The Value of Natural Climate Solutions in Minnesota

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Earth Economics is a leader in ecological economics.

We quantify and value the benefits nature provides.

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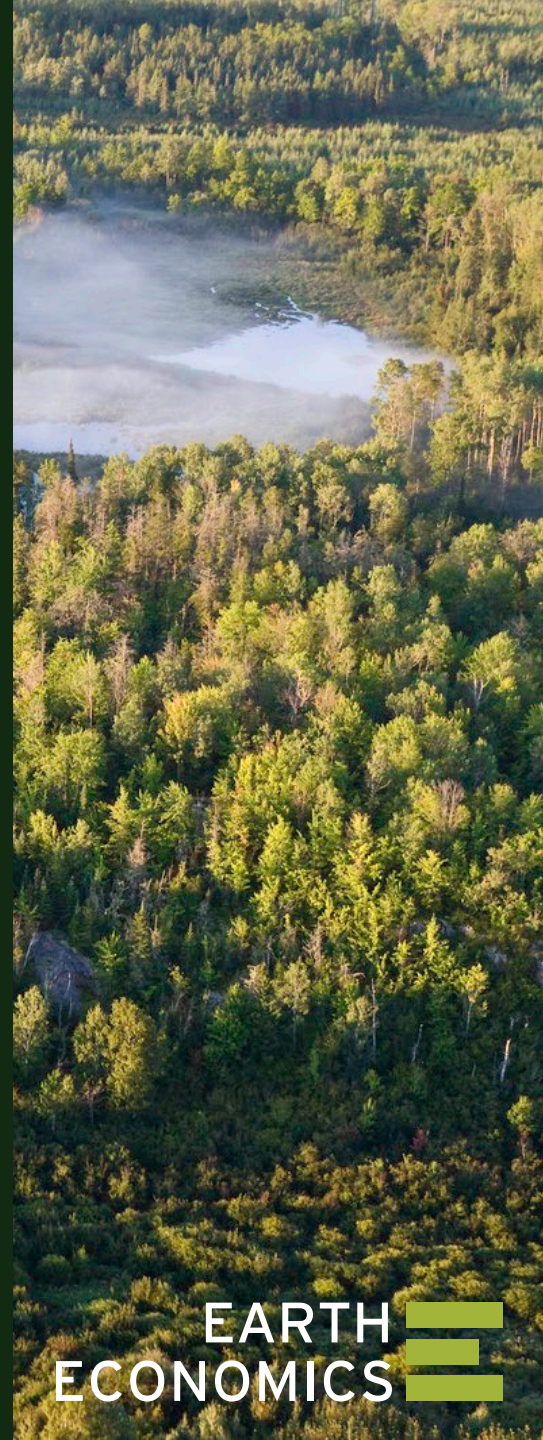
Natural Climate Solutions Implementation Strategy in Minnesota

Nature & Climate Report Influence

- Addresses mitigation and adaptation
- Elevated at MN legislature
- Initiated the “Minnesota Million” conversation
- Led to State emphasis & inclusion of natural and working lands in official Climate Framework
- Utilized by partners to improve understanding of nature’s climate impact

Why Minnesota?

- 1% of historic prairie remains[i]
- 1M acres of peatlands drained in last 100 yrs[ii]
- Lost half of forests since European settlement[iii]



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[i] Minnesota Prairie Plan Working Group. 2018. Minnesota Prairie Conservation Plan, 2nd Edition. https://files.dnr.state.mn.us/eco/mcbs/mn_prairie_conservation_plan.pdf.

[ii] Krause, L. et al. (2021) Impacts of historical ditching on peat volume and carbon in northern Minnesota USA peatlands. *Journal of Environmental Management* 296. https://doi.org/10.1016/j.jenvman.2021.113090

[iii] Minnesota Department of Natural Resources. 2008. Chapter Five: Forests Today. In: All About Minnesota's Forests and Trees. https://files.dnr.state.mn.us/forestry/education/primer/chapterfive.pdf.

