated water shortages worsened from 2001-2008, water allocations were cut by as much as 84%. Rice production dropped from 1.7 million tons in 2001 to only 19,000 tons by 2008 (99% decrease).	<i>Strengthening Irrigation Communities, Synthesis Report Stage 1: Where Are We At Now?</i> Appendix 3 – Appendix C, Rice Industry Case Study. Central Murray Cluster Group of Councils, Dec 2010. Prepared by Hyder Consulting, North Sydney, Australia <a href="http://www.berriganshire.nsw.gov.au/Portals/0/documents/central%20murray%20%20synthesis%20report%20part%202%2022%20Dec.pdf">http://www.berriganshire.nsw.gov.au/Portals/0/documents/central%20murray%20%20synthesis%20report%20part%202%2022%20Dec.pdf</a>
		Average dairy farm profits dropped by \$120,000 (160%)	<i>A dry argument: a future for dairy in the Murray Basin?</i> Beale, R., Radcliffe, J., Ryan, P., Report on the Lower Murray Darling Basin Inquiry, November 2009. Referenced in <a href="http://www.berriganshire.nsw.gov.au/Portals/0/documents/central%20murray%20%20synthesis%20report%20part%202%2022%20Dec.pdf">http://www.berriganshire.nsw.gov.au/Portals/0/documents/central%20murray%20%20synthesis%20report%20part%202%2022%20Dec.pdf</a>
		Similarly, navel orange production dropped by 85%, Valencia oranges by 64%, grapefruits by 36%, and lemons by 33%,	<i>Crop data of the SAIDB 2010.</i> South Australia Citrus Industry Development Board, Pooraka, South Australia. <a href="http://www.citrus.org.au/IndustryStatistics.aspx">http://www.citrus.org.au/IndustryStatistics.aspx</a>
Brazil	2012	The worst drought NE Brazil has seen in 100 years directly led to the death of five million cattle in 2012.	James, John (13 Sept 2013). “Analysis: When the water runs dry, ideas flow.” <i>IRIN</i> . <a href="http://www.irinnews.org/report/98747/analysis-when-the-water-runs-dry-the-ideas-flow">http://www.irinnews.org/report/98747/analysis-when-the-water-runs-dry-the-ideas-flow</a>
Burkina Faso	1997	Losses in crop and livestock production, with insect manifestations, plant disease, livestock mortality, wildlife damage to crops (cotton), and wind erosion. Food prices increased as supplies were reduced, requiring increased importation of food (higher costs). Impacts on fertilizer manufacturers, food processors, dairies, and makers of farm machinery	“Socio-economic impacts of drought in Burkina Faso: role of the meteorological service.” Guillaume Nakoulma. Workshop on High-Impact Weather Predictability and Information System for Africa and Amma-Thorpex Forecaster’s Handbook. 5-8 Oct 2009
China (Yellow River)	1997	River ran dry for 226 days, denying water to 7.4 million acres of farmland. Wheat harvests have been reduced by 3.3 million tons.	<i>Facts and Details: Water Shortages in China.</i> Jeffrey Hays. Updated April 2011. <a href="http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;subcatid=66">http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;subcatid=66</a>

		River ran dry for 600 kms inland, causing agricultural losses of \$1.6 billion	World Economic Forum. 2011. <i>Water Security</i> . Island Press, Washington DC
	2001	Water shortages impacted 98,600 ha farmland in Jinan area and 15,000 ha farmland had no harvest	Zijun Li, "As Flood Season Arrives, China Combats 'Drought and Flood' Climate," <i>Worldwatch Institute</i> , 6 June 2006, [10 July 2006].
China (northern)	2006	Drought affected or threatened 182 million hectares of farmland, 8.7 million livestock, and 95 million people	Sekiguchi, Rylan. <i>Water Issues in China</i> . Updated September 2006. <a href="http://spice.stanford.edu/docs/113">http://spice.stanford.edu/docs/113</a>
China (Shandong)		Shandong, a major wheat producing area in the Yellow River basin, is drying out. Water shortages there have reduced grain harvests by 3.3 million tons (enough to feed 9 million people).	Hays, Jeffery. <i>Water Shortages in China</i> . Updated April 2011. <a href="http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;ubcatid=66">http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;ubcatid=66</a>
Ecuador	2005	Agricultural losses were bleak for many farmers. Drought conditions, frost and plant sicknesses cut national production by 35 percent. An estimated \$30 million was lost.	"When the Water Runs Out." Pauline Bartalone, <i>Salon</i> , April 6, 2007. <a href="http://www.salon.com/2006/04/07/ecuador2/">http://www.salon.com/2006/04/07/ecuador2/</a>
Egypt (Tarhuna)	2013	Tarhuna's Municipal Council is trying to find out the reasons for the severe water shortages. The Tarhuna's area depends on the water for 3,000 hectares of cereal production. Over time, yields are coming in low due to the irrigation problems.	"Water shortage hits Tarhuna." <i>Libya Herald</i> , 3 April 2013. <a href="http://www.libyaherald.com/2013/04/02/water-shortage-hits-tarhuna/">http://www.libyaherald.com/2013/04/02/water-shortage-hits-tarhuna/</a>
European Union	2003	A drought in 2003 cost the European Union economy €8.7 billion ( \$11.4 billion US). Many crops failed or produced lower yields. The five worst affected countries each sustained agricultural losses between hundreds of millions and 5 billion euros.	Farmer, Andrew; Bassi, Samuela; and Fergusson, Malcolm. <i>Water Scarcity and Droughts</i> . 2008. Economic and Science Policy, European Parliament, Brussels. <a href="http://www.europarl.gr/ressource/static/files/projets_pdf/water_scarcity.pdf">http://www.europarl.gr/ressource/static/files/projets_pdf/water_scarcity.pdf</a>



