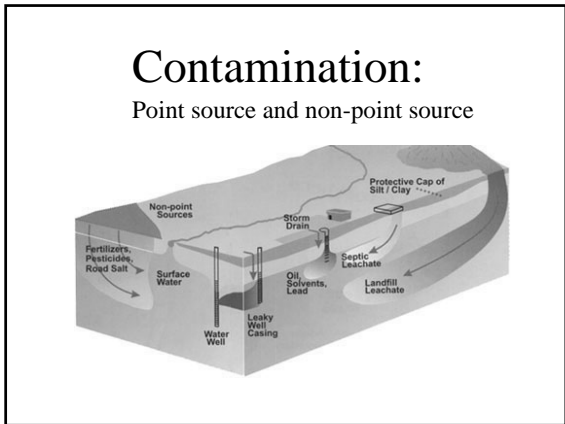
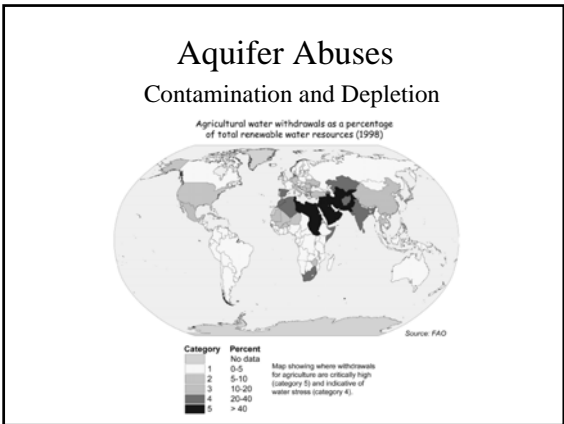
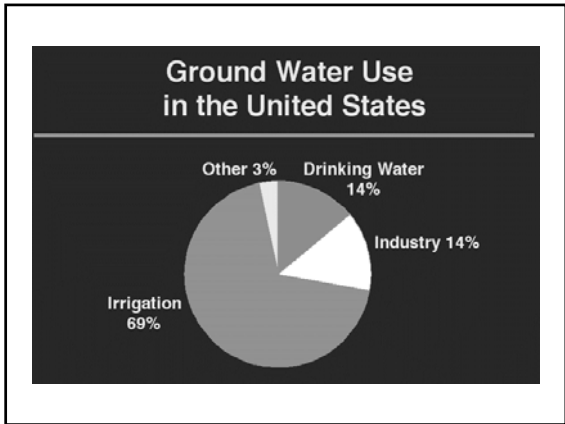


### Ground Water Use in the United States

- 25% of all water used
- Supplies 50% of the population
- Supplies 95% of the drinking water needs of rural populations
- 75% of public water systems rely on ground water

<http://maven.gtri.gatech.edu/ward/slide12.html>



## Ground Water Contamination in the US Magnitude / Cost of the Problem

Est. 33,000 to 400,000 total sites

1,400 Superfund sites

1,700 RCRA sites

TCE #1 and PCE #3 contaminants at NPL sites

Est. \$0.5 to \$1 Trillion cleanup cost

## VOC Contamination of Ground Water

- Estimated 7% of U.S. ground water supplies contain more than 0.2 µg/L VOCs
- Drinking water for 35-50 million potentially affected
- Urban areas
  - 47% of wells had at least 1 VOC present
  - 29% had 2 or more VOCs present
- Most frequently detected VOCs
  - Trichloroethylene
  - Tetrachloroethylene
  - MTBE
  - Chloroform

## Sites/Facilities to be Cleaned up in the United States

Program	Approximate Number
• Superfund	1,500 - 2,100
• RCRA Corrective Action	1,500 - 3,500
• Underground Storage Tanks	295,000
• Dept. of Defense (DOD)	7,300 (1,800 installations)
• Dept. of Energy (DOE)	4,000 (110 installations)
• Other Federal Agencies	350
• States	19,000*

\*Sites needing some further investigation that might lead to cleanup

## National Priorities List For Superfund Sites

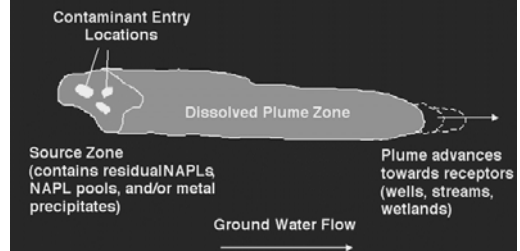


<http://www.epa.gov/superfund/sites/npl/npl.htm>

## The 25 Most Frequently Detected Ground Water Contaminants at Hazardous Waste Sites

- |                          |                               |
|--------------------------|-------------------------------|
| 1. Trichloroethylene     | 14. Cadmium                   |
| 2. Lead                  | 15. Manganese                 |
| 3. Tetrachloroethylene   | 16. Copper                    |
| 4. Benzene               | 17. 1,1-Dichloroethene        |
| 5. Toluene               | 18. Vinyl chloride            |
| 6. Chromium              | 19. Barium                    |
| 7. Methylene chloride    | 20. 1,2-Dichloroethane        |
| 8. Zinc                  | 21. Ethylbenzene              |
| 9. 1,1,1-Trichloroethane | 22. Nickel                    |
| 10. Arsenic              | 23. Di(2-ethylhexyl)phthalate |
| 11. Chloroform           | 24. Xylenes                   |
| 12. 1,1-Dichloroethane   | 25. Phenol                    |
| 13. 1,2-Dichloroethane   |                               |

## Source and Dissolved Plume



Welcome to New Jersey:  
Home of the first EPA superfund site!



### Geology of New Jersey

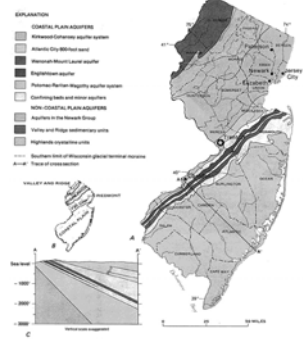
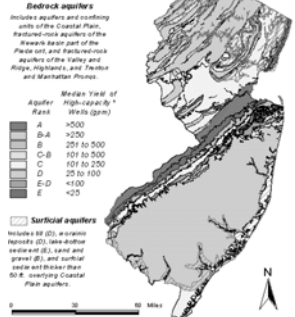


Figure 1. Primary aquifers in New Jersey. A. Alluvial aquifers; B. Pleistocene aquifers and alluvium; C. Consolidated rocks; D. Coastal aquifers; E. Highlands aquifers; F. Highlands crystalline units.

### Aquifers and Confining Units of New Jersey



\*High-capacity wells are industrial wells that are cased and bedded for use in an water table that often greatly exceeds draw-down points for the use as aquifer.

