

Module IX & X

Environmental Pollution & Env. Law



Lecture 12 (8 September 2024)
Dr. Asib Ahmed



**Department of Social Relations
EAST WEST UNIVERSITY**

These toxic chemicals are everywhere – even in your body. And they won't ever go away.

By **Joseph G. Allen**

Jan. 3, 2018 at 2:18 a.m. GMT+6

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The poison found in everyone, even unborn babies - and who is responsible for it

Rob Bilott

Chemicals called PFAS and PFOS - known as forever chemicals - are in the blood of virtually every person on the planet. And they will only accumulate

Forever Materials/ Chemicals

PFAS, PFOA, Gen-X etc.

perfluorinated or polyfluorinated alkyl

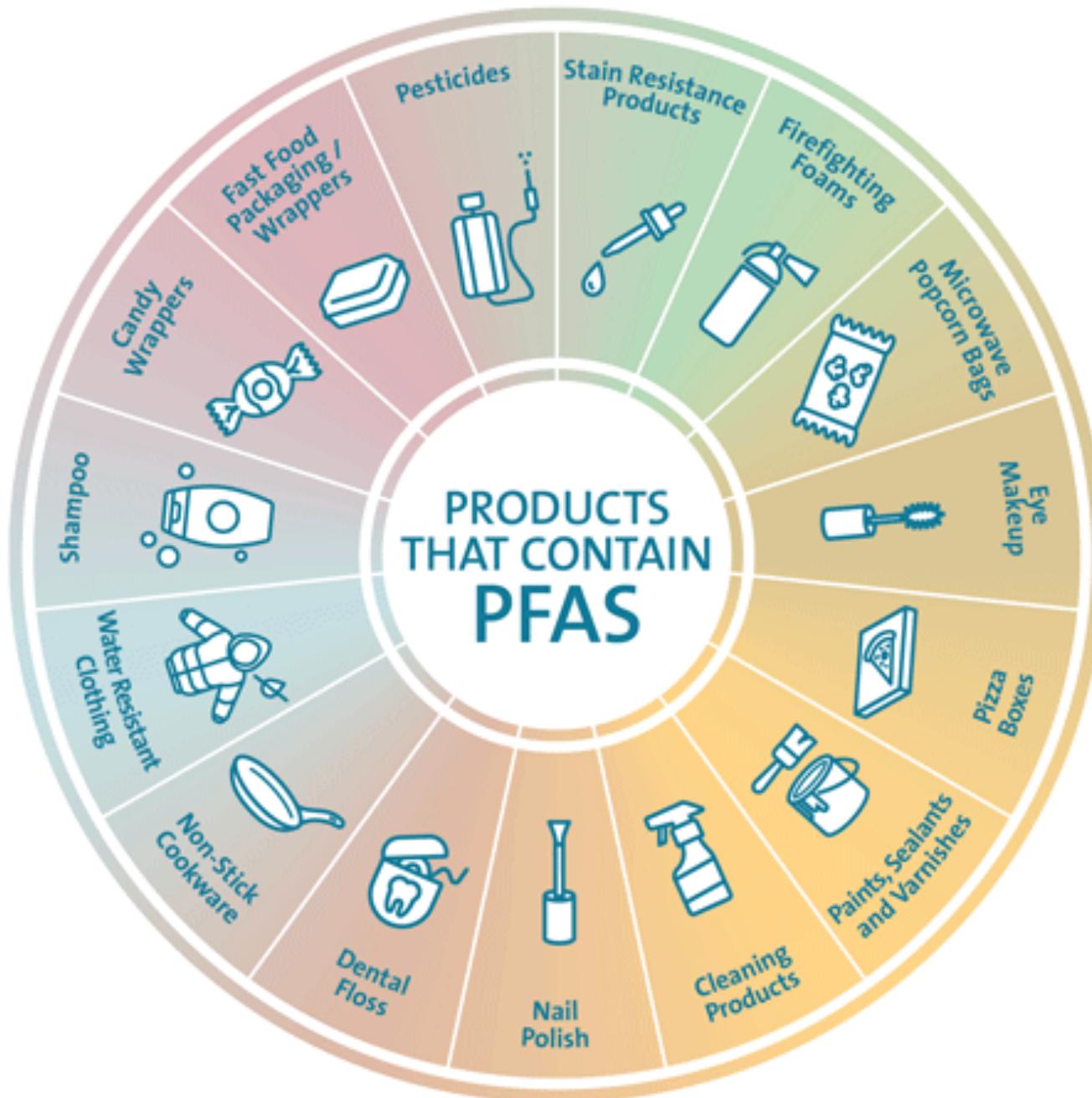
“Forever chemicals” is a term used to describe per- and polyfluoro alkyl substances (PFAS), a group of thousands of synthetic chemicals used in everything from carpets to fast food containers.