France	2011	13 percent decline in the French wheat crop	“Europeans Act to Stem Drought Damage.” Doreen Carvajal, New York Times, Europe edition, June 9, 2011. <a href="http://www.nytimes.com/2011/06/10/world/europe/10iht-drought10.html?_r=1&amp;scp=4&amp;sq=river+drying&amp;st=nyt">http://www.nytimes.com/2011/06/10/world/europe/10iht-drought10.html?_r=1&amp;scp=4&amp;sq=river+drying&amp;st=nyt</a>
India (Cauvery River)	1991	Inter-state disputes between farmers over water allocation rules set by federal government lead to arson, burglary, 23 deaths and displacement of 100,000.	Mollinga, P. 2008. The Water Resources Policy Process in India – Centralisation, Polarisation and New Demands on Governance. <i>Governance of Water</i> . SAGE Publications. Menon, Parvathi. 2007. Sharing a River. <i>Frontline</i> , 24 (3).
	2002	Farmers commit suicide in protest of government’s control of water allocations	Ferdin, M., S. Görlitz, S. Schwörer. 2010. Water Stress in the Cauvery Basin, South India – How current water management approaches and allocation conflict constrain reform. <i>Asien</i> . 117, 27-44.
Mexico	2011-2012	The water shortage wiped out millions of acres of farmland, caused 15 billion pesos (\$1.18 billion) in lost harvests, killed 60,000 head of cattle and weakened 2 million more livestock, pushing food prices higher in Mexico.	Rucker, P. (2012, March 21). Stubborn drought expected to tax Mexico for years. Reuters, Stocks and Economy, 21 March 2012. Accessed online 10 May 2012 from URL: <a href="http://www.msnbc.msn.com/id/46813080/ns/business-stocks_and_economy/t/stubborn-drought-expected-tax-mexico-years/#.T6tX9-2LHwx">http://www.msnbc.msn.com/id/46813080/ns/business-stocks_and_economy/t/stubborn-drought-expected-tax-mexico-years/#.T6tX9-2LHwx</a>
Pakistan	2013	Floodwaters deposited silt in canals on the Indus River, increasing discharge from 13,649 cusec to 16,000 cusec in the Nara canal, and from 10,800 cusec to 15,000 cusec in the Rohri canal. The silt deposits created water shortages for farmers downstream, e.g. 18 (out of 300) acres are cultivatable. 80 farmers protest outside Islamabad courthouse.	Khan, Mohammad Hussain (9 Sept 2013). “Farmers face post-flood water shortage.” <i>Dawn</i> . <a href="http://dawn.com/news/1041498/farmers-face-post-flood-water-shortage">http://dawn.com/news/1041498/farmers-face-post-flood-water-shortage</a>
	2013	The ruling elite’s unlawful allocation of scarce water supplies has led to the desertification of 66,750 agricultural acres downstream, affecting 100,000 farmers and causing Rs 1.25 billion annual losses. The farmers protested with a hunger strike for 27 days, marched 150 km, and have taken	Khan, Azam (4 Oct 2013). “Diversion of water: Badin farmers approach SC’s Human Right Cell.” <i>The Express Tribune</i> . <a href="http://tribune.com.pk/story/613369/diversion-of-water-badin-farmers-approach-scs-human-right-cell/">http://tribune.com.pk/story/613369/diversion-of-water-badin-farmers-approach-scs-human-right-cell/</a>

the case to the Supreme Court.