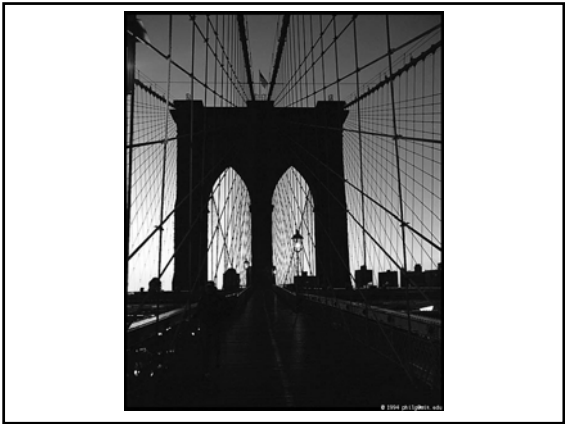
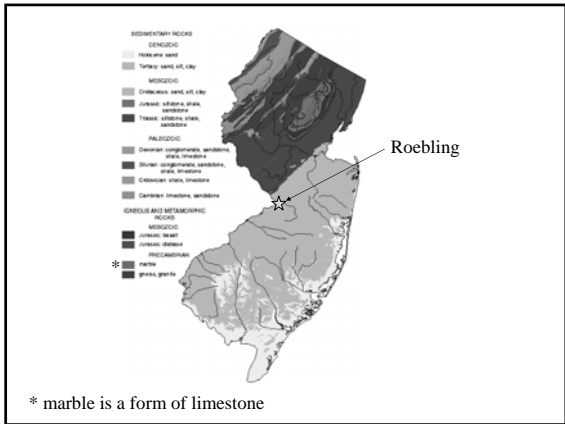
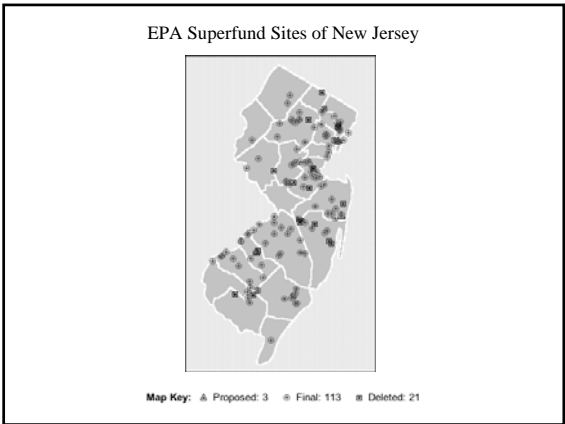
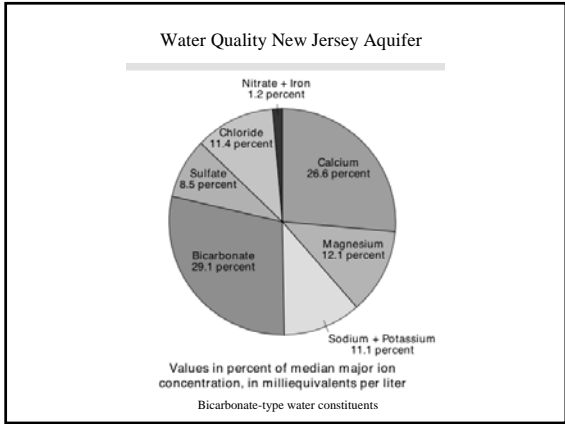
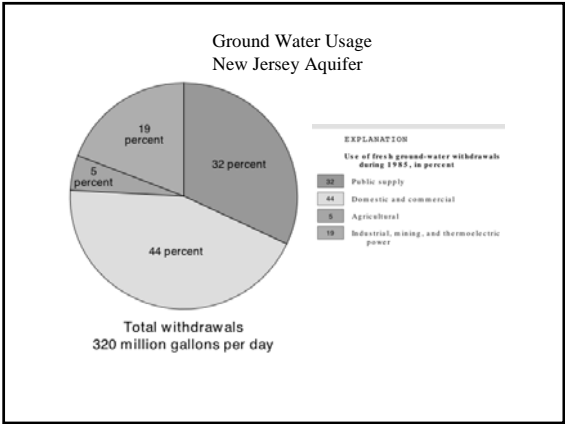
### USGS Groundwater Monitoring Program

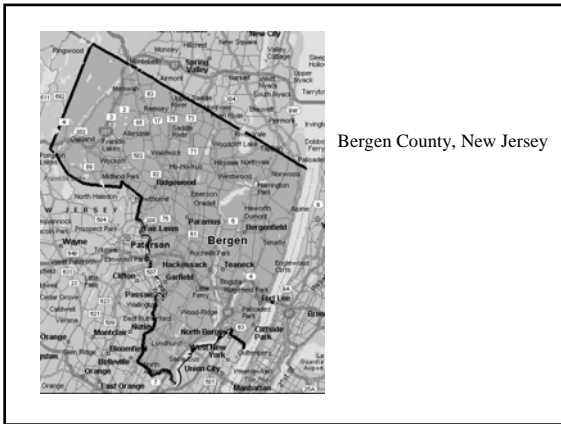
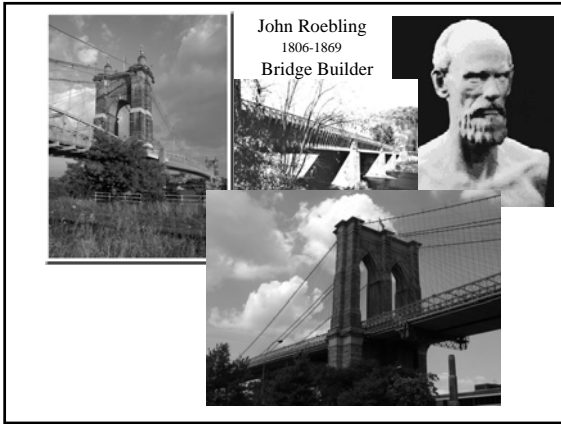


EXPLANATION  
DROUGHT REGION  
CENTRAL  
COASTAL NORTH  
COASTAL SOUTH  
NORTHWEST  
SOUTHWEST  
REAL-TIME OBSERVATION WELL



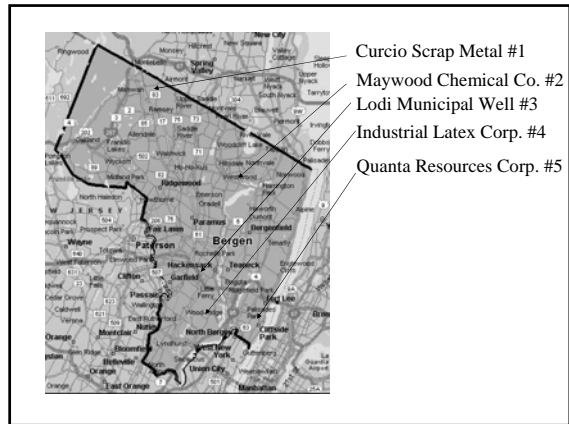
Sole Source Aquifers (SSA) in New Jersey  
1 Buried Valley  
2 Coastal Plain  
3 Highlands  
4 Northwest New Jersey  
5 Ramapo  
6 Ridgewood  
7 Rockaway  
8 Not a SSA

