

## AAE / Econ / Env. St. 343 Review for Exam #2

You should understand how to apply the following concepts to real-world environmental issues.

- Opportunity Cost
- Goods
  - Market goods: goods traded in a market with an observed price.
    - Ex/ Clothes.
  - Non-Market goods: goods that are not traded in a market and that have no observed price.
    - Ex/ clean air.
- Measures of economic value: Recall that we are typically interested in valuing changes in environmental quality.
  - Willingness to pay (WTP)
  - Willingness to accept (WTAC)
  - You should understand the implied property rights to specific levels of environmental quality from use of either WTP or WTAC.
  - You should understand how to graphically derive WTP and WTAC for changes in environmental quality through the use of utility curves.
  - You should understand how WTP and WTAC might differ.
- In what way does the environment have economic value?
  - Indirect benefits: the environment affects a person's utility indirectly through market goods.
    - Ex/ Trees used for paper production.
    - To value these benefits we can typically use observed market prices and calculate changes in consumer and producer surplus.
  - Direct benefits: the environment directly affects a person's utility.
    - Ex/ Hiking in a forest.
    - Use Values
    - Non-use values (incl. existence, option, and bequest values).
    - To value these benefits we typically need a non-market valuation technique.
- Non-Market Valuation Techniques
  - You should understand the relationship between the "productivity" of pollution, and the capitalization of pollution into land prices and wages.
  - You should understand how the following techniques are used (i.e. what can be measured, what data is used, what issues and criticisms are applicable, etc.)
    - Contingent Valuation Method (CVM)
    - Hedonic Pricing Model
      - Housing
      - Wages
    - Travel Cost Model
    - Value of statistical life

- Given a simple set of data you should be able to calculate economic benefits / costs for changes in environmental quality.
- You should understand when to use a particular valuation method. The most important step is to understand what you're valuing (i.e. market or non-market good; use value or non-use value).
- Cost-Benefit Analysis (CBA)
  - You should understand the relationship of the following to CBA:
    - Pareto Improvement
    - Potential Pareto Improvement (PPI)
  - You should understand how the major steps in a CBA are applied to real-world environmental issues:
    - Policy / Project Definition
    - Identifying physical impacts
    - Valuing physical impacts
    - Discounting of costs and benefits
      - Here, you should know the present value formula and be able to use it given a set of data.
      - You should be able to apply discounting concepts to simple allocation problems over time.
    - Net present value test
    - Sensitivity analysis
  - You should understand the role of CBA in public policy
    - What information does it give you?
    - What are the criticisms?
    - How do you interpret the results?
- You should understand the major points of the case studies, as discussed in class.
- Ways of dealing with uncertainty in CBA?
  - Sensitivity analysis.
  - Uncertain discount rates.
- Alternatives to CBA: safe minimum standard.