

Session 4

How Bad Is It? Analyzing a Perfect Storm



[NASA Photo](#)

Session goal: To understand the realities about what is happening to God's creation today, and why today's environmental crisis is different from any we have experienced in the past.

Key Scripture: Daniel 9:4-19

Background Reading: *Global Warming & The Risen Lord, chapters 1-4, Our Father's World, chapter 1 (p. 27-42)*

Warm Up

Report from a missions trip: Problems in God's creation are already happening in other parts of the world even if they are largely invisible here. Someone in your group may have recently been on an overseas missions trip. Wherever they went, they almost certainly encountered environmental problems. Ask them ahead of time to bring some pictures and to prepare to share with your group some of the ways in which they saw environmental degradation in person and how it was affecting the people who live there.

Content

Suggestions for the leader:

It would be easy to get bogged down in the material that follows. A couple of suggestions:

Summarize: If you have a group that is interested in the details, by all means spend as much time as you need to. If the group seems to be overwhelmed, you can easily summarize the material in each section in just a few minutes using the bullet points with only one or two comments each, and then spend most of the group's time on "Why it matters" under each section.

Visualize: You will need a newsprint pad and markers available (or a whiteboard / blackboard if you are meeting in a classroom setting): For each major topic, record 3 reasons why this particular topic is important – for you personally, for humanity generally and for God the Creator.

Discussion: Your discussions should focus on the simple question – "Why is this important?" You will note that we have not given you many hints as to how to answer this question. It is important that each member of the group think carefully about the different aspects of these creation care problems in order to understand for themselves what the importance of these effects are.

The Storm has already started

Our collective abuse of God's creation is already having serious effects throughout the world. In many cases, these are local problems – a polluted stream or river, a deforested hillside, toxic materials in ground water. But increasingly, our problems are not just local but global. Pollution injected into the atmosphere in China shows up in California; sulfuric acid from power plants in Michigan falls as acid rain in New England; and global burning of fossil fuels increases the entire world's level of carbon dioxide, leading to climate change with all kinds of consequences.

Picture this situation as if it were a hurricane bearing down on us. Some places are already in the middle of it while in other places the sky is still blue and the sun is shining. This doesn't mean the storm isn't real – it just means it hasn't reached some of us yet. But it is coming – and we need to understand both what this storm is doing (this session and the next) and also what is driving it (Session 7).

In this session we will examine five of the major areas where there is strong evidence of negative environmental impacts on creation: Soil, Forests, Oceans, Water, and Chemicals. In the next session we'll look at climate change – the big problem that is not only serious by itself, but that actually makes most of these other effects worse as well. We can see evidence of the environmental crisis at work, and how these affect us now and will do so even more in the future.

1. Soil



Dust storm approaching Stratford, Texas Dust bowl surveying in Texas

Image ID: theb1366, Historic C&GS Collection

Location: Stratford, Texas

Photo Date: April 18, 1935

Credit: NOAA George E. Marsh Album

[\[Web source\]](#)

What is happening

Soil is the foundation of our food supply, as well as that of all the plants and animals that live on earth. Franklin Roosevelt, the US President, was thinking of this when he said, "The nation that destroys its soil destroys itself." And here is one of my favorite quotes (no one knows who first said this), "All of human existence depends on two things: Six inches of topsoil and the fact that it rains."

Due to carelessness and deliberate mismanagement, earth's soils are being lost at an alarming rate. Lester Brown's excellent book, Plan B 4.0, summarizes the situation:

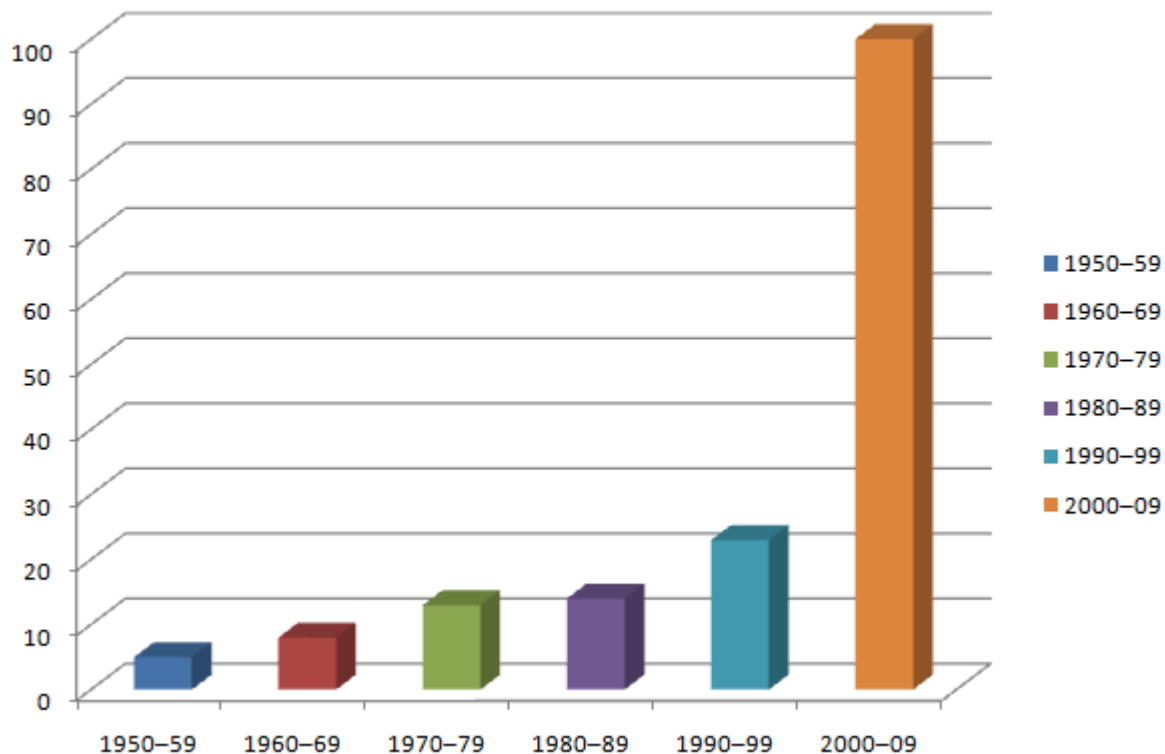
The thin layer of topsoil that covers the planet's land surface is the foundation of civilization. This soil, typically 6 inches or so deep, was formed over long stretches of geological time as new soil formation exceeded the natural rate of erosion. But sometime within the last century,

as human and livestock populations expanded, soil erosion began to exceed new soil formation over large areas. [Lester Brown, Plan B 4.0 p. 32]

While it is impossible to quantify exactly how much soil is being lost annually around the world, some of the figures from individual countries are startling:

- Ethiopia: 2 billion tons of topsoil a year.
- Nigeria: 351,000 hectares (about 1355 square miles) of grazing land is becoming desert every year.
- China: 360,000 hectares (1,400 square miles) is turning to desert.

Dust Storms In China by Decade



Data Source: China Meteorological Administration, cited in "Grapes of Wrath in Inner Mongolia," report from the U.S. Embassy in Beijing, May 2001. [Via Earth Policy Institute website]

This is due in part to poor farming practices. Specific land-management issues that are destroying the ability of land to produce food include these:

- **Over-fertilizing and failure to rotate crops**
Commercial nitrogen fertilizers allow for great increases in yields for a time. However, they tend to be expensive for the world's poor, exhaust the soil, requiring greater and greater

applications of fertilizer to maintain yields. Ultimately these formulas destroy the biotic communities that make up soil and cause massive oxygen depletion in both fresh and salt water. *[The US Midwest and many other parts of the world.]*

- **Erosion from plowing**

Plowing hillsides that are too steep or failing to plow across the slope of the land is one of the most common ways to lose soil through erosion. *[Ethiopia, Kenya, Haiti and many poorer nations where farmers are forced to cultivate unsuitable land.]* Many groups are seeking proactive solutions to restore the land. Groups like ECHO, Polyface farms, and others.