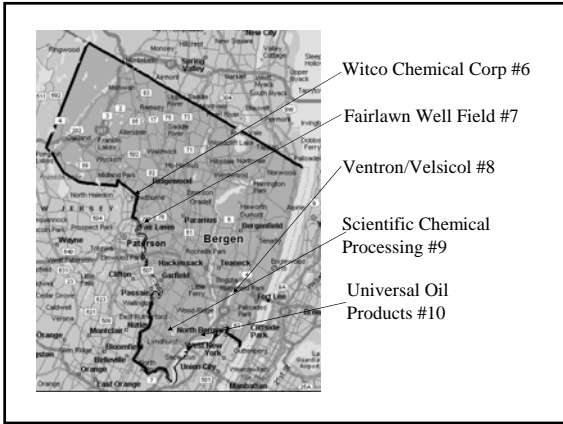





Site Name	Proposed Listing	Final Listing	Construction	Partial Deletion	Deletion
Curcio Scrap Metal, Inc. NJDO1171584	12/28/87	12/28/87	9/30/87	N/A	N/A
Fair Lawn Well Field NJDO0684107	12/30/82	9/28/83	N/A	N/A	N/A
Industrial Latex Corp. NJDO0128423	6/28/88	3/21/89	9/7/91	N/A	6/21/93
Lodi Municipal Well NJDO0698863	10/15/84	6/30/85	9/7/89	N/A	12/28/88
Maywood Chemical Co. NJDO0692790	12/30/82	9/28/83	N/A	N/A	N/A
Quanta Resources NJDO0688462	1/11/81	9/30/82	N/A	N/A	N/A
Scientific Chemical Processing NJDO0705643	12/30/82	9/28/83	N/A	N/A	N/A
Universal Oil Products/Chemical Division NJDO0681046	12/30/82	9/28/83	N/A	N/A	N/A
Ventron/Velsicol NJDO0528673	9/28/83	6/21/88	N/A	N/A	N/A
Witco Chemical Corp./Oakland PLO NJDO0683854	6/28/88	3/21/89	9/30/92	N/A	9/28/93

- 1 **CURCIO SCRAP METAL, INC.**  
NEW JERSEY  
EPA ID# NJD01171584
- 2 **MAYWOOD CHEMICAL COMPANY**  
NEW JERSEY  
EPA ID# NJD069259182
- 3 **LODI MUNICIPAL WELL**  
NEW JERSEY  
EPA ID# NJD068769301
- 4 **INDUSTRIAL LATEX CORP.**  
NEW JERSEY  
EPA ID# NJD081178411
- 5 **QUANTA RESOURCES CORP.**  
NEW JERSEY  
EPA ID# NJD000606442
- 6 **UNIVERSAL OIL PRODUCTS**  
NEW JERSEY  
EPA ID# NJD002985186
- 7 **SCIENTIFIC CHEMICAL PROCESSING**  
NEW JERSEY  
EPA ID# NJD0705643
- 8 **VENTRON/VELSICOL**  
NEW JERSEY  
EPA ID# NJD1980529879
- 9 **WITCO CHEMICAL CORP.**  
(OAKLAND PLANT)  
NEW JERSEY  
EPA ID# NJD045653854
- 10 **FAIR LAWN WELL FIELD**  
NEW JERSEY  
EPA ID# NJD980654107






**Threats and Contaminants**


 VOCs were detected in the groundwater from the three municipal wells. The threat due to exposure to the contaminated groundwater has been significantly reduced, since air strippers are currently treating contaminated groundwater from the municipal wells prior to distribution to the residents.

**Cleanup Approach**

This site is being addressed in two stages: immediate actions and a long-term remedial action. The immediate action of wellhead treatment has addressed the municipal well contamination, while the long-term action will focus on the entire groundwater cleanup and controlling potential sources of contamination.

**Response Action Status**

 **Immediate Actions:** In 1984, the potentially responsible parties (PRPs), Fisher Scientific Company and Sandvik, Inc., removed contaminated soil from a portion of their property. In 1987, the Borough of Fair Lawn installed air strippers to treat the contaminated wells. The PRPs later reimbursed the Borough for the installation of the air strippers and provided funding for future operation and maintenance activities.

**Cleanup Progress**  (Threats Mitigated by Cleanup Process)

The immediate actions described above have greatly reduced the potential for exposure to contaminated groundwater and soil at the Fair Lawn Well Field site while further investigations are taking place. The impacted public supply wells are currently being treated to remove contaminants and to ensure that the public is provided with a safe drinking water supply. The air stripper located at the Westmoreland Well Field is continuing to treat approximately 0.2 million gallons per day of contaminated groundwater.

NJ Drought Hotline: 1-800-4-ITS-DRY  
 Outside New Jersey Please Call: 1-609-631-0560

[drought home](#) [drought news](#) [drought status](#) [ask njdrought](#)

**Drought Resources**

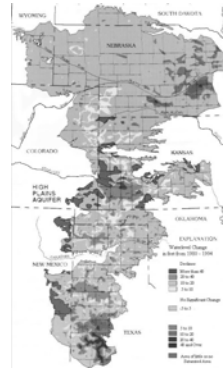
- > frequently asked questions
- > drought status & indicators (updated 2/4/04)
- > drought regions in New Jersey
- > ask NJDEP your drought question
- > you can make a difference: ideas for saving water
- > additional drought links
- > hardship exemption form
- > declared drought status in neighboring areas

**Current Events**

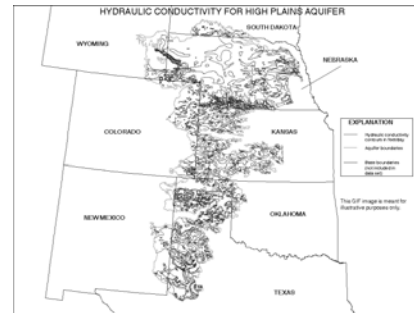
- > public information sessions
- > current drought restrictions
- > current rainfall statistics
- > current reservoir levels
- > news releases
- > administrative orders

**Drought Regions**

click an area for more status information



The Ogallala Aquifer



"All parts of Kansas grow good corn  
 but in wheat Kansas can beat the world."  
*Topeka Daily Capital, 1888.*

The Kansas climate is best suited to winter wheat (planted in the fall and harvested in the spring) because most moisture arrives in winter and early spring.