Russia	2010	Drought-induced losses in wheat production sent food prices soaring in North Africa and Middle East	Alan Bjerga, "Drought Stocks the Global Food Supply," 5 July 2012, Bloomberg Business Week (see link below)
Syria (Damascus)	2008-2009	More than 300,000 rural residents left their homes to migrate into Damascus due to water shortages that cut wheat harvests in half  Lack of water has caused more than 800,000 people in eastern Syria to lose "almost all of their livelihoods and face extreme hardship"	Williams, Daniel. "Water Crisis Grips Syria." The New York Times. March 2, 2010. Accessed 3-12-12 <a href="http://www.nytimes.com/2010/03/03/world/middleeast/03iht-letter.html">http://www.nytimes.com/2010/03/03/world/middleeast/03iht-letter.html</a>
United Kingdom	2010-2012	The 2010-2012 drought decreased the UK's agricultural revenue by 14%.	<i>The Poultry Site</i> (31 Oct 2013). "National Farmers Union Calls for Government Action on Water Shortage." <a href="http://www.thepoultrysite.com/poultrynews/30502/union-calls-for-government-action-on-water-shortage">http://www.thepoultrysite.com/poultrynews/30502/union-calls-for-government-action-on-water-shortage</a>
United States	2007-2008	Water shortages have cost the agricultural sector \$4 billion a year	World Economic Forum. 2009. <i>The Bubble is Close to Bursting</i> .
United States (Midwest)	1988	Water shortages resulted in \$78B in crop losses	Alan Bjerga, "Drought Stocks the Global Food Supply," 5 July 2012, Bloomberg Business Week. <a href="http://www.businessweek.com/articles/2012-07-05/drought-stalks-the-global-food-supply?utm_source=The+Nourishing+the+Planet+Project&amp;utm_campaign=76897554a3-NtP_Draft_2_5_11_2012&amp;utm_medium=email">http://www.businessweek.com/articles/2012-07-05/drought-stalks-the-global-food-supply?utm_source=The+Nourishing+the+Planet+Project&amp;utm_campaign=76897554a3-NtP_Draft_2_5_11_2012&amp;utm_medium=email</a>
United States (Texas)	2011	Texas agriculture lost \$7.62 billion as a result of drought. \$3.23 billion of that loss was from livestock, \$2.2 billion was from cotton, \$736 million was from corn, and the rest was from hay, wheat, and sorghum.	Plushnick-Masti, Ramit and Betsy Blaney. <i>AP News Break: Drought Costs Texas \$8B in Ag Losses</i> . Updated March 2012. <a href="http://www.businessweek.com/ap/2012-03/D9TL4AOG0.htm">http://www.businessweek.com/ap/2012-03/D9TL4AOG0.htm</a>
	2011	Drought contributed to the death of 500 million trees, 10% of Texas' forest cover, through a survey of 63 million acres of	Castillo, Juan (23 July 2012). "Drought not the only factor in Texas tree deaths, report says." <i>Austin-American Statesman</i> . <a href="http://www.statesman.com/news/news/local/drought-not-the-only-">http://www.statesman.com/news/news/local/drought-not-the-only-</a>

		forest. According to the Texas Forest Service, 5.6 million of these trees died in cities.	<a href="#">factor-in-texas-tree-deaths-r/nRqLX/</a> Accessed online 31 Oct 2013.
	2012	Due to drought, pecan growers lost more than 25,000 trees over the past year. The number of pecan growers has decreased from 60-75 to only about 12-15. A new pecan tree takes 8-10 years to mature into production.	Broyles, Addie (6 Nov. 2012). "Texas pecan industry slowly bouncing back from drought." <i>Austin 360</i> , Accessed online 14 Oct. 2013: <a href="http://www.austin360.com/news/lifestyles/food-cooking/texas-pecan-industry-slowly-bouncing-back-from-dro/nSx4D/">http://www.austin360.com/news/lifestyles/food-cooking/texas-pecan-industry-slowly-bouncing-back-from-dro/nSx4D/</a> Wiggins, Mark & Guest, Scott (9 Oct 2013). "Perry: Voters must make state water bank a reality." <i>KHou</i> , <a href="http://www.khou.com/news/texas-news?fId=227135431&amp;fPath=/news/local/&amp;fDomain=10232">http://www.khou.com/news/texas-news?fId=227135431&amp;fPath=/news/local/&amp;fDomain=10232</a>
United States (Kansas)	2012	Rising cost of corn due to drought-induced crop losses have caused cattle prices to drop from \$1.60 a pound to \$1.20	Raasch, Chuck. "How the drought is changing business," USA Today, July 30, 2012
United States (California)	1987-1992	Farmers suffered \$800M in losses Landscape and garden industry lost \$460 million and cut 5,600 jobs	"Governor Calls for Comprehensive Plan to Fix California's Water Crisis." <i>2008 Fact Sheet</i> , Office of the Governor, Sacramento, CA <a href="http://www.colorado.edu/AmStudies/lewis/west/calcrisis.pdf">http://www.colorado.edu/AmStudies/lewis/west/calcrisis.pdf</a>
United States (California)	2009	Avocado farming revenues decreased by 10% (nearly \$13M) due to water shortages and increased water costs (state imposed 30% reduction in water allocations)	<i>2009 Crop Statistics and Annual Report</i> , County of San Diego Dept. of Agriculture, Weights and Measures, San Diego CA <a href="http://www.sdcounty.ca.gov/reusable_components/images/awm/Docs/2009_CR_WebFinal.pdf">http://www.sdcounty.ca.gov/reusable_components/images/awm/Docs/2009_CR_WebFinal.pdf</a>
	2013	In Santa Rosa due to water shortage, sugar cane prices have dropped from 32.24 cents per pound in 2012 to 21.5 cents per pound. Sugar cane requires 60 inches of water per acre per year, but the rainfall average is 29 inches per year.	Vandini, Charlene. "Water shortage straps RGV sugar mill." Valley Morning Star, Santa Rosa, September 6, 2013. <a href="http://www.themonitor.com/news/local/article_833e37be-174c-11e3-a96b-0019bb30f31a.html">http://www.themonitor.com/news/local/article_833e37be-174c-11e3-a96b-0019bb30f31a.html</a>
United States (Colorado)	2013	Due to drought in the San Luis Valley, potato acreage dropped to 49,700, 11% fewer than in 2012.	Gaspar, Kathleen Thomas (12 Sept 2013). "Low water and prices result in acreage cut for SLV." <i>The Produce News</i> . <a href="http://www.producenews.com/index.php/news-dep-menu/test-featured/11228-low-water-and-prices-result-in-acreage-cut-for-slv">http://www.producenews.com/index.php/news-dep-menu/test-featured/11228-low-water-and-prices-result-in-acreage-cut-for-slv</a>
		More than temperature, drought is the	Hart, S., Veblen, T., & Scott, J. (10 Oct 2013). "Massive spruce beetle

