



Reforestation for the 21st Century: Introduction to the Seedlot Selection Tool

Brad St.Clair¹, Glenn Howe², and Nik Stevenson-Molnar³

¹USDA Forest Service, Pacific Northwest Research Station

²Department of Forest Ecosystems and Society, Oregon State University

³Conservation Biology Institute

SEEDLOT SELECTION TOOL | CBI WEBINAR, NOVEMBER 29, 2018



People and Funding

Glenn Howe – Co-Principal Investigator

Oregon State University, Corvallis, Oregon

glenn.howe@oregonstate.edu

Brad St.Clair – Co-Principal Investigator

Pacific Northwest Research Station

USDA Forest Service, Corvallis, Oregon, USA

bstclair@fs.fed.us

Nikolas Stevenson-Molnar – Software Engineer

Conservation Biology Institute, Corvallis, Oregon

nik.molnar@consbio.org

Brendan Ward – Software Engineer

Conservation Biology Institute, Corvallis, Oregon

bcward@consbio.org

The screenshot shows the website for the Conservation Biology Institute (CBI). The header includes the CBI logo and name, with the tagline "Bridging conservation science and practice". A search bar and a "Donate" button are in the top right. A navigation menu contains "ABOUT", "PEOPLE", "PRODUCTS & PUBLICATIONS", "PROJECTS", and "NEWS & EVENTS". The main content area features a large image of a forest at sunset with the title "Seedlot Selection Tool". Below the title is a brief description: "The seedlot selection tool (SST) is a GIS mapping program designed to help forest managers match seedlots with planting sites based on climatic information." A breadcrumb trail reads "Home > Products & Publications > Projects > Seedlot Selection Tool". There are social media sharing buttons for Twitter, LinkedIn, Facebook, and StumbleUpon. A date range "September 2015 – September 2020" is visible. Below the main text, there are tabs for "About" and "People". The "About" tab is active, showing a map of Oregon with a red area indicating the project location. The text describes the collaborative effort between the U.S. Forest Service, Oregon State University, and the Conservation Biology Institute to develop a "free web-based decision-support tool".

consbio.org/products/webinars/climate-smart-seedlot-selection-tool



Addressing Climate Change Risk

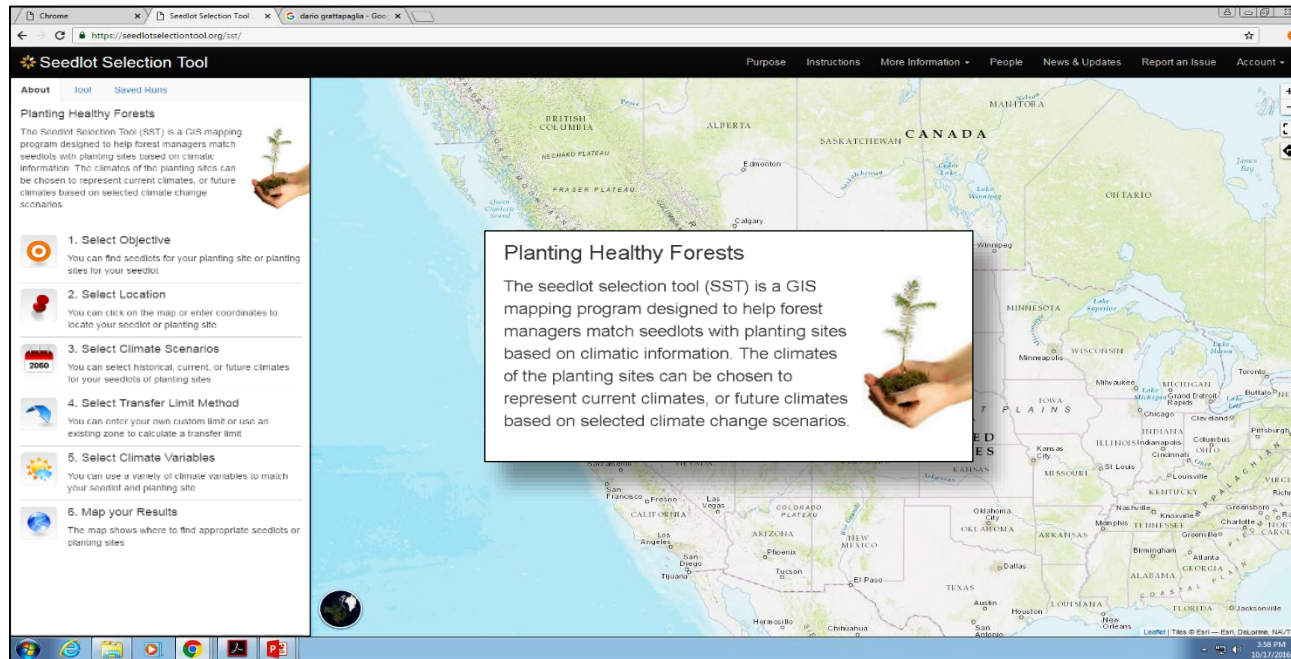
- Climates are warming and are expected to continue to warm, more so in the north than in the south
- In the short-term (currently, next decade or so), local populations are adapted to the local climate (within range of current transfer guidelines)
- In the long-term (by mid- to late-century), local populations are at a high risk of maladaptation to projected climates
- Adapted populations (i.e., from similar climates as present) may be found to the south
- Need to balance adaptation to the present conditions with adaptation to future conditions – a moving target
 - Match to the climate of the next decade or two
 - Stand establishment is highly critical phase
 - Aim too far out and likely to see frost damage in the near term
- Start planning for future seed needs for warming climates
- Use mixtures to account for uncertainty and climate change over the life of a stand
- Consider gene conservation activities to conserve genetic diversity

Seedlot Selection Tool

- Seedlot Selection Tool is a powerful tool for exploring where climates occur now and in the future, and for matching seedlots to planting sites
- Allows user to determine appropriate seedlots or populations for reforestation or restoration
- Allows users to explore different assumptions
 - Climate variables important for adaptation for species of interest
 - Appropriate transfer limits for species of interest -- as well as risk level of user
 - Time periods of concern for adaptation
 - Future emission pathways
- Tool is only as good as the knowledge behind it
 - Climate interpolation
 - Climate change scenarios
 - How species are adapted to their environments
- Research is needed to understand the adaptive niches of species and populations, although lack of knowledge is not an excuse for inaction

Seedlot Selection Tool (SST)

- **A mapping tool to help forest managers match seedlots with planting sites based on climatic information**
- **Assumes adaptive variation correlated with climate**
- **Requires knowledge of climate variables important for adaptation**



Can address two objectives:

Given a planting site

Which seedlot is well adapted today...or in the future?



Find
→



Given a seedlot

Where is it well adapted today...or in the future?



Find
→




How the tool works








- Select objective
- Select location
- Select region
- Select climate scenarios
- Select transfer limit method
- Select climate variables and transfer limit
- Apply constraints
- Map your results

About Tool Saved Runs

Planting Healthy Forests

The Seedlot Selection Tool (SST) is a GIS mapping program designed to help forest managers match seedlots with planting sites based on climatic information. The climates of the planting sites can be chosen to represent current climates, or future climates based on selected climate change scenarios.



-  **1. Select Objective**
You can find seedlots for your planting site or planting sites for your seedlot
-  **2. Select Location**
You can click on the map or enter coordinates to locate your seedlot or planting site
-  **3. Select Region**
You can select the geographic region closest to your site or choose from a list of available regions
-  **4. Select Climate Scenarios**
You can select historical, current, or future climates for your seedlots of planting sites
-  **5. Select Transfer Limit Method**
You can enter your own custom limit or use an existing zone to calculate a transfer limit
-  **6. Select Climate Variables**
You can use a variety of climate variables to match your seedlot and planting site
-  **7. Map your Results**
The map shows where to find appropriate seedlots or planting sites

SST Instructions

ABOUT

OVERVIEW

The Seedlot Selection Tool (SST) is a web-based mapping application designed to help forest managers match seedlots with planting sites based on climatic information. The climates of the planting sites can be chosen to represent current climates, or future climates based on selected climate change scenarios.

The Seedlot Selection Tool involves the following steps.

1. Select Objective
2. Select Location
3. Select Climate Scenarios
4. Select Transfer Limit Method
5. Select Climate Variables
6. Map your Results

TOOL



1. SELECT OBJECTIVE

1.1. FIND SEEDLOTS FOR MY PLANTING SITE

Click on the **Find seedlots** button if you have a planting site for which you want to find adapted seedlots.

1.2. FIND PLANTING SITES FOR MY SEEDLOT

Click on the **Find planting sites** button if you have a seedlot and you want to know where you can plant it.

Select Objective: Find seedlots for planting site on the Chequamegon-Nicolet National Forest

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

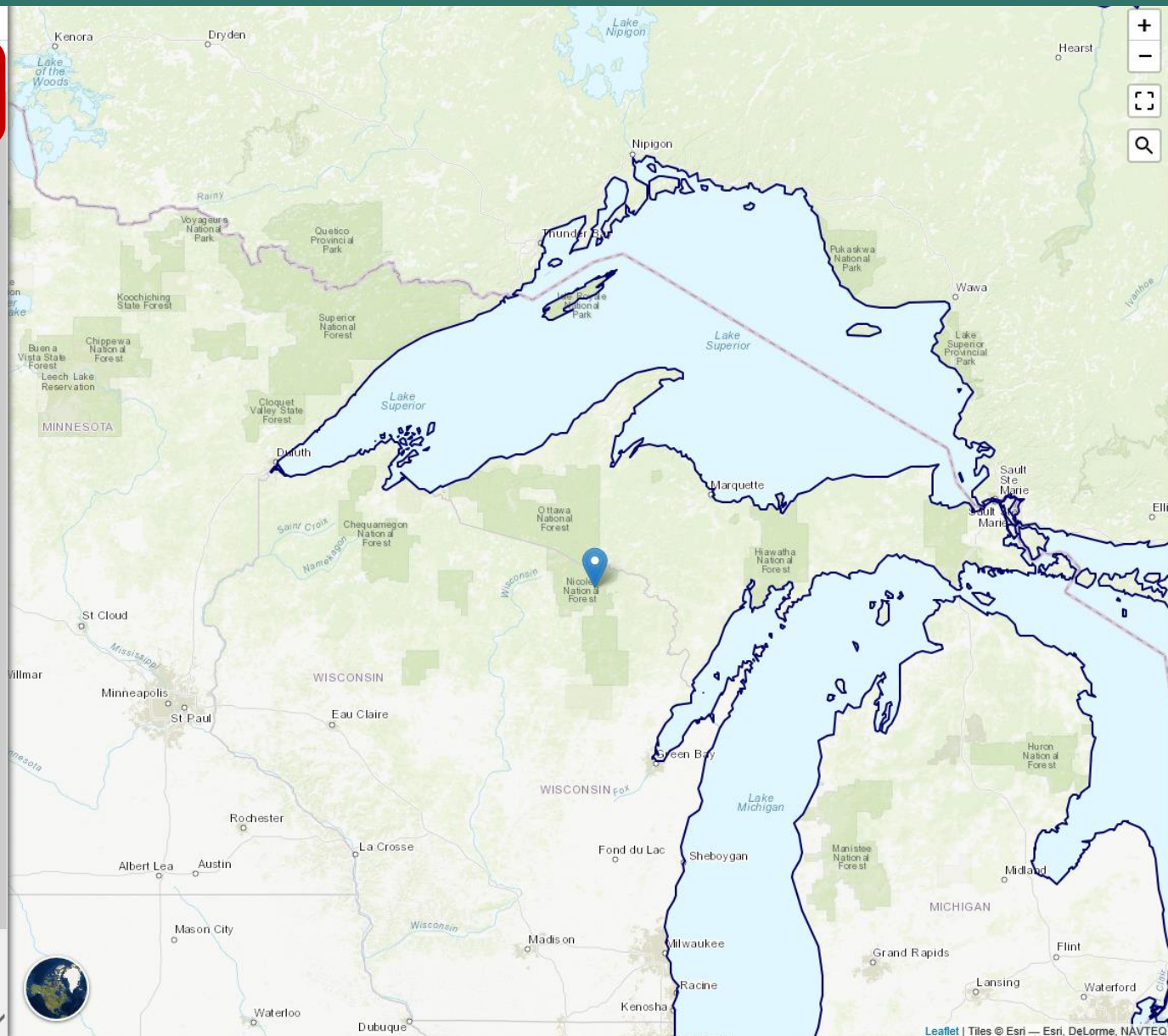
Units: Metric Imperial

Add a variable...

7 Apply constraints

Add a constraint...

8 Map your Results



Select location

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Add a variable...

7 Apply constraints

Add a constraint...

8 Map your Results

Select location by:

- Clicking on map, or
- Entering the lat/long

Lat: 45.84 Lon: -88.67
Elevation: 1516 ft (462 m)

Set Point

Select region

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

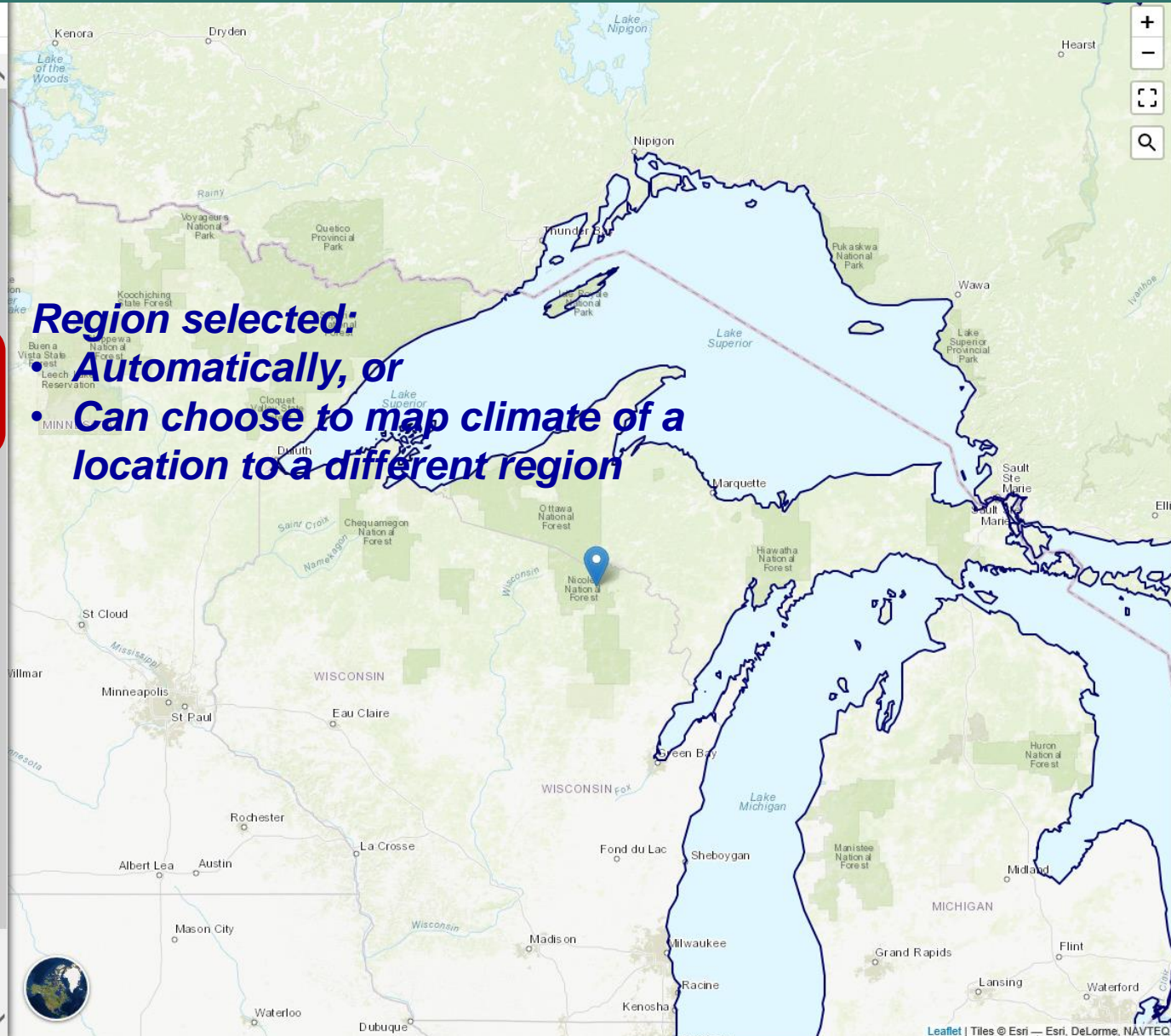
Units: Metric Imperial

Add a variable...

7 Apply constraints

Add a constraint...