Kansas Wheat Farmers



Circa 1930



All About Wheat	Grains of History	Kansas Wheat Farm
Prairie Skyscrapers	Super Trivia	Home

### Kansas Wheat Farm Adventures

Ever wonder what life is like on a farm? These farm families kept diaries to help you find out what it's like to live and work on Kansas farms. Check out their daily entries and photos to learn more.

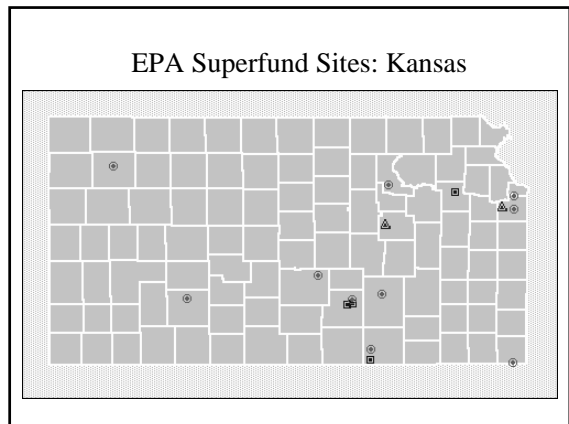
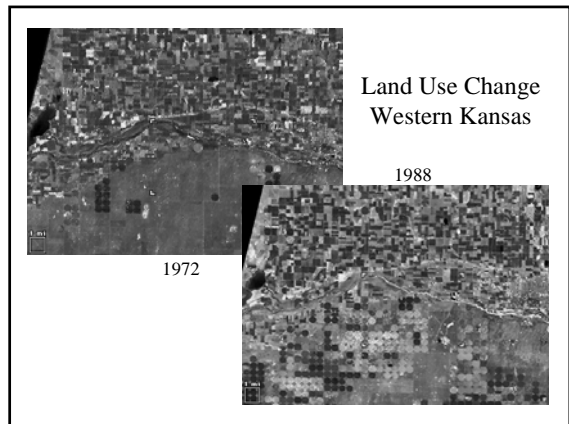
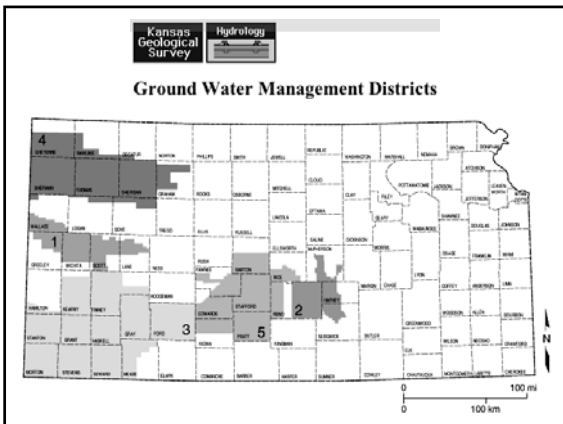
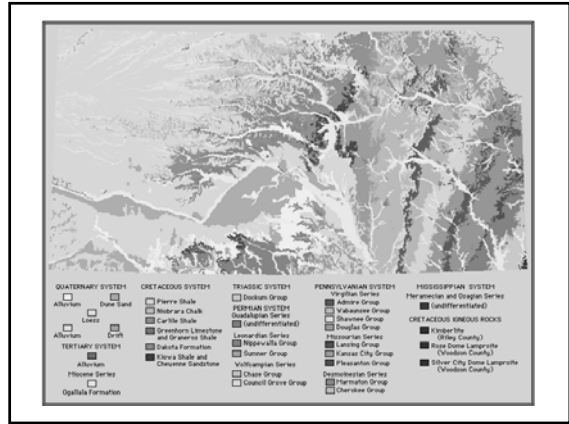
**Stoskopf Family**  
Wheat Harvest & Summer Adventures - 1997  
May 1998 Update

**Ehmke Family**  
Fall Harvest & Activities - 1997  
June 1998 Update  
Harvest 2000!

**Hixon Family**  
Baby Calves & Winter Happenings

**Clanton Family**  
Wheat Harvest & Fall Planting - 1998

Contact any of the families at [wackywheat@hoisington.com](mailto:wackywheat@hoisington.com)





**HIGH PLAINS AQUIFER AND THE U.S. GEOLOGICAL SURVEY NATIONAL WATER-QUALITY ASSESSMENT PROGRAM**

*By Larry M. Piper, U.S. Geological Survey-Water Resources Division, Lawrence, KS*

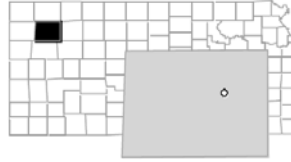
*"Whiskey is for drinking and water is for fighting"*

Water from 22 percent of the wells sampled in Kansas had dissolved solids concentrations greater than the U.S. Environmental Protection Agency (USEPA) Secondary Maximum Contaminant Level of 500 milligrams per liter for drinking water; dissolved solids in water from 2 of the 46 wells exceeded 1,000 milligrams per liter. Water from 9 percent of the wells had nitrate concentrations greater than the 10-milligrams-per-liter USEPA Maximum Contaminant Level (a primary drinking-water standard); 76 percent of the wells had nitrate concentrations greater than 2.0 milligrams per liter, which indicates potential enrichment from land-use activities. Concentrations of trace elements exceeded water-quality standards in water from only two wells. Concentrations of arsenic and manganese exceeded standards in one sample each from these two wells.

<http://webservice.cr.usgs.gov/nawqa/hpgw/meetings/POPE2.html>

**ACE SERVICES  
KANSAS  
EPA ID# KSD046746731**

**EPA Region 7  
City: Colby  
County: Thomas County  
Other Names:**



**SITE DESCRIPTION**

The 2 1/2-acre Ace Services site is a former chrome plating facility where chrome plating was applied to farm implement parts. The facility operated from 1969 to 1989, and was permanently closed in early 1990. From 1969 to 1975, chrome plating wastewater generated during operations at the Ace Services facility was discharged directly to the ground surface immediately west of the unnamed tributary to Prairie Dog Creek. A local citizen filed a complaint with the Kansas Department of Health and Environment (KDHE) in early 1971. KDHE and EPA collected wastewater samples in 1971 and 1972 that showed the presence of chromium. In 1974 and 1975, concrete retention vats were installed at the

present at the site. Ground water from the Ogallala Aquifer is the sole source of municipal and private drinking water in and around Colby. The Colby public water supply well No. 8 is located one-fifth of a mile from the site. This well was closed by KDHE in 1980 due to chromium concentrations measuring above Federal drinking water standards. Approximately 6,180 people are currently served by seven

**THREATS AND CONTAMINANTS**



Soils and sludge in the lagoon area were contaminated with chromium prior to removal by Ace Services, KDHE and EPA. Surface wastewater was also contaminated with chromium prior to treatment and disposal by KDHE and EPA. The ground water in the Ogallala Aquifer is contaminated with chromium. Inhalation exposure to lead and chromium VI in indoor air within on-site buildings and ingesting contaminated ground water are the primary threats to the public.