- **Over-irrigation**

Most water used for irrigation contains naturally occurring salts and minerals. When this water is poured on very flat land over many years, evaporation causes these salts and minerals to build up to toxic levels, destroying the ability of the ground to support agriculture and polluting ground water. *[Pakistan and India are the best examples of this.]*

- **Over-grazing of cattle, sheep and goats**

Grazing land managed properly support herds of animals indefinitely; when it is over-used, however, it quickly degrades to nothing but dust, and this allows wind and water to rapidly remove any soil that is left. *[China's annual dust storms are caused by this abuse of land.]*

Why Does it Matter?

Is it important to have sustainable farming practices? [Consider visiting a sustainable farm to see the difference]

2. Forests



Deforestation in Bolivia [[CR: boliviabella.com](http://boliviabella.com)]

What is happening?

In many countries around the world the most obvious environmental problem is deforestation – the loss of forests. This was identified as a problem in the United States as early as 1835, and even in 1811 missionary William Carey was writing about the problem in India.

According to the National Geographic Society,

The statistics paint a grim picture. According to the World Resources Institute, more than 80 percent of the Earth's natural forests already have been destroyed. Up to 90 percent of West Africa's coastal rain forests have disappeared since 1900. Brazil and Indonesia, which contain the world's two largest surviving regions of rain forest, are being stripped at an alarming rate by logging, fires, and land-clearing for agriculture and cattle-grazing.
[[National Geographic web site](#)]

This pictures is of deforestation from close up and from above



Remember what we learned about how God reveals himself in creation? How should we feel about places like Madagascar when we read quotes like this?

Madagascar, as an isolated island, has one of the highest rates of biodiversity in the world – that is, for its size, it has more different kinds of plants and animals than almost anywhere else. But rainforests are key habitats for almost all of these species – and Madagascar is

losing its forest fast: “rampant deforestation, a swelling human population and the early effects of climate change have already pushed countless species out of existence. Of the surviving 71 lemur species and subspecies on Madagascar, 63% are endangered. [Time Magazine 9/25/2008](#)

Deforestation is being caused by

- **Wood for cooking**

Surprisingly, the single largest use of wood in the world (almost 50%, according to Lester Brown in Plan B 4.0 p. 194) is as fuel for cooking. . More efficient cook stoves and even solar ovens are some options being implemented by groups like [Plant with Purpose](#) and the Paradigm Project.



SPONSOR A STOVE IN TANZANIA

Wood-saving stoves help families and the environment. By reducing wood use by 60%, stoves prevent deforestation and save time, improving the lives of rural women and girls. These stoves produce far less smoke, which significantly decreases the risk of respiratory disease in women and children. Each stove also keeps 1.6 tons of carbon dioxide out of the atmosphere every year. **Sponsor a stove today for \$30** and make an investment in the health of our planet as well as rural communities in Tanzania.

YOU CAN INVEST IN THE LIVES OF THE RURAL POOR TODAY!

Juster Aminja is a single mother of three and works as a farmer in Komalyangoe, Tanzania. She is faced with many obstacles to provide for her family day to day. Mama Juster has received a wood-saving stove and has learned many sustainable agriculture techniques. Mama says, “Thanks to the encouragement and training provided by Plant With Purpose, our health has improved and I have hope for a better life for my children.”

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San Diego, CA 92117
www.plantwithpurpose.org

PLANT WITH PURPOSE

- **Biofuels**

Conversion of rainforest to farmland for soybeans to produce ethanol especially in the Amazon basin of South America.

- **Increased demand for grazing land and farm land:**

This is an example of how the problems we are studying interact with each other. As grazing land is abused and degraded, people move their herds into areas less suitable for grazing, and will destroy forests to give themselves more room to raise cattle. A good part of the deforestation in the Amazon rainforest is being caused by this.