8 Map your Results



Select climate scenarios

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

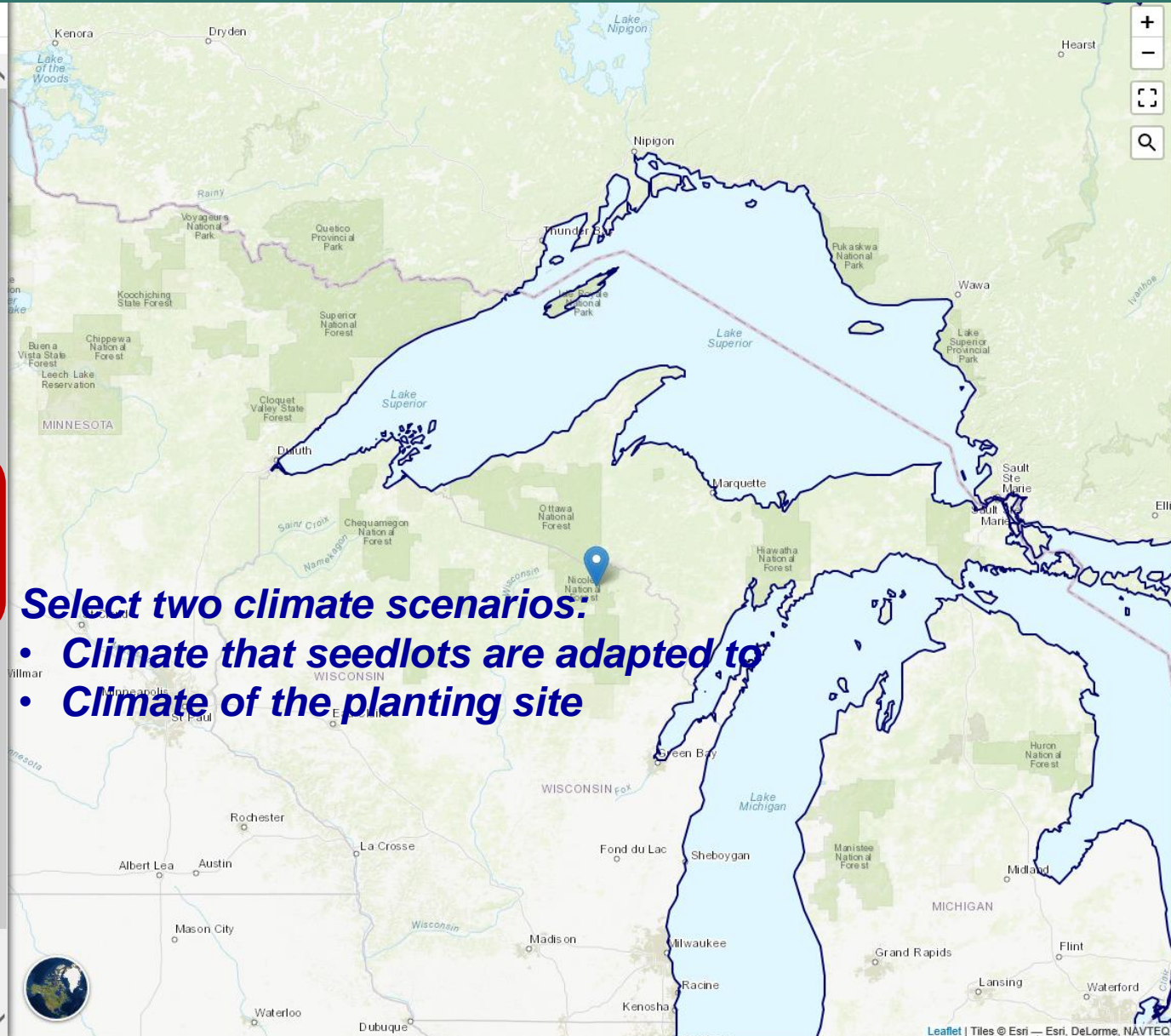
Units: Metric Imperial

Add a variable...

7 Apply constraints

Add a constraint...

8 Map your Results



Select two climate scenarios:

- Climate that seedlots are adapted to
- Climate of the planting site

Select transfer limit method

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

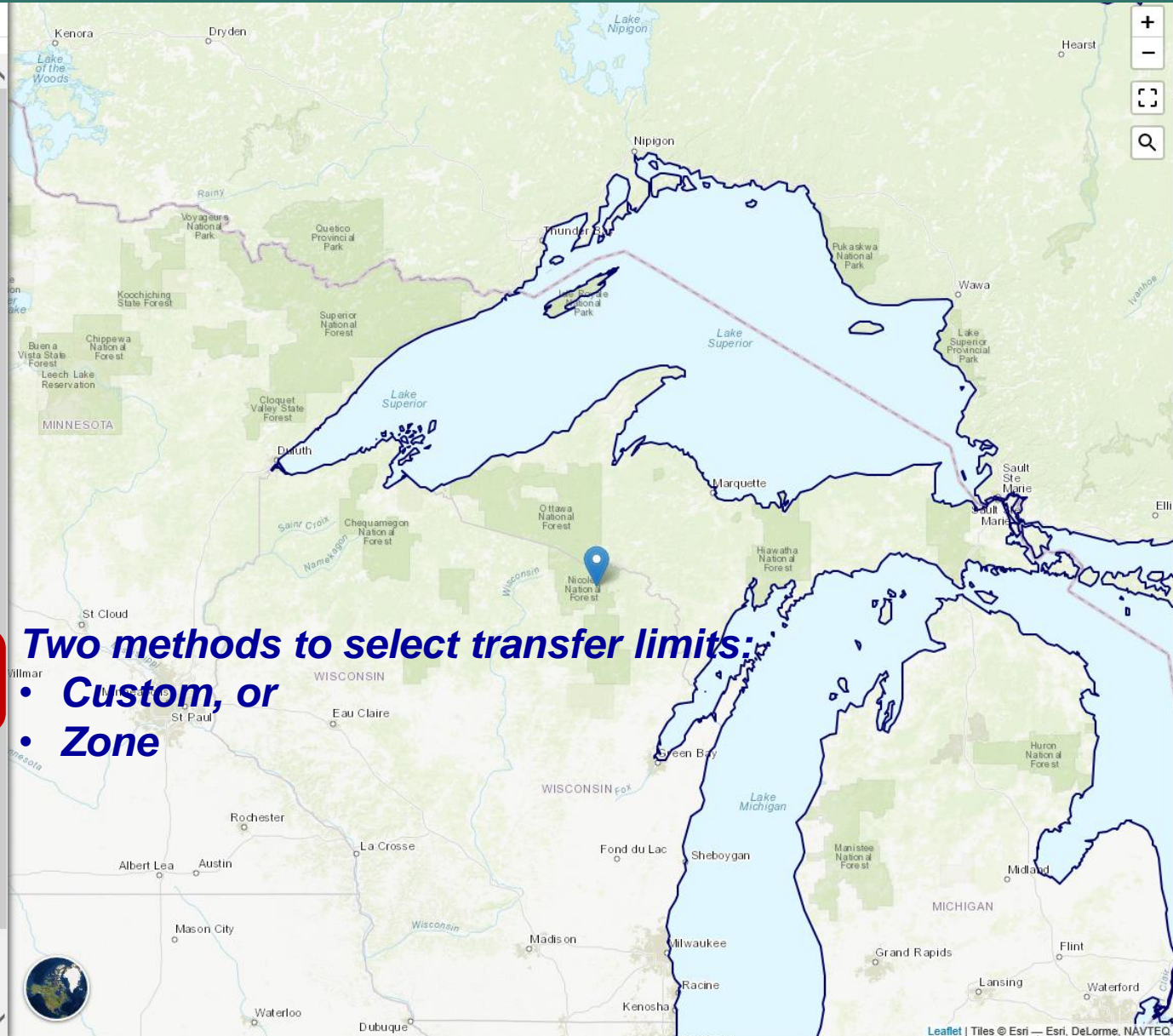
Units: Metric Imperial

Add a variable...

7 Apply constraints

Add a constraint...

8 Map your Results



Two methods to select transfer limits:

- Custom, or
- Zone

Using seed zones to define transfer limits

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom **Zone**

Select a species

Generic

Select zone

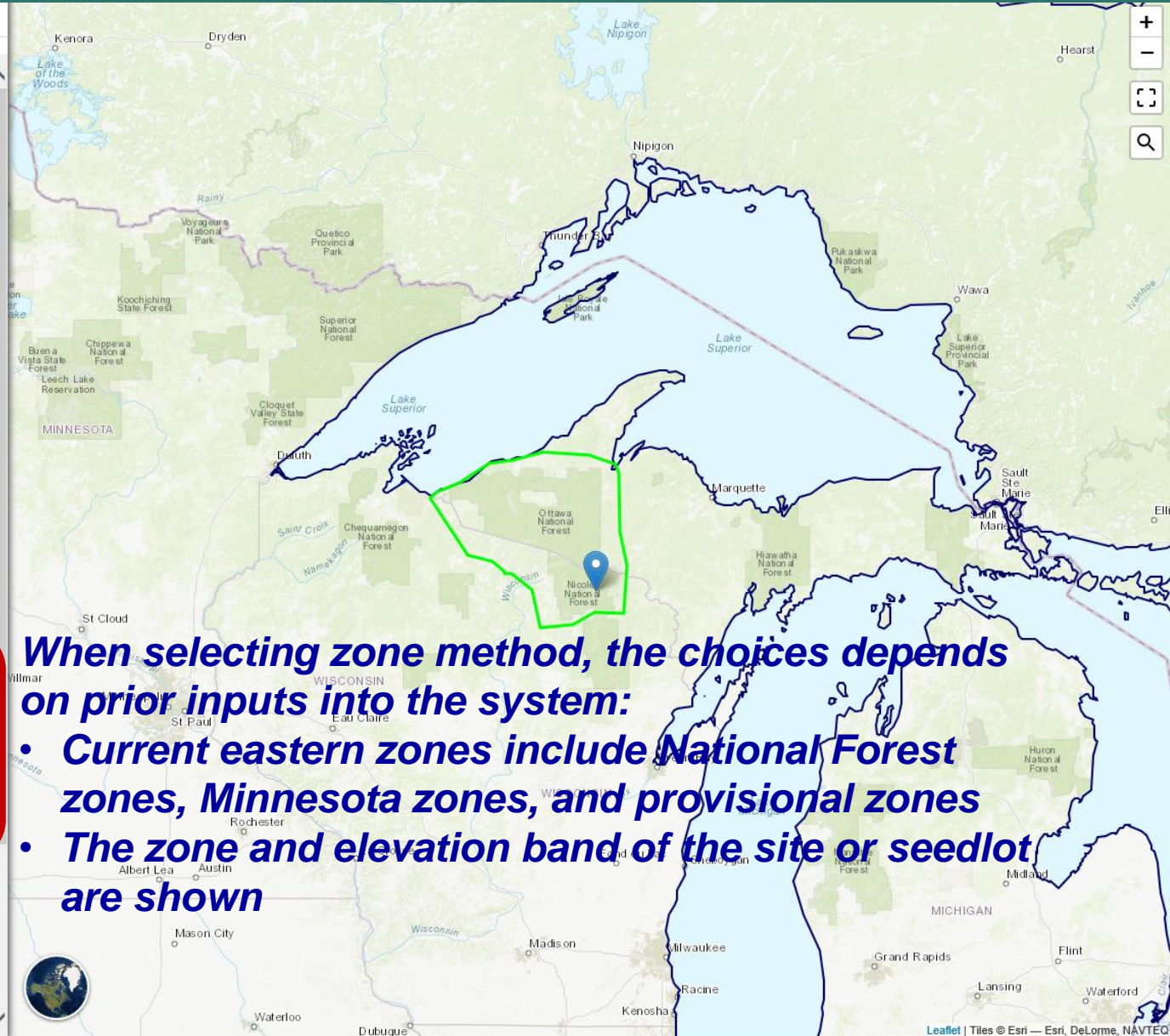
Region 9 - Zone 5, 1000' - 2000'

6 Select climate variables

Units: Metric Imperial

Add a variable...

7 Apply constraints



When selecting zone method, the choices depends on prior inputs into the system:

- **Current eastern zones include National Forest zones, Minnesota zones, and provisional zones**
- **The zone and elevation band of the site or seedlot are shown**

Select climate variables

About Tool Saved Runs

1 Select objective

Find seedlots Find planting sites

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

Select a species

Generic

Select zone

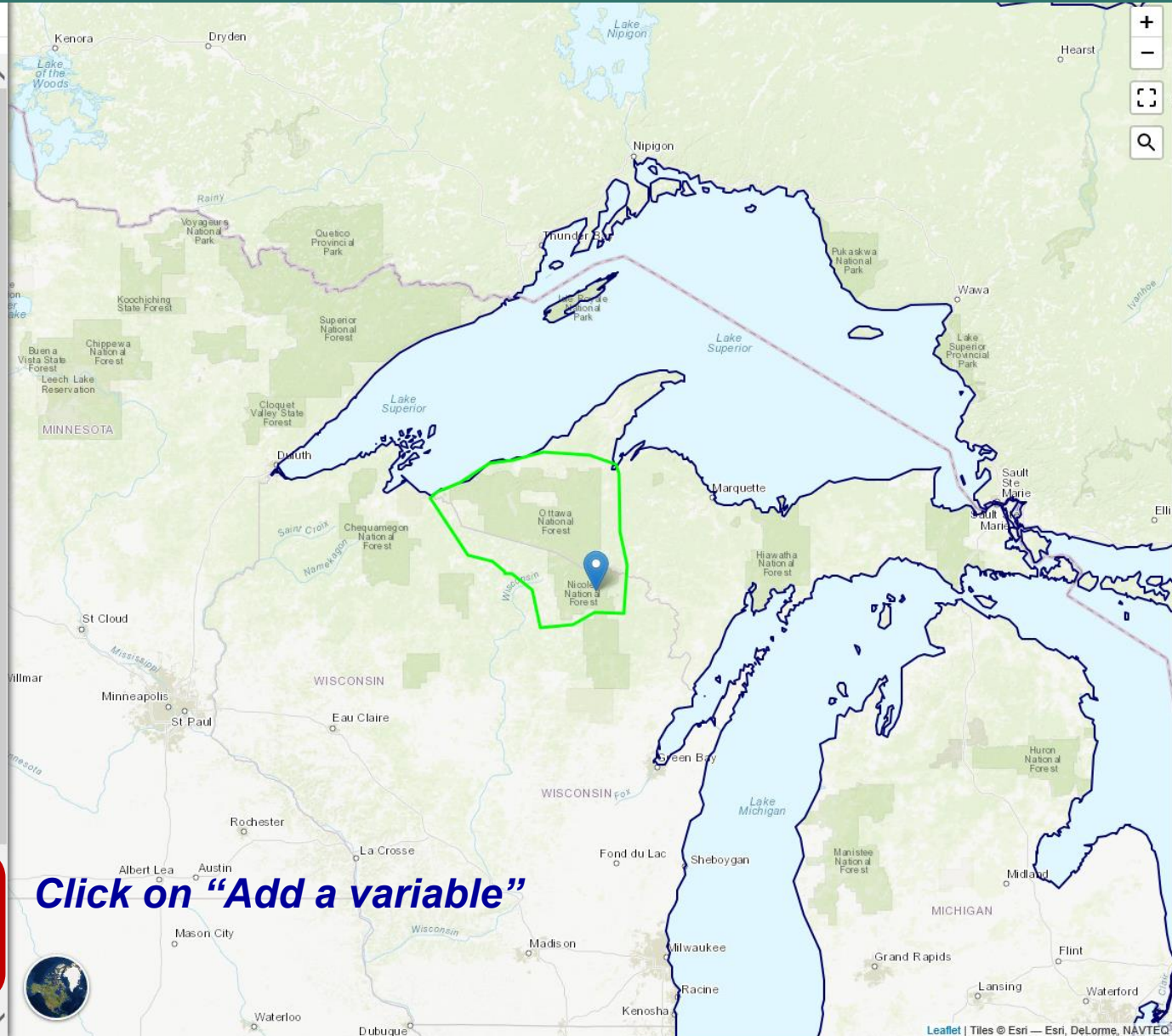
Region 9 - Zone 5, 1000' - 2000'

6 Select climate variables

Units: Metric Imperial

Add a variable...