			primary cause for spruce beetle outbreaks in Colorado, killing trees and increasing runoff, historically and most recently in the broad-scale outbreak from 2004-2010.	outbreak in Colorado tied to drought, according to new CU study.” <i>University of Colorado Boulder</i> . <a href="http://www.colorado.edu/news/releases/2013/10/10/massive-spruce-beetle-outbreak-colorado-tied-drought-according-new-cu-study">http://www.colorado.edu/news/releases/2013/10/10/massive-spruce-beetle-outbreak-colorado-tied-drought-according-new-cu-study</a>
<b>Fisheries Impacts</b>	Australia (Murray-Darling River)	2001-2008	Murray River commercial fisheries experienced large losses in certain species such as flounder, which declined in economic value by 91%.	<i>Economic Indicators for the Lakes and Coorong Fishery 2008/2009</i> . Econsearch 2010, Marrayatville, South Australia <a href="http://www.pir.sa.gov.au/data/assets/pdf_file/0009/137844/Lakes_and_Coorong_Final_Report_100616.pdf">http://www.pir.sa.gov.au/data/assets/pdf_file/0009/137844/Lakes_and_Coorong_Final_Report_100616.pdf</a>
	United States (California)	2009	Due to river waters being too warm and far too low to support a good salmon population, the state government halted fishing to protect the species. The California Department of Fish and Game estimated this season's shutdown toll at 2,690 jobs and an economic drain of \$279 million. Fishing groups say the economic multiplier pegs the overall loss at 23,000 jobs and \$1.4 billion.	Gardener, M. (2009, July 12). Fishermen feeling pinch of water policy. Union-Tribune, San Diego. Accessed online 10 May 2012 at URL: <a href="http://www.utsandiego.com/news/2009/jul/12/1n12fish211229-fishermen-feeling-pinch-water-polic/">http://www.utsandiego.com/news/2009/jul/12/1n12fish211229-fishermen-feeling-pinch-water-polic/</a>
	United States (California)	2013	In the Sacramento-San Joaquin Delta, a “critically dry” summer has led to the continual decline and lowest recorded delta smelt population, a species protected by the ESA. The species abundance index has decreased from 0.9-0.7 since last year.	Cannon, Thomas (August 2013). “The demise of Delta smelt under D-1641 Delta Water Quality Standards.” <i>California Sportfishing Protection Alliance</i> . <a href="http://calsport.org/news/wp-content/uploads/2013/08/Cannon-Summer-2013-6.pdf">http://calsport.org/news/wp-content/uploads/2013/08/Cannon-Summer-2013-6.pdf</a> Accessed online 31 Oct 2013.
	United States (Florida)	2013	Due to water shortage and inadequate freshwater flows, daily harvest yields per oysterman have shrunk from 40 sacks to only several. In the past year, the oyster population has shrunk by 60%, leading to 44% less revenue for the industry.	Alvarez, Lizette (2 June 2013). “A Fight Over Water, and to Save a Way of Life.” <i>The New York Times</i> . Accessed online 30 Sept 2013: <a href="http://www.nytimes.com/2013/06/03/us/thirst-for-fresh-water-threatens-apalachicola-bay-fisheries.html?pagewanted=all&amp;r=0">http://www.nytimes.com/2013/06/03/us/thirst-for-fresh-water-threatens-apalachicola-bay-fisheries.html?pagewanted=all&amp;r=0</a> Klas, Mary Ellen (12 Aug 2013). “Feds declare fisheries disaster for struggling Apalachicola Bay.” <i>Miami Herald</i> . Accessed online 3 Oct 2013: <a href="http://miamiherald.typepad.com/nakedpolitics/2013/08/feds-declare-fisheries-disaster-for-struggling-apalachicola-bay.html">http://miamiherald.typepad.com/nakedpolitics/2013/08/feds-declare-fisheries-disaster-for-struggling-apalachicola-bay.html</a>
<b>Energy Impacts</b>	Brazil	2001	Two-thirds of electricity in Brazil is from hydropower. Extremely low river flow greatly depressed hydropower production,	Morrison, Jason; Morikawa, Mori; Murphy, Michael; and Schulte, Peter. <i>Water Scarcity and Climate Change: Growing Risks for Business and Investors</i> . 2009.

