1.8 billion people gained access to improved sanitation facilities between 1990 and 2010.

2.5 billion people still lack improved sanitation. 1.1 billion people still practice open defecation, that's 15% of the world population.

If current trends continue, 2.4 billion people will still lack improved sanitation facilities in 2015.

Access to sanitation, the practice of good hygiene, and a safe water supply could save 1.5 million children a year.

EVERY 20 SECONDS, A CHILD DIES AS A RESULT OF POOR SANITATION.

ACCESS TO SANITATION AS A PERCENTAGE OF WORLD POPULATION:

- 49% in 1990
- 63% in 2010
- 67%* projected in 2015

* Projected total (Millennium Development Goals’ target is 75%)

UN WATER.ORG
WATER USE HAS BEEN GROWING AT MORE THAN TWICE THE RATE OF POPULATION INCREASE IN THE LAST CENTURY

By 2025, 1800 million people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under stress conditions.

INCREASE IN WATER WITHDRAWALS BY 2025

50% DEVELOPING COUNTRIES

18% DEVELOPED COUNTRIES

UNWATER.ORG
BETWEEN 1991 AND 2000 OVER 665,000 PEOPLE DIED IN 2,557 NATURAL DISASTERS OF WHICH 90% WERE WATER RELATED EVENTS.

Adaptation to climate change is mainly about better water management.

Without improved water resources management, the progress towards poverty reduction targets, the Millennium Development Goals, and sustainable development in all its economic, social and environmental dimensions, will be jeopardized.

PROJECTED CHANGE IN RUNOFF IN 2041-60:

Mill et al., 2005 (with technical modifications).

Multimodel mean-changes in annual runoff indicating degree of agreement between the 12 models used.
There are numerous examples where transboundary waters have proved to be a source of cooperation rather than conflict.

Almost 450 Agreements on international waters were signed between 1820 and 2007.
MORE THAN HALF OF THE WORLD POPULATION - OVER 3.5 BILLION PEOPLE - LIVES IN CITIES

THERE IS BETTER ACCESS TO WATER AND SANITATION SERVICES IN URBAN AREAS

Population with access to improved sources of drinking water in 2010

Urban - 96%
Rural - 81%

Population with access to improved sanitation facilities in 2010

Urban - 79%
Rural - 47%

827.6 million people live in slums, often lacking adequate water and sanitation services

227 million people have moved out of slum conditions between 2000 and 2010, mainly as the result of slum upgrading

Increase of overall slum population between 2000 and 2010:
6 million people a year

On these trends, the world slum population should reach 888 million by 2020
WATER FOR FOOD

7 BILLION PEOPLE TO FEED TODAY

= 60% more food needed

+19% increase of agricultural water consumption (including both rainfed and irrigated) by 2050

GLOBAL WATER WITHDRAWALS

70% AGRICULTURE

10% DOMESTIC

20% INDUSTRY

EVERY DAY 1 PERSON

DRINKS

2-4 LITRES OF WATER

EATS

2000-5000 LITRES OF VIRTUAL WATER EMBEDDED IN FOOD

ALL WE EAT NEEDS WATER TO GROW

1 APPLE

70 litres

150G OF BEEF STEAK

2025 litres

100G OF VEGETABLES

20 litres

1 SLICE OF BREAD

40 litres

UN WATER.ORG
One in nine people worldwide doesn’t have access to improved sources of drinking water and one in three lacks improved sanitation.

The major sources of water pollution are from human settlements and industrial and agricultural activities.

80% of sewage in developing countries is discharged untreated directly into water bodies. Industry dumps an estimated 300-400 MT of polluted waste in waters every year. Nitrate from agriculture is the most common chemical contaminant in the world’s groundwater aquifers.

Approximately 3.5 million people die each year due to inadequate water supply, sanitation and hygiene.

The biodiversity of freshwater ecosystems has been degraded more than any other ecosystem.
WATER AND GENDER

IN AFRICA, 90% OF THE WORK OF GATHERING WATER AND WOOD IS DONE BY WOMEN

Women and girls often spend up to 6 HOURS every day fetching water

Reducing the distance to a water source from 30 to 15 min increased girls’ school attendance by 12% according to a study in Tanzania

With the same access to productive resources as men, including water, women could increase yields on their farms by 20–30% and lift 150 million people out of hunger

Involving women can increase the effectiveness of water projects 6 to 7 times
FRESHWATER HOLDS OVER 10% OF ALL LIFE ON THE PLANET AND 35% OF ALL VERTEBRATES.

COMPARED WITH A DECLINE OF ABOUT 32% FOR BOTH MARINE AND TERRESTRIAL SPECIES.

FRESHWATER ALSO SUPPORTS ALL TERRESTRIAL BIODIVERSITY.


A well-functioning watershed, with its forests, grasslands and soils, and wetlands, including watercourses, lakes, swamps and floodplains, provides water storage, clean water, flood flows management and many other benefits.