The effects of deforestation are various, and include

- **Local climate change:** Trees make their own rain, and when a forest is gone, rainfall patterns, both in time and geography, change dramatically.
- **Floods and Droughts:** . Forests are critical for soil stability, water recharge into aquifers, and continuous stream flow.
- **Erosion of farm land** because of the flood/drought cycle just described.

See it for yourself:

Deforestation is so rampant in many parts of the world that you can see it from space – or on your own computer screen, thanks to Google Earth. Download this Google Earth tour to see a few obvious examples, then – knowing what to look for – find additional examples yourself.

Why does it matter?

Is Forest management important?

3. Oceans

What is happening?

Earth's oceans cover 70% of God's creation. Until now, no one could have imagined that human activities could begin to affect the health – and wealth – hidden in the seas, the truth is we are.

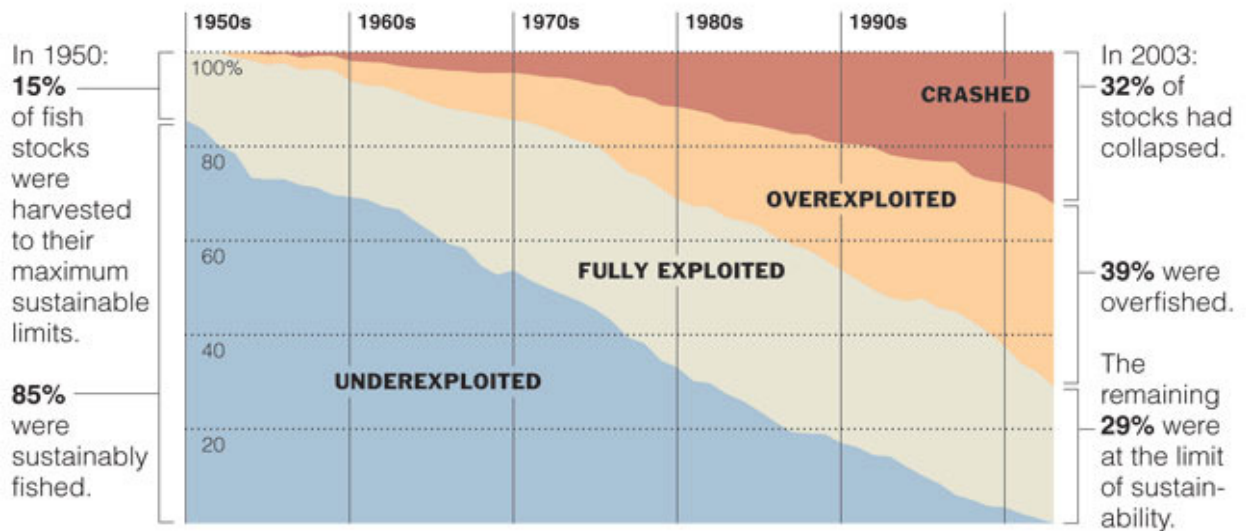
These are some of the major effects we are causing:

- **Over-fishing**

All of the major fisheries in the oceans are being fished at a rate that will almost certainly cause their collapse. Some ocean species are already showing signs of starvation probably because their sources of food are being taken by humans for our own consumption.

At the Breaking Point

The condition of the world's fisheries has declined drastically because of overfishing.



Source: Sea Around Us Project (searoundus.org)

BILL MARSH/THE NEW YORK TIMES

[NY Times graphic]

- **Pollution**

A surprising amount of plastic waste runs into the seas and is gathered in enormous floating islands of garbage, some as large as the state of Texas. One such island is in the central Pacific ocean. It has plastics from all of the countries that border the Pacific ocean, including the US, China, Japan, all of the southeast-Asian, South American and Latin American countries.

