

Environmental Water Quality BAE 452/552

Session 2

More definitions and “Setting the Stage”

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Definition of Criterion vs Standard

- Criterion: scientific quantity upon which a judgement can be based (based on experiment).
- Standard: applies to a definite rule or measure established by an authority.
- For details on standards visit:
<http://www.epa.gov/waterscience/standards>

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Water Quality Standards (WQS)

Four basic elements:

1. Designated uses of the water body
2. Water quality criteria
3. An anti-degradation policy to maintain and protect existing uses and high quality waters, and
4. General policies addressing implementation issues (e.g., low flows)

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Mass Loading

Mass Loading = Concentration x Flow

$$M/T = M/L^3 \times L^3/T$$

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TMDL

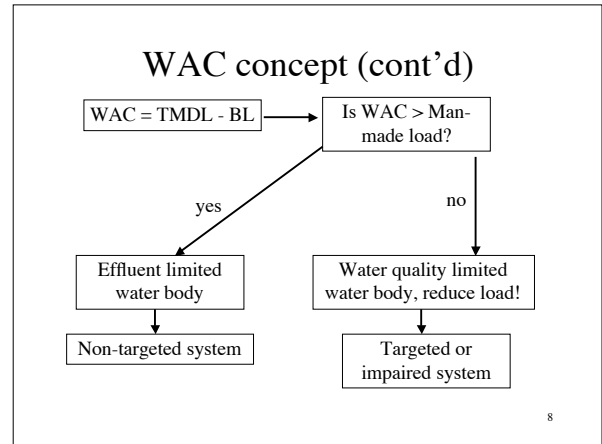
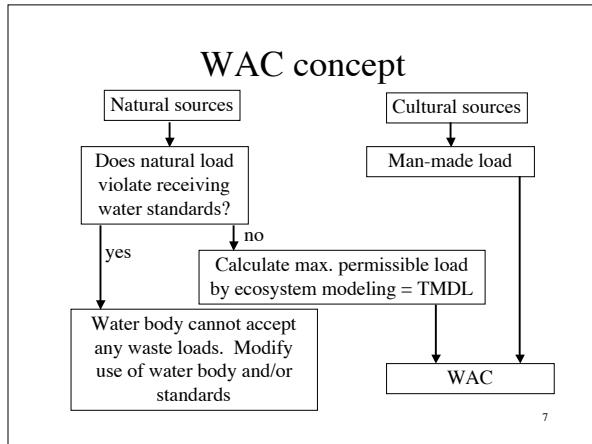
- Total Maximum Daily Load
- $TMDL = WQS \times Q$

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Definition of WAC

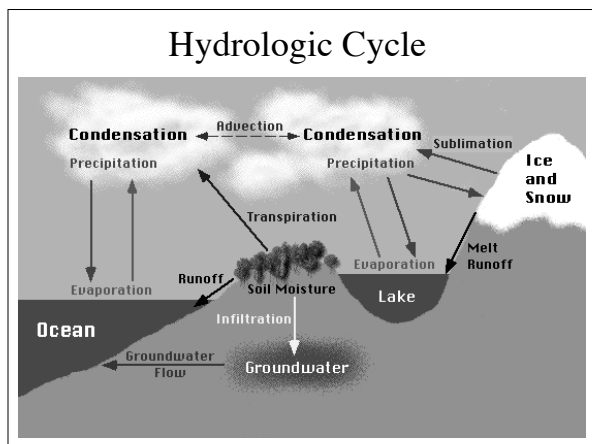
- Waste Assimilative Capacity: the quantity of potential pollutants that can be discharged into the environment (water, air, land) without causing pollution or impair beneficial uses.

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- ### Impaired Waters by State
- Alaska: 58
 - Idaho: 813
 - Oregon: 1183
 - Washington: 1317
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- ### “Setting the Stage”
- Remember the definition of NPS pollution:
- Contamination of streams and ground water by waters draining the landscape.
 - Reviewing the hydrologic cycle, NPS sources are transported by runoff and percolation.
 - NPS pollution requires availability of wastes
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- ### NPS pollution
- Human influences: urban wastes on impervious surfaces, deforestation and agriculture causing erosion, nutrient and pesticide transport (runoff and leaching)
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Control of Pollution

- Control of NPS pollution requires understanding of chain of processes which produce pollution
 - Limit availability or exposure to transporting water
 - Timing of hydrologic events
 - Geographic location

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Definition of BMP

- Best Management Practices: a practice or set of practices determined to be the most effective, practical means of preventing or reducing NPS pollution. "Practical" includes physical, chemical, biological, cultural and economic aspects.

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Critical Source Areas

- Areas within a watershed that are most polluting and require pollution elimination
- Determination and location of critical source areas is one of the most important tasks in planning diffuse-pollution abatement
- Examples: urban subdivisions, sanitary landfill, and farmer's fields

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Watershed Scale Approach

- A watershed may consist of many different landscapes and source areas.
- NPS loads in streamflow are not the sum of loads from individual source areas in the watershed.
- Groundwater and stream interactions, and attenuations of chemicals and sediment during streamflow must be considered.

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Characteristics of Watershed in NPS Pollution

- Water balance
- Antecedent moisture conditions
- Delayed watershed response

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The NPS 'Model'