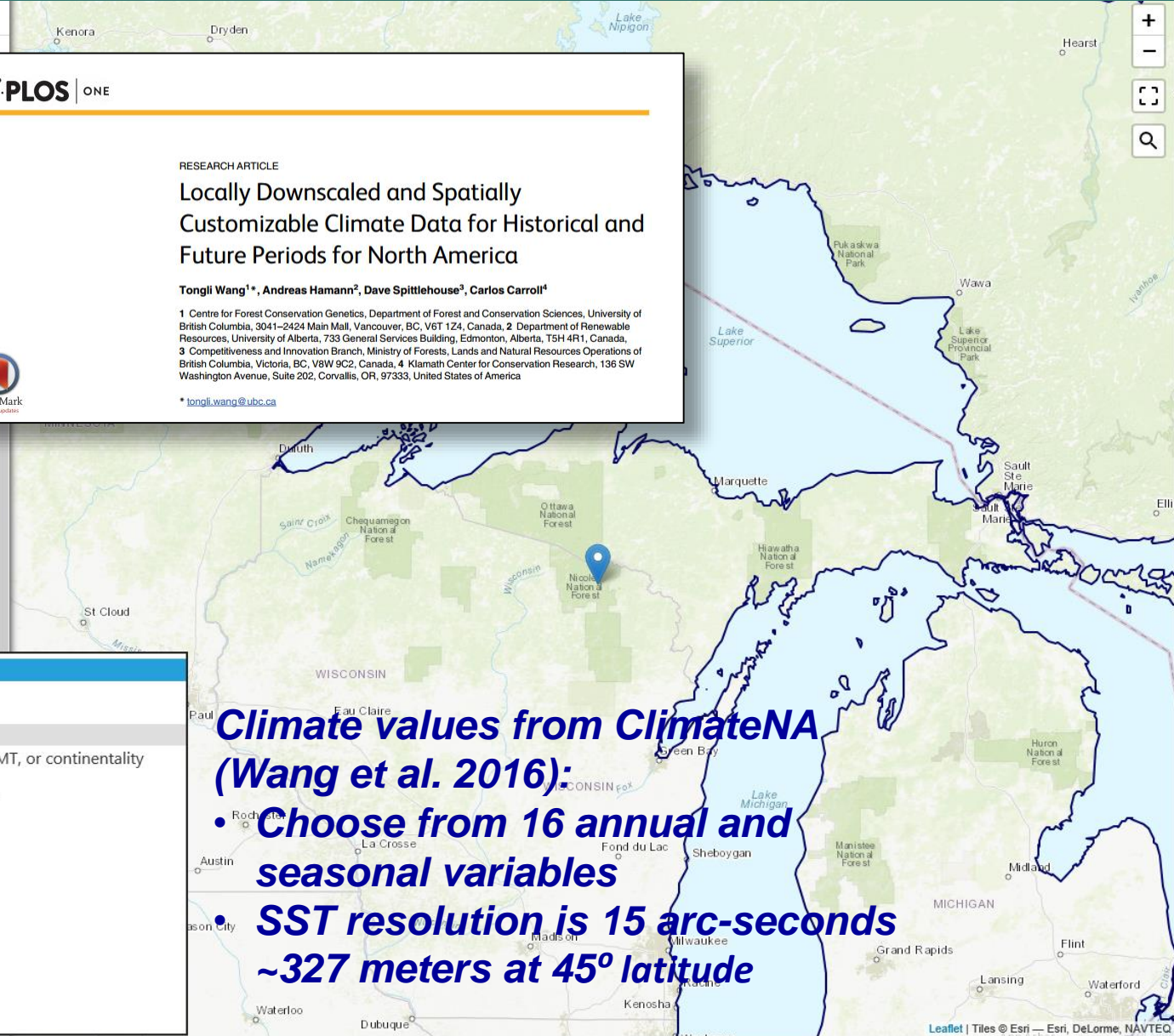
7 Apply constraints



Click on "Add a variable"

Climate variables from which to choose

About Tool Saved Runs



PLOS ONE

RESEARCH ARTICLE

Locally Downscaled and Spatially Customizable Climate Data for Historical and Future Periods for North America

Tongli Wang^{1*}, Andreas Hamann², Dave Spittlehouse³, Carlos Carroll⁴

1 Centre for Forest Conservation Genetics, Department of Forest and Conservation Sciences, University of British Columbia, 3041-2424 Main Mall, Vancouver, BC, V6T 1Z4, Canada, **2** Department of Renewable Resources, University of Alberta, 733 General Services Building, Edmonton, Alberta, T5H 4R1, Canada, **3** Competitiveness and Innovation Branch, Ministry of Forests, Lands and Natural Resources Operations of British Columbia, Victoria, BC, V8W 9C2, Canada, **4** Klamath Center for Conservation Research, 136 SW Washington Avenue, Suite 202, Corvallis, OR, 97333, United States of America

* tongli.wang@ubc.ca

CrossMark
click for updates

2 Select planting site location

Locate your planting site
Use the map or enter coordinates

Lat: 45.8441 Lon: -88.6707

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Add a variable...

- MAT: Mean annual temperature
- MWMT: Mean warmest month temperature
- MCMT: Mean coldest month temperature
- TD: Temperature difference between MWMT and MCMT, or continentality
- MAP: Mean annual precipitation
- MSP: Mean summer precipitation, May to September
- AHM: Annual heat-moisture index
- SHM: Summer heat-moisture index
- DD_0: Degree-days below 0°C
- DD5: Degree-days above 5°C
- FFP: Frost-free period
- PAS: Precipitation as snow, August to July
- EMT: Extreme minimum temperature over 30 years
- EXT: Extreme maximum temperature over 30 years
- Eref: Hargreaves reference evaporation
- CMD: Hargreaves climatic moisture deficit

Climate values from ClimateNA (Wang et al. 2016):

- Choose from 16 annual and seasonal variables
- SST resolution is 15 arc-seconds ~327 meters at 45° latitude

Select measure of cold and water availability

About Tool Saved Runs

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

Select a species

Generic

Select zone

Region 9 - Zone 5, 1000' - 2000'

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	1.30 °C
MAP	784 mm	133 mm

Add a variable...

7 Apply constraints

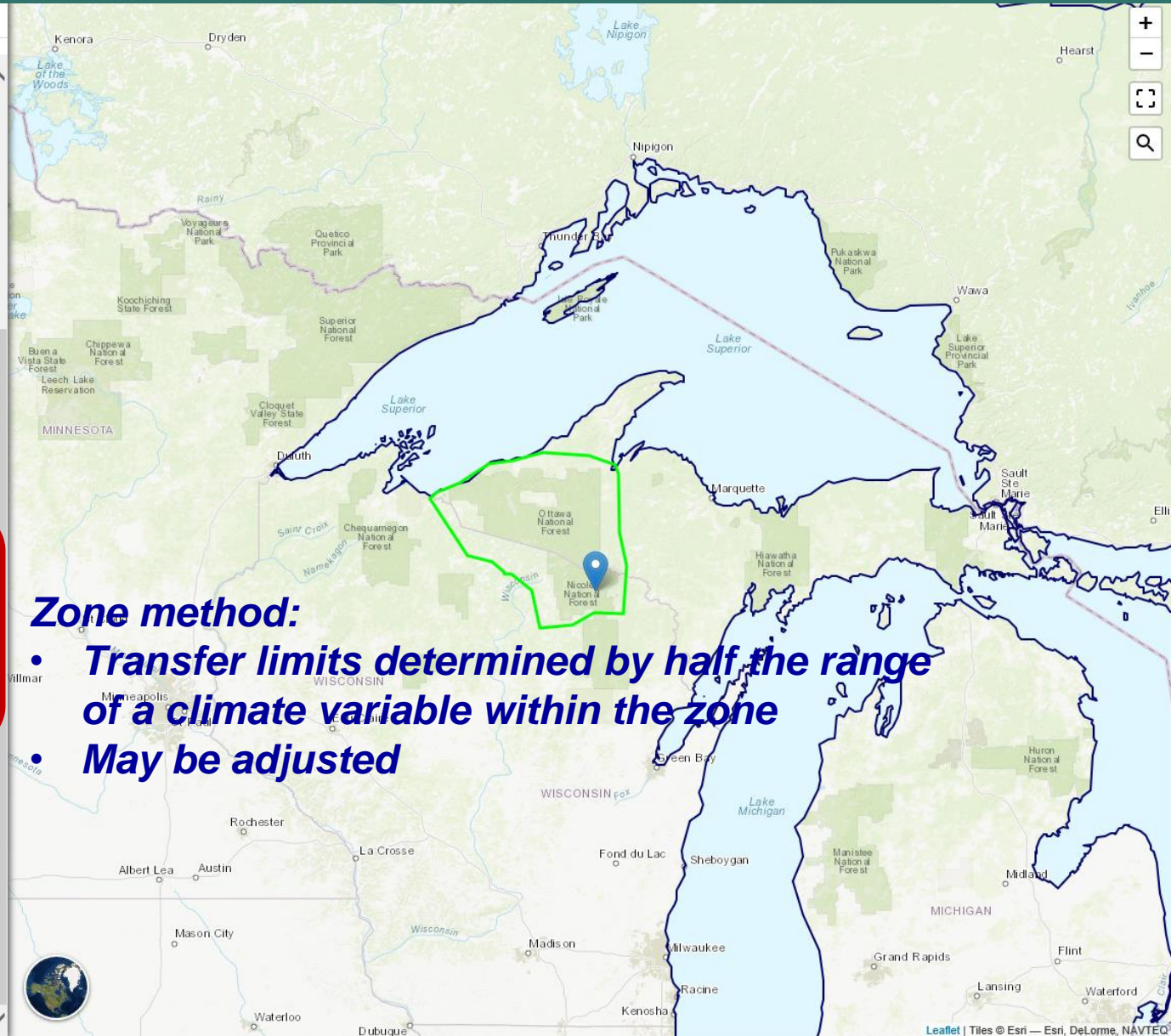
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Zone method:

- Transfer limits determined by half the range of a climate variable within the zone
- May be adjusted

Can 'hover' for more information

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

Select a species

Generic

Select zone

Region 9 - Zone 5, 1000' - 2000'

6 Select climate variables

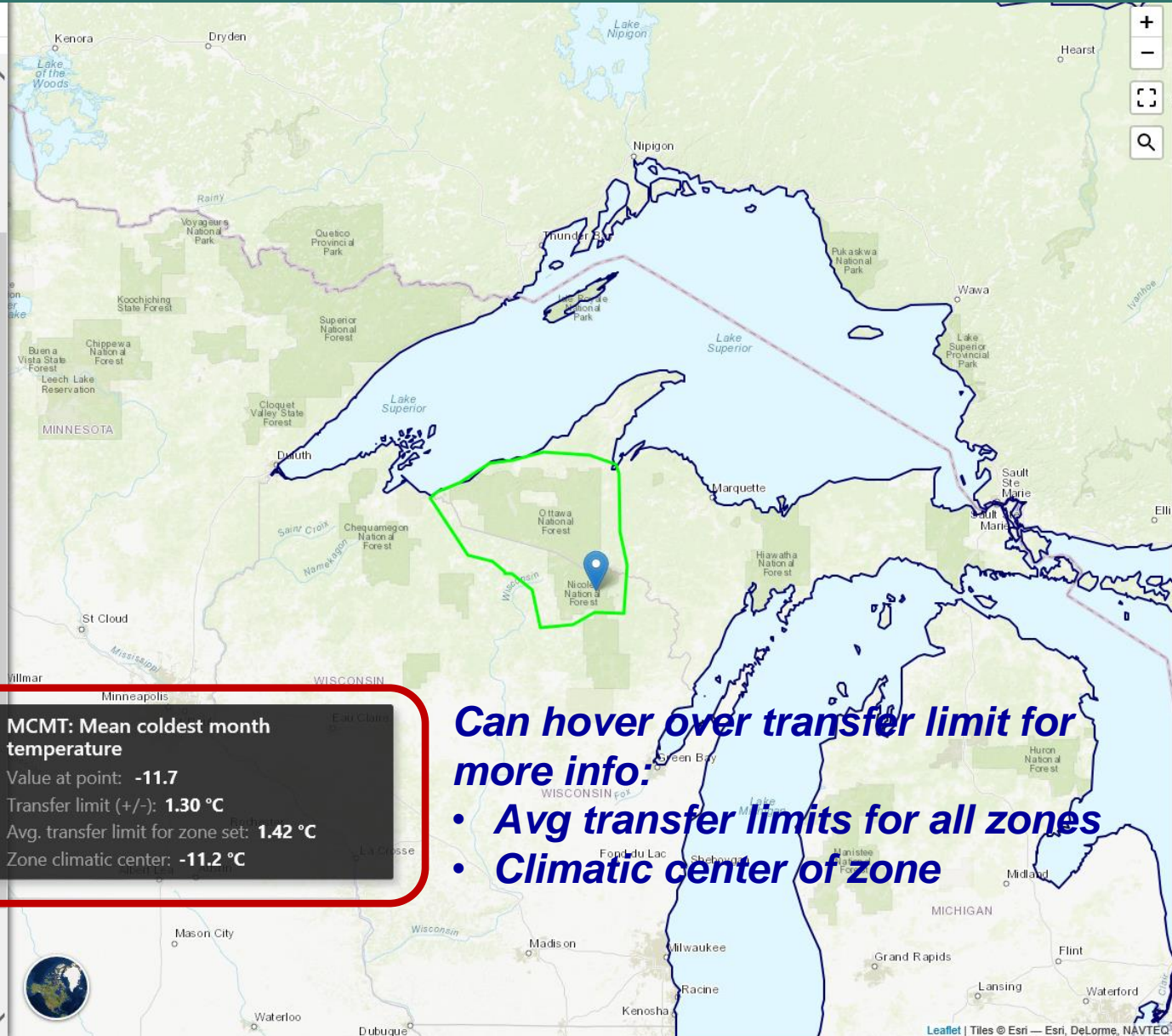
Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	1.30 °C
MAP	784 mm	133 mm

Add a variable...

7 Apply constraints

Add a constraint...



MCMT: Mean coldest month temperature

Value at point: -11.7

Transfer limit (+/-): 1.30 °C

Avg. transfer limit for zone set: 1.42 °C

Zone climatic center: -11.2 °C

Can hover over transfer limit for more info:

- Avg transfer limits for all zones
- Climatic center of zone

Using custom method

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

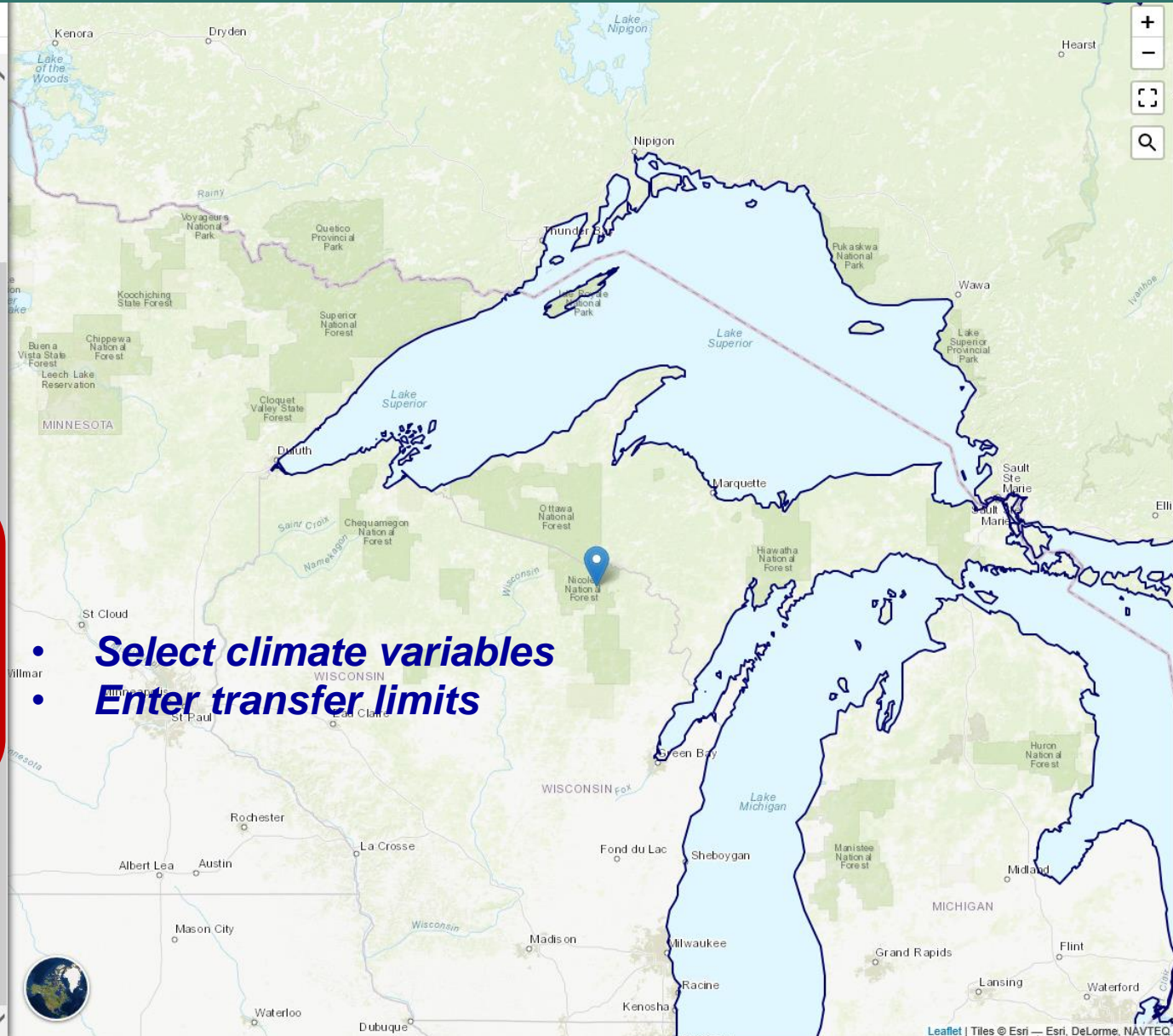
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Can apply constraints