Natural Climate Solutions
in Minnesota

AVOIDED CONVERSION + RESTORATION

FORESTS

GRASSLANDS

WETLANDS + PEATLANDS

IMPROVE SOIL QUALITY

CROPLANDS

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Key Goals

Spatial Analysis

+

Economic Analyses:

- Ecosystem Services Valuation (ESV)
- Economic Contribution Analysis
- Benefit-Cost Analysis

MIN and MAX Implementation Levels

Methodology

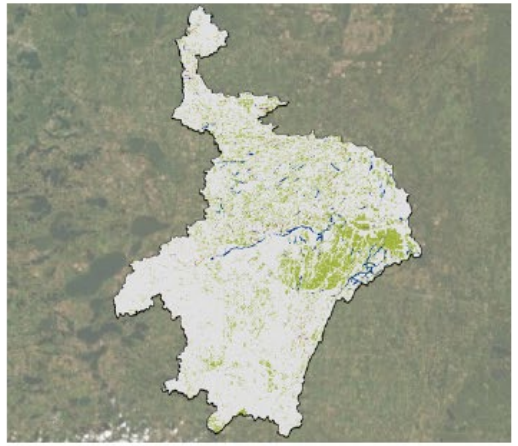
Spatial Analysis

Goal: Avoid 2 practices valued for the same acre

Some Assumptions:

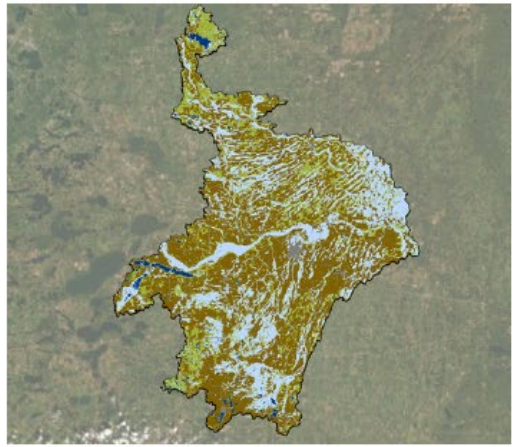
- **Avoided Conversion > Restoration**
- Avoided Peat Conversion > Avoided Wetland Conversion
- Peat Restoration > Wetland Restoration
- **Restoration & Conservation > Non-Prime Farmland**

Figure 4. Hypothetical restoration scenario in the Redeye River watershed, for illustrative purposes only.



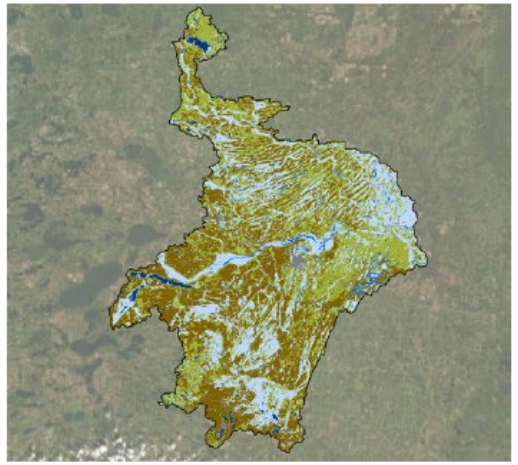
Restoration Practice Extent

- Peatland ditch rewetting
- Reforestation



Pre-Implementation Scenario Land Cover

- Agricultural land
- Barren land
- Developed
- Forest
- Herbaceous
- Open water
- Peatland ditches
- Shrub/scrub
- Wetlands



Post-Implementation Scenario Land Cover

- Agricultural land
- Developed
- Forest
- Herbaceous
- Open water
- Peatland ditches
- Shrub/scrub
- Wetlands

