United States Environmental Protection Agency

EPA Tools and Resources Training Webinar

Global Change Explorer: Identifying and Downloading Climate Change Information using LASSO

Phil Morefield
US EPA Office of Research and Development

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EPA United States Environmental Protection Agency

Presentation Outline

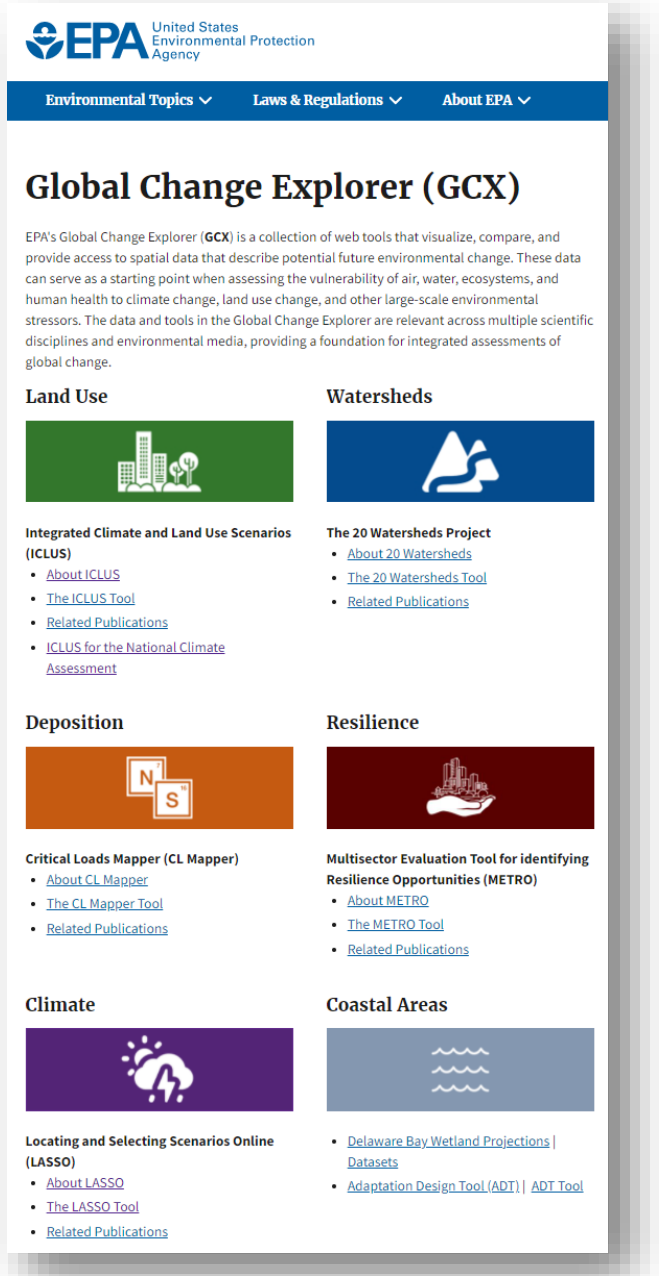
1. The Global Change Explorer
2. The Problem: *Which climate projections should I use?*
3. The Solution: An introduction to the LASSO tool
4. Demonstration
5. Concluding remarks

Global Change Explorer

EPA's Global Change Explorer (GCX) is a collection of web-based tools that:

- Describe and visualize scenarios of future environmental change
- Provide access to underlying spatial data
- Facilitate adaptation and resilience planning

https://www.epa.gov/gcx



LASSO: Locate and Select Scenarios Online

Global Change Explorer (cont'd): *Impacts & Hazards*

Name	Topics	Mapping tool	Download data	Data coverage
Integrated Climate and Land-Use Scenarios (ICLUS)	• Population • Land use • Impervious surface • Climate change	**Yes**	**Yes**	Contiguous US
20 Watersheds	• Water quality • Climate change	**Yes**	**Yes**	Contiguous US (partial)
Critical Loads Mapper (CL Mapper)	• Atmospheric deposition • Critical loads • Ecosystem impacts • Climate change	**Yes**	**Yes**	Contiguous US
Locate and Select Scenarios Online (LASSO)	• Climate change	No	**Yes**	Contiguous US

LASSO: Locate and Select Scenarios Online

Global Change Explorer (cont'd): *Adaptation & Resilience*

Name	Purpose/Topic area	Mapping tool/ Download data	Format
Multisector Evaluation Tool for identifying Resilience Opportunities (METRO)	• Assess resilience • Metro/urban areas	No	Online tool (password protected)
Adaptation Design Tool (ADT)	• Adaptation planning • Natural resources	No	Downloadable worksheets