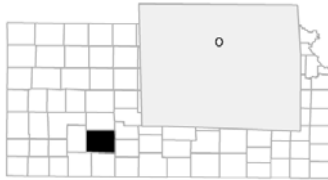
**ENVIRONMENTAL PROGRESS**



Removing containers of hazardous waste and removing and stabilizing contaminated soils, sludges, dust, and buildings, and treating contaminated wastewater reduced threats at the Ace Service site while investigations into ground water contamination were conducted. Remedial design for the ground water remedy is currently completed and construction on the ground water treatment system has just begun.

**WRIGHT GROUND WATER  
CONTAMINATION  
KANSAS  
EPA ID# KSD984985929**

**EPA Region 7  
City: Wright  
County: Ford County  
Other Names:**



**THREATS AND CONTAMINANTS**



Groundwater is contaminated with pesticides, heavy metals, and VOCs including benzene, bromodichloromethane, and carbon tetrachloride. There are no bodies of water located within 2 miles of the site and it is unlikely that the hazardous substances in the groundwater would be released into the air or soil.

**CLEANUP APPROACH**

**Response Action Status**



**Site Studies:** Entire Site: A full-scale investigation into the nature and extent of groundwater contamination has been completed. A final cleanup remedy is being selected to address long-term cleanup goals.

**Site Facts:** A non-time critical removal, completed in 1997, provided a municipal water system for the residents of Wright.

**ENVIRONMENTAL PROGRESS**



The provision of bottle water and whole-house filter systems has reduced the risk of groundwater contamination to residents affected by the Wright Ground Water Contamination site while investigations are being planned.

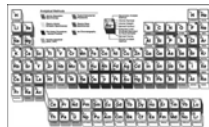
**Agrochemicals**

**Pesticides**

2,4,5-T  
endrin  
aldrin  
paraquat  
chlordane  
lindane  
DDT  
campachlor  
chlordimeform  
ethylene dibromide  
DBCP  
dieldrin  
ethyl parathion  
pentachlorophenol

**Herbicides**

Atrazine  
Cyanazine  
Prometon  
Simazine  
Acetochlor  
Alachlor  
Metolachlor



**Fertilizers**

Ammonia  
Ammonium Nitrate  
Ammonium Phosphate (N)  
Ammonium Phosphate (P2O5)  
Ammonium Sulphate  
Ammonium Sulphat Nitrate  
Basic Slag  
Calcium Ammonium Nitrate  
Calcium Cyanamide  
Calcium Nitrate  
Complex Fertilizer (K2O)  
Concent Superphosphate  
CRUDE FERTILIZERS -271+  
CRUDE FERTILIZERS -271+  
Phosphate Fertilizers  
Phosphoric Acid  
Potash Fertilizers  
Potassium Sulphate  
Single Superphosphate  
Sodium Nitrate

**National Water Quality Assessment Study**



USGS

## Clean Water Act

Originally enacted under the administration of Gerald Ford in 1977 and amended under the administration of George W. Bush in 2002

### Activities Exempt under the Clean Water Act, Section 404(f):

- Established (ongoing) farming, ranching, and forestry activities
- Plowing
- Seeding
- Cultivating
- Harvesting food, fiber, and forest products
- Minor drainage
- Upland soil and water conservation practices
- Maintenance (but not construction) of drainage ditches
- Construction and maintenance of irrigation ditches
- Construction and maintenance of farm or stock ponds
- Construction and maintenance of farm and forest roads, in accordance with best management practices
- Maintenance of structures, such as dams, dikes, and levees

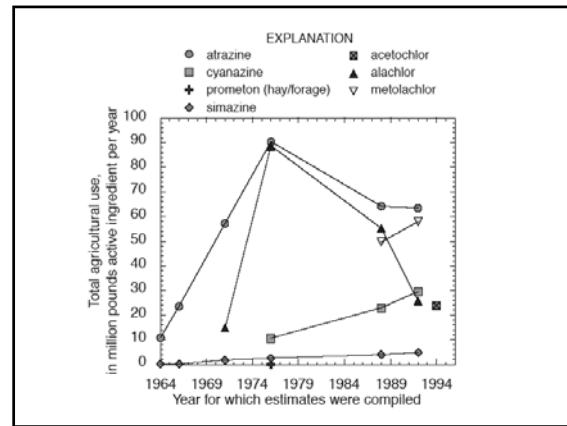
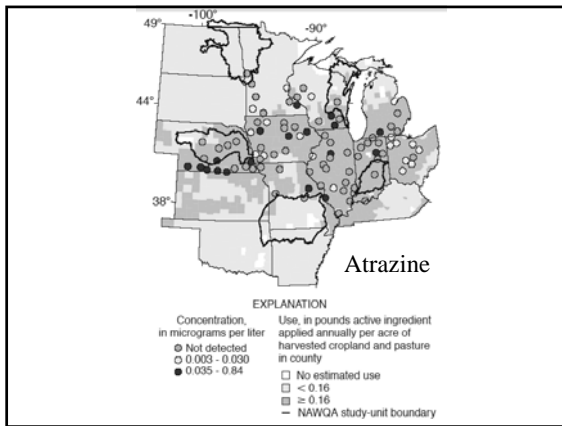
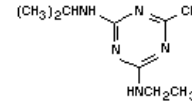
See: <http://www.epa.gov/region5/water/cwa.htm>

Herbicide:

Atrazine Usage: 2001

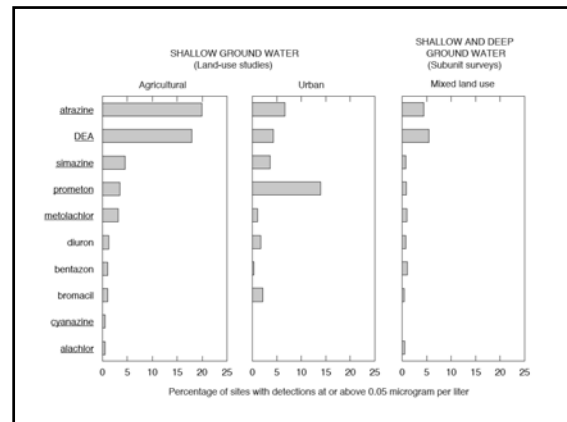
Atrazine Application on Corn Crops by State, 2001

