

5.1 Nature of Pollution

Course Companion

p.276 & 277

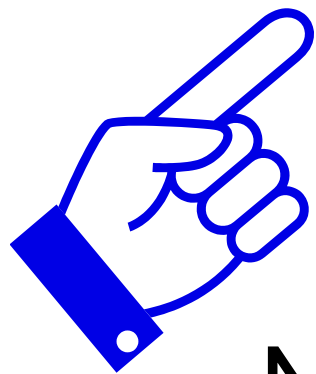
What is pollution?

- Pollution definition: The addition to an environment of a substance or an agent by human activity at a rate greater than that at which it can be rendered harmless by the environment, and which has an appreciable effect on the organisms within it.
- For examples of major sources of pollutants and their effects, see the table on p.277 of c.c.

5.1.2 Distinguish between the terms **point source pollution and nonpoint source pollution, and outline the challenges they present for management.**

C.C. p.277

What's the difference?

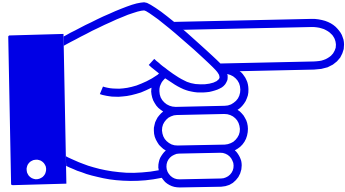


Point Source Pollution

and

Non-point Source Pollution





Point Source

- Definition: the discharge of pollutants from a single clear point, such as a factory or power plant.

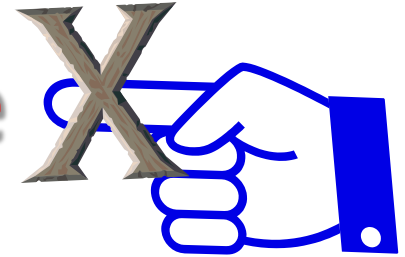


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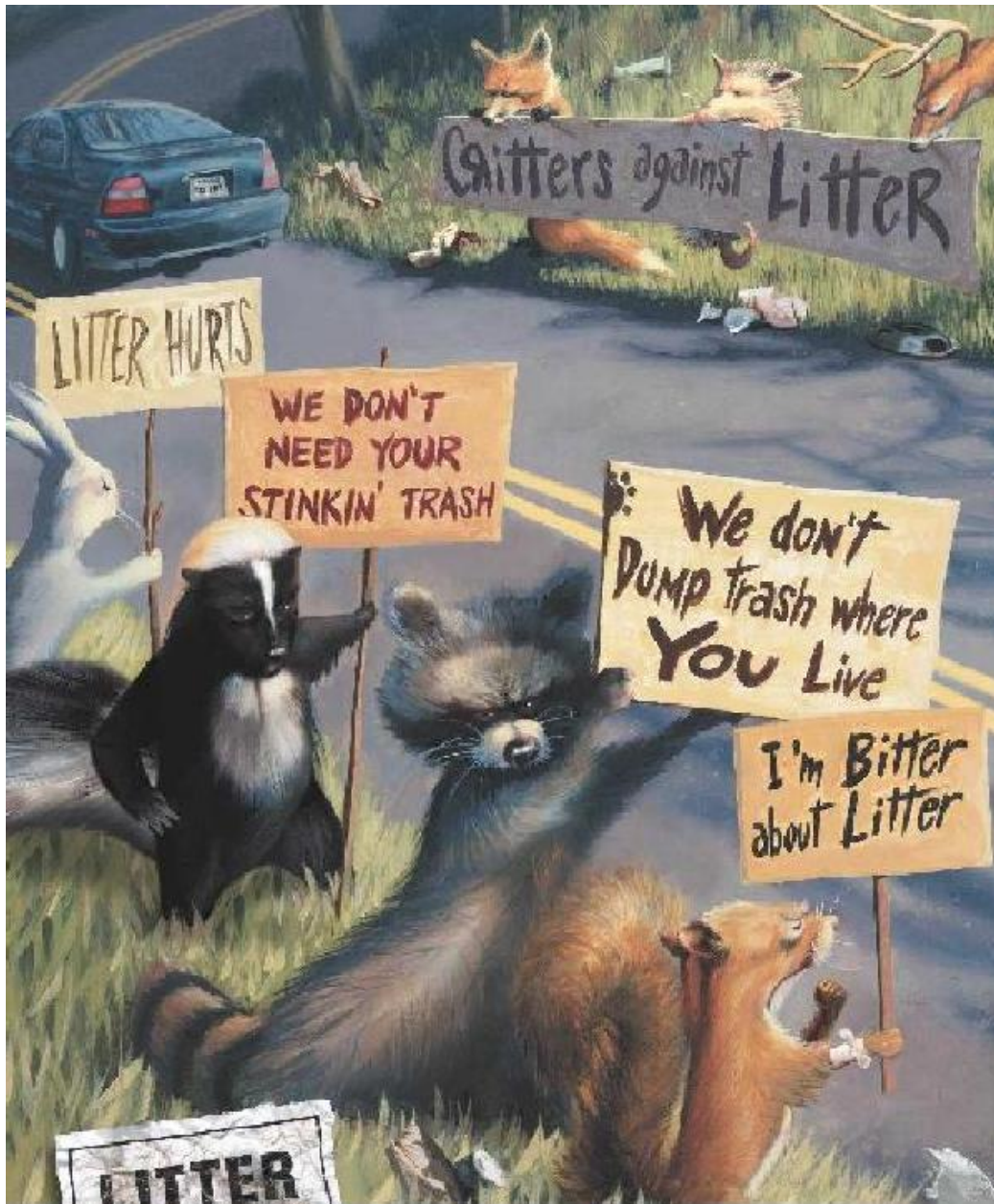


