

CEAP-ARS Economic Analysis

Team Leaders:

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CEAP Objective 4

Selection and placement of conservation practices to optimize:

- 1) Profit maximization at the farm level
- 2) Environmental outcome at the watershed level
- 3) Program efficiency

Objective: Profit maximization at farm level

Objective: Profit maximization at farm level

Constrained by:

land area

Objective: Profit maximization at farm level

Constrained by:

land area

crop

Objective: Profit maximization at farm level

Constrained by:

land area

crop

yield

Objective: Profit maximization at farm level

Constrained by:

land area

crop

yield

labor

Objective: Profit maximization at farm level

Constrained by:

land area

crop

yield

labor

fertilizer

Objective: Profit maximization at farm level

Constrained by:

land area

crop

yield

labor

fertilizer

pesticides

Objective: Profit maximization at farm level

Constrained by:

land area

other costs

crop

yield

labor

fertilizer

pesticides

Objective: Profit maximization at farm level

Constrained by:

land area

other costs

crop

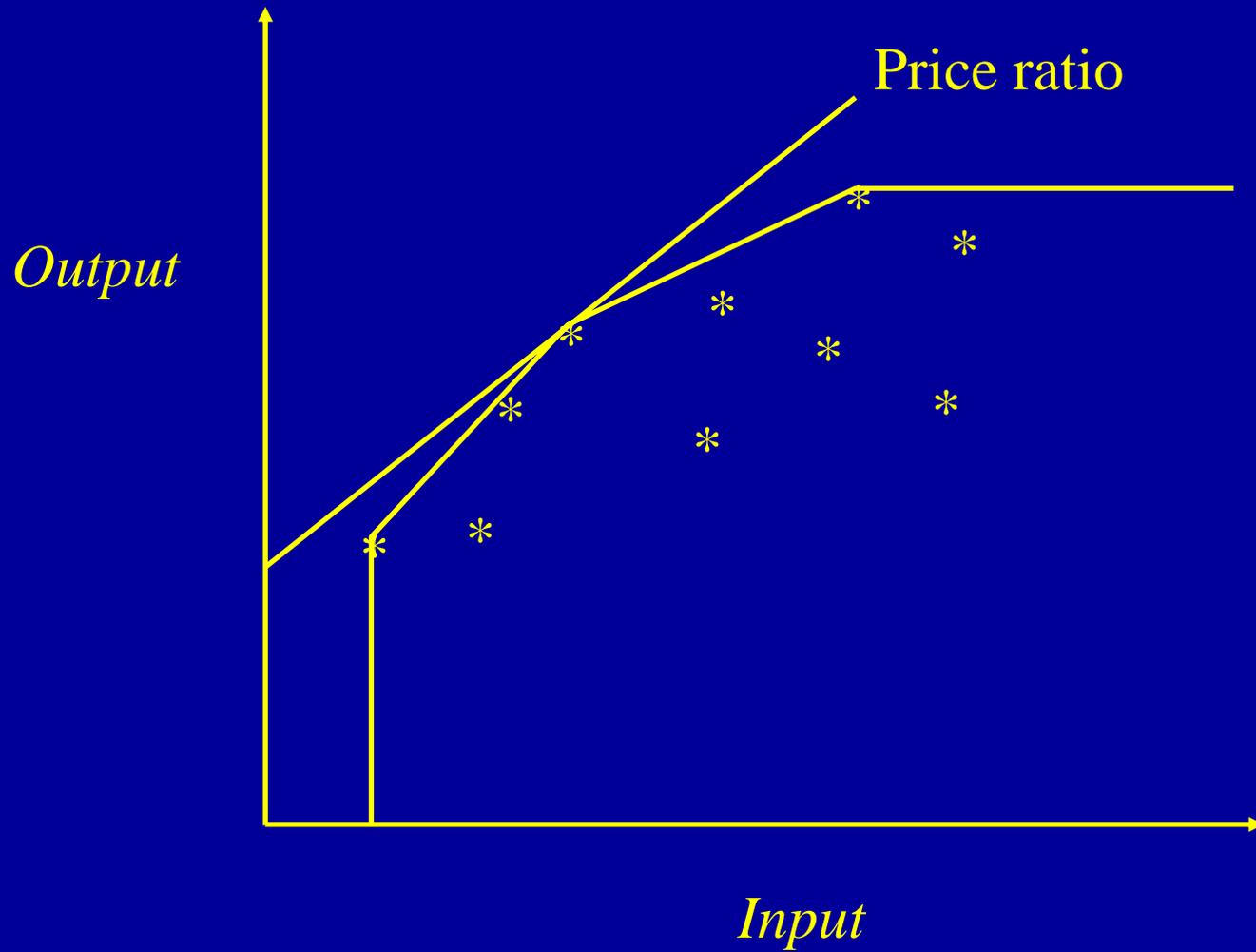
ownership

yield

labor

fertilizer

pesticides



Conservation practices

Add more constraints

BMP cost

change in available land

change in nonpoint source emissions

location in watershed

incentive payments for adoption

Environmental Quality

Environmental performance index

Shows whether conservation practice has improved production of “goods” relative to “bads”