The loss and degradation of biodiversity compromise ecosystems and all the services they deliver, including the supply of clean water.

BIFODIVERSITY FOR WATER

PROVISIONING SERVICES
Food Production
Water
Wood and Fiber
Fuel

SUPPORTING SERVICES
Nutrient Cycling
Soil Formation
Primary Production
Habitat Provision

CULTURAL SERVICES
Spiritual
Aesthetic
Educational
Recreational

REGULATING SERVICES
Climate Regulation
Flood Regulation
Water Purification

FRESHWATER ECOSYSTEMS PROVIDE A VAST ARRAY OF SERVICES TO SOCIETY, INCLUDING CLEAN WATER.

BASED ON MILLENIUM ECOSYSTEM ASSESSMENT, 2005.
During the period 2000 to 2006, a total of 2,163 water-related disasters were reported globally in the Emergency Disasters Database, killing more than 290,000 people, affecting more than 1.5 billion, and inflicting more than US$422 billion of damage.

Floods, droughts and windstorms have been the most frequently occurring disaster events since 1900. They account for 88.5% of the thousand most disastrous events.

More than 83% of the disastrous events occurred in Asia.

Since 1900 more than 11 million people have died as a consequence of drought, and more than 2 billion have been affected by drought, more than any other physical hazard.
# Drinking Water Treatment Methods for Backcountry and Travel Use

This document should only serve as a guide for individuals intending to use untreated or poorly treated water as a drinking water source. This document may also aid travelers and backcountry water users in researching drinking water treatment methods. Except for boiling, few of the water treatment methods are 100% effective in removing all pathogens.

## Contaminant | Potential Health Effects | Sources of Contaminant in Drinking Water | Methods that may remove some or all of the contaminant
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Boiling (boiling for 1 minute effective)</th>
<th>Filtration (filters vary)</th>
<th>Disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Protozoa:</strong></td>
<td></td>
<td></td>
<td>++++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>Enteroxial diseases (e.g., diarrhea, vomiting, cramps)</td>
<td>Human and animal fecal waste</td>
<td>++++</td>
<td>Absolute 4.0 micron filter (NPT Standard 50 or 55 rated)</td>
<td>++ to +++</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Absolute 4.5 micron filter (NPT Standard 55 or 55+ rated)</td>
<td>+ to +++</td>
</tr>
<tr>
<td>Giardia lamblia (aka Giardia lamblia)</td>
<td>Enteroxial diseases (e.g., diarrhea, vomiting, cramps)</td>
<td>Human and animal fecal waste</td>
<td>++++</td>
<td>Absolute 4.0 micron filter (NPT Standard 50 or 55 rated)</td>
<td>+ to +++</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Absolute 4.5 micron filter (NPT Standard 55 or 55+ rated)</td>
<td>++++</td>
</tr>
<tr>
<td><strong>Bacteria:</strong></td>
<td></td>
<td></td>
<td>++++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Enteroxial diseases (e.g., diarrhea, vomiting, cramps)</td>
<td>Human and animal fecal waste</td>
<td>++++</td>
<td>Absolute 4.0 micron filter</td>
<td>++++</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Absolute 4.5 micron filter</td>
<td>++++</td>
</tr>
<tr>
<td>Vibrio spp. (e.g., shigella, hepatitis A, nereus, typhus)</td>
<td>Enteroxial diseases (e.g., diarrhea, vomiting, cramps)</td>
<td>Human and animal fecal waste</td>
<td>++++</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Treatment methods listed above:

- **Boiling** can be used as a protozoa reduction method that should get all pathogens. Water should be brought to a rolling boil for 1 minute at elevations greater than 5,902 feet (~1,800 m), boil water for 3 minutes.

- **Filtration** can be used on a protozoa reduction method against most microorganisms, depending on the type of the filter, amount of the contaminant, particle size of the contaminant, and change of the contaminant particle size.

- **Disinfection** is the most effective protozoa reduction method. Boiling water for backcountry use is safe. Manufacturer’s instructions must be followed.

### Other treatment methods can be effective against some of the above pathogens:

- **Ultraviolet Light (UV Light)** can be used as a protozoa reduction method against some microorganisms. However, contact time, biological contaminant, and temperature of the water are factors in the effectiveness of UV radiation.

- **Chlorine Tablets** are effective against some pathogens, but they must be used according to the manufacturer’s instructions and may have disinfectant by-products.

### Important:

- Always use a water treatment method that is suitable for the water source, and follow the manufacturer’s instructions carefully.

- In addition to using the appropriate drinking water treatment methods listed above, you can also protect yourself and others from waterborne illness by:
  - Boiling human waste 8 inches deep and at least 200 feet away from natural water sources.
  - Practicing good personal hygiene. Wash hands before handling food, eating, and after using the toilet.