They are characterized by a fluorine- carbon backbone. And the F-C bond, the Forever-Chemical bond, is quite amazing, representing one of the strongest bonds in all of organic chemistry.

**The F-C bond is so strong that these chemicals never fully degrade. Ever.
Like, for millennia ever.**

We also find them inside all of us; in the most recent survey of the U.S. population, one set of these Forever Chemicals showed up in the blood of more than 98 percent of Americans.

PRODUCTS THAT CONTAIN PFAS



Invasive Species

An invasive species is an organism that causes ecological or economic harm in a new environment where it is not native.

Invasive species can harm both the natural resources in an ecosystem as well as threaten human use of these resources. An invasive species can be introduced to a new area via the ballast water of oceangoing ships, intentional and accidental releases of aquaculture species, aquarium specimens or bait, and other means.

Invasive species are capable of causing extinctions of native plants and animals, reducing biodiversity, competing with native organisms for limited resources, and altering habitats. This can result in huge economic impacts and fundamental disruptions of coastal and Great Lakes ecosystems.

<https://education.nationalgeographic.org/resource/invasive-species>

Invasive Species



https://youtu.be/spTWwqVP_2s

Space debris/junk

Space junk refers to fragments left behind in space. Most space junk is debris from rocket-launching material and disused satellites.



In 1961, when the Soviet Union sent the first person into space, fewer than 1,000 pieces of junk had accumulated there from previous exploration efforts.

Decades later, there are nearly 30,000 pieces —and that number only includes the pieces that are trackable. As space debris accumulates, it poses a growing challenge to space travel and exploration.

What kinds of junk are in space?

Formally known as orbital debris, space junk can be bits and pieces of inactive satellites, the rockets that carry them into space, debris from missiles, and detritus left behind by astronauts.

Space debris can be as large as a school bus or as small as paint chips. (As we'll see, just because a piece of space junk is tiny doesn't mean it's harmless.)

How does junk get into space?

Junk gets into space the same way junk gets anywhere: people put it or leave it there. Sometimes debris ends up in space because of a rocket launch or because no one bothered to bring down a decommissioned satellite.

Other space junk gets there because of an accident. In 1965, two satellites exploded, generating nearly 500 pieces of debris. And 15 years ago, a single collision—the highest-impact collision ever recorded in space —generated more than 3,200 pieces of junk.

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The primary contributor to increased space activity and objects in orbit is the growth of satellite constellations. Through 2015, in the 58 years since the first satellite was launched, a total of 7,500 payloads were launched into space. In the eight years since then, the number of total satellites launched has more than doubled.

The rate of debris accumulation

Debris is accumulating in space at an alarming rate. Since space exploration began, more than 15,000 satellites have been launched. Now rocket launches take place more than three times per week, many deploying multiple satellites. And every new launch has the potential to generate more junk.

In the year 2000, there were around 8,000 trackable pieces of debris in space.

By 2019, there were roughly 20,000.

Now, just four years later, there are nearly 30,000 pieces of junk larger than a softball floating in space.

Why is space junk potentially dangerous?

Space junk can be dangerous because anything orbiting Earth is moving fast: debris in space travels at roughly 10 kilometers per second. That's about 300 times faster than the maximum speed on most US highways. And since both objects in a collision would be moving fast, the relative speed would be even higher.

