Waste water recharge cycle

Leak prevention can help to avoid high remediation costs

Resource recovery system

An open liquid waste leeching pit

Waste water recycler

Seawater distillation and energy plant
Reverse osmosis desalinator

Urban runoff is a serious problem

Biological oxygen demand lowers dissolved oxygen levels

High nitrogen and phosphorus levels increase eutrophication

Sedimentation increase with nutrient level increases

Worst case example

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Clean, undeveloped surface areas may mask subsurface pollutants

Toxic waste sites threaten water supplies

Major cities contribute huge pollutant load

Agricultural uses are a major pollutant source

Fertilizers, pesticides and herbicides create a toxic mix

Across the world, local people are testing local waters
Communities must know where pipes are and what and how much of what comes out of them.

Signage alone will not stop pollution.

"Environmental Justice" groups have formed to fight for safe environments.

Everyone should expect safe treatment of wastes.

Toxic runoff is a world wide problem.

Harbors are major problems.
Sewage runoff can contain pathogenic organisms.

Shellfish harbor pathogens.

High nutrient load can encourage growth of nuisance species.

Valuable species can be displaced by pollutants.

Some unwanted species can cause wholesale environmental changes.

Recreational areas can be closed due to pollutants.
Silt causes many organisms to close up

Filter feeding organisms concentrate toxins

ACEC's were created to provide specialized protection

Chemical laden runoff is like a time bomb

Coastal shorelines often collect debris

Cruise boats often dump untold tons of waste

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Plastics pose a serious risk to aquatic organisms.

Marine organisms often mistake plastic for food like jellyfish.

Federal and international efforts aim to reduce ocean debris.

Clean-up efforts help, but waste reduction must occur.

Coastal species show the cumulative effects of decades of ocean waste disposal.

Analysis of polluted waters show a startling array of chemical wastes.
Airborne pollution can also affect aquatic resources.

Road runoff contains a toxic brew of pollutants.

Bottom paints from boats are highly toxic.

Discarded tires pose many risks.

Radioactive wastes need to be carefully monitored with MSDS systems.

Oceanic oil drilling and transport are serious threats.
Oil spills are preventable

Emergency crews attempt to transfer remaining oil from the supertanker Exxon Valdez as the vessel leaked 20,000 barrels of oil per hour. More than 250,000 barrels of crude oil (11 million gallons) was released into the environment.

March 24, 1989
Prince William Sound, Alaska

Oil transport and storage on land also threaten aquatic resources

Nuclear power plants create thermal pollution

Industrial cooling water usually comes from a local source

Docks as well as fisheries can be impacted by thermal pollution
Warm cooling water can change species diversity

*Teredo* shipworms can literally eat wood

*Teredos* start life as a small larvae

The results can be disastrous

Dredging operations can disturb silt and pollutants

Booms and absorbent pillows can greatly limit adverse effects
Nature has a hard time dealing with many man-made wastes.

Bio-shelters can reduce and recycle wastes.

Some aquaculture endeavors may recycle nutrient-rich waters.

Left alone, natural unpolluted ecosystems function quite well.

Nature's biogeochemical cycles have been doing the job for hundreds of millions of years.

We are improving remediation and wetland creation methods.
Some areas must be kept ‘off limits’ to people and pets

We are running out of time and space

The environments that we like best are still natural ones

End of Presentation
Thank you for your attention

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SCIENCE NETWORK
5000 John F. Kennedy - Boston, MA 02114-0036 USA
“The Best Way to Predict the Future is to Create It”

1-800-SCIENCE
Toll-free in the USA (1-800-723-3623), International (01) 617-723-3606
email@sciencenetwork.com www.Sciencenetwork.com