		leading to government mandate to cut electricity use by 20%. The effects of the drought-induced energy rationing extended to the national economy, with an estimated reduction of two percent of the country's GDP, or a loss of around US\$26 billion.	<a href="http://www.pacinst.org/reports/business_water_climate/full_report.pdf">http://www.pacinst.org/reports/business_water_climate/full_report.pdf</a>
	2013	Low river flows have resulted in reductions in hydropower production by as much as 70%.	Barrucho, Luis. "Brazil drought stokes worries over energy shortages." BBC Brasil, Sao Paulo, 18 January 2013. Accessed 31 Jan 2013: <a href="http://www.bbc.co.uk/news/world-latin-america-21055803">http://www.bbc.co.uk/news/world-latin-america-21055803</a>
Burkina Faso	1997	Burkina Faso had to operate under a reduced power supply because the power generation was forced to be cut by the drought conditions	Nakoulma, Guillaume. "Socio-economic impacts of drought in Burkina Faso: role of the meteorological service." Workshop on High-Impact Weather Predictability and Information System for Africa and Amma-Thorpex Forecaster's Handbook. 5-8 Oct 2009. <a href="http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=23&amp;ved=0CFAQFjACOBQ&amp;url=http%3A%2F%2Fclimate-dods.ictp.it%2Fd10%2Fsmr2019%2FTuesday%2Fsession3%2Fsocio-economic%2520impacts_burkina%2520faso.ppt&amp;ei=P-JzT82BOcLX0QHv9bj_Ag&amp;usg=AFQjCNERZ0aMF8ulo309Lu5WdkM-gCJh4Q">http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=23&amp;ved=0CFAQFjACOBQ&amp;url=http%3A%2F%2Fclimate-dods.ictp.it%2Fd10%2Fsmr2019%2FTuesday%2Fsession3%2Fsocio-economic%2520impacts_burkina%2520faso.ppt&amp;ei=P-JzT82BOcLX0QHv9bj_Ag&amp;usg=AFQjCNERZ0aMF8ulo309Lu5WdkM-gCJh4Q</a>
France	2003	Several nuclear power plants were shut down because water levels were too low	Carvajal, Doreen. <i>Europeans Act to Stem Drought Damage</i> . Updated June 2011. <a href="http://www.nytimes.com/2011/06/10/world/europe/10iht-drought10.html?_r=1&amp;scp=4&amp;sq=river+drying&amp;st=nyt">http://www.nytimes.com/2011/06/10/world/europe/10iht-drought10.html?_r=1&amp;scp=4&amp;sq=river+drying&amp;st=nyt</a>
		France cut its power exports in half	World Economic Forum. 2011, Water Security. Island Press, Washington DC
India	2012	Low rainfall during the monsoon season led to reduced river flows and hydropower production (-6%). This contributed to the widespread electricity blackout that affected 600 million Indians.	Center for Science and the Environment (India), as reported by Dan Morrison in "India's Massive Blackout, and the Environmental Damage to Come." National Geographic Water Currents blog posted July 31, 2012. <a href="http://newswatch.nationalgeographic.com/2012/07/31/indias-massive-blackout-and-the-environmental-danger-to-come/">http://newswatch.nationalgeographic.com/2012/07/31/indias-massive-blackout-and-the-environmental-danger-to-come/</a>
	2013	Due to acute water shortages and mismanagement, the city of Agra will shut down its power for six hours per day for the next month and a half.	Khandelwal, Brij (16 Sept 2013). "Sans power, water, no 'Come September' for Taj city (letter from Agra)." <i>Business Standard</i> . <a href="http://www.business-standard.com/article/news-ians/sans-power-water-no-come-september-for-taj-city-letter-from-agra-">http://www.business-standard.com/article/news-ians/sans-power-water-no-come-september-for-taj-city-letter-from-agra-</a>