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

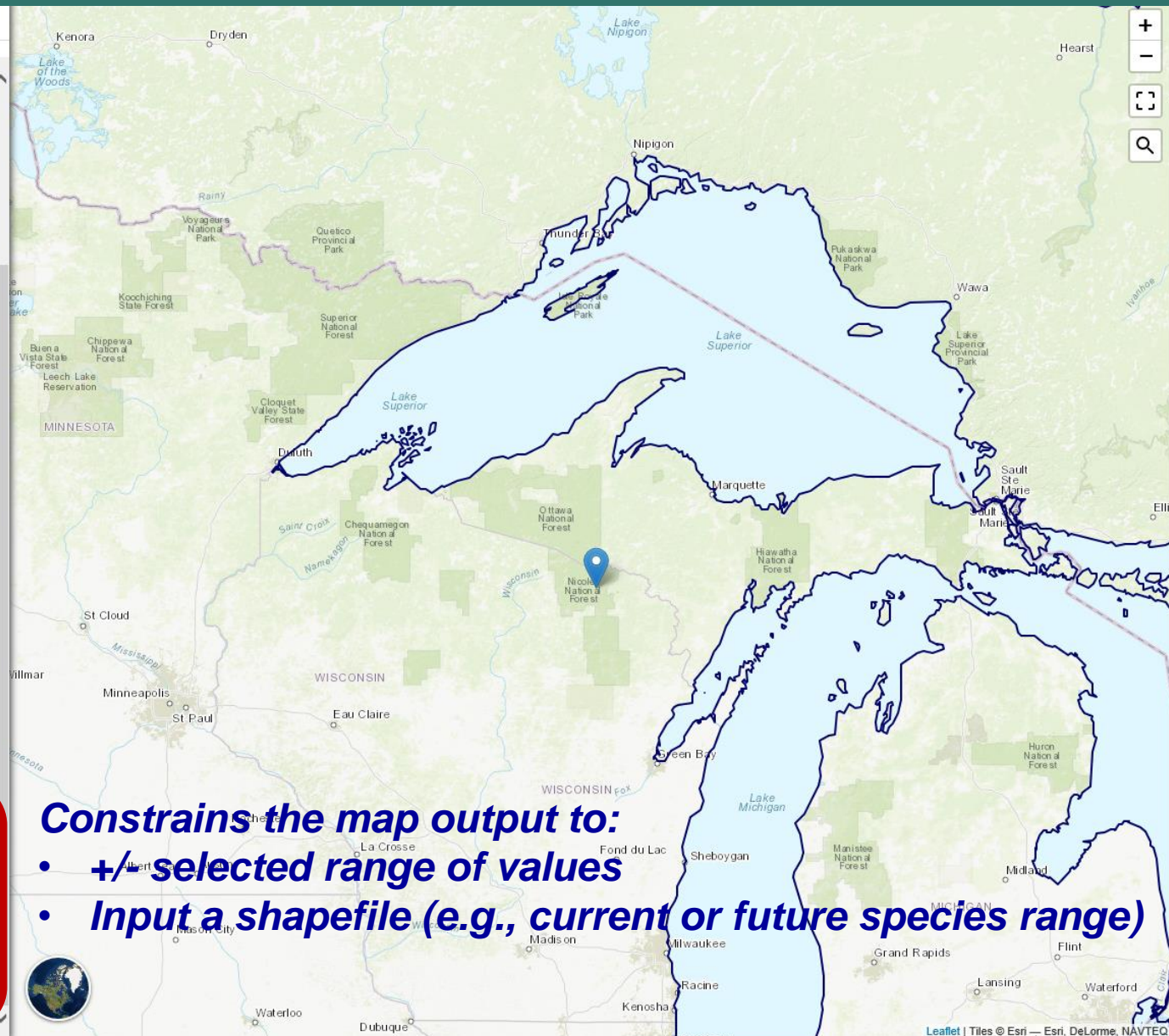
7 Apply constraints

Add a constraint...

Elevation
Photoperiod
Latitude
Longitude
Distance
Shapefile

Save Last Run

Export As...



Constrains the map output to:

- **+/- selected range of values**
- **Input a shapefile (e.g., current or future species range)**

Seedlots for planting site – no climate change

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

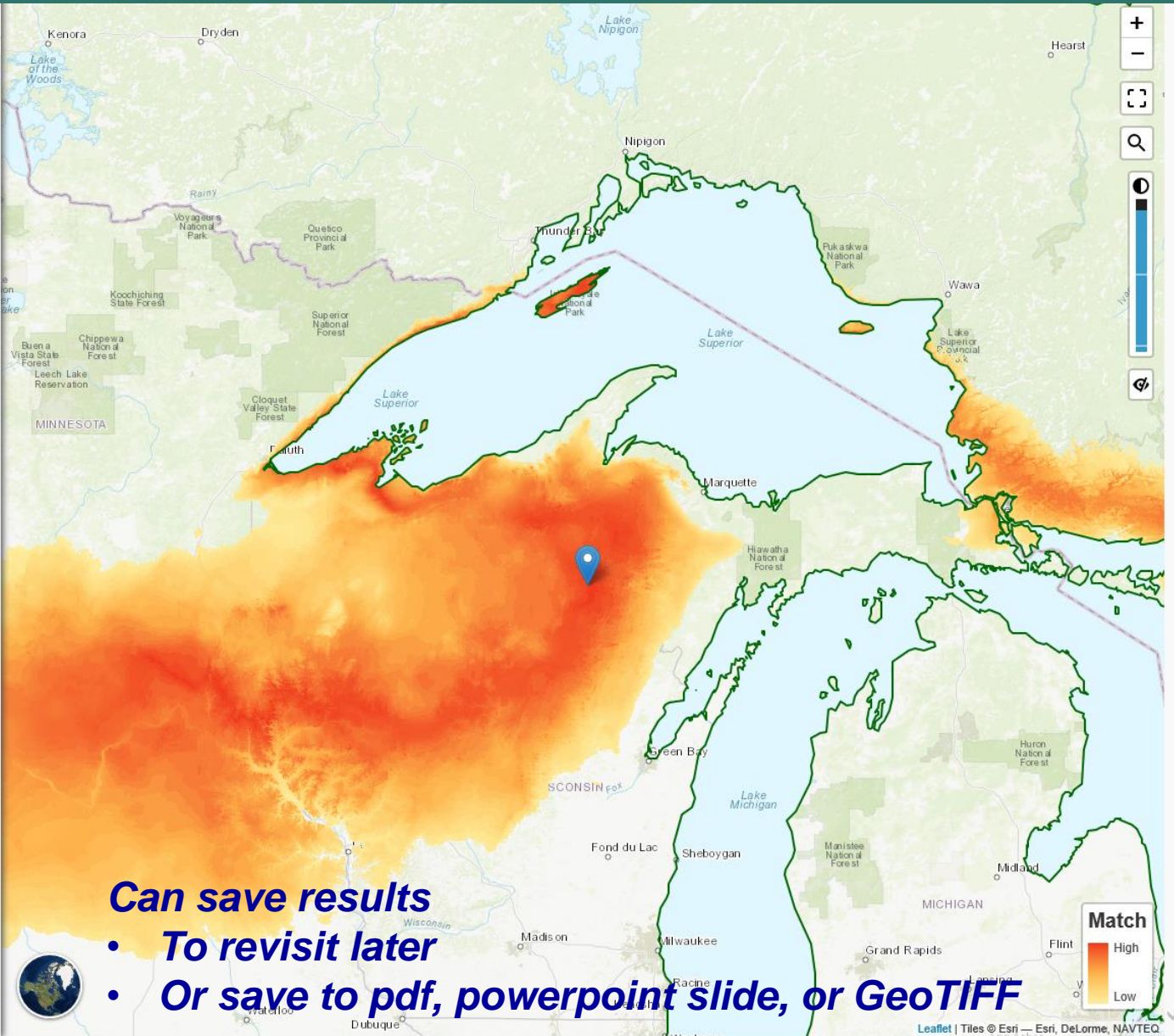
7 Apply constraints

Add a constraint...

8 Map your Results

Run Tool

Save Last Run Export As...



Seedlot Selection Tool Examples

Seedlots for planting site – no climate change

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

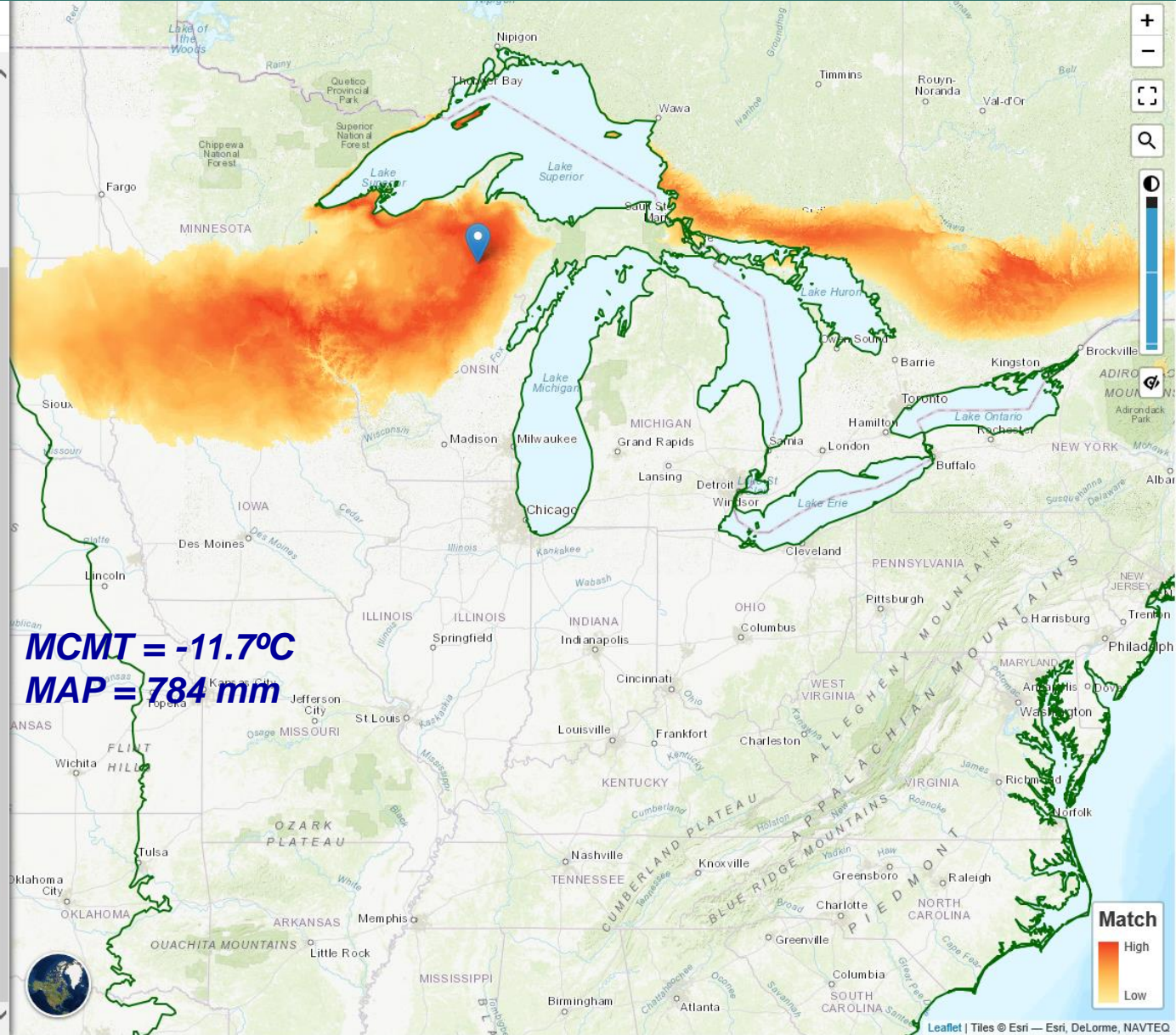
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



MCMT = -11.7°C
MAP = 784 mm



Seedlots for planting site – recent climate

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1981 - 2010

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-10.6 °C	2.00 °C
MAP	752 mm	400 mm

Add a variable...

7 Apply constraints

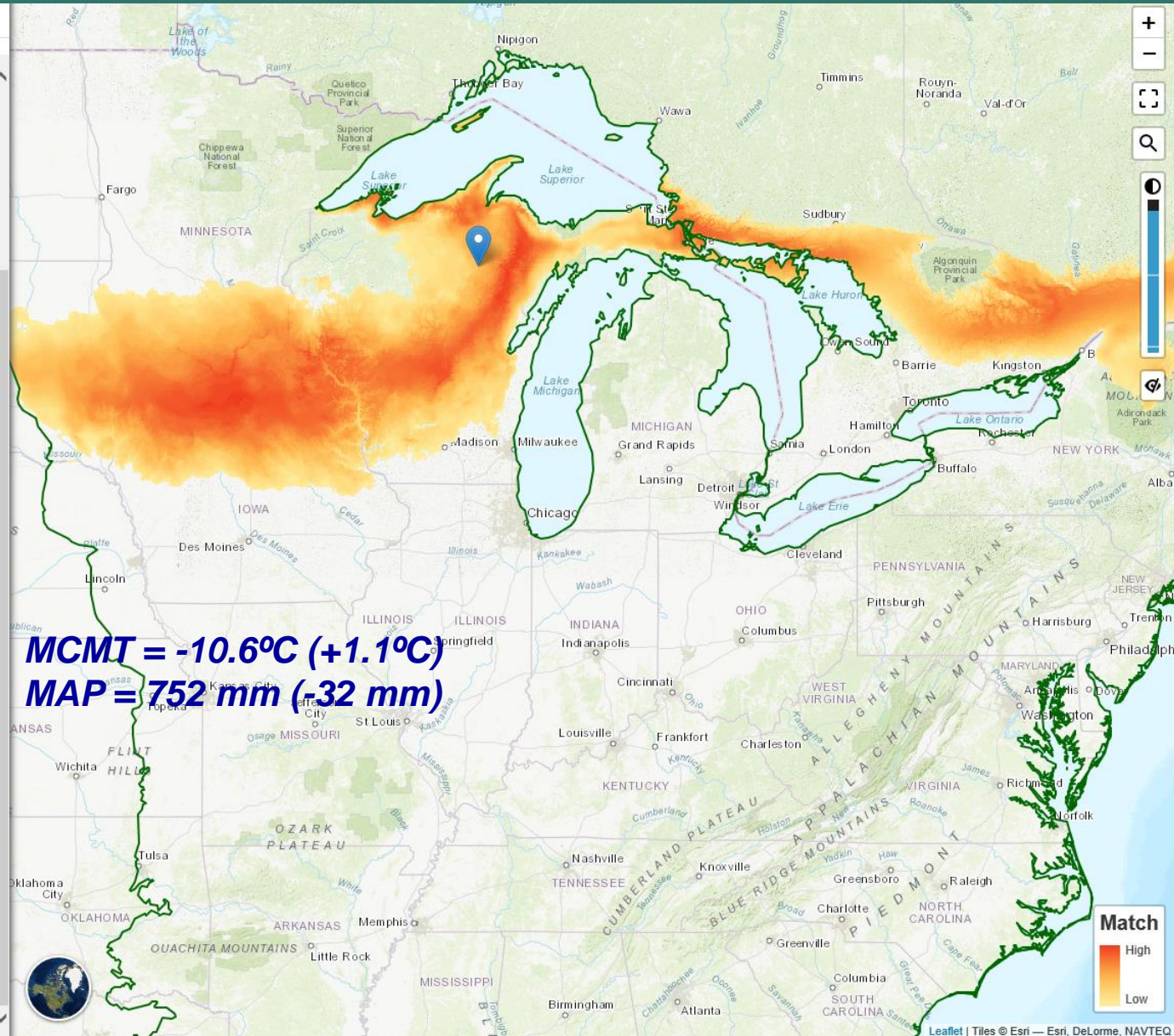
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – 2020s + RCP8.5

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2011 - 2040

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-9.4 °C	2.00 °C
MAP	813 mm	400 mm

Add a variable...

7 Apply constraints

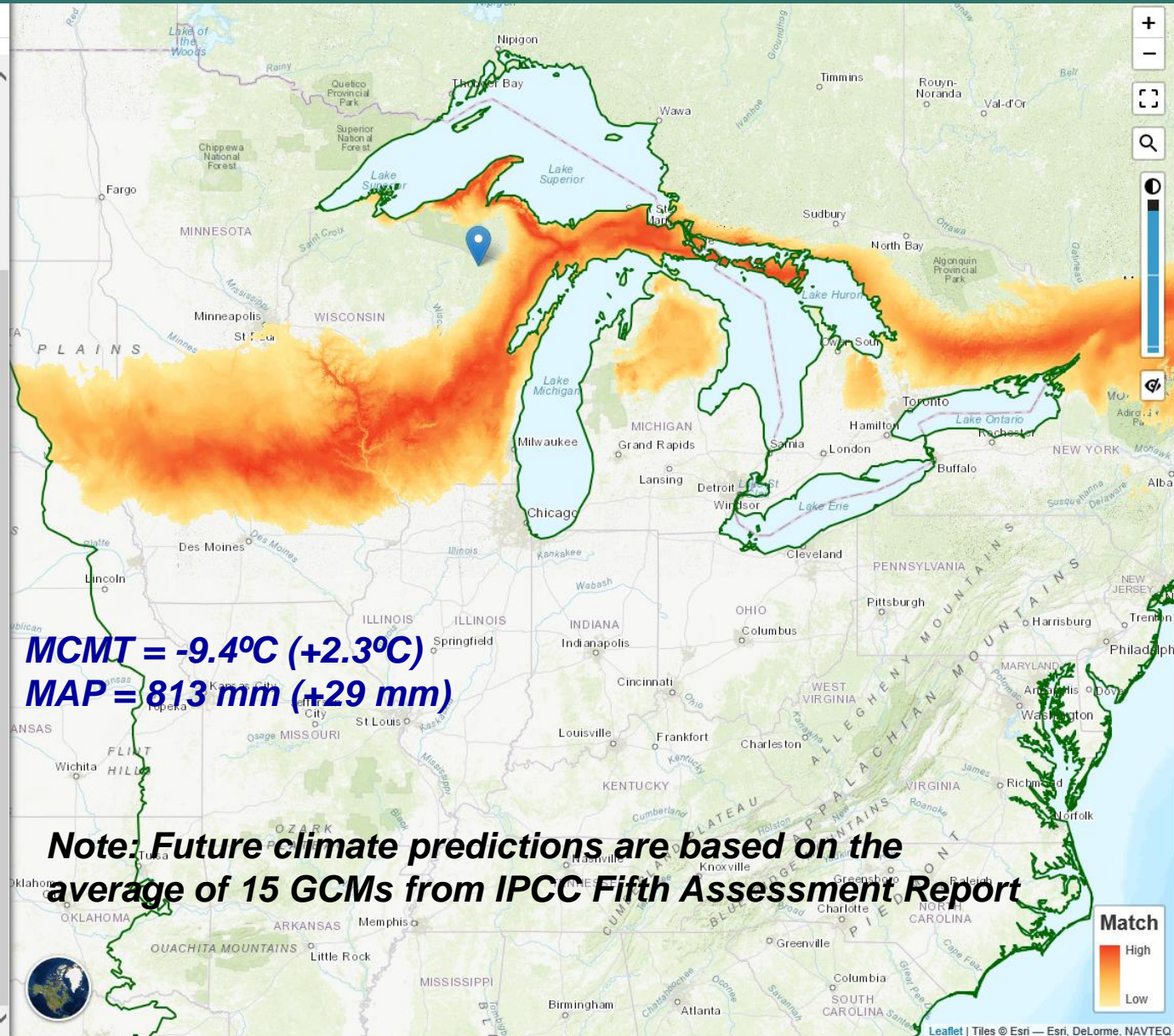
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – 2050s + RCP8.5

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2041 - 2070

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-6.9 °C	2.00 °C
MAP	844 mm	400 mm

Add a variable...