Sources: USGS, Esri, U.S. Census Bureau

Methodology **ESV**

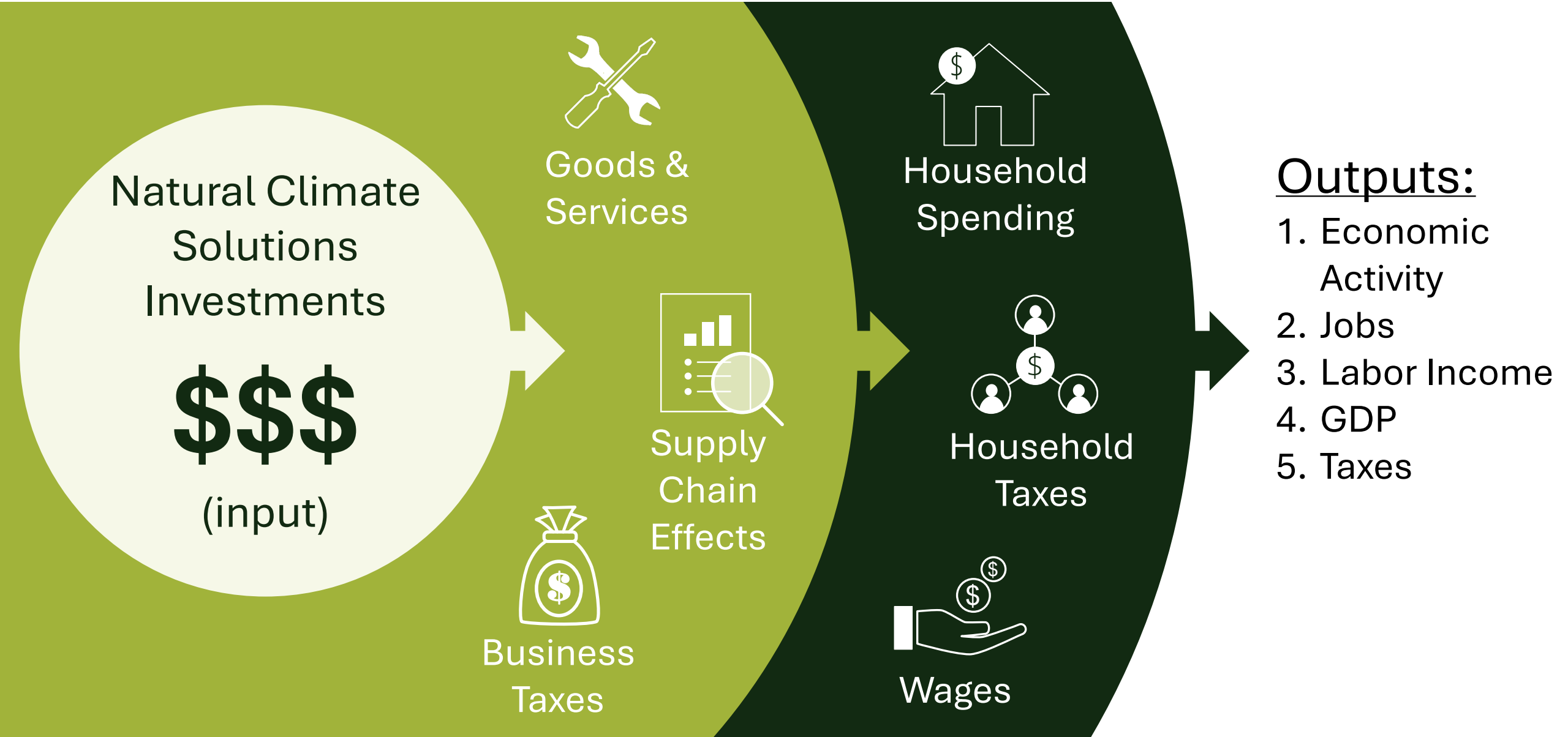
Ecosystem Services	Landcover types				
	Forest	Grassland	Wetland	Peatland	Cropland*
Aesthetic Information	✓		✓	✓	
Air Quality	✓	✓	○		
Biological Control	○	○	○		✓
Carbon Storage	✓	○	○	○	○
Carbon Sequestration	✓	✓	✓	✓	✓
Climate Stability	✓	○	○	○	
Disaster Risk Reduction	✓	○	○	○	
Habitat	○	○	✓	✓	
Recreation & Tourism	✓	✓	✓	✓	
Soil Quality	○	○	○	○	✓
Soil Retention	○	○	✓	✓	○
Water Capture, Conveyance, Supply	✓	○	○	○	✓
Water Quality	✓	○	○	○	○

KEY:

✓ = present, valued

○ = present, not valued

ECONOMIC CONTRIBUTION: **IMPLAN INPUT-OUTPUT MODEL**



RESULTS

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DISASTER RISK REDUCTION
$291 MILLION per year