Kenya	1992	Failure of rains led to power rationing in April–May 1992	<a href="http://www.uneca.org/eca_programmes/sdd/documents/making_the_power_sector_sustainable.pdf">113091600100_1.html</a> African Energy Policy Research Network. 2005. <i>Making the African Power Sector Sustainable</i> . Final Regional Report, Nairobi. <a href="http://www.uneca.org/eca_programmes/sdd/documents/making_the_power_sector_sustainable.pdf">http://www.uneca.org/eca_programmes/sdd/documents/making_the_power_sector_sustainable.pdf</a>
Kenya	1999 to 2001	Massive drought decreased hydro generation (25 percent in 2000), which had to be replaced by more expensive fuel-based generation. Power rationing in 1999–2001  The Tana River Basin, which accounts for about 57% of the total hydropower generation in Kenya, experienced prolonged droughts in 1999 – 2001 and 2008-2009 that led to severe water scarcity and shortage in electrical power supply, causing electricity rationing though out the country. The estimated losses in hydropower generation and industrial production due to water shortage during 1999/2000 were over \$2 billion.	AEPRN 2005 (see above)  H Mogaka, S Gichere, R Davis and R Hirji. 2006. <i>Climate Variability and Water Resources Degradation in Kenya</i> . World Bank, Washington DC.
Lesotho	1992	Hydro operation limited to 6 months, leading to 20 percent reduction compared to 1991	AEPREN 2005 (see above)
Malawi	1997 to 1998	Engineering operations affected by drought. Amount of hydro energy generated was 6 percent less than in years of normal rainfall.	AEPREN 2005 (see above)
Mauritius	1999	Massive drought led to 70 percent drop in normal annual production of electricity.	AEPREN 2005 (see above)
Tanzania	1997	The Mtera dam reached its lowest ever level resulting in a 17 percent drop in hydro generation, use of thermal generation to meet the shortfall, and power rationing.	AEPREN 2005 (see above)

Turkmenistan	2013	In Turkmenbashi, due to acute water shortage, 15 hospitals and 14 out of 15 schools have no heating.	Sadykov, Murat (11 Oct. 2013). "Turkmenistan: Opposition Blasts Government for Water, Heating Cuts." <i>The Open Society Institute</i> . <a href="http://www.eurasianet.org/node/67615">http://www.eurasianet.org/node/67615</a>
Uganda	2004/2005	Reduction in water levels at Lake Victoria resulting in reduction in hydro-power generation by 50MW	AEPREN 2005 (see above)
Uganda	2004/2005	Reduction in water levels at Lake Victoria resulting in reduction in hydro-power generation by 50MW	AEPRN 2005 (see above)
United States		Proposed power plants have also taken hits over water needs. Local concerns about water use have scuttled planned facilities in Arizona, Idaho, Virginia, and elsewhere. Developers of proposed water-cooled concentrating solar plants in California and Nevada have run into opposition, driving them toward dry cooling instead.	Averyt, K., J. Fisher, A. Huber-Lee, A. Lewis, J. Macknick, N. Madden, J. Rogers, and S. Tellinghuisen 2011. <i>Freshwater use by U.S. power plants: Electricity's thirst for a precious resource</i> . A report of the Energy and Water in a Warming World initiative. Cambridge, MA: Union of Concerned Scientists
United States (Arizona)	2010	Hydropower generation dropped by 20% due to low lake levels along the Colorado River during drought	Adee, S., & Moore, S. K. (2010, June). In the American Southwest, the Energy Problem Is Water. In <i>IEEE Spectrum</i> . Retrieved from <a href="http://spectrum.ieee.org/energy/environment/in-the-american-southwest-the-energy-problem-is-water/1">http://spectrum.ieee.org/energy/environment/in-the-american-southwest-the-energy-problem-is-water/1</a>
United States (Alabama)	2007	Tennessee Valley Authority shut down one of three reactors at its Browns Ferry nuclear plant to avoid heating the Tennessee River to dangerous levels. Due to a drought that reduced the river level and hottest temperatures in 50 years, the plant could not discharge the cooling tower water since it would have crossed the permissible limit.	Tennessee Valley Authority, Browns Ferry nuclear plant. <a href="http://www.knoxnews.com/news/2007/aug/18/heat-wave-ignites-problems-in-et/">http://www.knoxnews.com/news/2007/aug/18/heat-wave-ignites-problems-in-et/</a>
United States (California)	1987-1992	Californians paid \$500M more for energy as utilities substituted hydroelectric power with more expensive energy sources	"Governor Calls for Comprehensive Plan to Fix California's Water Crisis." <i>2008 Fact Sheet</i> , Office of the Governor, Sacramento, CA <a href="http://www.colorado.edu/AmStudies/lewis/west/calcrisis.pdf">http://www.colorado.edu/AmStudies/lewis/west/calcrisis.pdf</a>