The Problem

- Addressing climate change requires the best available scientific knowledge
- Some of that knowledge is not easily accessible
- Climate change projections offer many options, very little guidance

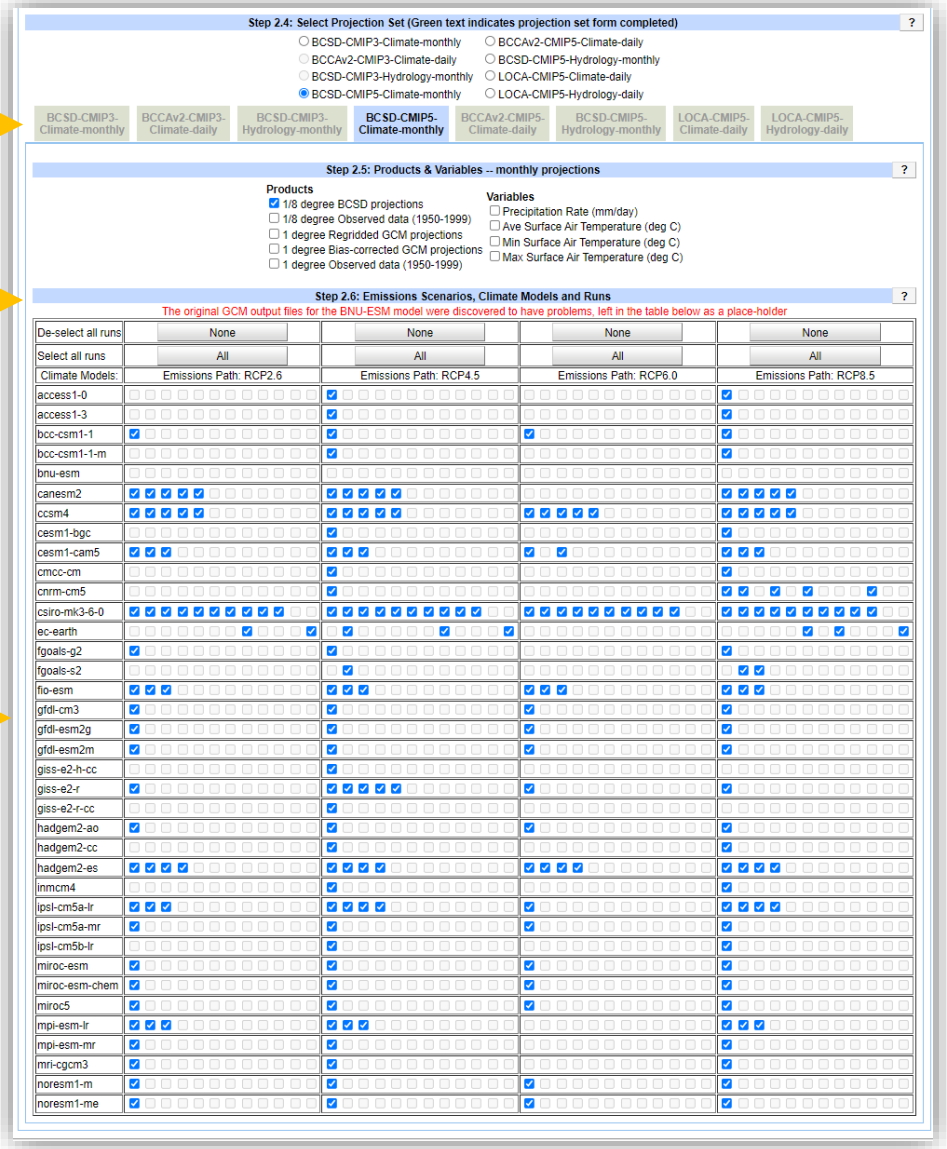
The Problem (cont'd)

Choose a data source

Choose a climate variable

Choose projections

Which climate projection(s) should I choose?



The Problem (cont'd)

"Which climate projection(s) should I use?"

- What is your study area?
- Do you care about precipitation, temperature, or both?
- What time period are you interested?
- Are you interested in seasonal changes?
- Do you need to be consistent with other analyses?
- How are you going to deal with uncertainty?