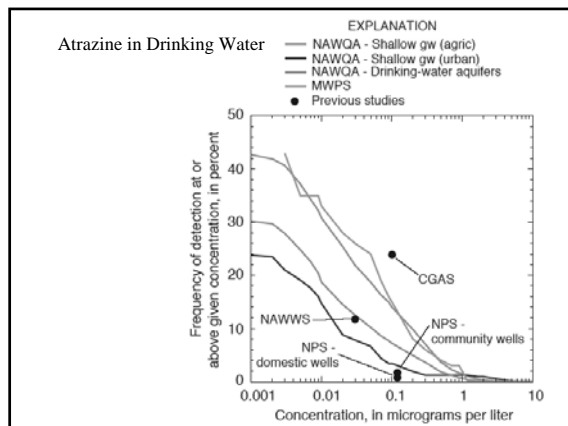
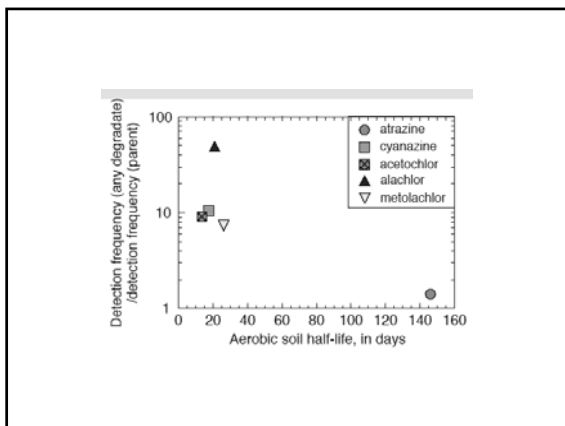
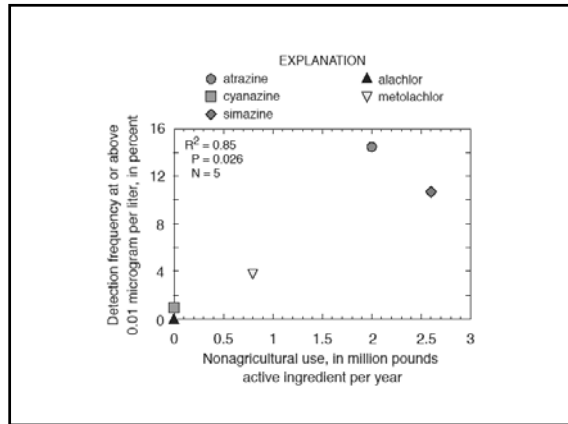
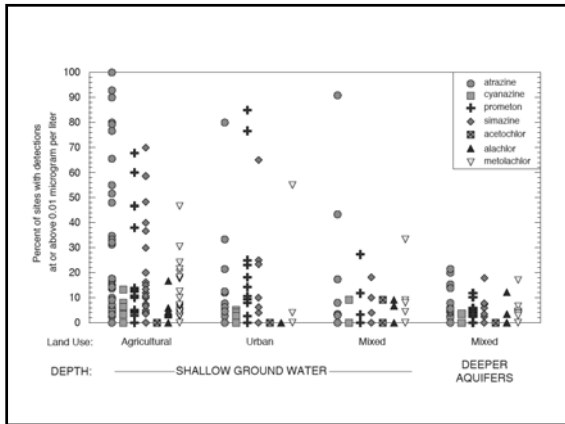
State	Pounds of Atrazine
CO, GA, KY, NC, ND, NY, PA, SD, TX, WI	Between 166,000 and 1,915,000
MI, MO, MN	Between 1,915,000 and 3,664,000
KS, OH	Between 3,664,000 and 5,413,000
NE	Between 5,413,000 and 7,162,000
IA, IN	Between 7,162,000 and 8,911,000
IL	Between 12,409,000 and 14,158,000
No data or very little data: AL, AR, AZ, CA, CT, DC, DE, FL, ID, LA, MA, MD, ME, MS, MT, NH, NJ, NM, NV, OK, OR, RI, SC, TN, VA, VT, WA, WV, WY	



## Average Annual Use Of Herbicides 1991-1995

Parameter	Atrazine	Cyanazine	Prometon	Simazine	Acetochlor	Alachlor	Metolachlor
	Agricultural use (principal crops)						
	Field crops, pasture	Field crops	Range/land, hay, forage	Field crops, orchards, vegetables	Field crops	Field crops	Field crops, vegetables
Millions of pounds a.i. applied per year	63.9	29.5	—	4.8	23.8	25.6	27.9
Millions of acres treated per year	57.0	15.8	—	3.4	11.8	14.5	31.3
Pounds a.i. applied per treated acre per year	1.1	1.9	—	1.4	2.0	1.8	1.9
	Nonagricultural use (principal settings)						
	Turf, sod farms, roads, lawns, plantations, rights-of-way	None	Asphalt, rights-of-way, fence rows, plantations, sod farms, ponds and aquaria	Rights-of-way, lawns, forests, plantations, sod farms, ponds and aquaria	—	None	Turf, hedgerows, lawns, landscaping
Millions of pounds a.i. applied per year	1.6-2.4	0	—	1.9-3.3	—	0	0.8
Millions of acres treated per year	—	—	—	—	—	—	—





**Syngenta's Workers Sue**

A number of workers at the St. Gabriel facility have sued Syngenta, alleging that working in an atrazine-laced environment caused them to develop prostate cancer. Their claims are remarkable. One worker says that he "worked 'eyeball' deep in the powder [atrazine]" and recalls instances of employees "eating meals . . . in areas covered with atrazine dust." Another worker recalls his supervisors telling him that "atrazine could be eaten without any adverse health effects."

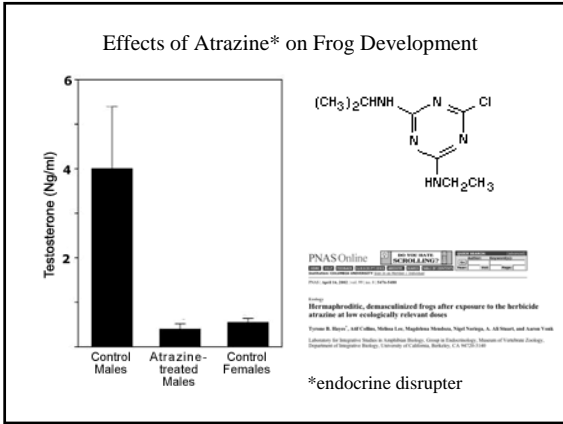
<http://www.nrdc.org/health/pesticides/natrazine.asp>

Arch Environ Contam Toxicol 33, 261-267 (1997)

ARCHIVES OF  
**Environmental  
 Contamination  
 and Toxicology**  
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**Chronic Toxicity of Atrazine to Sago Pondweed at a Range of Salinities:  
 Implications for Criteria Development and Ecological Risk**