Data from output of physical models
– SWAT, AnnAGNPS

Calculated using DEA, add more constraints

Program/Policy efficiency

Definition: cost/ change in nonpoint source agricultural pollution

Program - USDA conservation programs

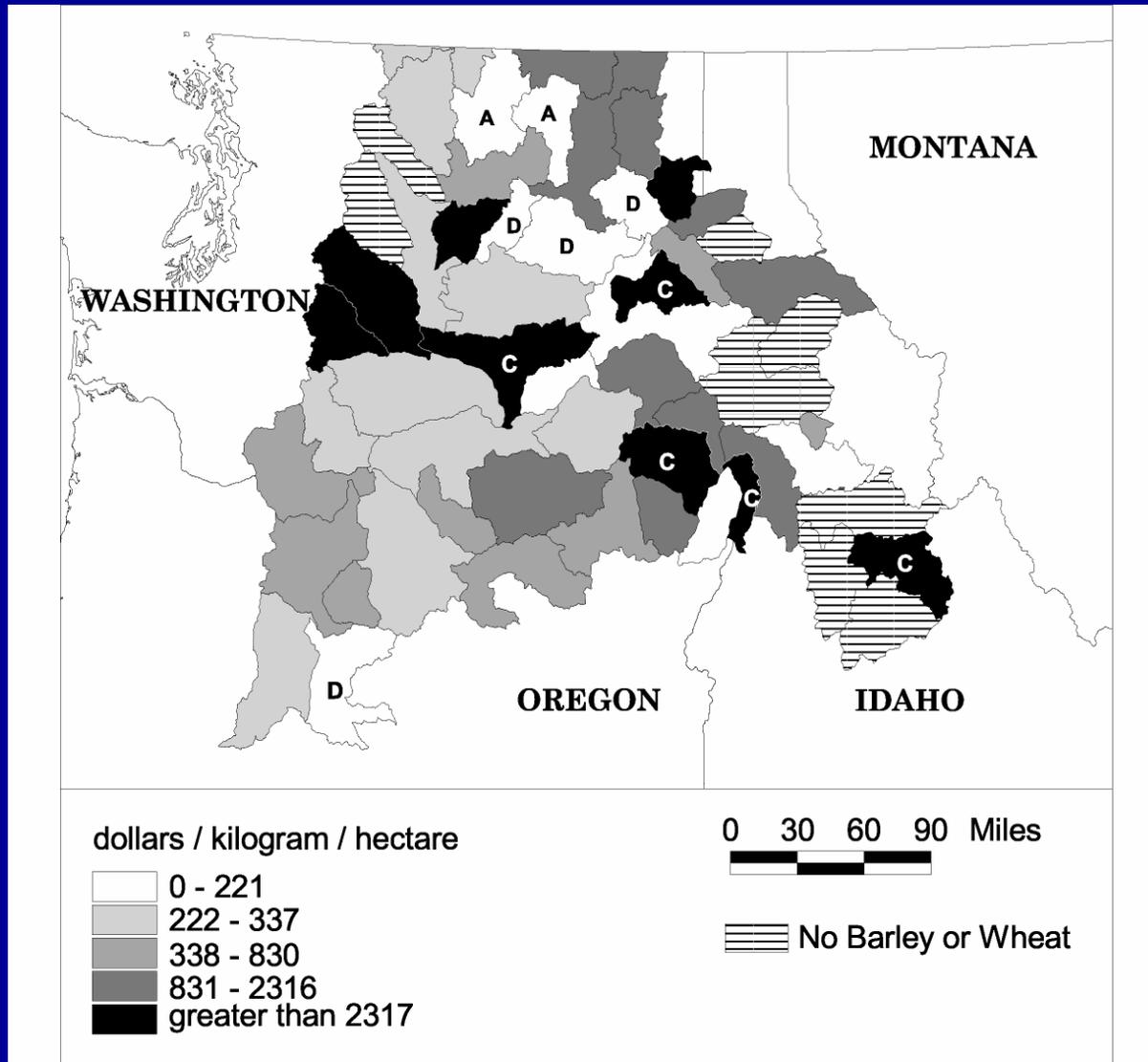
Policy - TMDL, command and control

Permit trading

