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

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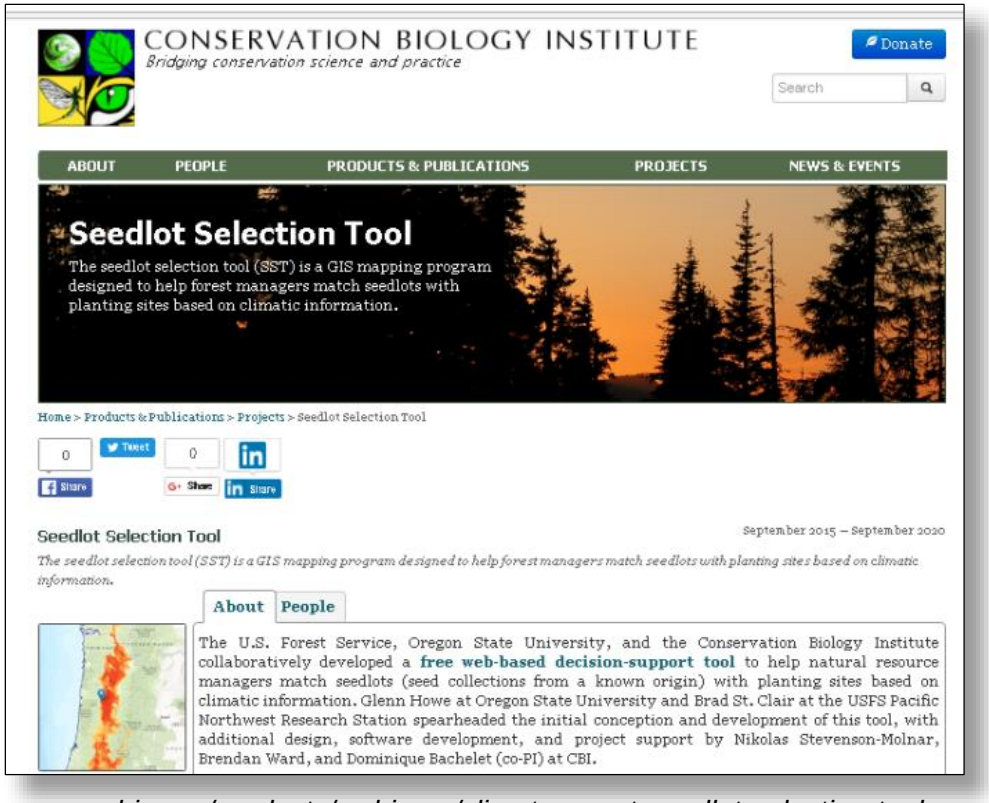

consbio.org/products/webinars/climate-smart-seedlot-selection-tool

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Addressing Climate Change Risk

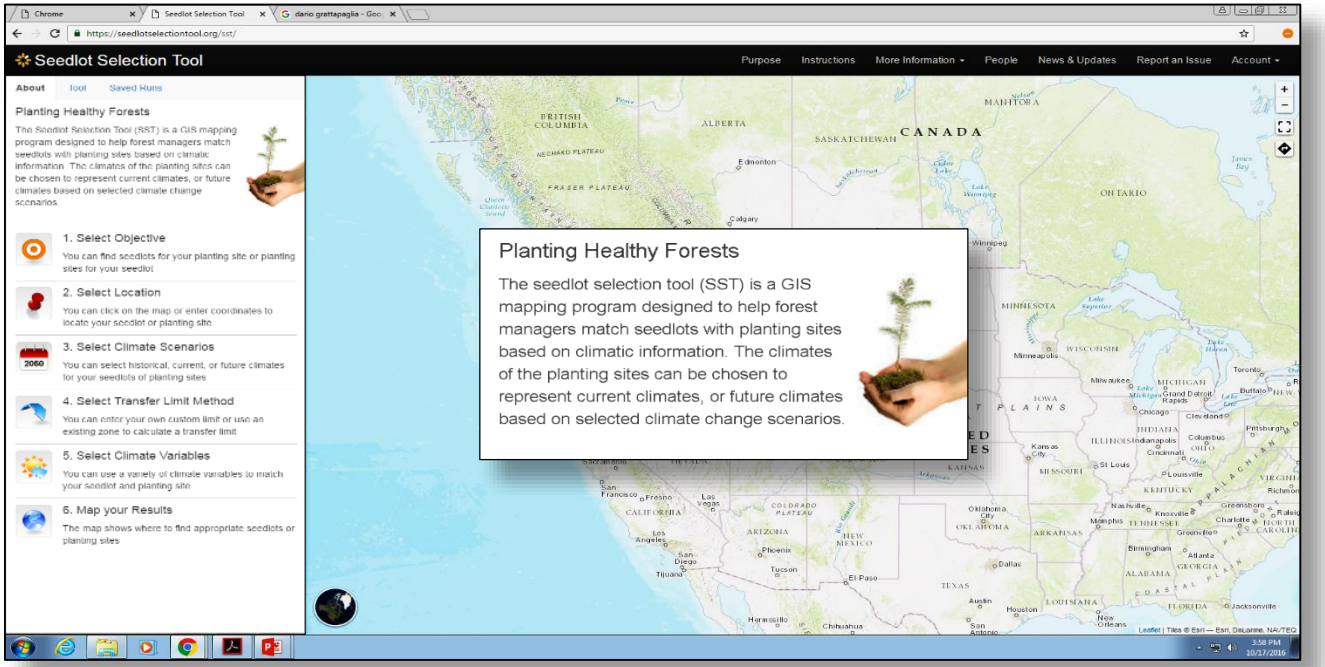
- Climates are warming and are expected to continue to warm, more so in the north than in the south
- In the short-term (currently, next decade or so), local populations are adapted to the local climate (within range of current transfer guidelines)
- In the long-term (by mid- to late-century), local 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