L. W. Hall, Jr.,<sup>1</sup> R. D. Anderson,<sup>1</sup> M. S. Ailstock<sup>2</sup>

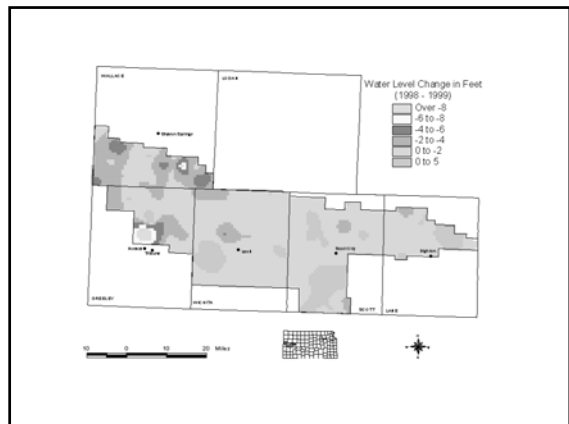
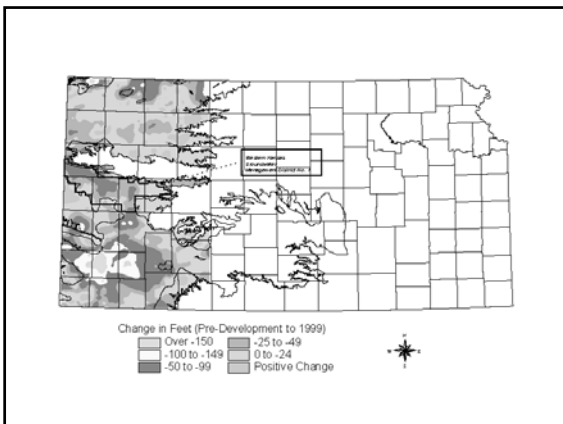
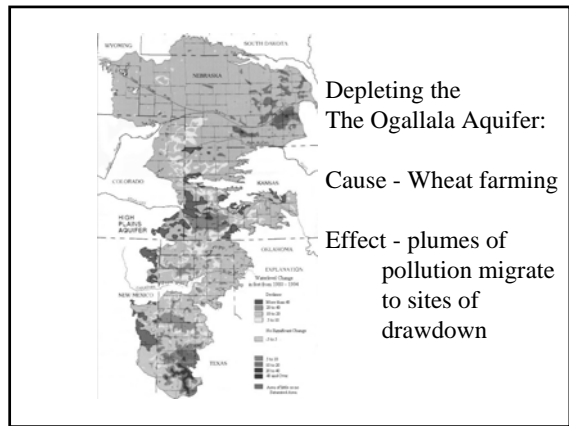
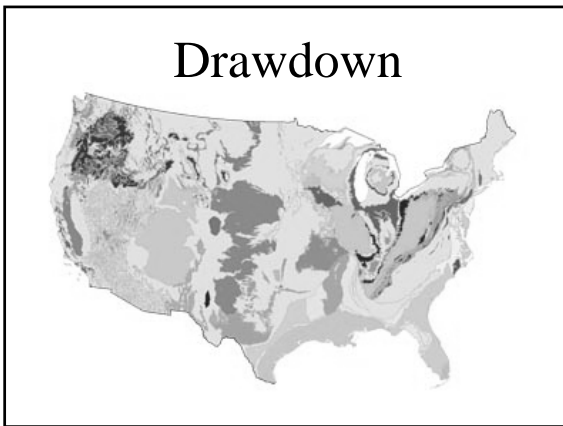


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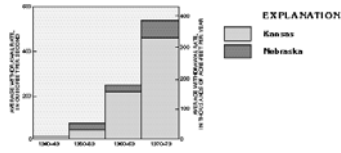
### Time to Take Action

NRDC is calling on the EPA to ban atrazine from the market. The agency's current atrazine assessment is significantly flawed, understating risks from exposure. And the deal the agency appears to have cut with Syngenta will make matters worse, not better.

**Chemical Structure:** CCNc1nc(Cl)cnc1C(C)C



## Drawdown of the Ogallala Aquifer



Modified from Helgesen, J.O., Leonard, R.B., and Wolf, R.J., 1993. Hydrology of the Great Plains aquifer systems in Nebraska, Colorado, Kansas, and adjacent areas: U.S. Geological Survey Professional Paper 1414-E, 80 p.

**Figure 86.** Rates of withdrawal of freshwater from the aquifer system in Kansas and Nebraska increased greatly during the 1960's and the 1970's. Withdrawals in Kansas were much greater than those in Nebraska during these two decades.

## Dwindling water supplies shape future of farming in western Kansas

October 2001

U.S. Water News Online

**SHARON SPRINGS, Kan.** — At age 12, Bill Mai was old enough to help move irrigation pipe at the family farm near Sharon Springs. That was back in 1944, when his father socked out the first water right in southeast Wallace County.

They drilled down nearly 165 feet to tap into the Ogallala Aquifer, the bottom of which reached 220 feet below the Kansas prairie.

Now 65, Mai owns that old water right. But the water table has dropped to 175 feet at the family homestead.

Last year alone, water levels fell another 2 to 3 feet — even though Mai stopped irrigating two years ago and went to dryland crops and no-ill farming. His neighbors still irrigate their fields.

"We shut down our wells because of the fact we know we can't keep pumping and have water left over for drinking, eventually," he said. "We have done this in my lifetime."

## Crop Progress Reports



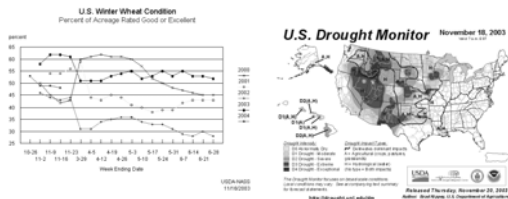
By Extension Crops Specialist Jim Shroyer

The Crop Progress Reports from Kansas Agricultural Statistics Will Only Be Issued Monthly During the Winter

Topsoil Moisture Still 55 percent Short to Very Short Monday, February 2, 2004



## Kansas Wheat Production



**WheatOnline.com**

The Home Page of the Kansas Association of Wheat Growers

## From The Western Kansas Wheat Field

By Vance Ehmke  
A Wheat Producer Farming Near Healy, Kansas  
And a KAWG Past President

Snow is Good News

February 5, 2004

It has been some time since I've written because I have gotten very tired of writing only bad news. So I vowed I wouldn't write again until we had some good news to report. Finally, we have some good news.

Over the past four to five days, we have gotten two snowstorms with 3 and 5 inches of snow. Hopefully this will keep us alive and in the game a little longer.

## Read More About It

### References:

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- Dugan, J. T., & Sharpe, J. B. (n.d.). *Water-level changes in the High Plains Aquifer: 1980-1994*. U.S. Geological Survey.
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- Zwingle, E. (1993, March). *Wetlands of the High Plains*. National Geographic, 80-109.