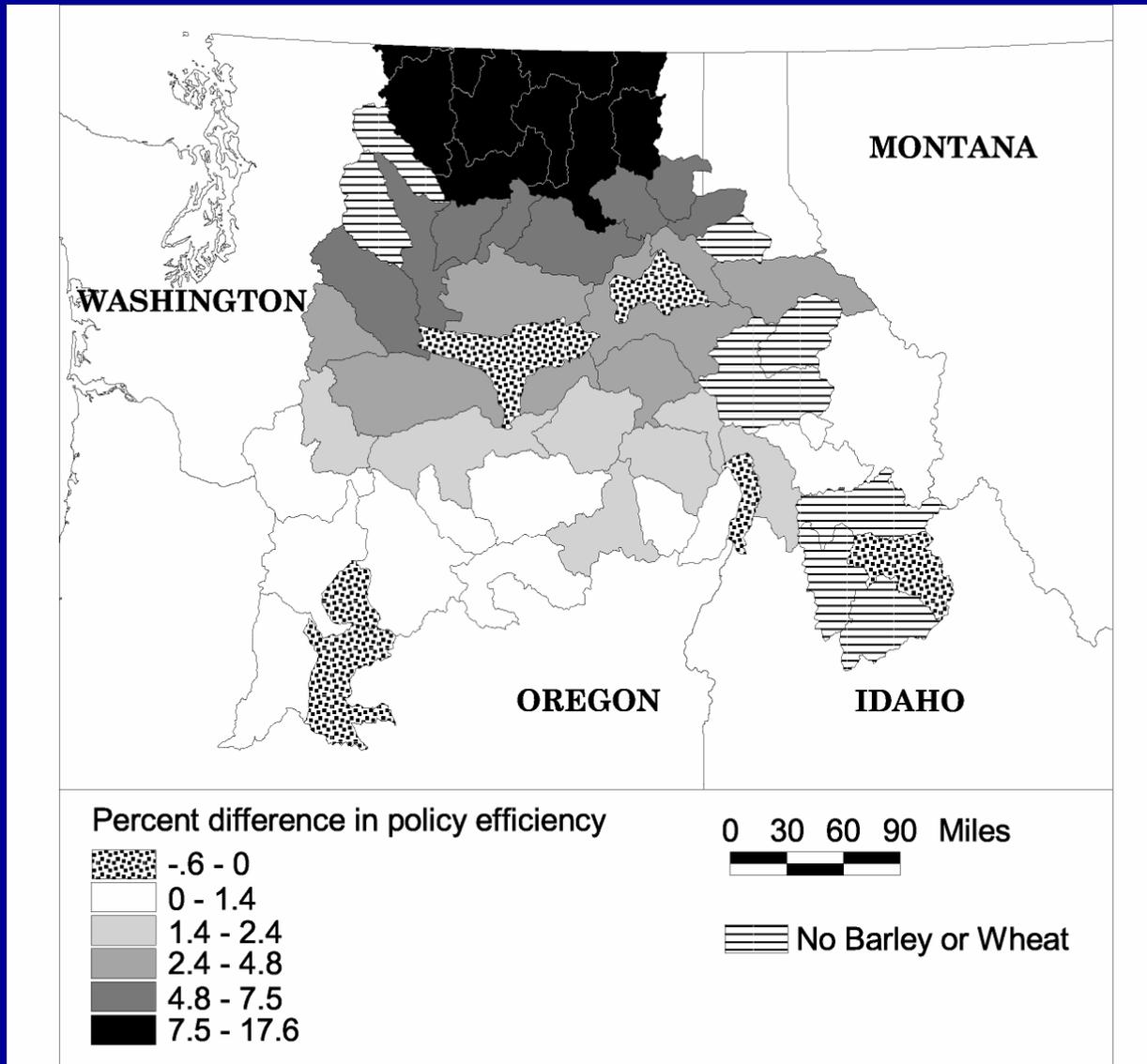
Green taxes

Court orders (e.g., buffer strips)

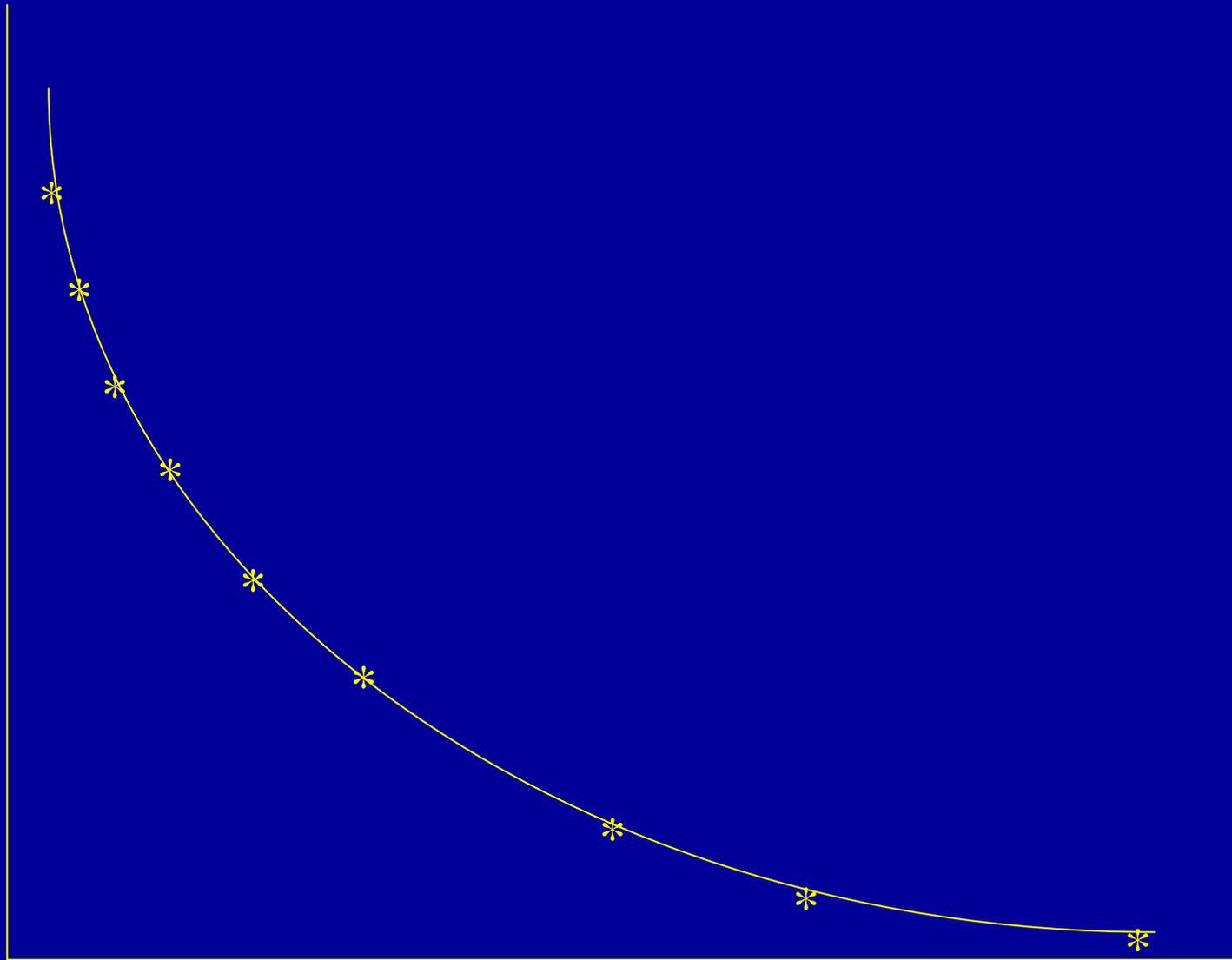
Efficiency of Green Tax – nutrient runoff reduction