A collision with a large object going that fast is obviously dangerous, but even junk as tiny as a paint fleck can be a problem.

How can the space junk problem be addressed?

Junk can remain in space for decades, centuries, or even millennia, depending on how close it is to Earth. Space junk in very low Earth orbit (LEO), under around 300 kilometers in altitude, will reenter the atmosphere on its own in a relatively short time. Junk in higher orbits may remain in space indefinitely.

Sustainable space operations should have four components:

1. awareness of the environment
2. coordination of activities among independent parties
3. minimizing the growth of space junk, and
4. removal of debris

https://www.youtube.com/watch?v=eeQnv_IWttw

<https://www.youtube.com/watch?v=uJcXCdbm77g>

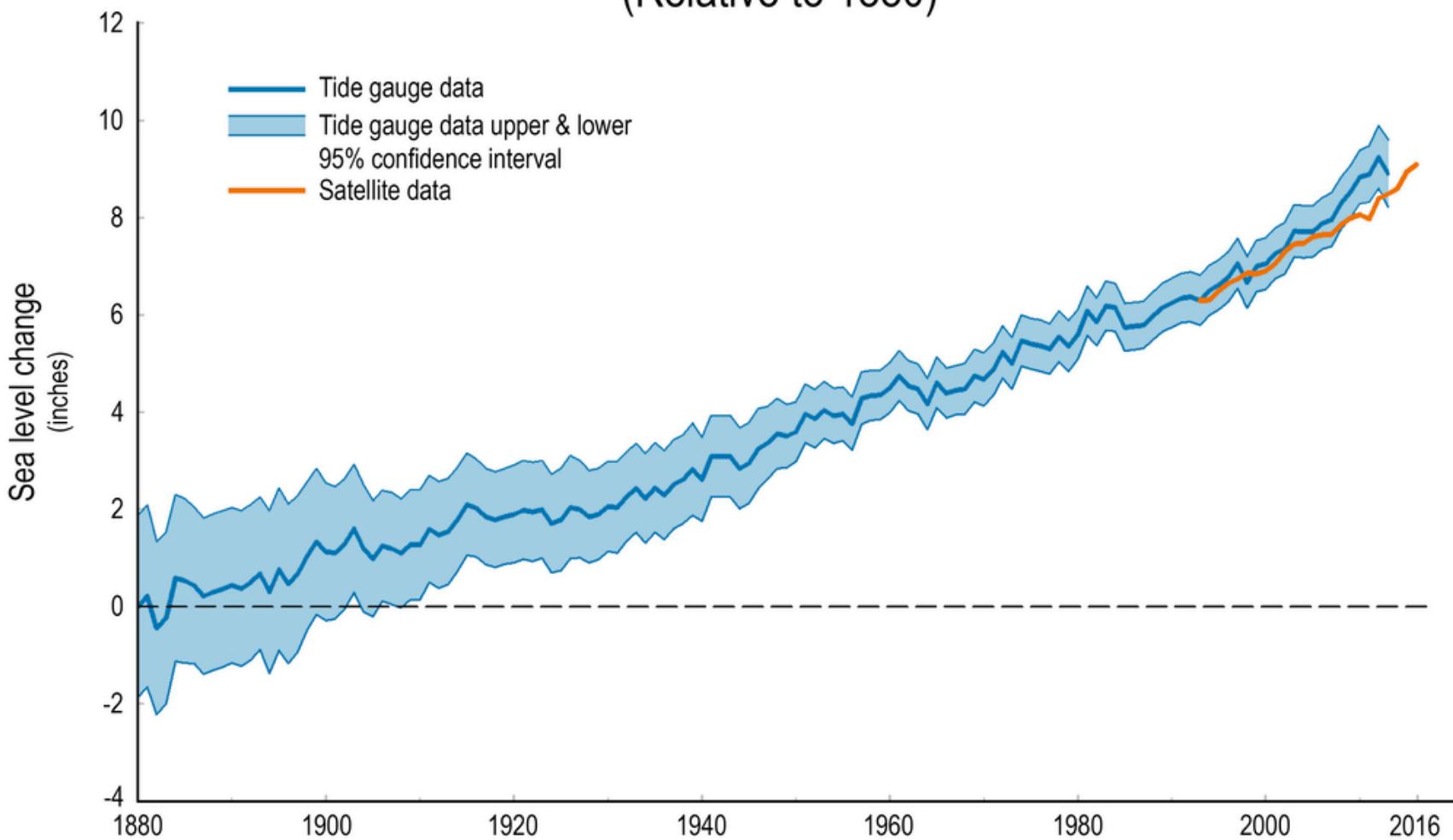
Module X

Current Environmental Laws (Int.)



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Global Average Sea Level Change (Relative to 1880)



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Environmental laws and regulatory issues (global perspectives)

Convention, Treaty and Protocol

- ▶ Treaty: an agreement whereby two or more countries establish or seek to establish relations between themselves governed by international law.
- ▶ Conventions: formal instrument of multilateral character adopted by organs of the international institutions.
- ▶ Protocols: less formal agreement; covers the following instruments.
 - ▶ Instruments subsidiary to a convention;
 - ▶ Ancillary instrument to a convention but of an independent character in operation and subject to independent ratification.

Convention on Biological Diversity (CBD)

- Commitment of the world to conserve biological diversity, to use biological resources sustainability, and to share equitably the benefits arising from use of genetic resources.
- Three aspects of biological diversity in one convention: genetic resources, species and ecosystem.
- Signed in 1992 in Rio during earth summit and came into force in December 1993.

- The International Panel on Climate Change (IPCC) is a scientific intergovernmental body tasked to evaluate the risk of climate change caused by human activity. The panel was established in 1988 by the world Meteorological Organization (WMO) and the United Nations Environment Program (UNEP), two organizations of the United Nations. The IPCC does not carry out research, nor does it monitor climate or related phenomena. A main activity of the IPCC is publishing special reports on topics relevant to the implementation of the UN Framework Convention on Climate Change (UNFCCC), which eventually to the Kyoto Protocol.