United States (Minnesota)	2006	A 2006 heat wave forced nuclear plants in the Midwest to reduce their output when customers needed power most. At the Prairie Island plant in Minnesota, for example, the high temperature of the Mississippi River forced the plant to cut electricity generation by more than half.	Averyt, K., J. Fisher, A. Huber-Lee, A. Lewis, J. Macknick, N. Madden, J. Rogers, and S. Tellinghuisen 2011. <i>Freshwater use by U.S. power plants: Electricity's thirst for a precious resource</i> . A report of the Energy and Water in a Warming World initiative. Cambridge, MA: Union of Concerned Scientists
United States (Southeast)	2007	As drought hit the Southeast in 2007, water providers from Atlanta to Raleigh urged residents to cut their water use. Power plants felt the heat as well. In North Carolina, customers faced blackouts as water woes forced Duke Energy to cut output at its G.G. Allen and Riverbend coal plants on the Catawba River. Meanwhile the utility was scrambling to keep the water intake system for its McGuire nuclear plant underwater. In Alabama, the Browns Ferry nuclear plant had to drastically cut its output (as it has in three of the last five years) to avoid exceeding the temperature limit on discharge water and killing fish in the Tennessee River.	Averyt, K., J. Fisher, A. Huber-Lee, A. Lewis, J. Macknick, N. Madden, J. Rogers, and S. Tellinghuisen 2011. <i>Freshwater use by U.S. power plants: Electricity's thirst for a precious resource</i> . A report of the Energy and Water in a Warming World initiative. Cambridge, MA: Union of Concerned Scientists
United States (Texas)	2011	The 2011 drought in Texas created tension among farmers, cities, and power plants across the state. At least one plant had to cut its output, and some plants had to pipe in water from new sources. The state power authority warned that several thousand megawatts of electrical capacity might go offline if the drought persists into 2012.	Averyt, K., J. Fisher, A. Huber-Lee, A. Lewis, J. Macknick, N. Madden, J. Rogers, and S. Tellinghuisen 2011. <i>Freshwater use by U.S. power plants: Electricity's thirst for a precious resource</i> . A report of the Energy and Water in a Warming World initiative. Cambridge, MA: Union of Concerned Scientists.
United States (Texas)	2012	New coal-fired power plants opposed due to water shortages	Galbraith, Kate. <i>Texas Drought Sparked Water Worries for Industry</i> . Updated February 2012. <a href="http://www.texastribune.org/texas-environmental-news/water-">http://www.texastribune.org/texas-environmental-news/water-</a>



**Urban & Industrial Impacts**

			Natural gas companies were forced to purchase water for hydraulic fracturing operations due to water shortages	<a href="#">supply/texas-drought-sparked-water-worries-industry/</a> Carroll, J. 2011. "Worst Drought in More Than a Century Strikes Texas Oil Boom." Bloomberg, June 13. <a href="http://www.bloomberg.com/news/2011-06-13/worst-drought-in-more-than-a-century-threatens-texas-oil-natural-gas-boom.html">http://www.bloomberg.com/news/2011-06-13/worst-drought-in-more-than-a-century-threatens-texas-oil-natural-gas-boom.html</a>
Zambia	1992		Poor rainfall resulted in a 35 percent reduction in hydro generation in relation to the previous year.	AEPREN 2005 (see above)
Zimbabwe	1993		Drought led to a drop of over 9 percent in energy production compared to 1992	AEPREN 2005 (see above)
Australia (Queensland)	2013		Residents from two communities are facing serious restrictions due to an on-going drought. Those who disobey the restrictions face fines up to \$440.00.	Nancarrow, K. (2013). Parched Gulf communities face water bans. ABC News. <a href="http://www.abc.net.au/news/2013-04-02/4604590">http://www.abc.net.au/news/2013-04-02/4604590</a>
China (Jinan city)			400 city wells used for industrial and domestic purposes were shut down in an attempt to raise the groundwater level. (pg. 1026)	Zhang, S. and L. Qiu. 2010. The Present Conditions and Optimized Distribution of Water Resources in Jinan Municipality.
China			China loses approximately \$28 billion a year in industrial output because of water shortages	Hays, Jeffery. <i>Water Shortages in China</i> . Updated April 2011. <a href="http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;subcatid=66">http://factsanddetails.com/china.php?itemid=390&amp;catid=10&amp;subcatid=66</a>
Europe (Danube River)			Cargo shipping reduced by 75%	Waterfield, Bruno. <i>Worst Drought in 200 Years Paralyzes Danube River Shipping</i> . Updated December 2011. <a href="http://www.telegraph.co.uk/news/worldnews/europe/hungary/8936080/Worst-drought-in-200-years-paralyzes-Danube-river-shipping.html">http://www.telegraph.co.uk/news/worldnews/europe/hungary/8936080/Worst-drought-in-200-years-paralyzes-Danube-river-shipping.html</a>
New Zealand (Marshall Islands)	2013		Northern Marshall Islands and other low-lying islands face extreme drought.	Radio New Zealand International. April 2013. <a href="http://www.rnzi.com/pages/news.php?op=read&amp;id=75045">http://www.rnzi.com/pages/news.php?op=read&amp;id=75045</a>