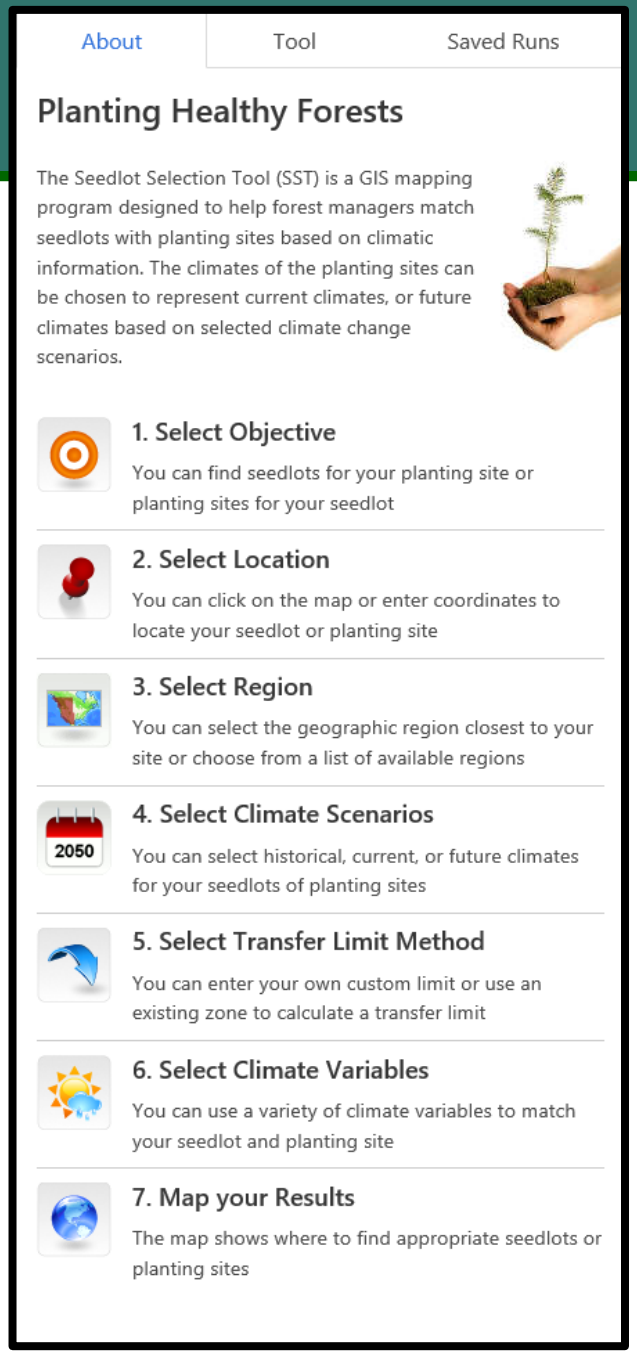
Given a seedlot

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



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

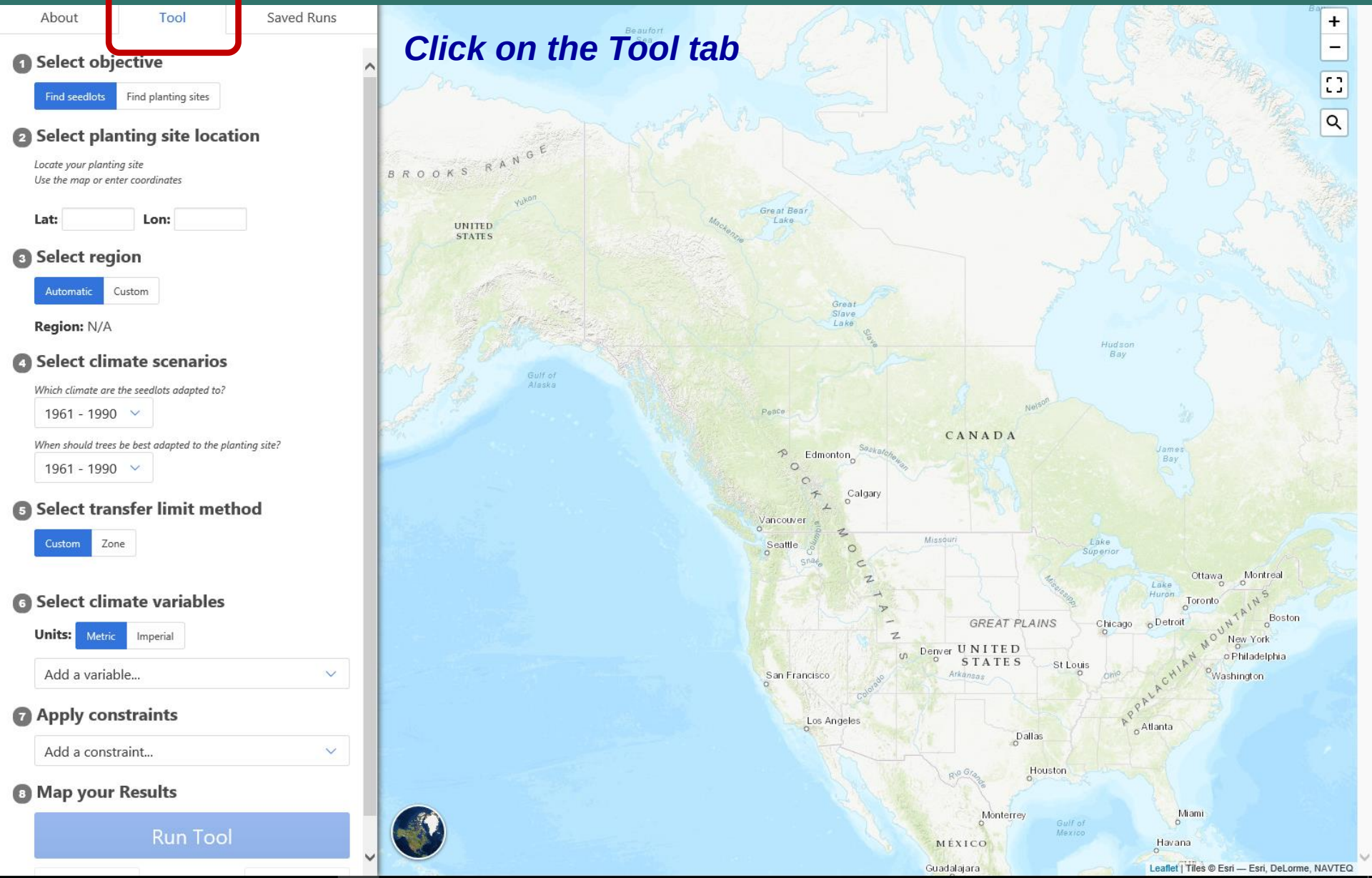
1.1. Find Seedlots For my Planting Site

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

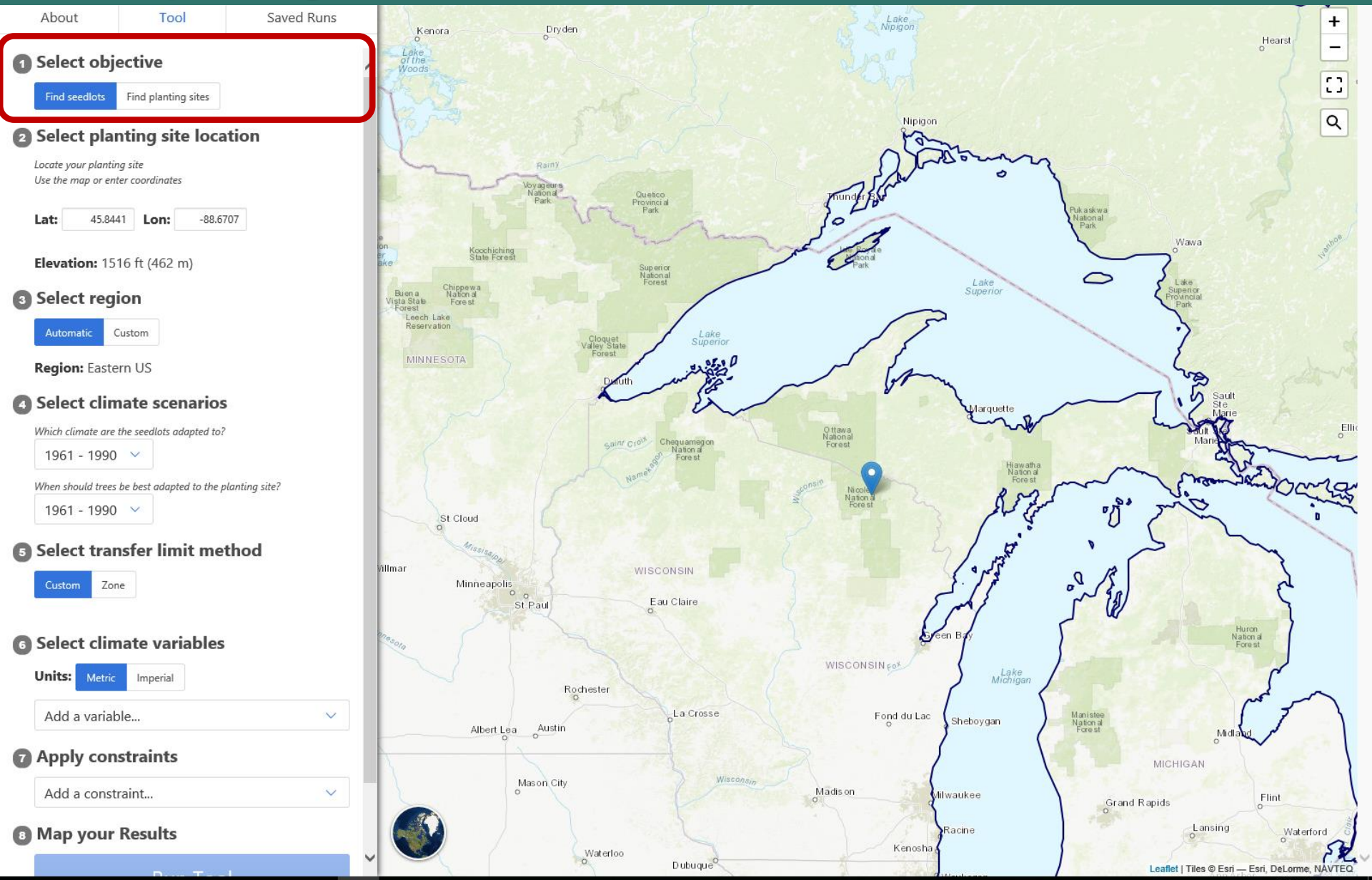
1.2. Find Planting Sites for my Seedlot