7 Apply constraints

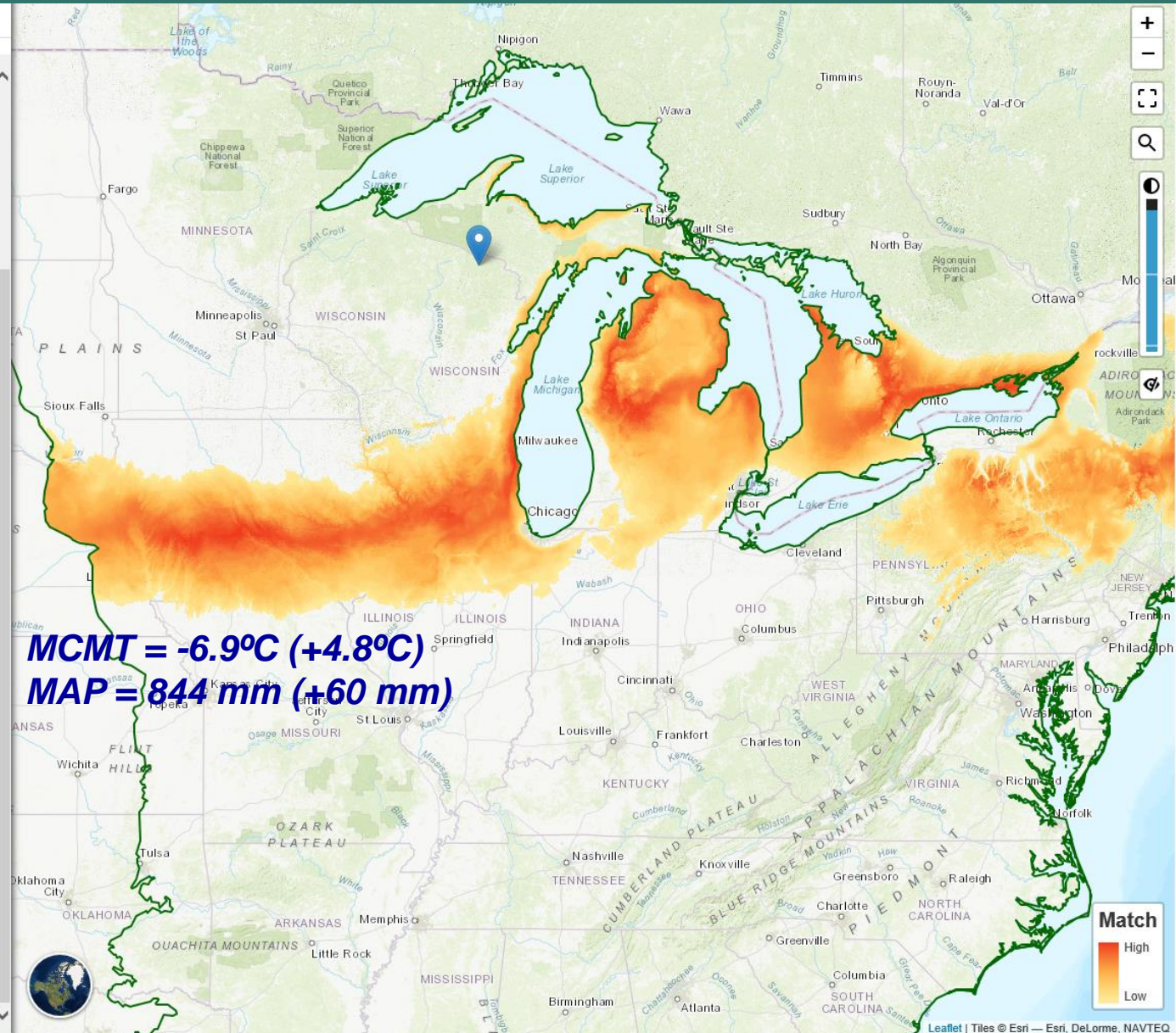
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – 2080s + RCP8.5

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2071 - 2100

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-4.2 °C	<u>2.00 °C</u>
MAP	856 mm	<u>400 mm</u>

Add a variable...

7 Apply constraints

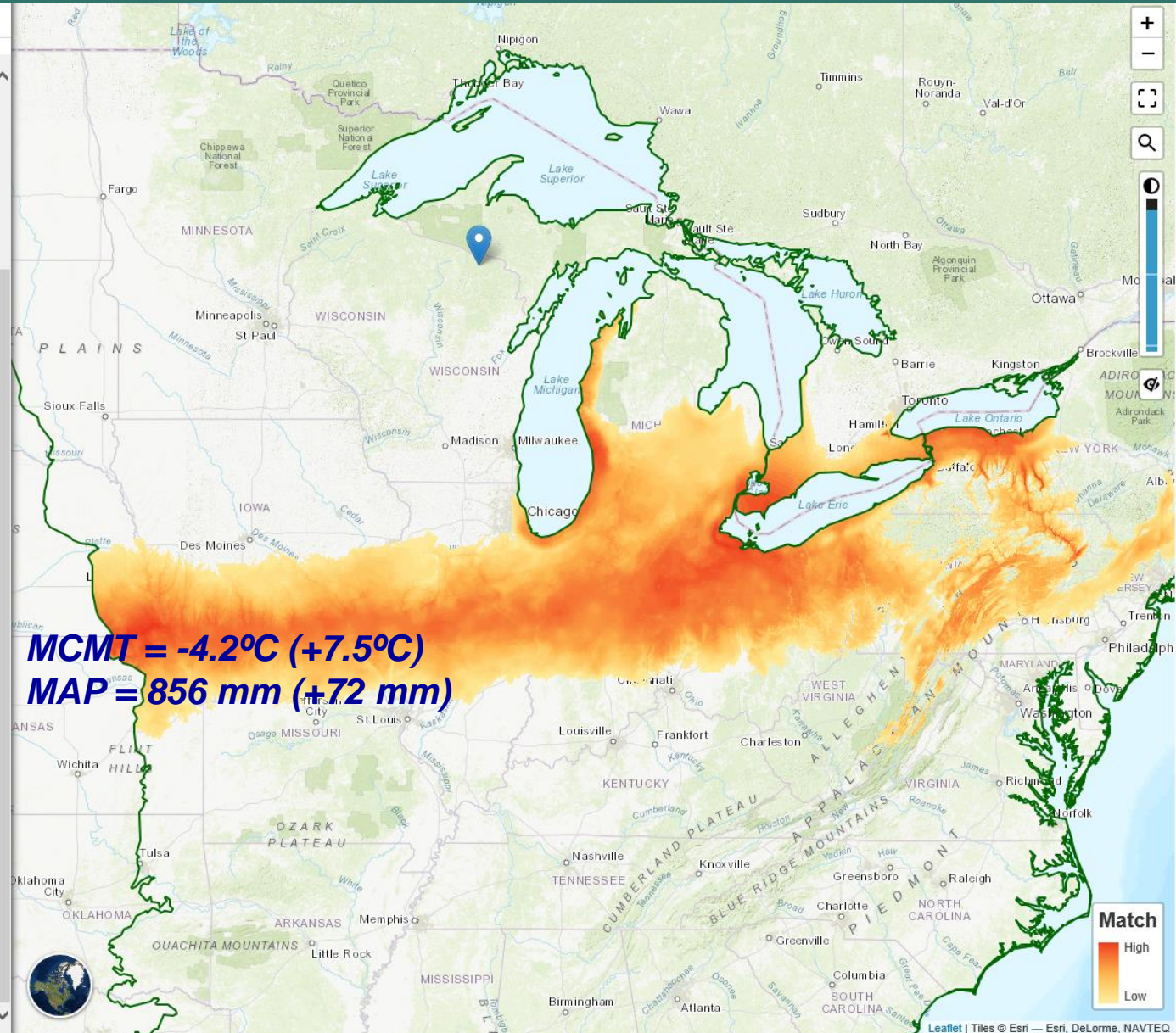
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – no climate change

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

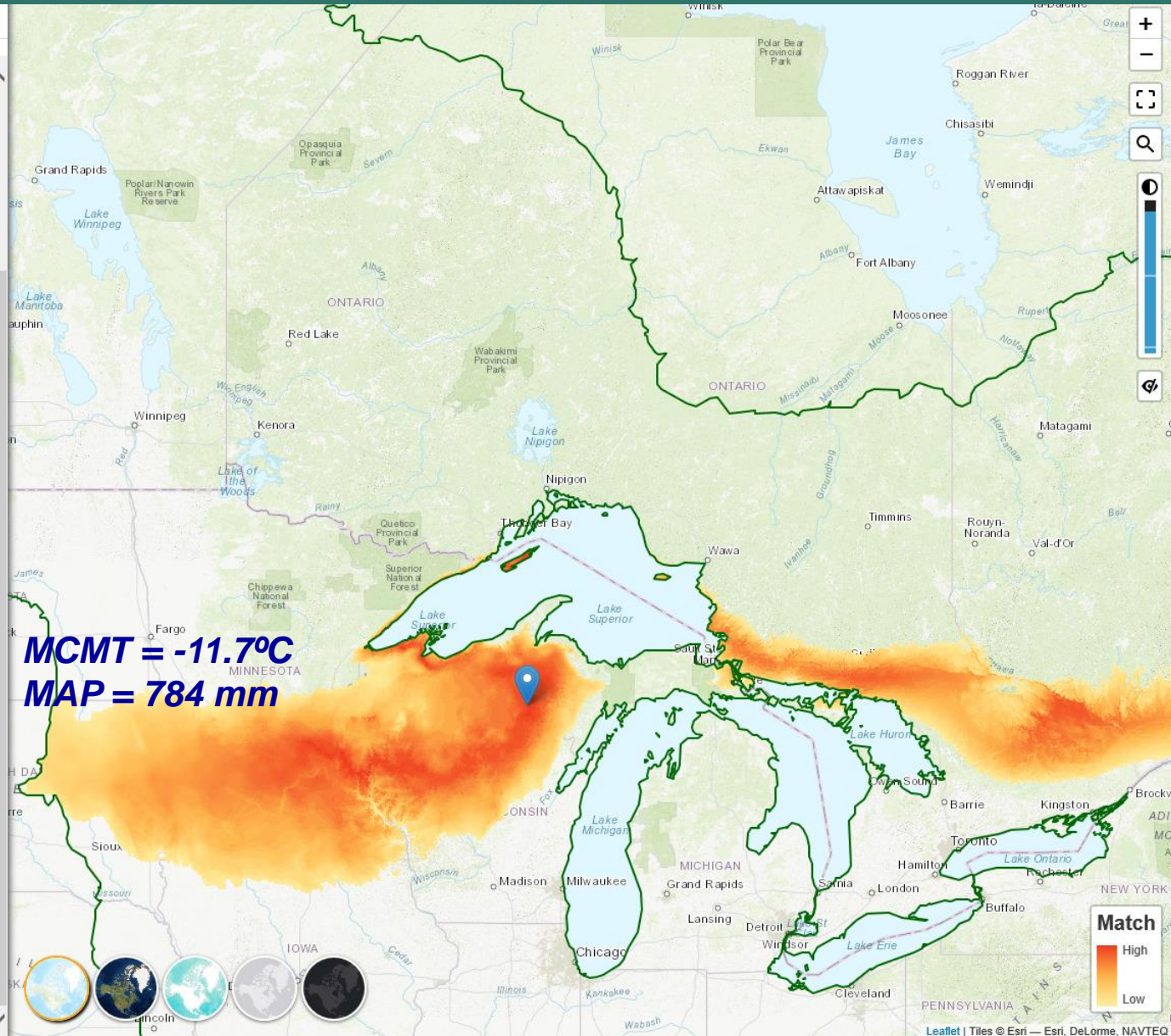
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – recent climate

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1981 - 2010

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

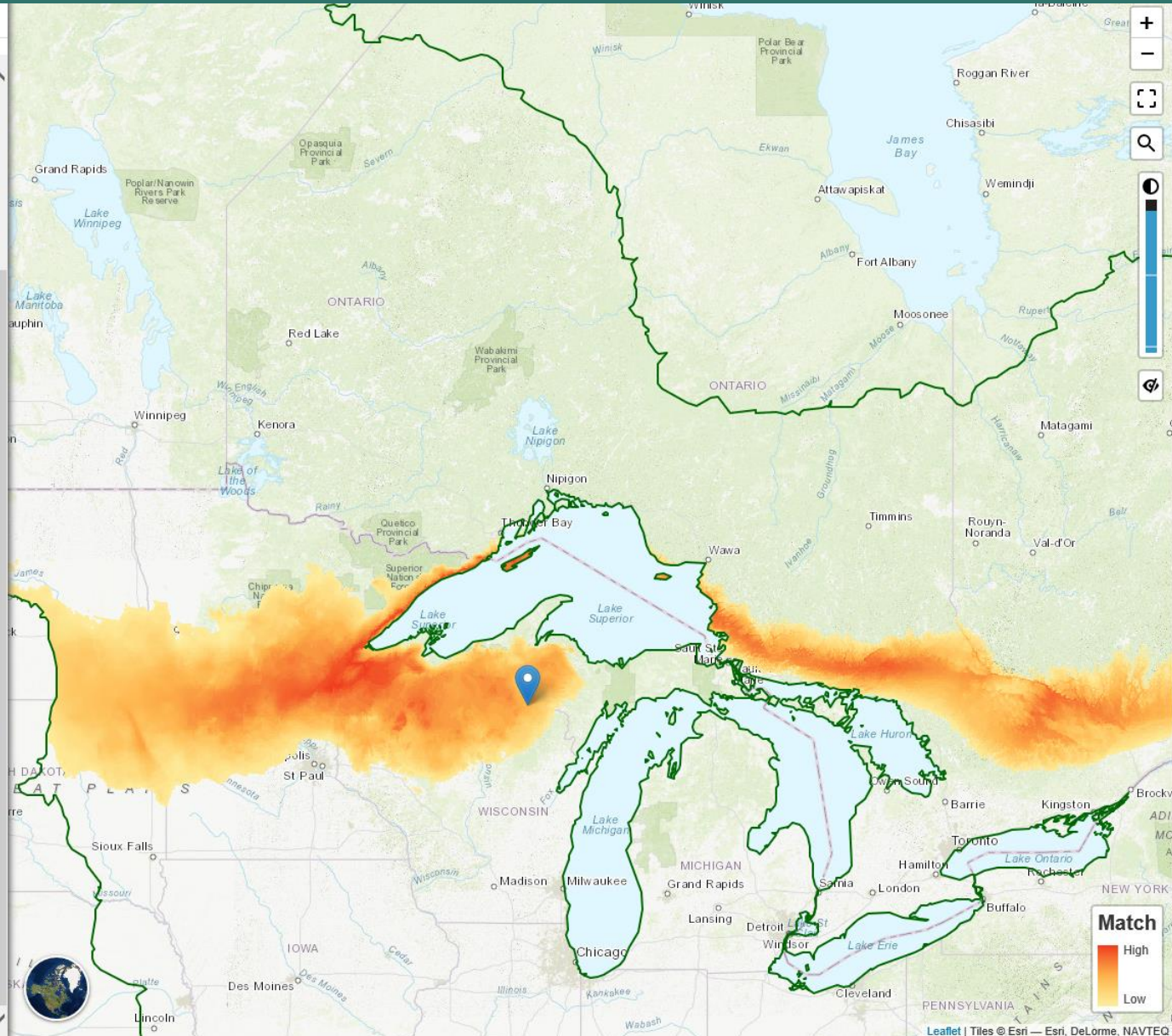
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – 2020s + RCP8.5