- **Acidification**

One of the serious but little known side effects of increased CO₂ in the atmosphere is that there is more CO₂ in the oceans. In fact, one of the reasons we have not seen as great an increase in the atmosphere as we might have is because much of this additional CO₂ has been absorbed by the seas. . Increasing the levels of the CO₂ in the oceans make them more acidic. Increased acidification of the oceans disseminates sensitive ecosystems, especially coral reefs. Coral ecosystems provide an abundant food supply for people. Go to <http://creationcare.org> on back issues of In the Beginning for real life examples.

- **Temperature related sea rise**

Sea-level rise is a well-documented effect of global warming and it is already happening. Many coastal areas have already lost valuable land or have had salt water infiltration into farm lands and water tables. However, rising seas will eventually affect up to half of the world's population, including major cities like New Orleans, Jakarta, London, New York, etc., almost all of which are built near the ocean, and will wipe out vast areas of fertile farm land,

further depleting our soil supplies. Coastal flooding could displace 100 million people within the next few decades.

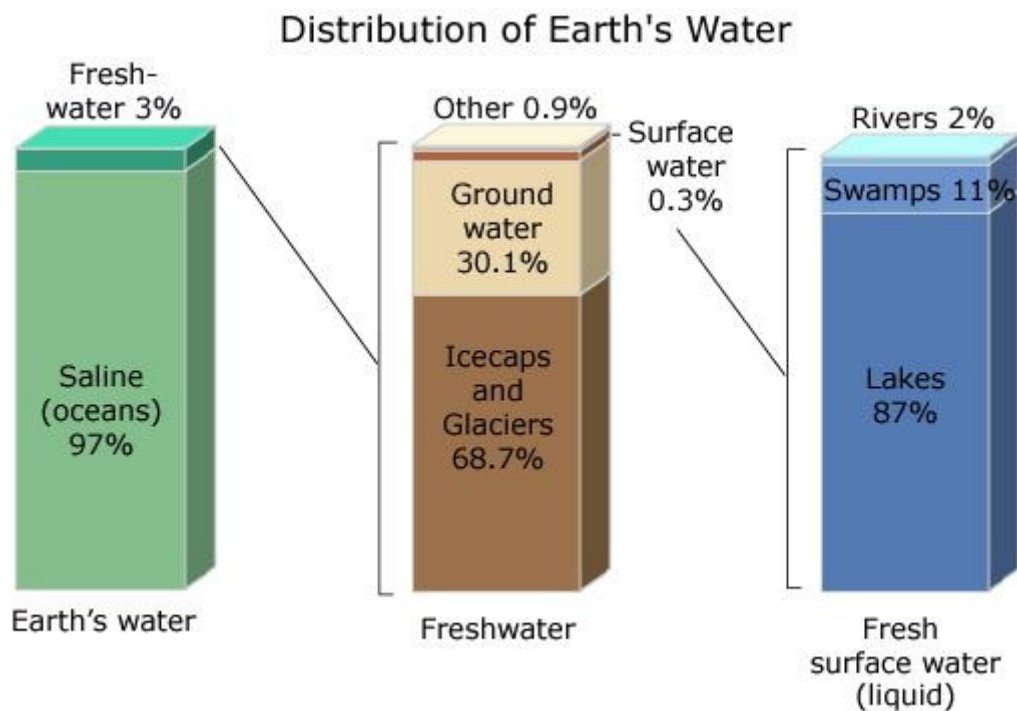
Why does it matter?

Discuss and record 3 reasons why damage to the oceans is important for you, for people in general and for God.

4. Water

What is happening?