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

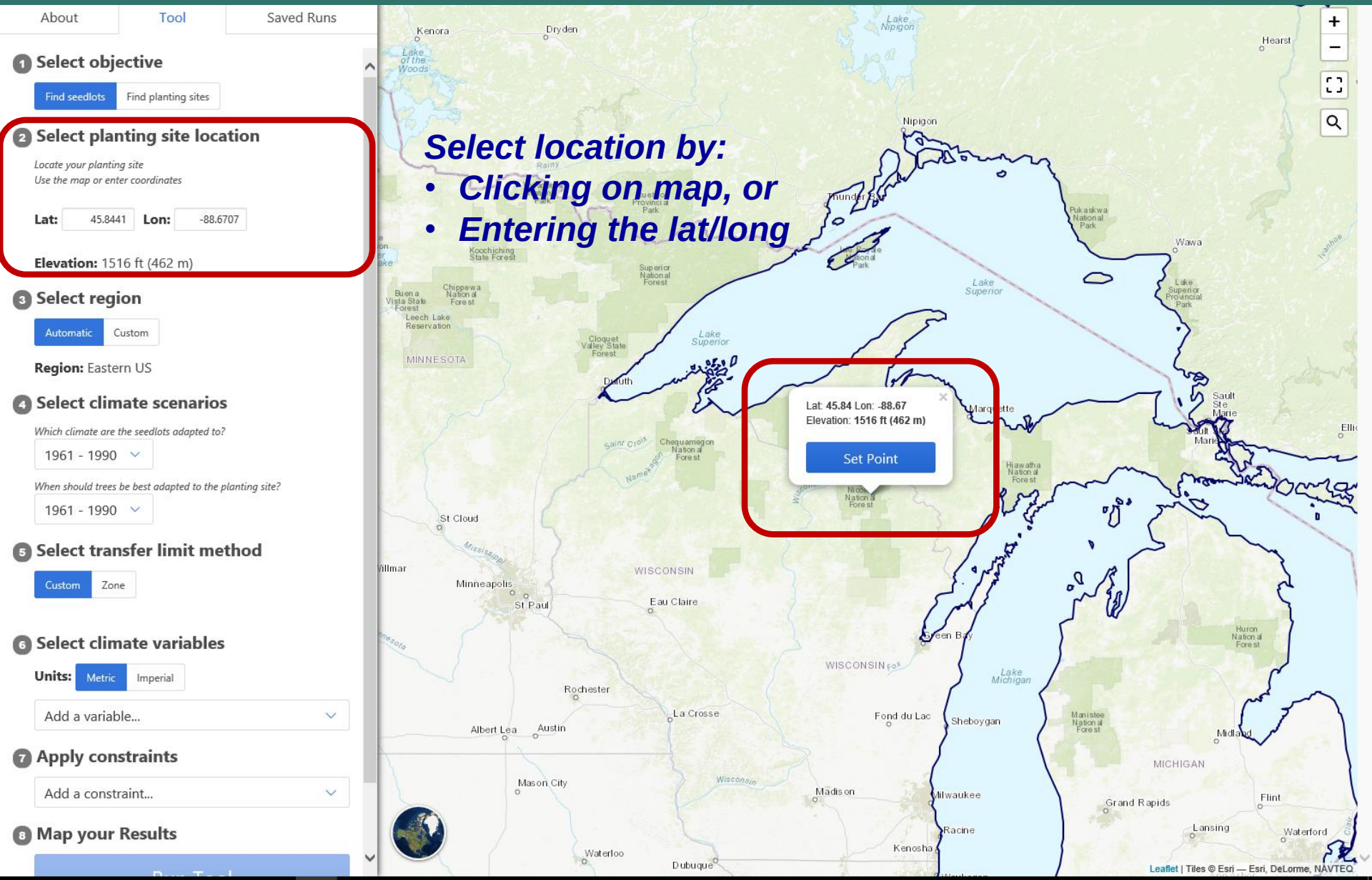
Seedlot Selection Tool Workflow



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



Select location



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

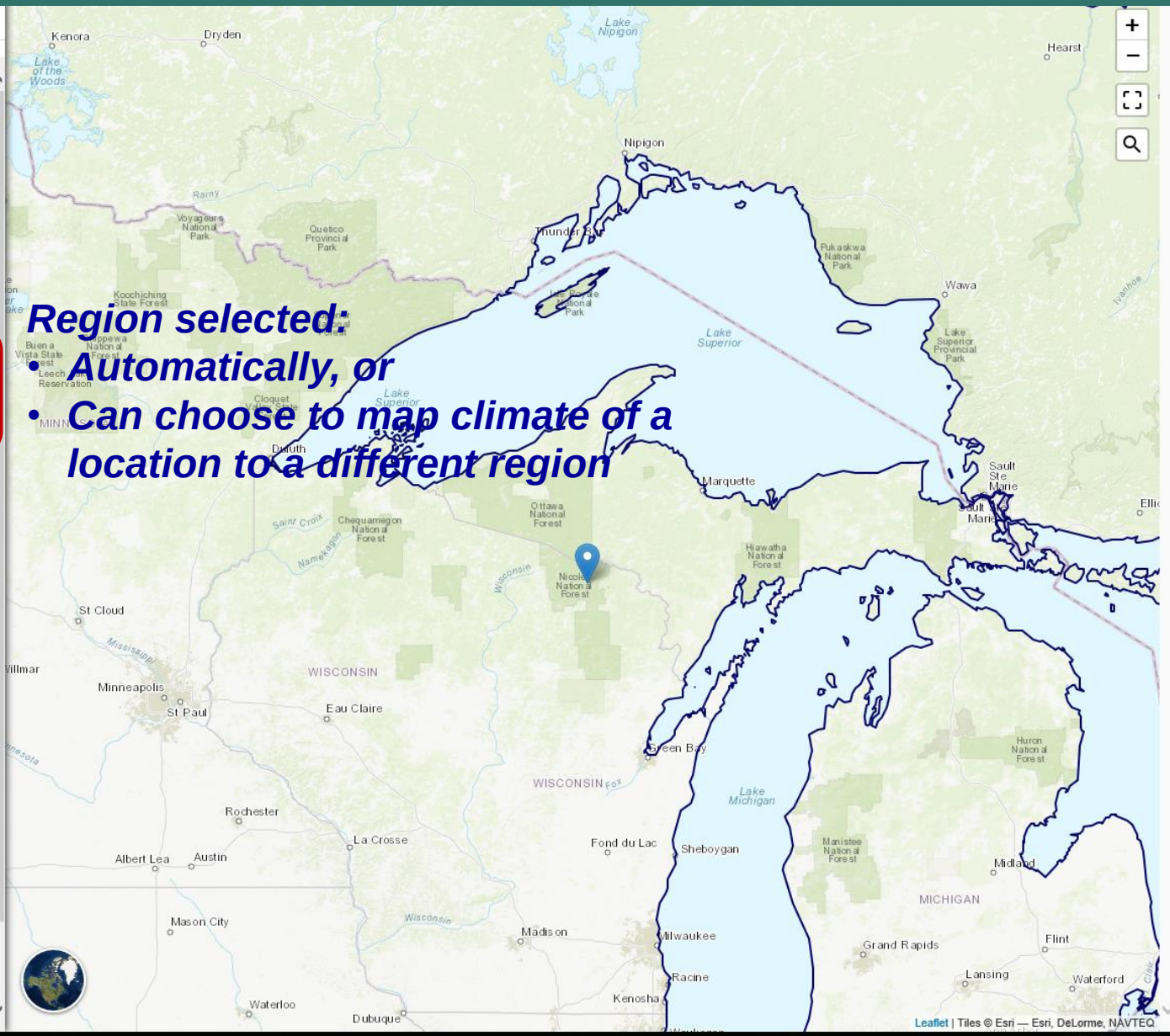
Add a variable...

7 Apply constraints

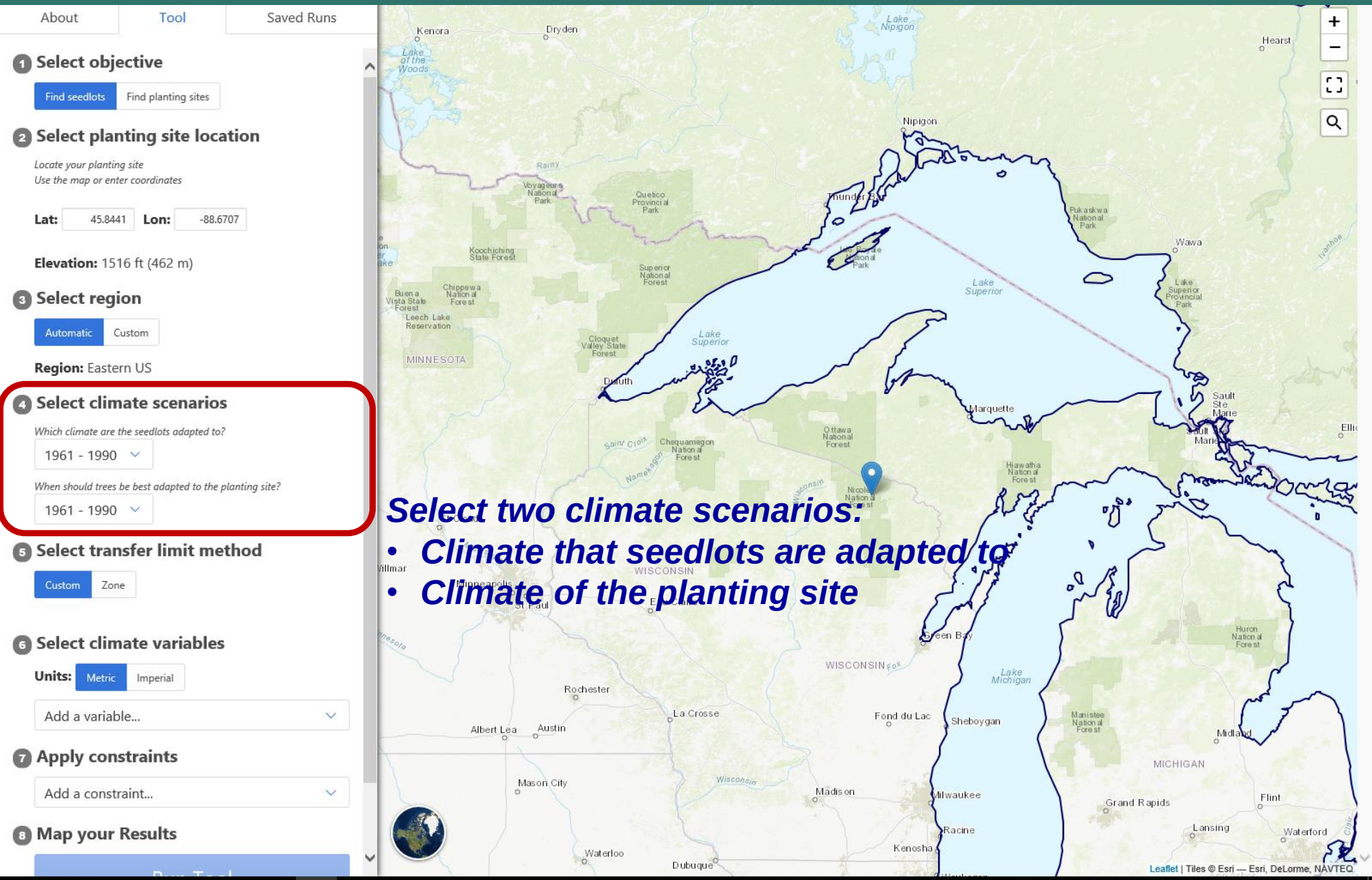
Add a constraint...