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2011 - 2040

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

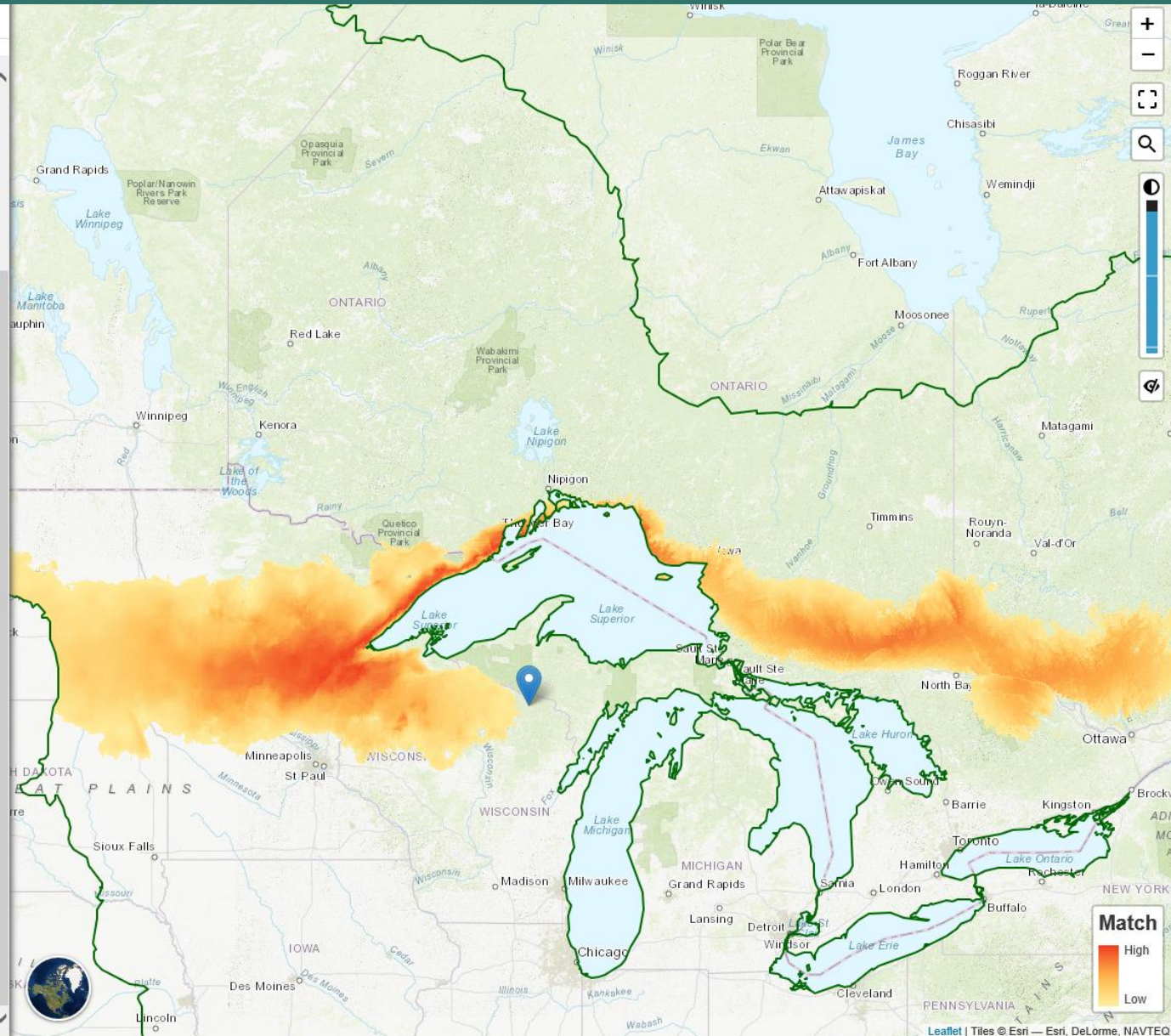
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – 2050s + RCP8.5

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2041 - 2070

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

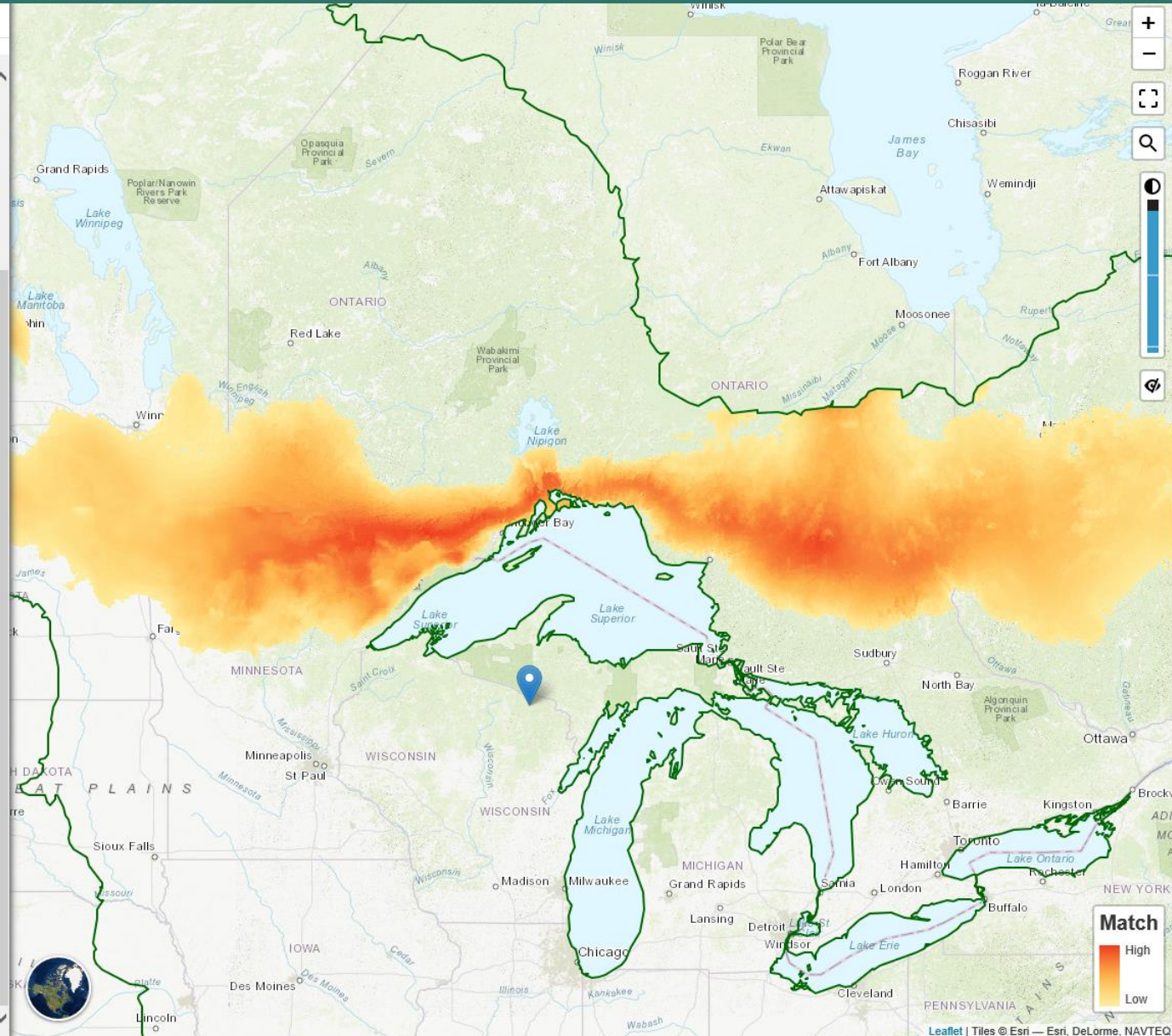
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Leaflet | Tiles © Esri — Esri, DeLorme, NAVTEQ

10:30 AM

11/21/2018

Planting sites for seedlot – 2080s + RCP8.5

About Tool Saved Runs

Elevation: 1516 ft (462 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2071 - 2100

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-11.7 °C	2.00 °C
MAP	784 mm	400 mm

Add a variable...

7 Apply constraints

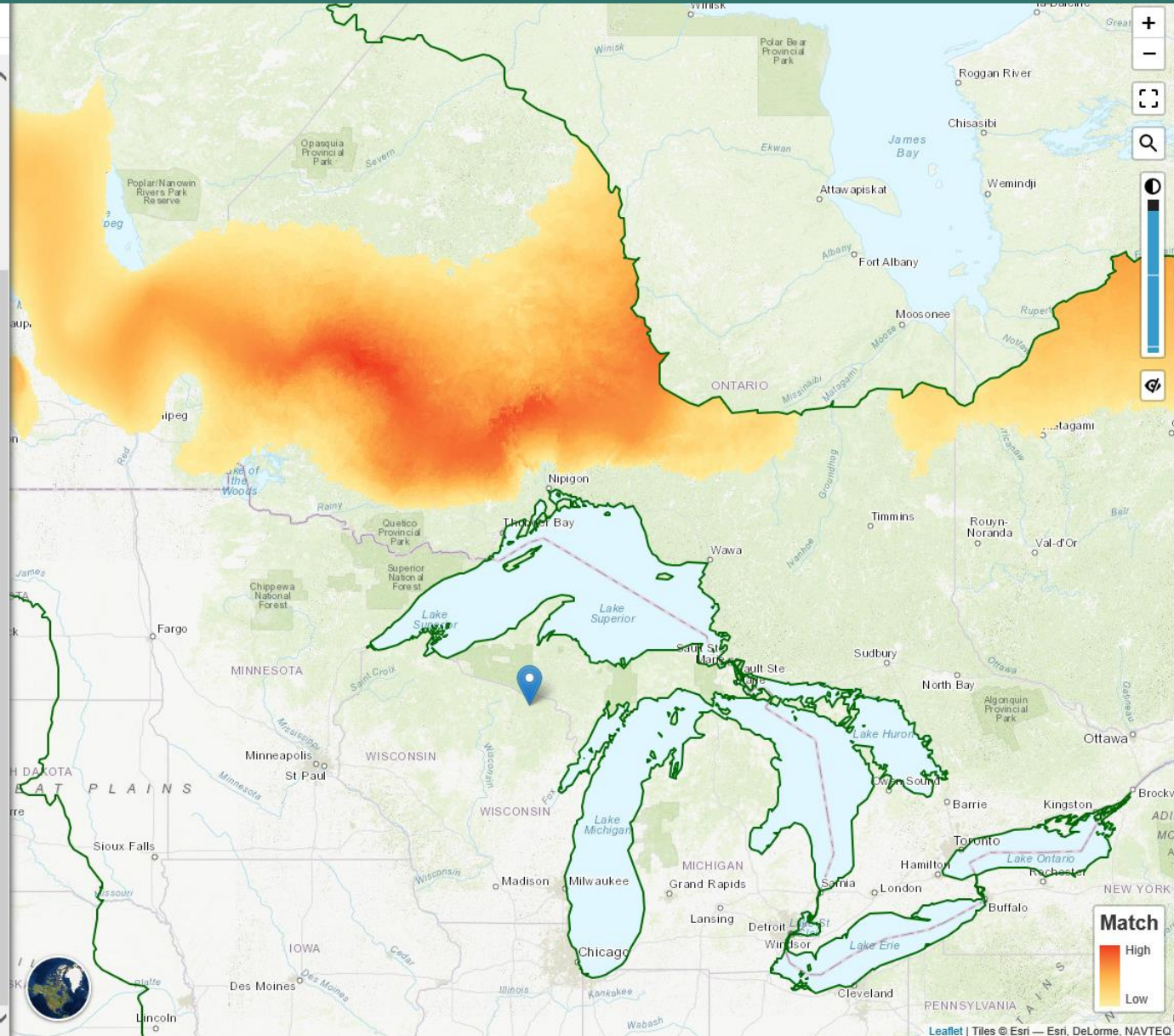
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – no climate change

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-0.1 °C	2.00 °C
MAP	1163 mm	400 mm

Add a variable...

7 Apply constraints

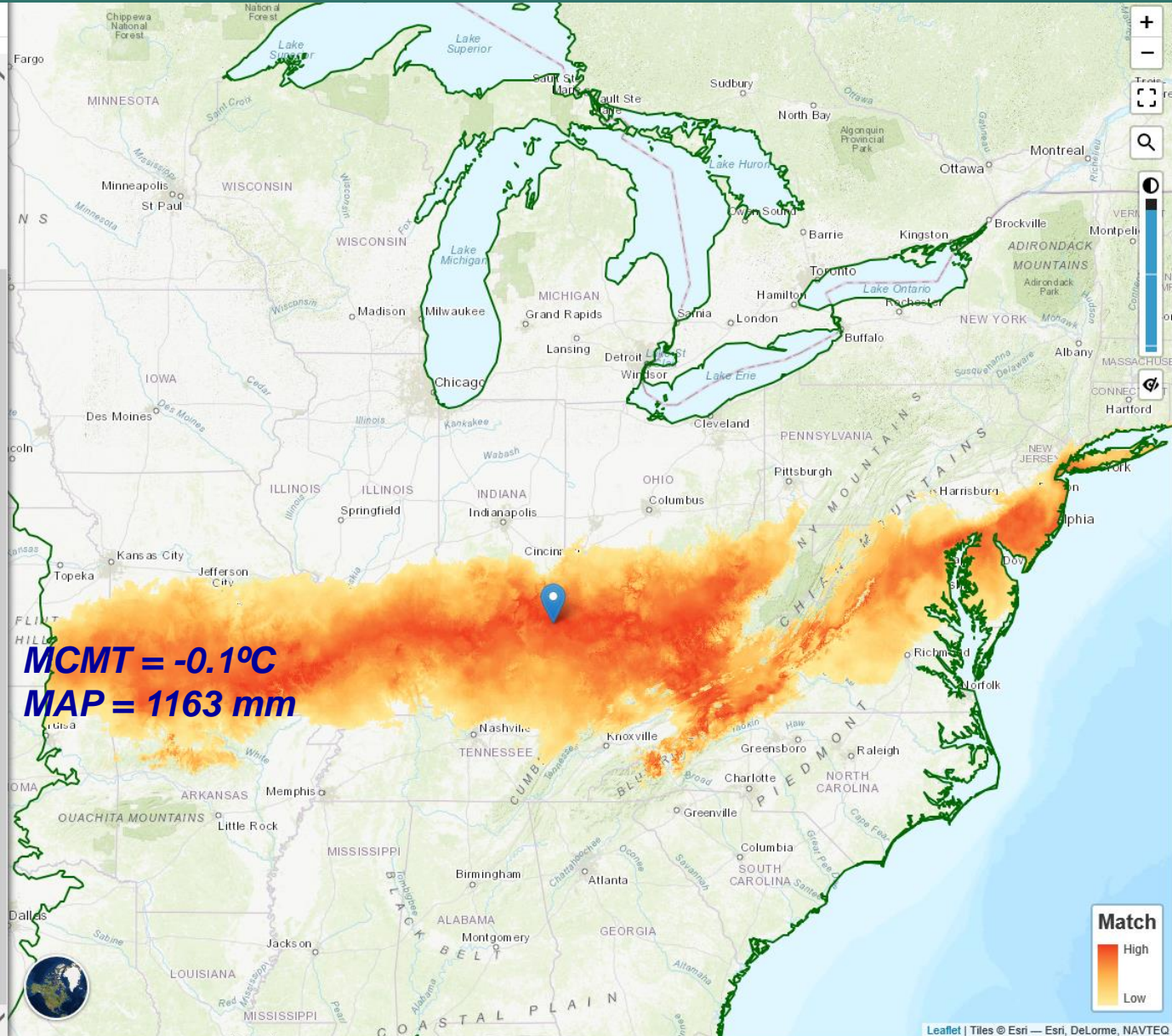
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – recent climate

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1981 - 2010

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	1.1 °C	<u>2.00 °C</u>
MAP	1193 mm	<u>400 mm</u>

Add a variable...