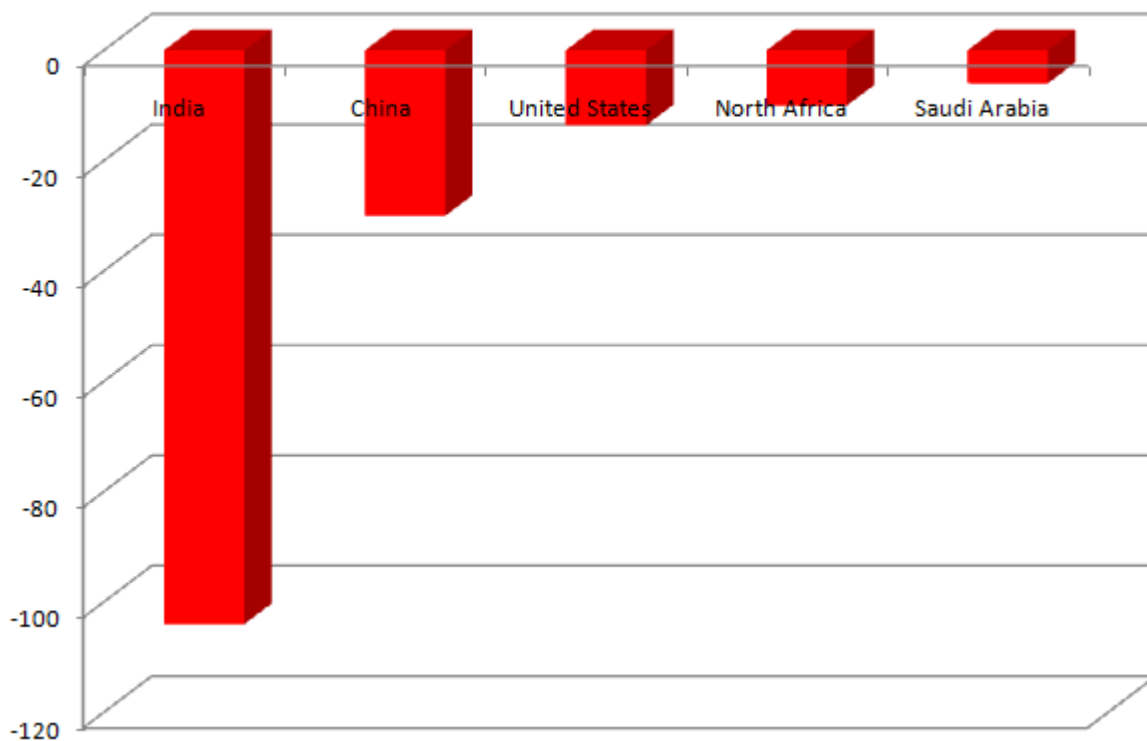
Water is indispensable for all life God created, but there is a shortage of access to fresh water. , There's only a fraction of water ~~the total~~ that is available for all land-based life – plants, animals and humans.



[USGS Image - <http://ga.water.usgs.gov/edu/watercyclesummary.html>]

A number of countries are accumulating vast water “deficits” – ie. they are using more water each year than they receive from renewable sources like rainfall. These deficits are made up usually by pumping from underground aquifers that are not being replenished.

Annual Water Deficits (Billion Cubic Meters)



Data Source: [Earth Policy Institute](#)

These are some of the things we are doing to our water supply:

- **Over-use of surface water sources like rivers and lakes**
Many great river systems like the Indus (Pakistan), the Yellow (China) and the Colorado (USA) no longer flow to the sea because every drop is taken for irrigation and human consumption. This practice has not only destroyed the lower watersheds and formerly flourishing deltas of these rivers but because they are already fully used, there is no more water available.
- **Destruction of watershed support systems like mountain forests**
This is one of many ways in which the problems we are exploring interact with each other. Deforestation of mountain slopes causes streams and rivers to flood in rainy seasons and disappear during dry seasons, leading to erosion, contamination of the entire river system by loads of soil and flood damage.
- **Excessive pumping of underground aquifers**
In many parts of the world, we have compensated for the limited supply of surface water by pumping from vast underground aquifers. The problem here is that this water over thousands of years incomplete sentence here !