8 Map your Results

- ***Region selected:***
- ***Automatically, or***
- ***Can choose to map climate of a location to a different region***



Select climate scenarios



Select two climate scenarios:

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

Select transfer limit method

About | Tool | Saved Runs

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Custom | Zone

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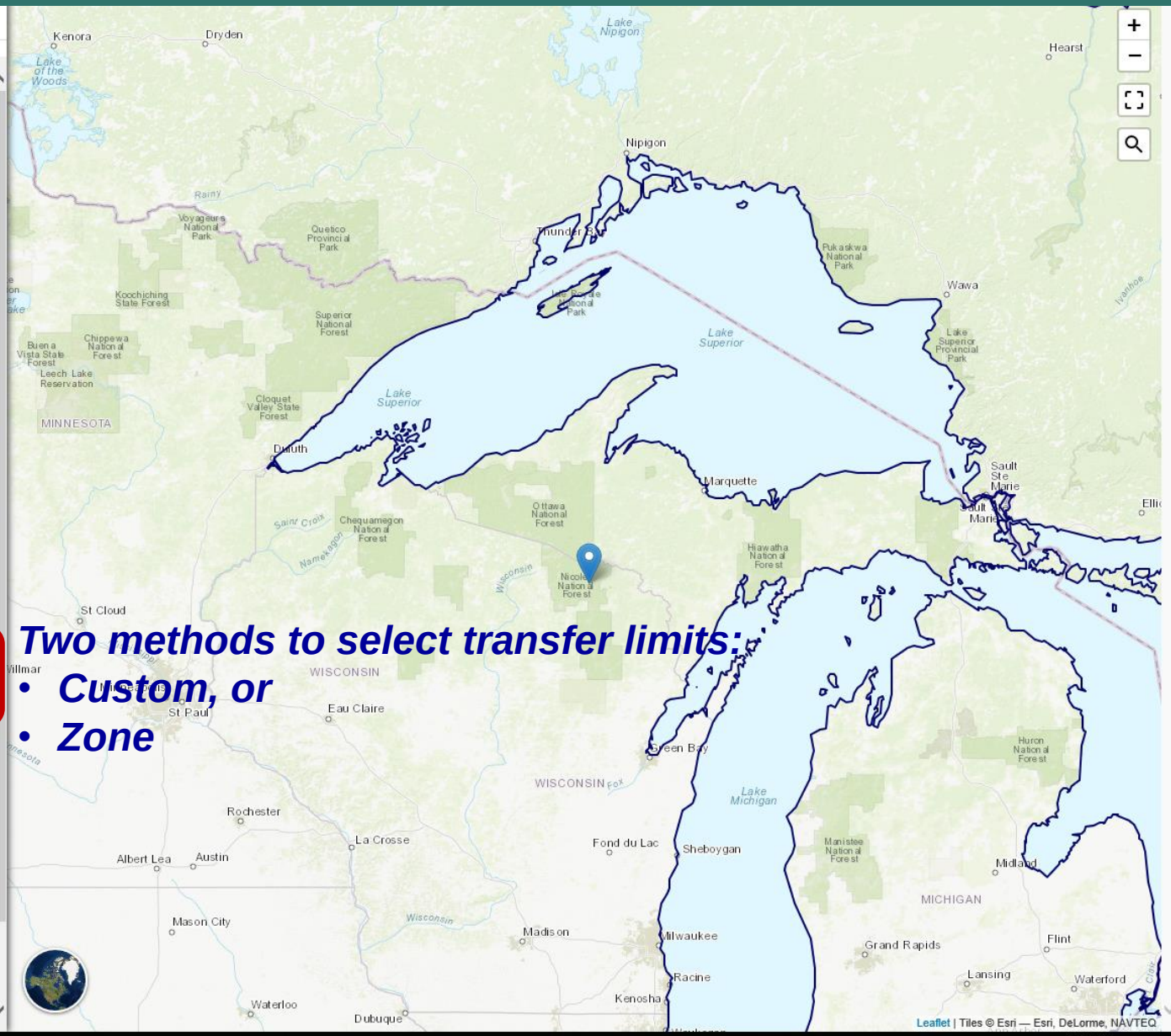
Units: Metric | Imperial

Add a variable...

7 Apply constraints

Add a constraint...

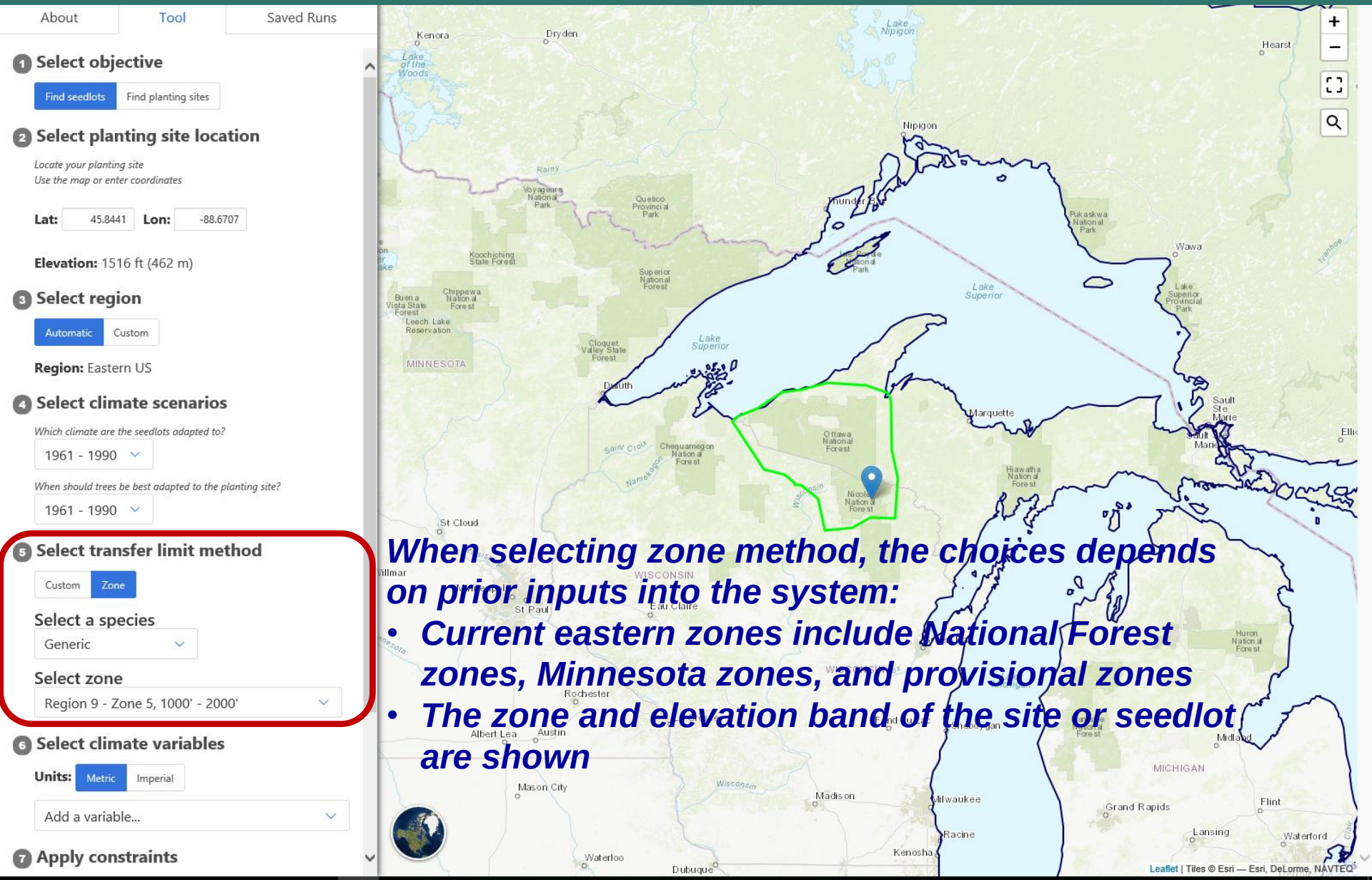
8 Map your Results



Two methods to select transfer limits:

- ***Custom, or***
- ***Zone***

Using seed zones to define transfer limits



Select climate variables

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2 Select planting site location

Locate your planting site
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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"

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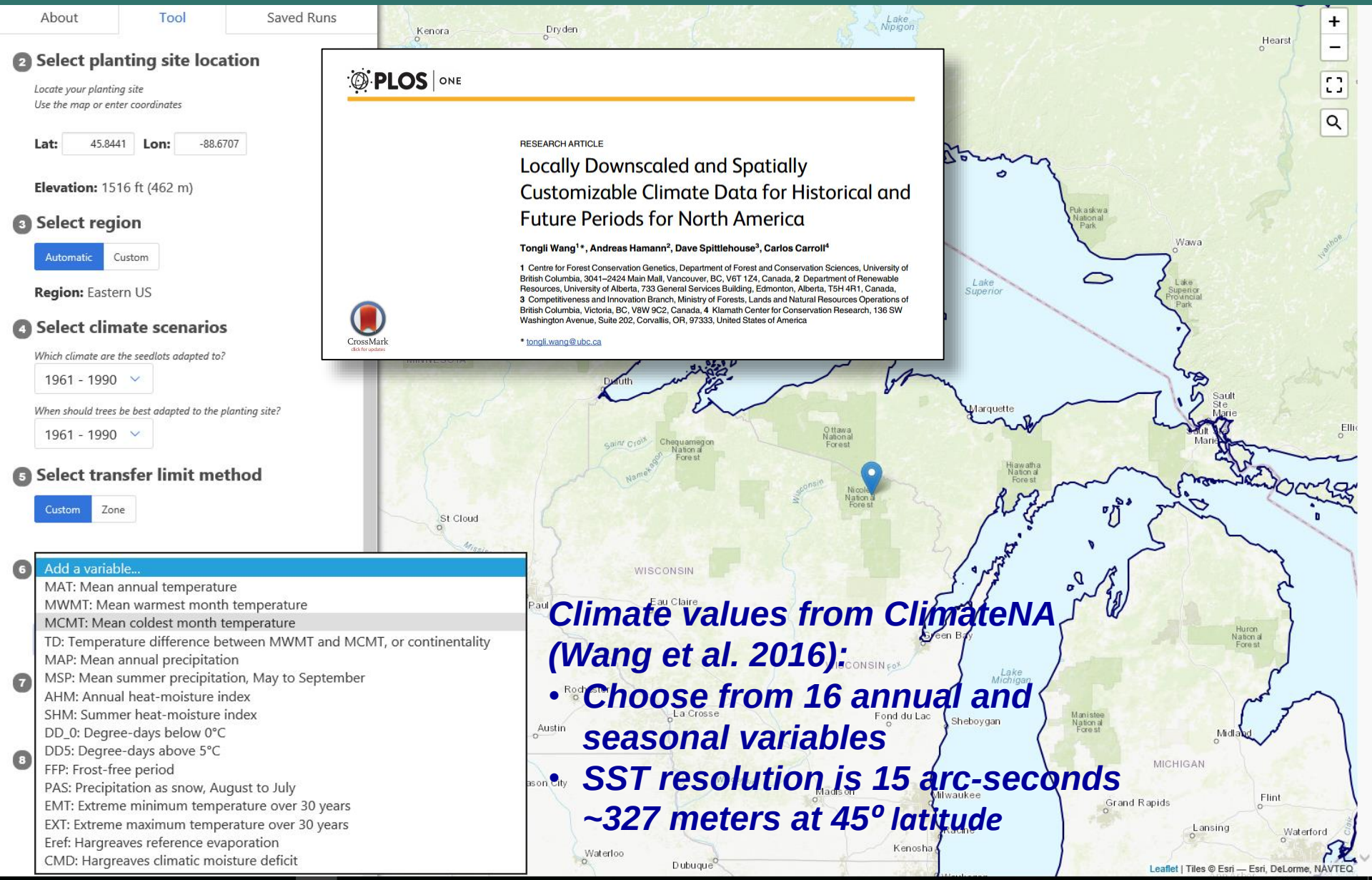
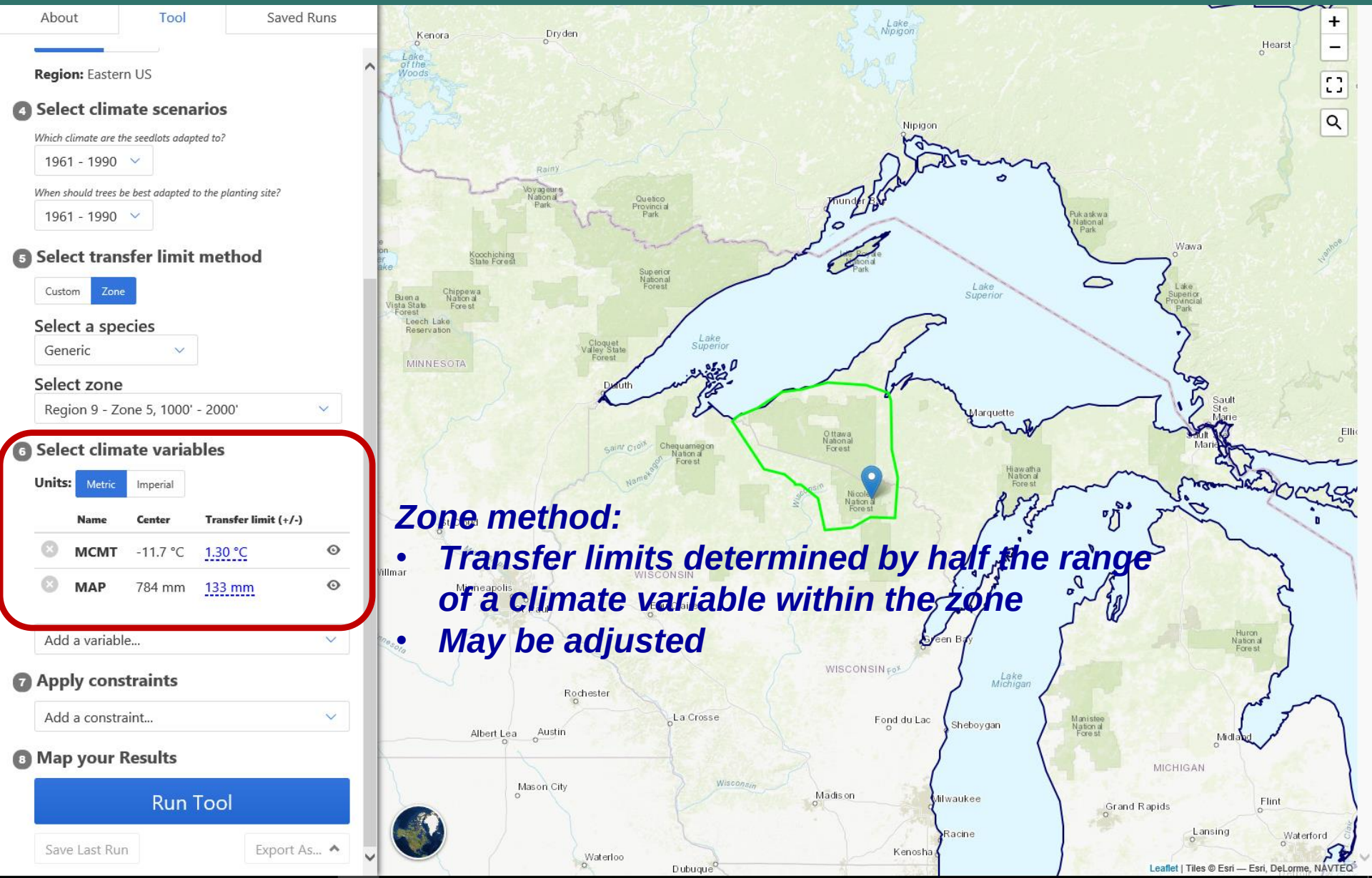
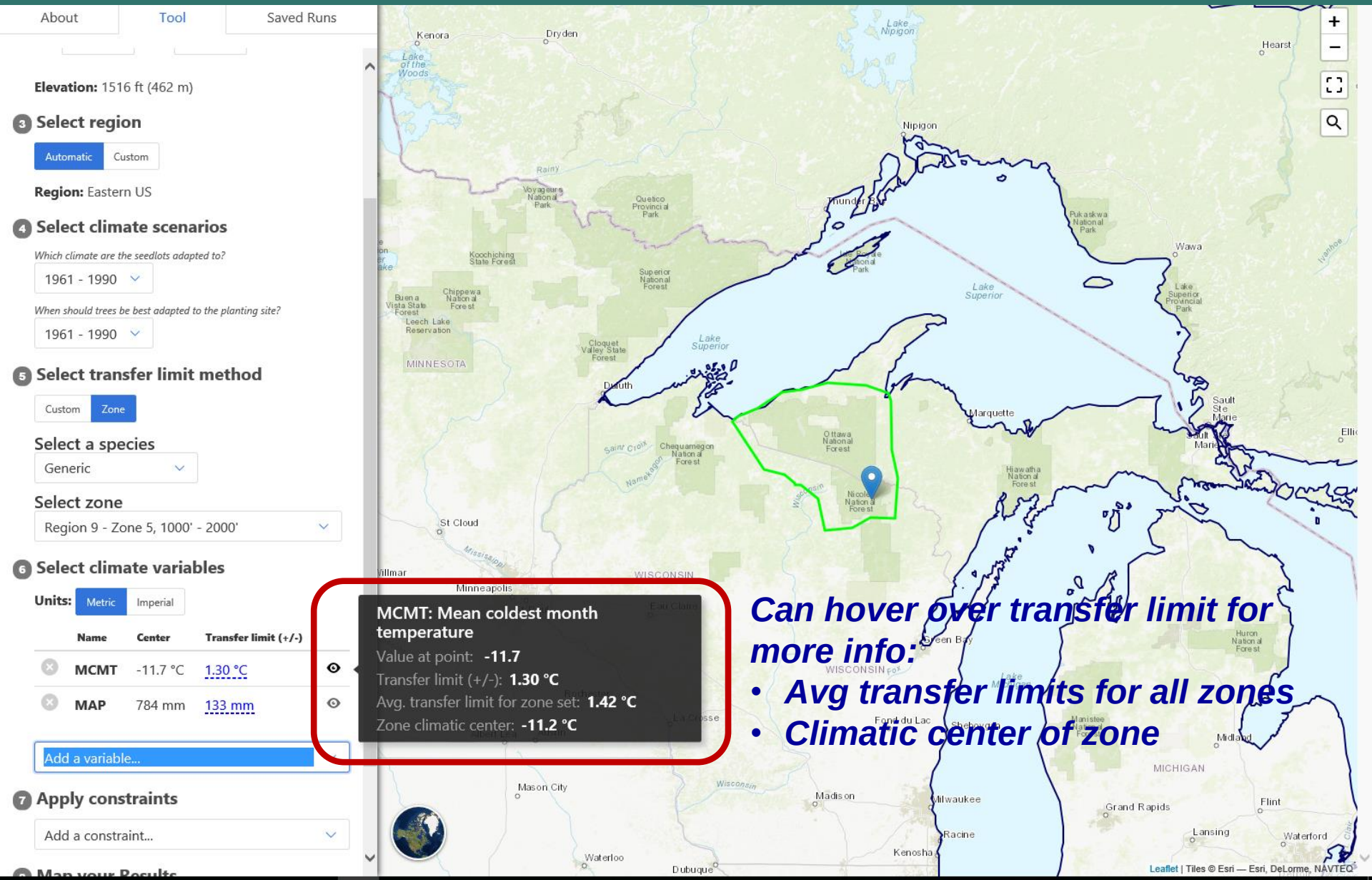
Climate variables from which to choose