7 Apply constraints

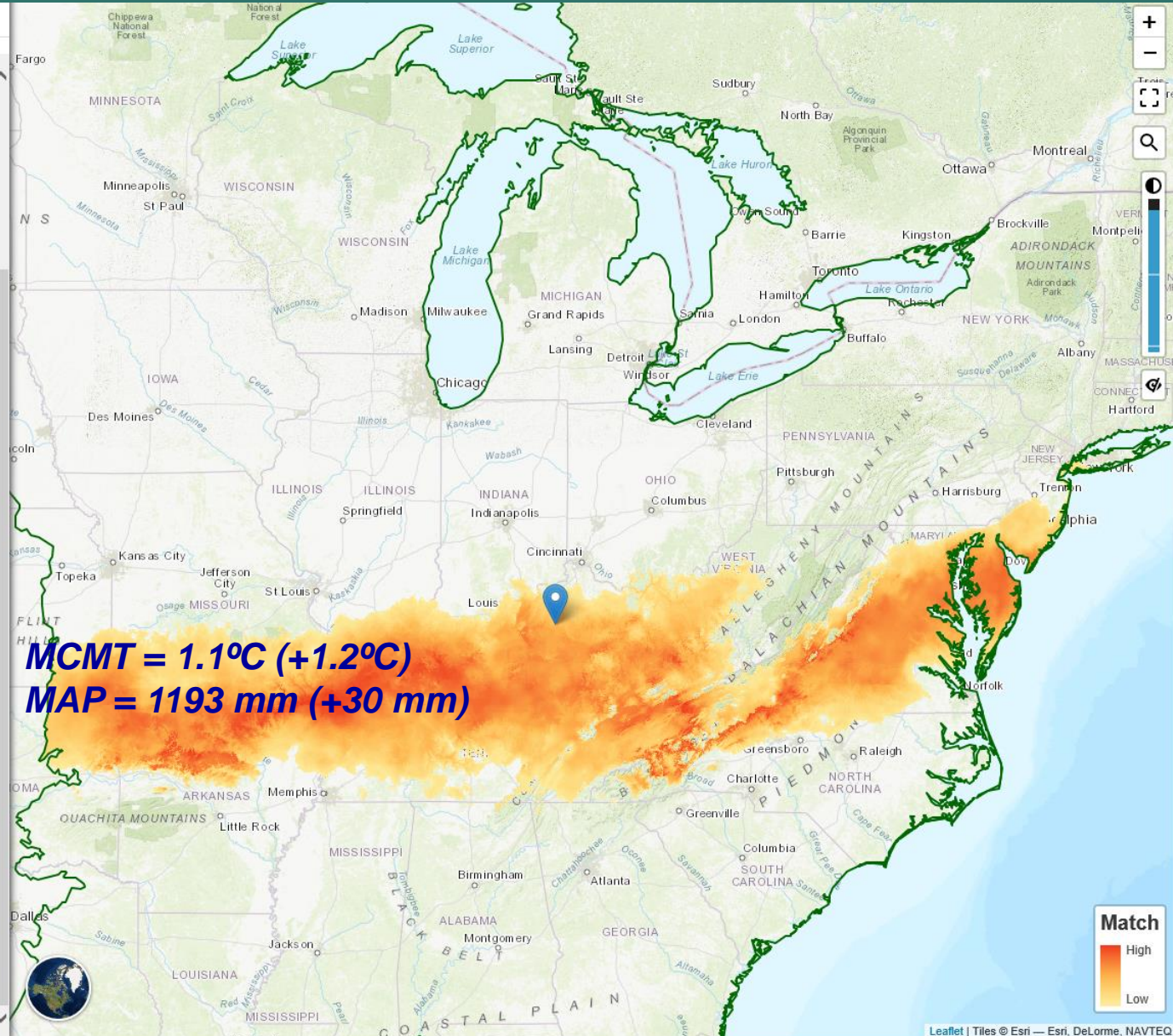
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – 2020s + RCP8.5

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2011 - 2040

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	1.4 °C	2.00 °C
MAP	1188 mm	400 mm

Add a variable...

7 Apply constraints

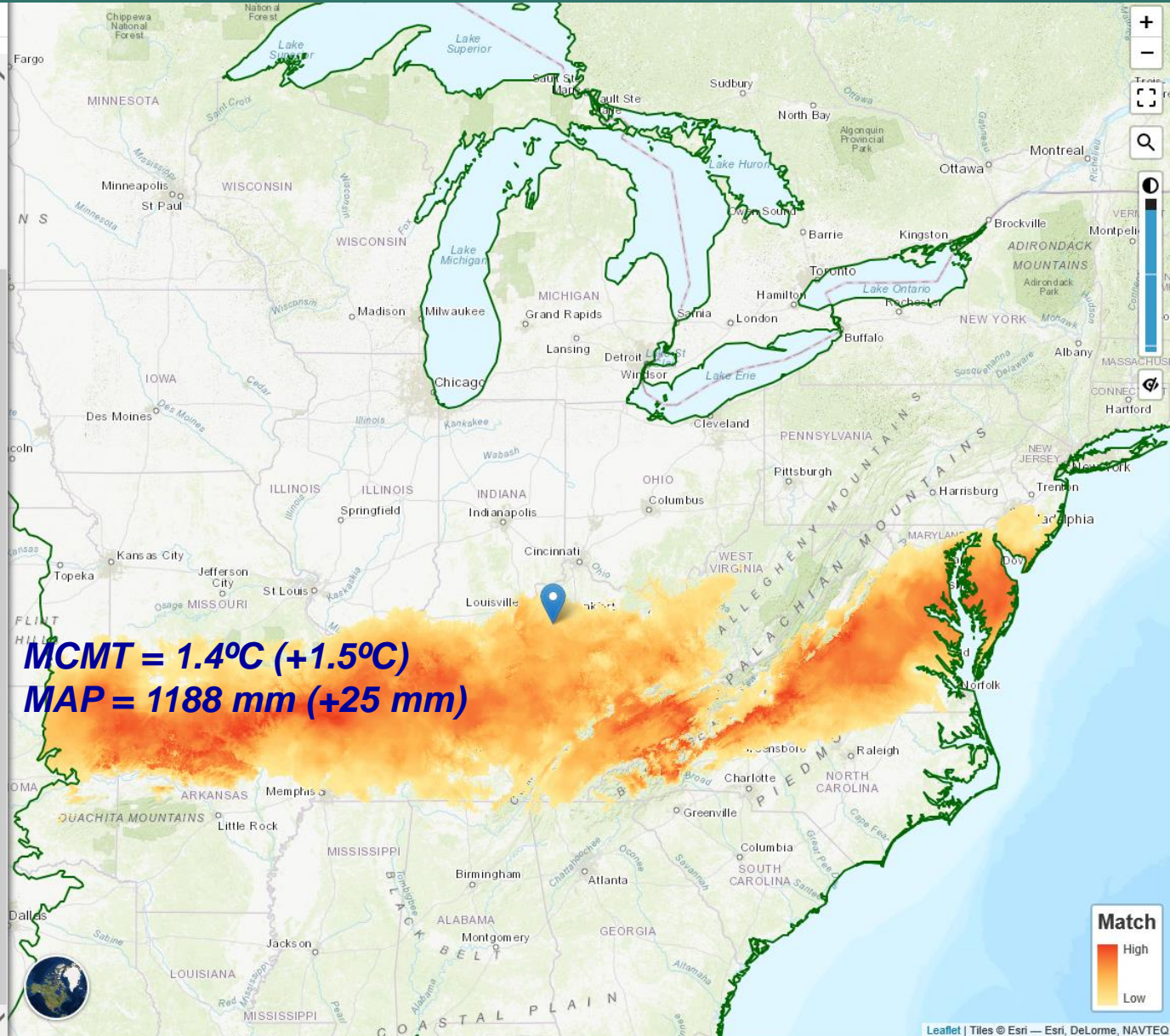
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – 2050s + RCP8.5

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2041 - 2070

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	3.0 °C	2.00 °C
MAP	1221 mm	400 mm

Add a variable...

7 Apply constraints

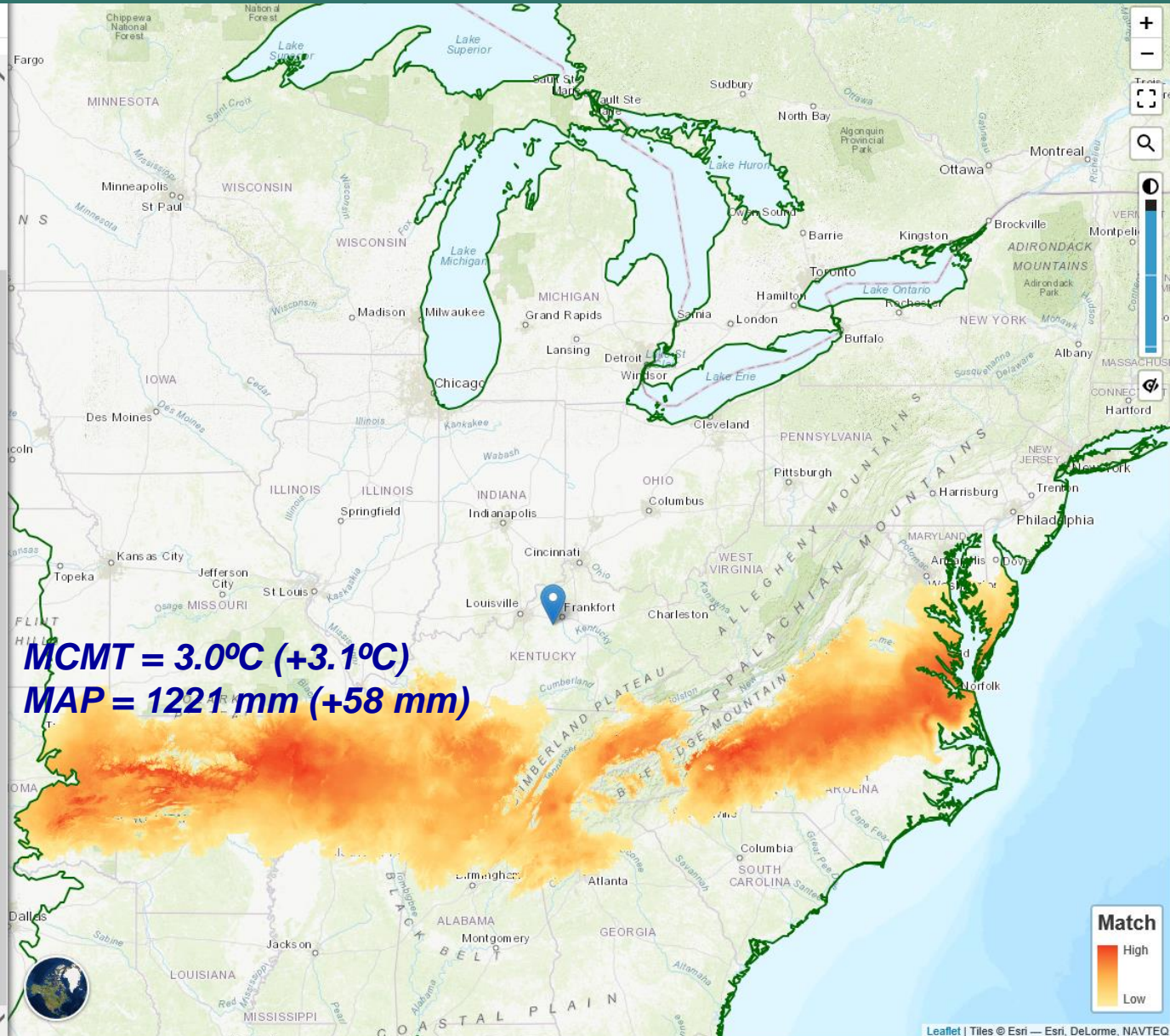
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – 2080s + RCP8.5

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2071 - 2100

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	4.6 °C	2.00 °C
MAP	1265 mm	400 mm

Add a variable...

7 Apply constraints

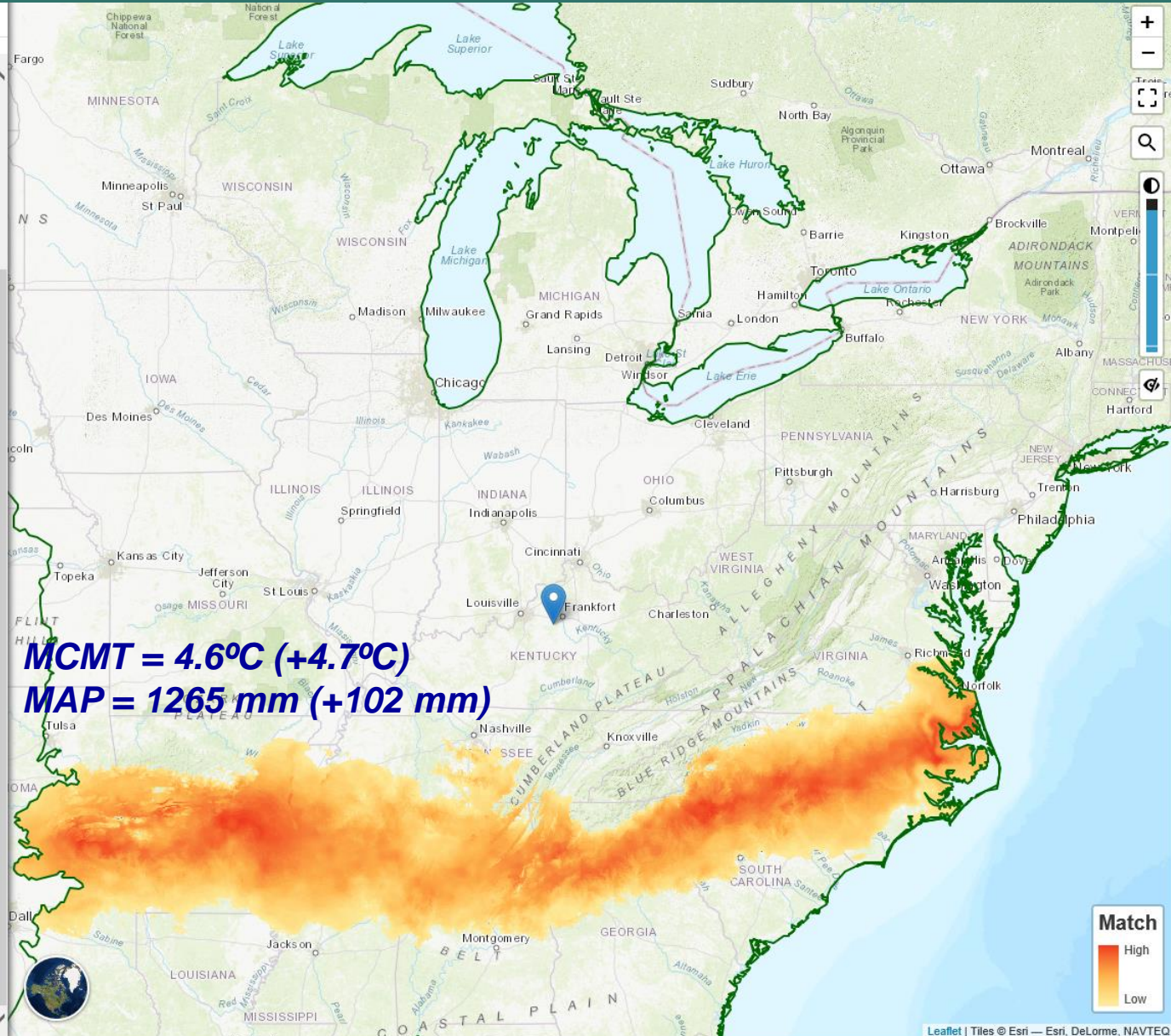
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Seedlots for planting site – no climate change

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1961 - 1990

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-0.1 °C	2.00 °C
MAP	1163 mm	400 mm

Add a variable...

7 Apply constraints

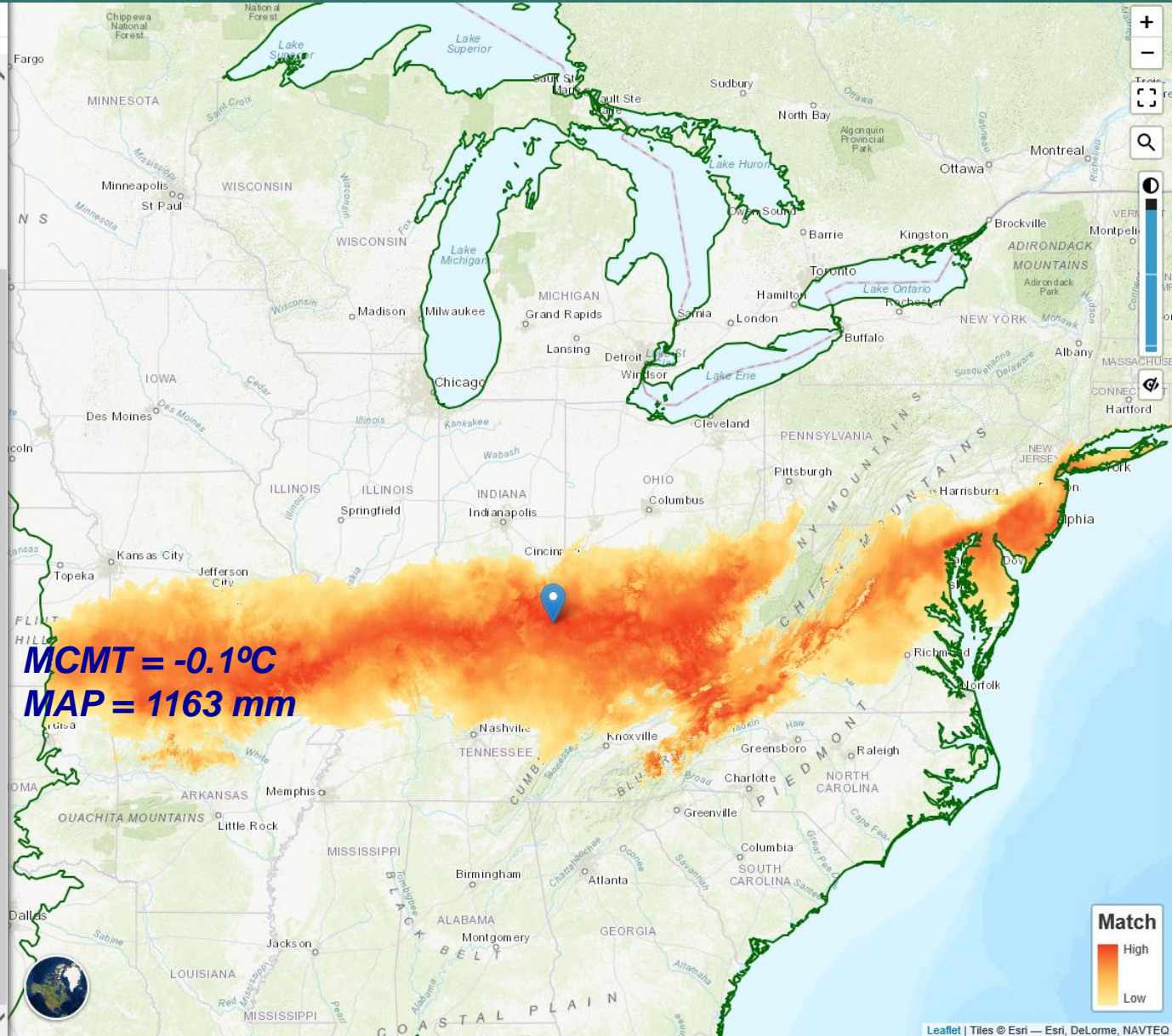
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – recent climate

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

1981 - 2010

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-0.1 °C	2.00 °C
MAP	1163 mm	400 mm

Add a variable...