## Other Sources of Ground-water Information

### Scientific Organizations and Agencies

- US Environmental Protection Agency (EPA) || Office of Water
- American Geophysical Union (AGU)
- American Water Resources Association (AWRA)
- American Water Works Association(AWWA)
- Association of American State Geologists
- Geological Society of America (GSA)
- National Ground Water Association (NGWA)
- Other USGS links and other science organizations and agencies
- The Groundwater Foundation
- Conservation Technology Information Center (CTIC) || Know Your Watershed

<http://water.usgs.gov/ogw/other.html>

# Appendix

Irrigation water use per country in the year 2000

	Total renewable water resources (cubic km)	Irrigation water requirements (cubic km)	Water use efficiency in percentages	Water withdrawal for agriculture (cubic km)	Water withdrawal as percentage of renewable water resources
Alghanistan	65	8.78	38%	22.84	35%
Algeria	14.32	1.45	37%	3.94	27%
Angola	184	0.04	20%	0.21	0%
Argentina	814	3.43	16%	21.52	3%
Bangladesh	1210.644	19.09	25%	76.35	6%
Bahrain	24.8	0.06	30%	0.19	1%
Bolivia	622.531	0.26	23%	1.16	0%
Botswana	14.4	0.02	30%	0.06	0%
Brazil	8233	6.21	17%	36.63	0%
Burkina Faso	12.5	0.21	30%	0.69	5%
Burundi	3.6	0.06	30%	0.19	5%
Cambodia	476.11	1.20	30%	4.00	1%
Cameroon	285.5	0.22	30%	0.73	0%
Chad	43	0.07	35%	0.19	0%
Chile	922	1.59	20%	7.97	1%
China	2829.569	153.90	36%	426.85	15%
Colombia	2132	1.23	25%	4.92	0%
Congo, Republic of	832	0.00	30%	0.00	0%
Congo, Dem Republic of	1283	0.03	30%	0.11	0%
Costa Rica	112.4	0.36	25%	1.43	1%
Cote d'Ivoire	81	0.17	28%	0.60	1%
Cuba	38.12	1.41	25%	5.64	15%
Dominican Republic	20.995	0.56	25%	2.24	11%

	Total renewable water resources (cubic km)	Irrigation water requirements (cubic km)	Water use efficiency in percentages	Water withdrawal for agriculture (cubic km)	Water withdrawal as percentage of renewable water resources
Ecuador	432	2.67	19%	13.96	3%
Egypt	58.3	28.43	53%	53.85	92%
El Salvador	25.23	0.19	25%	0.76	3%
Eritrea	6.3	0.09	32%	0.29	5%
Ethiopia	110	0.56	22%	2.47	2%
Gabon	164	0.02	30%	0.05	0%
Gambia	8	0.01	30%	0.02	0%
Ghana	53.2	0.06	26%	0.25	0%
Guatemala	111.27	0.40	25%	1.61	1%
Guinea	226	0.41	30%	1.36	1%
Guyana	241	0.45	28%	1.60	1%
Haiti	14.025	0.18	20%	0.93	7%
Honduras	95.929	0.17	25%	0.69	1%
India	1896.66	303.24	54%	558.39	29%
Indonesia	2838	21.49	28%	75.60	3%
Iran, Islamic Rep of	137.51	21.06	32%	66.23	48%
Iraq	75.42	11.20	28%	39.38	52%
Jamaica	9.404	0.01	25%	0.02	0%
Jordan	0.88	0.29	39%	0.78	86%
Kenya	30.2	0.30	30%	1.01	3%
Korea, Dem People's Rep	77.135	1.49	30%	4.96	6%
Korea, Republic of	89.7	2.67	30%	8.92	13%
Laos	333.55	0.81	30%	2.70	1%
Lebanon	4.407	0.37	40%	0.92	21%
Libyan Arab Jamahiriya	0.6	2.56	60%	4.27	712%

	Total renewable water resources (cubic km)	Irrigation water requirements (cubic km)	Water use efficiency in percentages	Water withdrawal for agriculture (cubic km)	Water withdrawal as percentage of renewable water resources
Madagascar	337	3.58	25%	14.31	4%
Malawi	17.28	0.20	25%	0.81	5%
Malaysia	580	1.68	30%	5.60	1%
Mali	100	2.06	30%	6.87	7%
Mauritania	11.4	0.44	29%	1.50	13%
Mexico	457.222	18.53	31%	60.34	13%
Morocco	29	4.28	37%	11.48	40%
Mozambique	216.11	0.22	39%	0.55	0%
Myanmar	1045.601	9.79	30%	32.64	3%
Nambia	17.94	0.07	40%	0.17	1%
Nepal	210.2	2.45	25%	9.82	5%
Nicaragua	196.69	0.30	27%	1.08	1%
Niger	33.65	0.62	30%	2.08	6%
Nigeria	286.2	1.65	30%	5.51	2%
Pakistan	222.67	72.14	44%	162.65	73%
Panama	147.98	0.05	20%	0.23	0%
Paraguay	336	0.08	23%	0.35	0%
Peru	1913	5.07	31%	16.42	1%
Philippines	479	6.33	30%	21.10	4%
Rwanda	5.2	0.01	30%	0.03	1%

	Total renewable water resources (cubic km)	Irrigation water requirements (cubic km)	Water use efficiency in percentages	Water withdrawal for agriculture (cubic km)	Water withdrawal as percentage of renewable water resources
Saudi Arabia	2.4	6.68	43%	15.42	643%
Senegal	39.4	0.43	30%	1.43	4%
Sierra Leone	160	0.12	33%	0.35	0%
Samoa	13.5	0.96	30%	3.28	24%
South Africa	50	2.34	21%	11.12	22%
Sri Lanka	50	2.92	24%	12.00	24%
Sudan	64.5	14.43	40%	36.07	56%
Suriname	122	0.18	30%	0.62	1%
Swaziland	4.51	0.12	16%	0.76	17%
Syrian Arab Republic	26.29	8.52	45%	18.93	72%
Tanzania, United Rep of	91	0.56	30%	1.85	2%
Thailand	409.844	24.83	30%	82.75	20%
Togo	14.7	0.02	30%	0.08	1%
Tunisia	4.56	1.21	54%	2.23	49%
Turkey	229.3	11.27	40%	27.86	12%
Uganda	66	0.03	30%	0.12	0%
Uruguay	139	0.66	22%	3.03	2%
Venezuela, Bolv Rep of	1233.17	1.24	31%	3.97	0%
Viet Nam	891.21	15.18	31%	48.62	5%
Yemen	4.1	2.53	40%	6.32	154%
Zambia	105.2	0.26	19%	1.32	1%
Zimbabwe	20	0.67	30%	2.24	11%