The LASSO Tool

Where….? → **Locate**

And

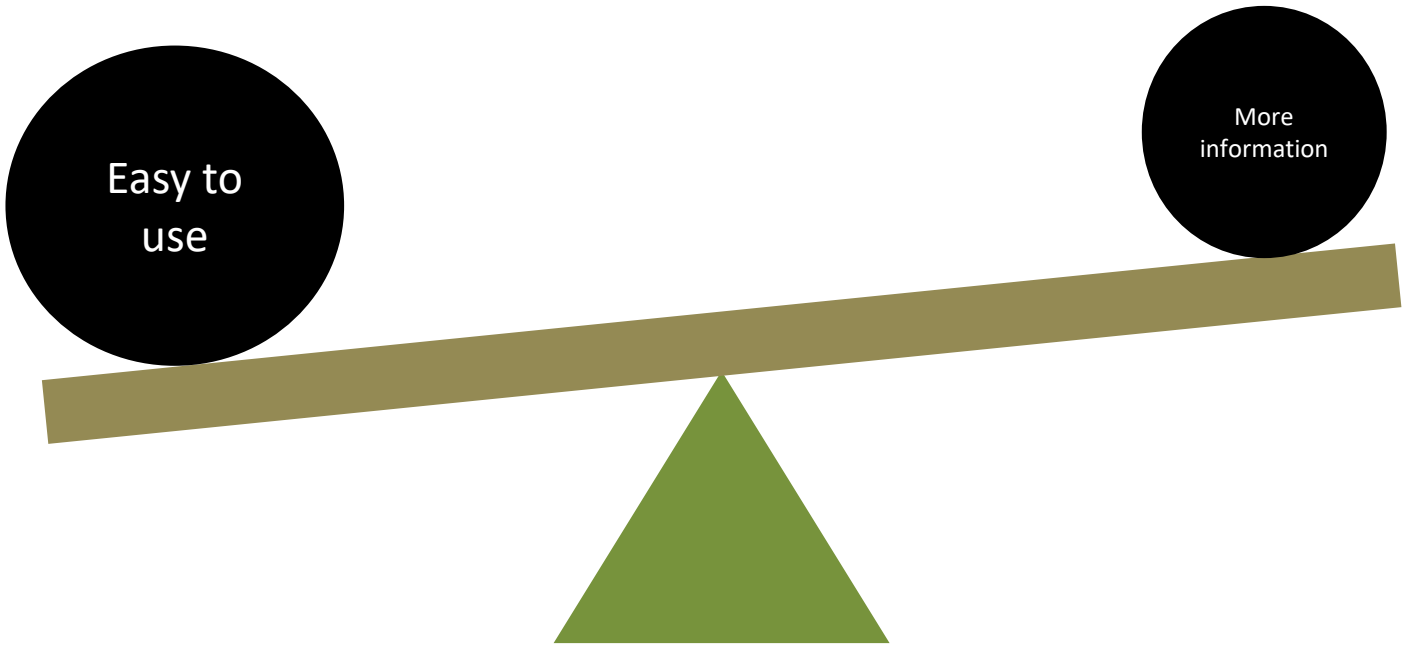
Which ones….? → **Select**

Scenarios

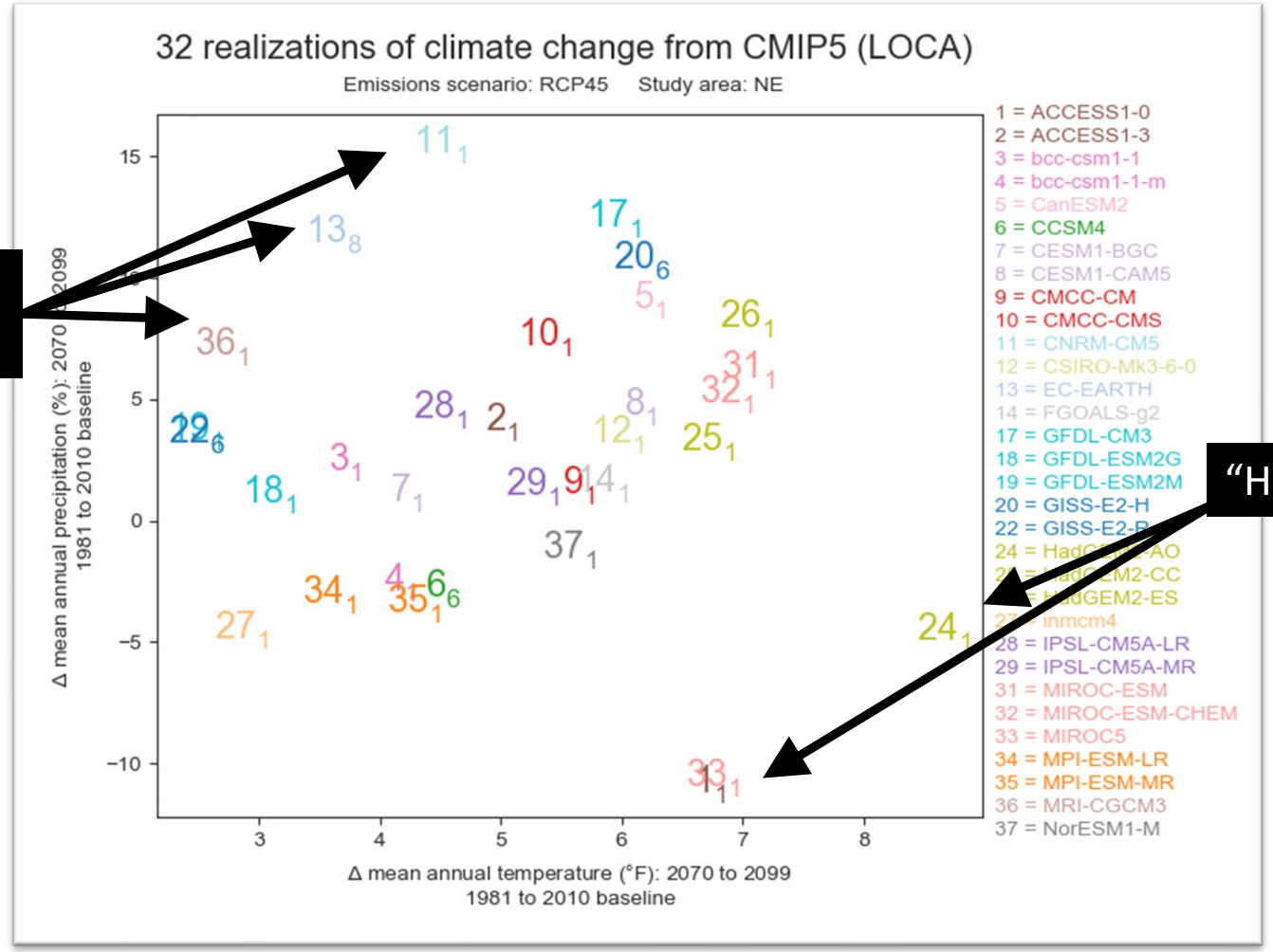
Online

The LASSO Tool (cont'd)

- GIS analysts & scientists
- Regional planners
- Watershed managers
- Sustainability officers
- *Anyone interested in quantifying climate change*



The LASSO Tool: Scatterplots



"Warm and wet"

"Hot & dry"

- Simple
- Useful for interpreting uncertainty
- Already used in climate studies

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Demonstration

https://lasso.epa.gov

Example Use Cases

- Watershed modeling (EPA ORD)
  - Cypress Creek (TX)
  - Upper Soldier Creek (KS)
  - Taunton (MD)
- Chesapeake Bay Climate Change Assessment Framework*
- Climate Change Impacts and Risk Analysis (CIRA; EPA Office of Atmospheric Programs)

Take Home Messages

- There are many good climate change tools and viewers
  - ➢ Climate Explorer
  - ➢ National Climate Change Viewer
- In most cases, projections need to be *translated* or *characterized* in order to be useful
- LASSO is one of the few that provides subsetting guidance and functionality
- LASSO methods are based on peer-reviewed approaches
- Embrace the uncertainty

Contact

Phil Morefield
Geographer
Center for Public Health and Environmental Assessment
US EPA Office of Research and Development
morefield.philip@epa.gov
202-564-7549

The views expressed in this presentation are those of the author and do not necessarily reflect the views or policies of the US EPA.

Contact

Name	Contact
Integrated Climate and Land-Use Scenarios (ICLUS)	Philip Morefield morefield.philip@epa.gov
20 Watersheds	Thomas Johnson johnson.thomas@epa.gov
Critical Loads Mapper (CL Mapper)	Christopher Clark clark.christopher@epa.gov
Locate and Select Scenarios Online (LASSO)	Philip Morefield morefield.philip@epa.gov
Multisector Evaluation Tool for identifying Resilience Opportunities (METRO)	Susan Julius julius.susan@epa.gov
Adaptation Design Tool (ADT)	Jordan West west.jordan@epa.gov

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