7 Apply constraints

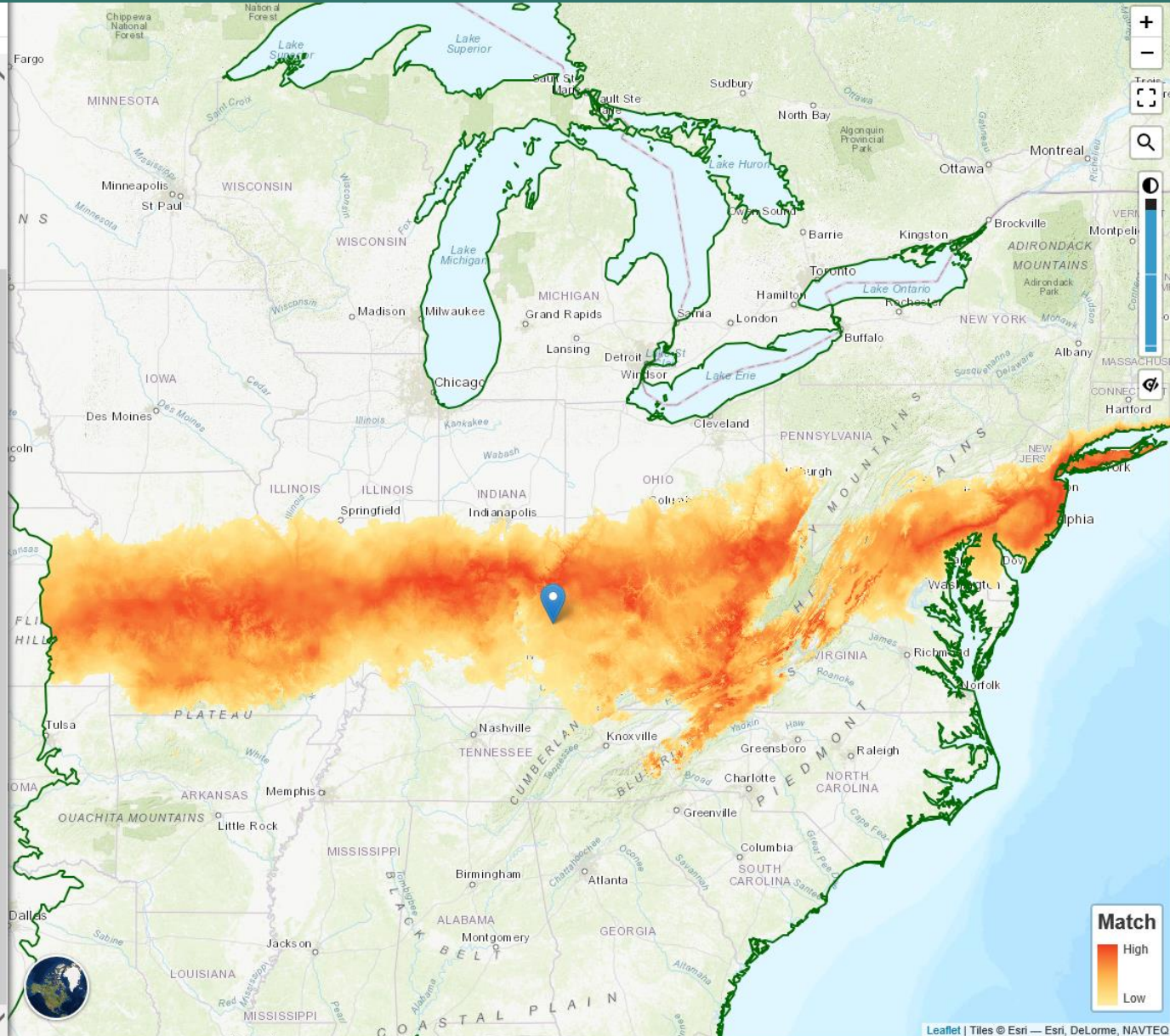
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – 2020s + RCP8.5

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2011 - 2040

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-0.1 °C	2.00 °C
MAP	1163 mm	400 mm

Add a variable...

7 Apply constraints

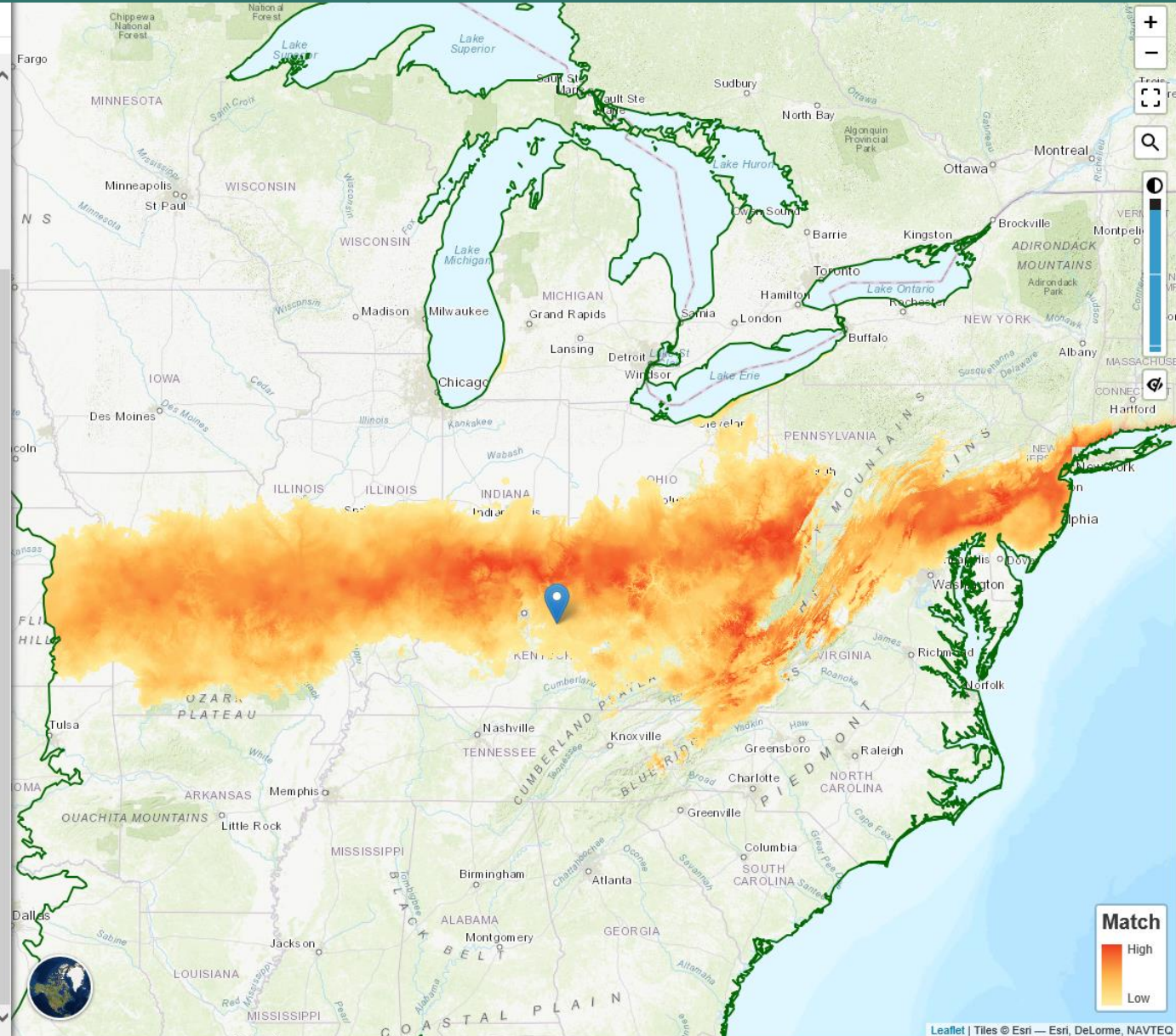
Add a constraint...

8 Map your Results

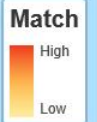
Run Tool

Save Last Run

Export As...



Leaflet | Tiles © Esri — Esri, DeLorme, NAVTEQ



11:24 AM
11/21/2018

Planting sites for seedlot – 2050s + RCP8.5

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2041 - 2070

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-0.1 °C	2.00 °C
MAP	1163 mm	400 mm

Add a variable...

7 Apply constraints

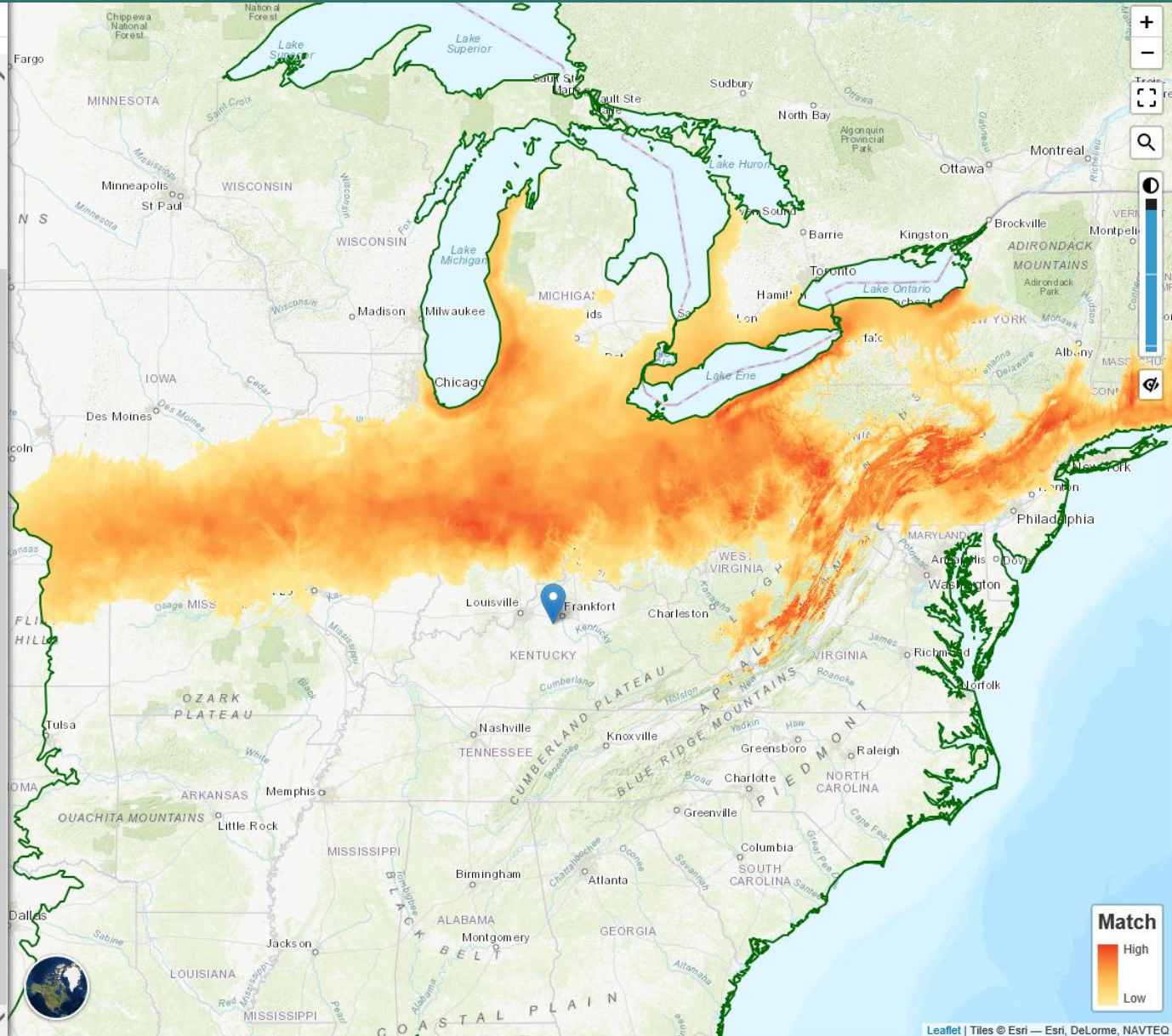
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



Planting sites for seedlot – 2080s + RCP8.5

About Tool Saved Runs

Elevation: 843 ft (257 m)

3 Select region

Automatic Custom

Region: Eastern US

4 Select climate scenarios

Which climate are the seedlots adapted to?

1961 - 1990

When should trees be best adapted to the planting site?

2071 - 2100

RCP8.5

5 Select transfer limit method

Custom Zone

6 Select climate variables

Units: Metric Imperial

Name	Center	Transfer limit (+/-)
MCMT	-0.1 °C	2.00 °C
MAP	1163 mm	400 mm

Add a variable...

7 Apply constraints

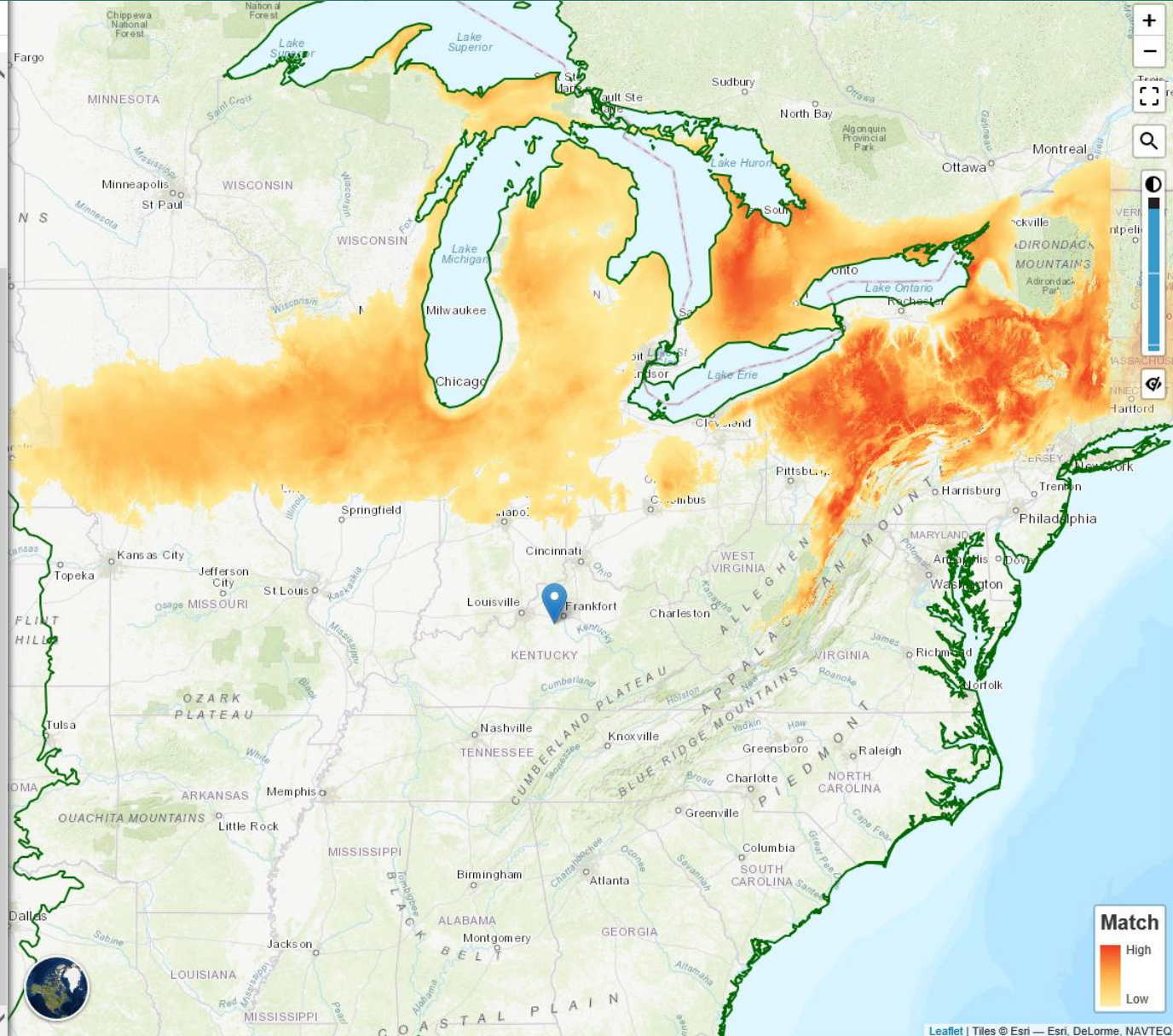
Add a constraint...

8 Map your Results

Run Tool

Save Last Run

Export As...



<https://seedlotselectiontool.org/sst/>