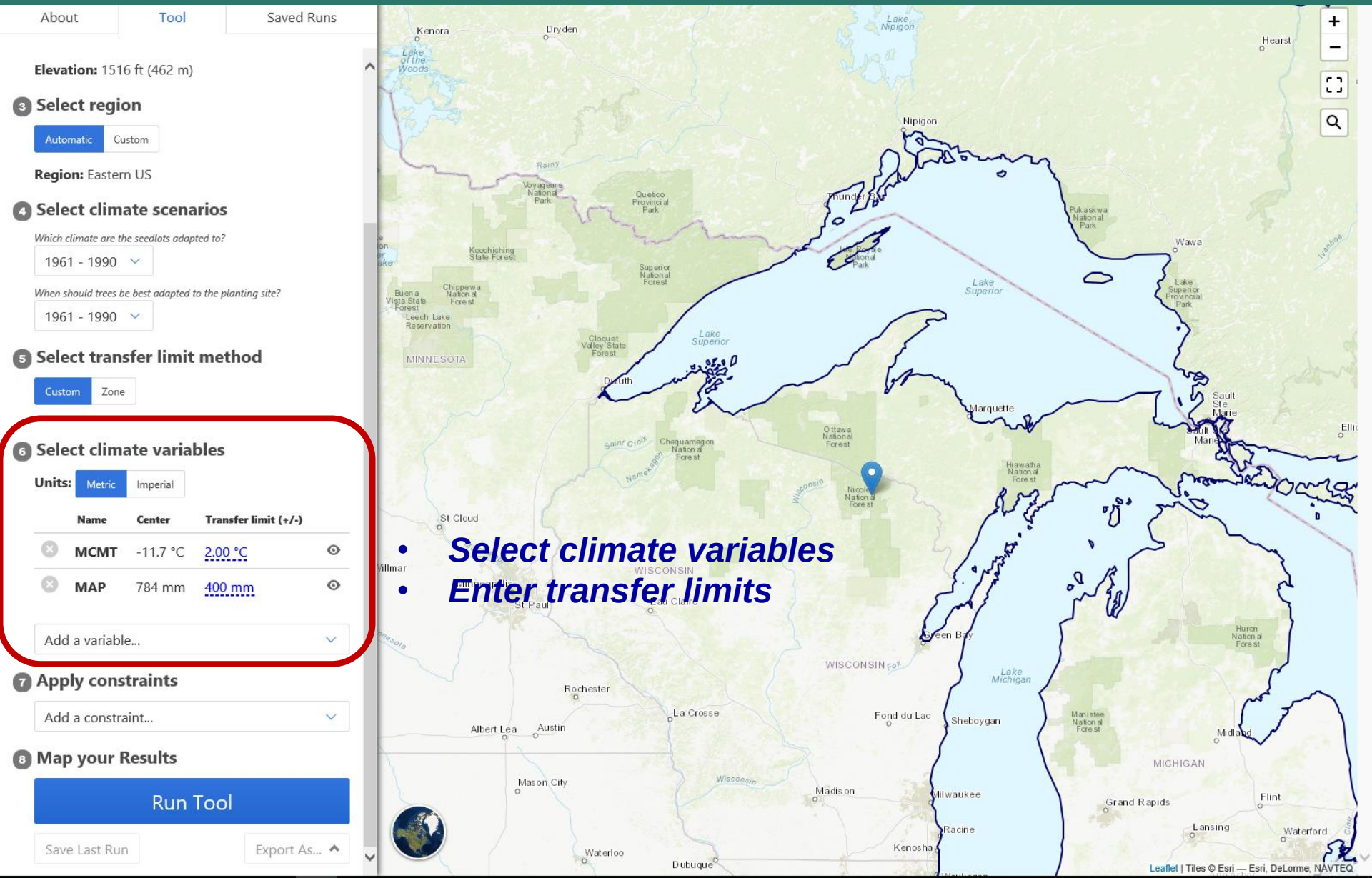
Select measure of cold and water availability