Comparison of Green Tax and Regulatory Reduction



Objective 1



Objective 2

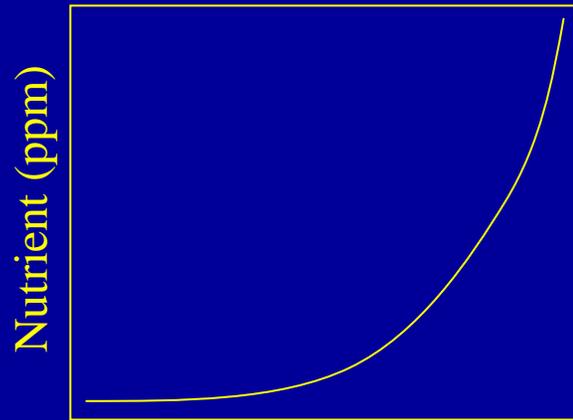


NFSPRC Beowulf Cluster

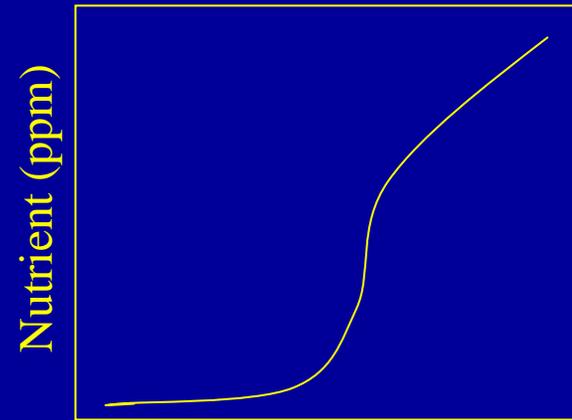
- 24 Pentium 4 processors (2.4 GHz) processor, 1 GB of RAM,– 12 with hyperthreading technology
- 24 port, 1 Gbit/s (gigabit/second) ethernet switch
- Integrated INTEL 10/100/1000 Mbps NIC
- 24 ports - KVM switches
- Linux, Fedora Core2, kernel version 2.6.5smp

CEAP-ARS Deliverable

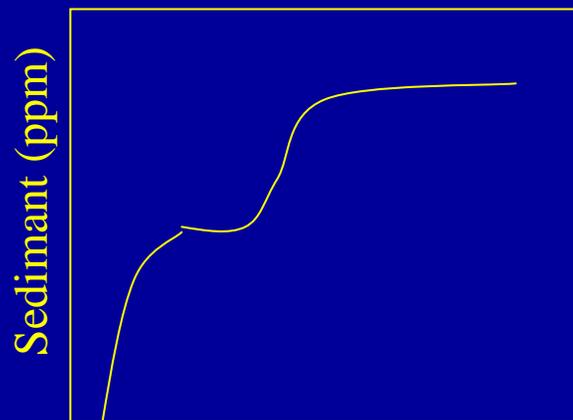
Database of Pareto optimal solutions



Basin Revenue



Basin Profit



Farm Profit