The United Nations Framework Convention on Climate Change (UNFCCC)

- Is an international environmental treaty produced at the United Nations Conference on Environment and Development (UNCED) informally known as Earth Summit, held in Rio de Janeiro from 3 to 14 June 1992.
- The United Nations Framework Convention on Climate Change is the foundation of **global efforts to combat global warming**. The objective of this convention is to **stabilize green house gas concentrations** in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climatic system.
- It entered into force on March 21, 1994.

Kyoto Protocol

- The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions .
- Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities.”
- The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005.

- Developed countries should reduce their emission by 5.2% from 1990 emission level.
- As part of the Kyoto Protocol, many developed countries have agreed to legally binding limitations/reductions in their emissions of greenhouse gases in **two commitments periods**. The first commitment period applies to emissions between **2008-2012**, and the second commitment period applies to emissions between **2013-2020**. The protocol was amended in 2012 to accommodate the second commitment period but this amendment has (as of January 2013) not entered into legal force.

The Vienna Convention for the Protection of the Ozone Layer (1985), which outlines states' responsibilities for protecting human health and the environment against the adverse effects of ozone depletion, established the framework under which the Montreal Protocol was negotiated.

Montreal Protocol

- The Montreal Protocol on Substances that Deplete the Ozone Layer is a landmark international agreement designed to protect the stratospheric ozone layer. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere--chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform--are to be phased out.
- The treaty was opened for signature on September 16, 1987, and entered into force on January 1, 1989, followed by a first meeting in Helsinki, May 1989.

Stockholm Convention on POPs

- Stockholm Convention on Persistent Organic Pollutants is an international environmental treaty, signed in 2001 and effective from May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).
- The Convention seeks the elimination or restriction of production and the use of all internationally produced POPs (industrial chemicals, pesticides etc.)