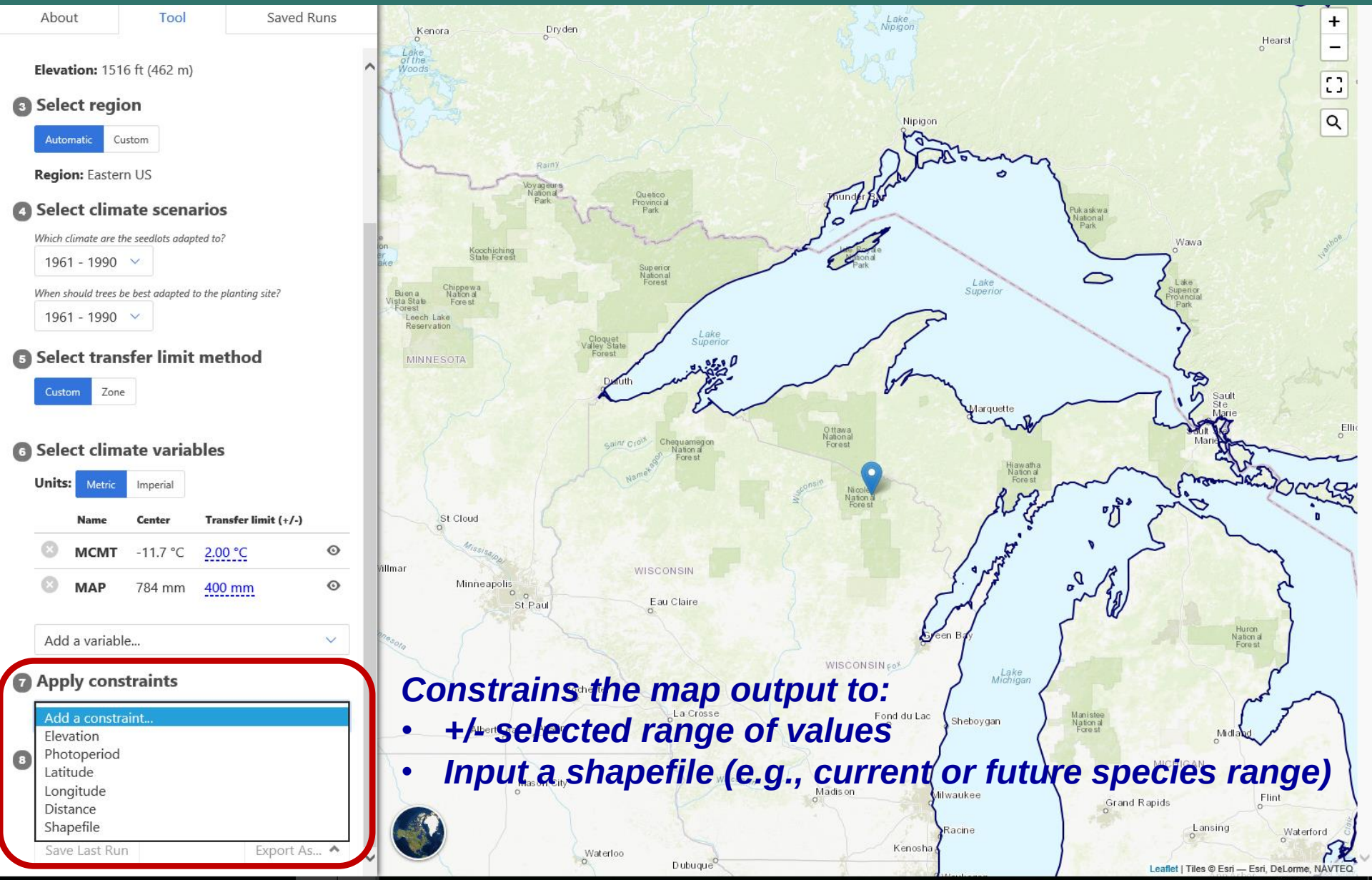
Can ‘hover’ for more information



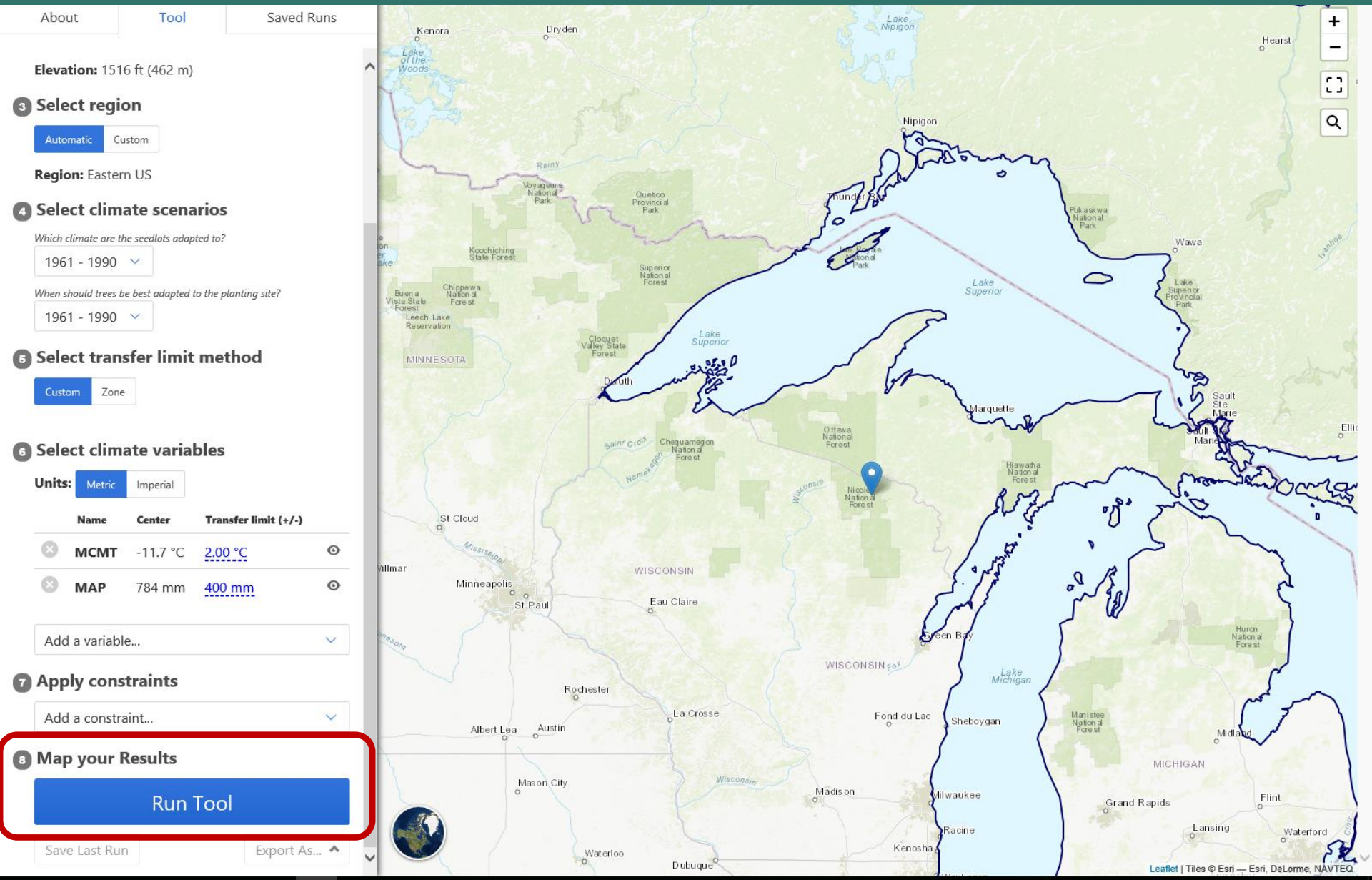
Using custom method



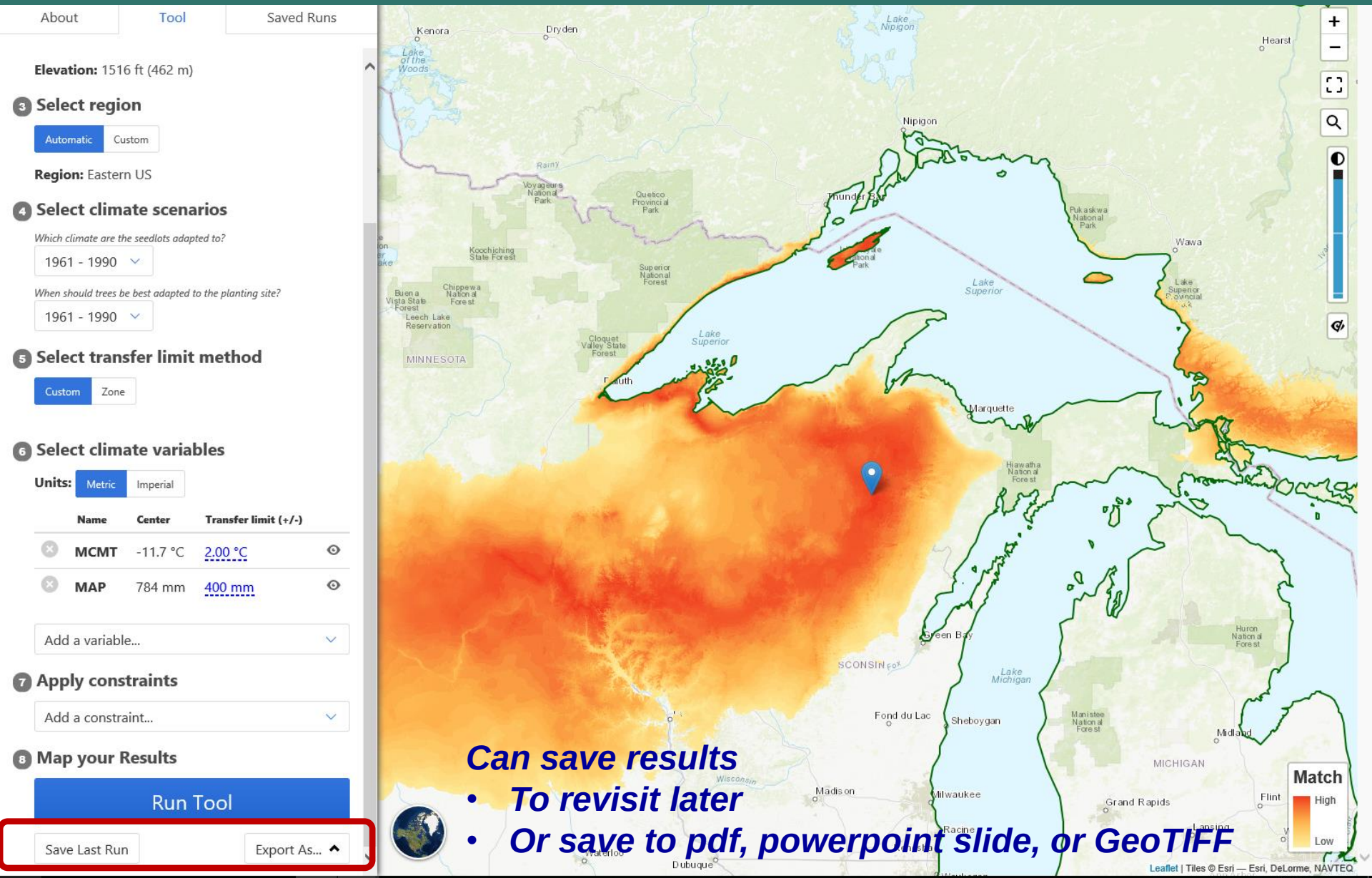
Can apply constraints