- **Contamination of water supplies**

Human beings have been a little careless not only in the use of water, but in keeping our supplies clean. Pollution of rivers and lakes is an old problem but is reversible when we decide it is important enough. More difficult and damaging is the contamination of groundwater by industrial chemicals and even consumer pharmaceuticals – medicines that get flushed from our homes into rivers, streams and ground water.

- **Loss of glaciers due to climate change**

Glaciers all over the world are shrinking due to climate change. Many of the great rivers of the world, like the Indus in Pakistan, the Ganges in India and the Yellow and Yangtze in China are fed by mountain glaciers. While there is debate as to how soon the melting of glaciers at the headwaters of each of these great rivers will have an effect, there is little doubt that it will – and when it does, a third of the world's population will be directly affected.



Summer of 2010: A glacier the size of Manhattan broke off the Greenland Ice Sheet. [Cr 1sky.com]

Why does it matter?

Discuss How water is important to life?

5. Chemicals

What is happening?

Our society uses all different kinds of chemicals to make and process the things we use. And we have created thousands of new chemicals, compounds that are not found in nature. These chemicals – natural ones like mercury, synthetic substances like Teflon, are everywhere – in the

air, in the water, in our cooking utensils and our pillows and blankets. There is a great deal we do not know about this situation, but here are a few things we do know:

- **Synthetic chemicals** have been found by the hundreds in almost everyone's bloodstream. For an illuminating article on this topic from a respectable source, check David Ewing Duncan, "Pollution Within," in [National Geographic, October, 2006](#).

Even though many health statistics have been improving over the past few decades, a few illnesses are rising mysteriously. From the early 1980s through the late 1990s, autism increased tenfold; from the early 1970s through the mid-1990s, one type of leukemia was up 62 percent, male birth defects doubled, and childhood brain cancer was up 40 percent. Some experts suspect a link to the man-made chemicals that pervade our food, water, and air. There's little firm evidence. But over the years, one chemical after another that was thought to be harmless turned out otherwise once the facts were in.

The classic example is lead. In 1971 the U.S. Surgeon General declared that lead levels of 40 micrograms per deciliter of blood were safe. It's now known that any detectable lead can cause neurological damage in children, shaving off IQ points. From DDT to PCBs, the chemical industry has released compounds first and discovered damaging health effects later. Regulators have often allowed a standard of innocent until proven guilty in what Leo Trasande, a pediatrician and environmental health specialist at Mount Sinai Hospital in New York City, calls "an uncontrolled experiment on America's children."

- **Significant increases in certain kinds of health problems**, including autism and autoimmune diseases, have been linked to pollutants such as mercury in our water.
- **Deformities in amphibians (like frogs) and in fish seem to be increasing** and may be linked to a variety of human causes, including the increasing numbers of human pharmaceuticals in water supplies. A useful article can be found on [the Amphibiaweb website here](#).



CR: NPR

A recent story on NPR covered the surprising evidence of “gender-bending” in fish – that is, male fish with female characteristics:

A survey of fish in rivers and streams around the country shows that a large percentage of male bass have acquired feminine characteristics.

*Scientists say it's the biggest survey of this gender-bending condition in U.S. waters. And while they can't be sure of the cause, they suspect industrial and pharmaceutical chemicals are the culprit. ...In regions of the southeast, **70 to 90 percent** of the fish were found to be intersex. Only in Alaska's Yukon River in were fish completely free of the condition. "When we're up with the majority of fish showing this condition," the biologist says, "we don't believe that's normal and we do need to answer those questions as to what is the cause." And that's hard to nail down. Scientists have wondered whether it's something in nature like changes in water temperature or acidity, or something genetic about some kinds of fish. But **experiments in laboratories point to certain chemicals**, especially a group loosely called "estrogenic compounds." These mimic the behavior of natural sex hormones — estrogens — in the body. These can come from pharmaceuticals like birth control pills, or agricultural runoff loaded with pesticides, as well as an ingredient in plastic.*

[\[NPR\]](#)

Why does it matter?

Discuss if the amount of pollution in America’s waterways surprises you?