HABITAT VALUE
$73.1 MILLION per year

WATER STORAGE & SUPPLY
$95.7 MILLION per year

RECREATION
$370 MILLION per year

WATER QUALITY
$3.44 BILLION per year

AIR QUALITY
$4.6 MILLION per year

FORESTS

$4.5 BILLION per year
in ecosystem services preserved by avoided conversion

$32 BILLION per year
in ecosystem services generated by reforestation

GRASSLANDS

$3.8 MILLION per year
in ecosystem services preserved by avoided conversion

$65 MILLION per year
in ecosystem services generated by restoration

WETLANDS + PEATLANDS

$114 MILLION per year
in ecosystem services preserved by avoided conversion

$210 MILLION per year
in ecosystem services generated by restoration

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For every $1 invested in the maximum scenario of NCS implementation, **Minnesota would receive $8.55 in public benefits** by 2050.

NATURAL CLIMATE SOLUTIONS INVESTMENTS WOULD SUPPORT*:

2,700 to 5,200 jobs per year through 2050

$110 million to $148 million in wages per year for MN workers through 2050.

$173 million to $221 million in annual GDP through 2050.

*Sum of all NCS practices in the minimum to maximum implementation scenarios

DISCUSSION + **RECOMMENDATIONS**

1. **Expanded** use of ESV tools
2. **Focused** Investment in Equity
3. **Integration** with Financial Instruments
4. **Strengthened** Public-Private Partnerships

As Minnesota spends millions to restore peatlands, it sells mining rights for $12 an acre

Peatlands are vital to efforts to control greenhouse gas emissions, and the Minnesota DNR is in charge of both saving them and leasing them to peat mining companies.

By Greg Stanley
The Minnesota Star Tribune

SEPTEMBER 13, 2024 AT 6:47PM

POLITICS

Minnesota voters approve maintaining use of lottery funds to protect the environment

WCCO NEWS

By **Reg Chapman**
Updated on: November 7, 2024 / 8:42 AM CST / CBS Minnesota

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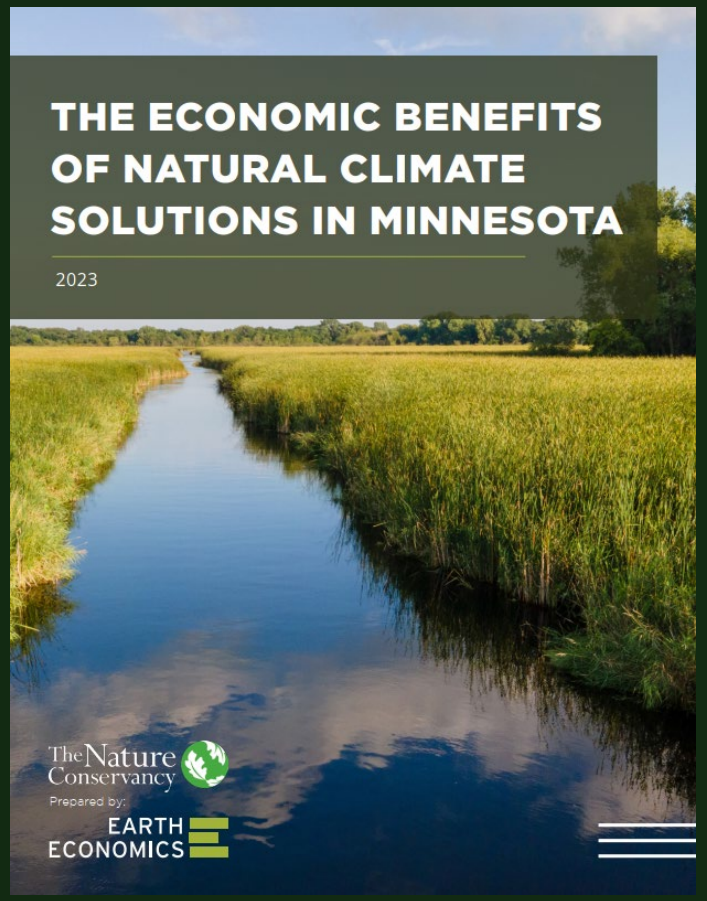

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Download the report to learn more

nature.org/mnclimate