New Zealand (Wellington)	2013	Conservation is the theme for Wellingtonians due to the severe drought which continues to get worse. Those folks who defy the ban can face fines up to \$20,000. The city council has instituted a series of contributive actions to save water such as daily irrigation of public gardens, sports fields.	Wellington Water Shortage – Update. 15 March 2013. <a href="http://www.scoop.co.nz/stories/AK1303/S00367/wellington-water-shortage-update-15313.htm">http://www.scoop.co.nz/stories/AK1303/S00367/wellington-water-shortage-update-15313.htm</a> .
Spain (Barcelona)	2008	City had to start importing water in tankers from Marseille, paying triple the normal cost	World Economic Forum. 2011. Water Security. Island Press, Washington DC
Taiwan (Taipei)	2013	With little rainfall, the city of Taipei is in the first-stages of water rationing. Brought about since February rainfall amounts have been only 8-9 percent on the average from previous years. Update: 18 April 13, The drought has eased slightly with heavy rains, but a drought still persists.	First-stage water rationing initiated in parts of Taiwan. Joy Lee, The China Post/Asia News Network, Mar 15, 2013. <a href="http://www.asiaone.com/News/AsiaOne%2BNews/Asia/Story/A1Story20130315-408877.html">http://www.asiaone.com/News/AsiaOne%2BNews/Asia/Story/A1Story20130315-408877.html</a> Update: <a href="http://focustaiwan.tw/news/aall/201304180009.aspx">http://focustaiwan.tw/news/aall/201304180009.aspx</a>
United States (Colorado)	2013	On-going drought caused city council to approve water restriction measures. Homes are limited twice-per-week. The goal, to use 30% less water this irrigation season compared to last year. Restriction estimates this will save 30 gallons per day per person.	Water restrictions installed. Watch the water use. Pam Zubeck, The Colorado Springs Independent, Apr 6, 2013. <a href="http://www.csindy.com/coloradosprings/water-restrictions-installed-council-race-donations-updated-more/Content?oid=2652874">http://www.csindy.com/coloradosprings/water-restrictions-installed-council-race-donations-updated-more/Content?oid=2652874</a>
US (Texas)	2011	Formosa Plastics had its water allocation from Lake Texana reduced by 20%. The plant was able to avoid losses in production, but had to pay \$1 million to Corpus Christi for more water.	“Texas Drought Sparked Water Worries for Industry.” Kate Galbraith, The Texas Tribune, Feb 27, 2012 <a href="http://www.texastribune.org/texas-environmental-news/water-supply/texas-drought-sparked-water-worries-industry/">http://www.texastribune.org/texas-environmental-news/water-supply/texas-drought-sparked-water-worries-industry/</a> .
Yemen (Al-Mashana district)	2013	Water disputes are becoming common in Yemen over access to available water sources. The Minister of Water and	Water dispute claims two lives in Ibb. Ali Ibrahim Al-Moshki, 18 April 2013. <a href="http://www.yementimes.com/en/1669/news/2241/Water-dispute-claims-two-lives-in-Ibb.htm">http://www.yementimes.com/en/1669/news/2241/Water-dispute-claims-two-lives-in-Ibb.htm</a>

Environment explains the entire country of Yemen is in a crisis concerning access to water sources. Clashes and deaths are the norm as Yemen finds their available ground water is being depleted at an “alarming rate.” Out of 14 water basins in the country, 5 of them are threatened due to depletion from consumption.

Zimbabwe 2013

Harare and Parirenyatwa Groups of Hospitals face acute water shortages, forcing patients to smuggle their own water into the hospitals. With clogged toilets and lack of sanitation, cross infections and nosocomial infections will rise. The hospital remains open despite the protests of the Zimbabwe Association of Doctors for Human Rights, citing international by-laws.

Mbanje, Phyllis (8 Sept 2013). “Health time bomb as patients bring own water to hospitals.” *The Standard*. <http://www.thestandard.co.zw/2013/09/08/health-time-bomb-patients-bring-water-hospitals/>

***Tourism Impacts***

Arizona (Lake Mead) 1999-2003

Lower water level in Lake Mead led to 900,000 fewer visits, 680 lost jobs, \$28 million loss in visitor spending and \$9.6 million loss in personal income

How can tourism research benefit from multi-disciplinary assessments of climate change? Lessons from the US Southwest. *Developments in Tourism Climatology*2007. Barbara Morehouse, George Frisvold, Rosalind Bark-Hodgins

Glen Canyon National Recreation Area (Lake Powell) lost 500,000 visits, 758 jobs, \$ 32 million in visitor spending and \$ 13.4 million in personal income.

*See above*