Non-Point Source



- Definition: the release of pollutants from numerous, widely dispersed origins. It is associated with surface runoff
- cannot be traced to a specific direct discharge point – no pipes or chimneys so it is difficult to monitor and control





Critters against Litter

LITTER HURTS

WE DON'T
NEED YOUR
STINKIN' TRASH

We don't
Dump trash where
You Live

I'm Bitter
about Litter

LITTER
IT JUST ISN'T NATURAL.





Where do non-point source pollutants come from?

1. oil & grease from cars
2. fertilizers
3. animal waste
4. grass clippings
5. septic systems
6. sewage & cleaners from boats
7. household cleaning products
8. litter



- Non-point source pollutants build up on land surfaces and are washed off during rain events (runoff) which flow into rivers and lakes



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5.1.2 Distinguish between the terms point source pollution and nonpoint source pollution, and outline the challenges they present for management.

C.C. p.277

**Turn to the person next to you
and brainstorm the following...**

Which is harder to control? Point source? Non-point source? Why?

Which do you contribute to? How?

What are good ways to deal with each? Any solutions?

Management of Point Source

- Point source pollution is generally more easily managed (in theory) because its impact is more localized making it easier to control emissions, attribute responsibility and take legal action
- It can be monitored and controlled by a permit system... but...

**What do you perceive
to be the issues here?**

Management of Non-Point Source

- It cannot be traced to a specific direct discharge point – no pipes or chimneys so it is difficult to monitor and control
- **Task:**
 - Read handout “Nonpoint Sources and Land Management” for management solutions for farmland and for urban areas
 - Highlight the efforts made to manage the issues



Answers:

1. Soil conservation techniques in commercial farming:
 - Use precise amounts of fert, water, pest – avoid overloading (also saves \$)
2. Preserving/protecting wetlands:
 - They are natural filters & prevent groundwater contamination
3. Urban areas:
 - Citizens encouraged to recycle & minimize use of fertilizer, pesticides...
 - Design specific drains to divert runoff away from lakes/rivers
 - Street sweeping

Answers:

(continued)

4. Chesapeake Bay – mini case study:

- Nutrition loading reduced
- Ban on phosphate use (detergents...)
- Replant/restore wetlands
- Results? 1980s phosphate levels down by 40% in the bay but nitrogen still a problem (increased in some areas...)

- Consider that solutions to point source and non-point source pollution do not need to be visible such as buffer strips on fields.
- They can be people, legislation, as well as community support

5.3 Approaches to Pollution Management

See model – Processes and Strategies
in syllabus and c.c. p. 282

Process of pollution

HUMAN ACTIVITY
PRODUCING
POLLUTANT



RELEASE OF
POLLUTANT INTO
ENVIRONMENT



LONG-TERM
IMPACT OF
POLLUTANT ON
ECOSYSTEM

Strategies for reducing impacts

Altering human activity through education, incentives and penalties to promote:

- development of alternative technologies
- adoption of alternative lifestyles
- reducing, reusing, recycling.

Regulating and reducing the pollutant at the point of emission by:

- setting and imposing standards
- introducing measures for extracting the pollutant from waste emissions.

Cleaning up the pollutant and restoring ecosystems by:

- extracting and removing the pollutant from the ecosystem
- replanting and restocking with animal populations.

5.3.2 Discuss the human factors that affect the approaches to pollution management

Task:

- Read “Case Study 2” in c.c. p. 282 & 283 and answer the questions at the start of the reading
 - At what level are the strategies implemented?
(Refer to the diagram)
 - What factors influence the choice of the strategy?
(Think cultural values, political systems and economic systems)