Map your results

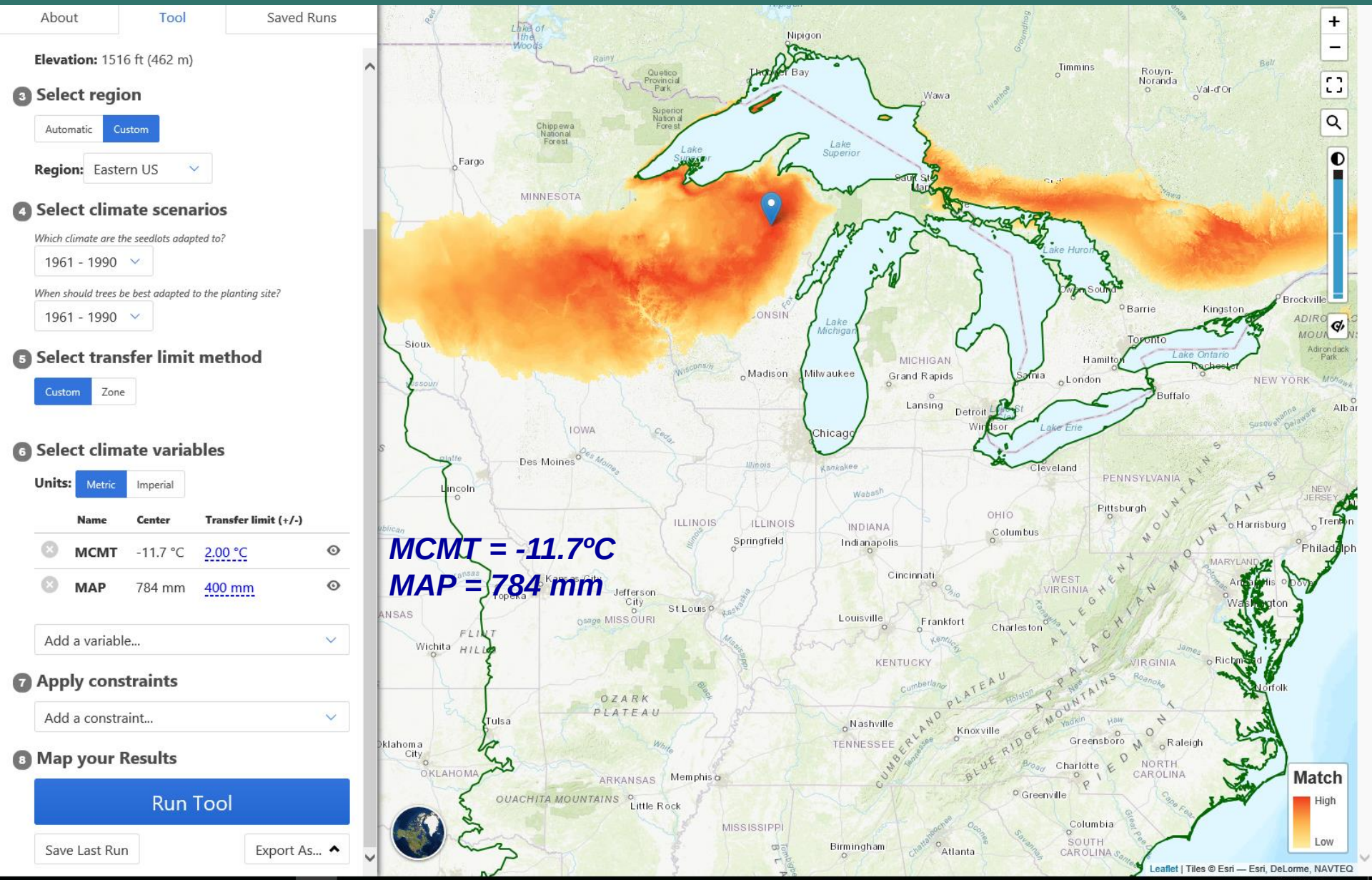


Seedlots for planting site – no climate change

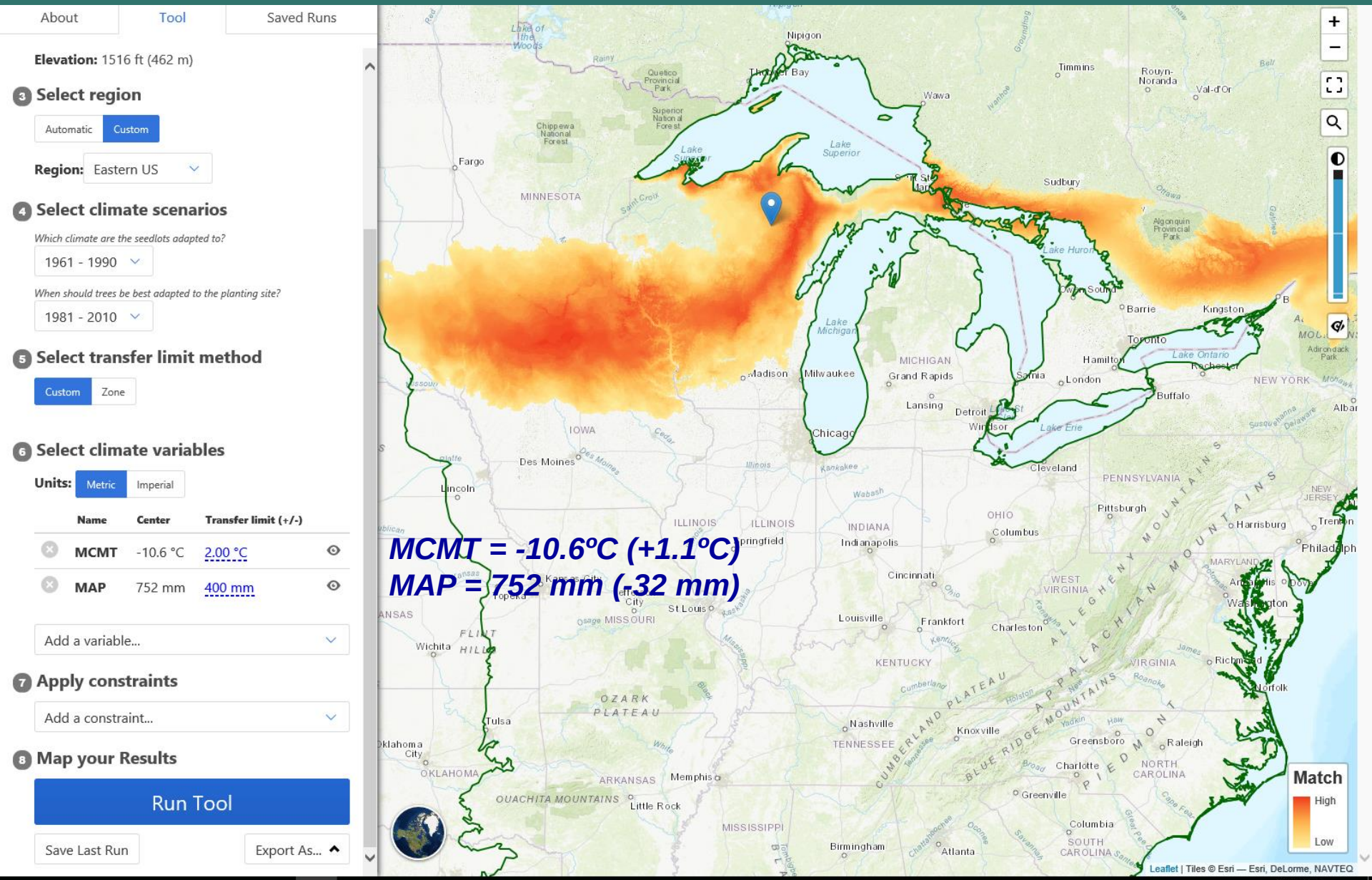


Seedlot Selection Tool Examples

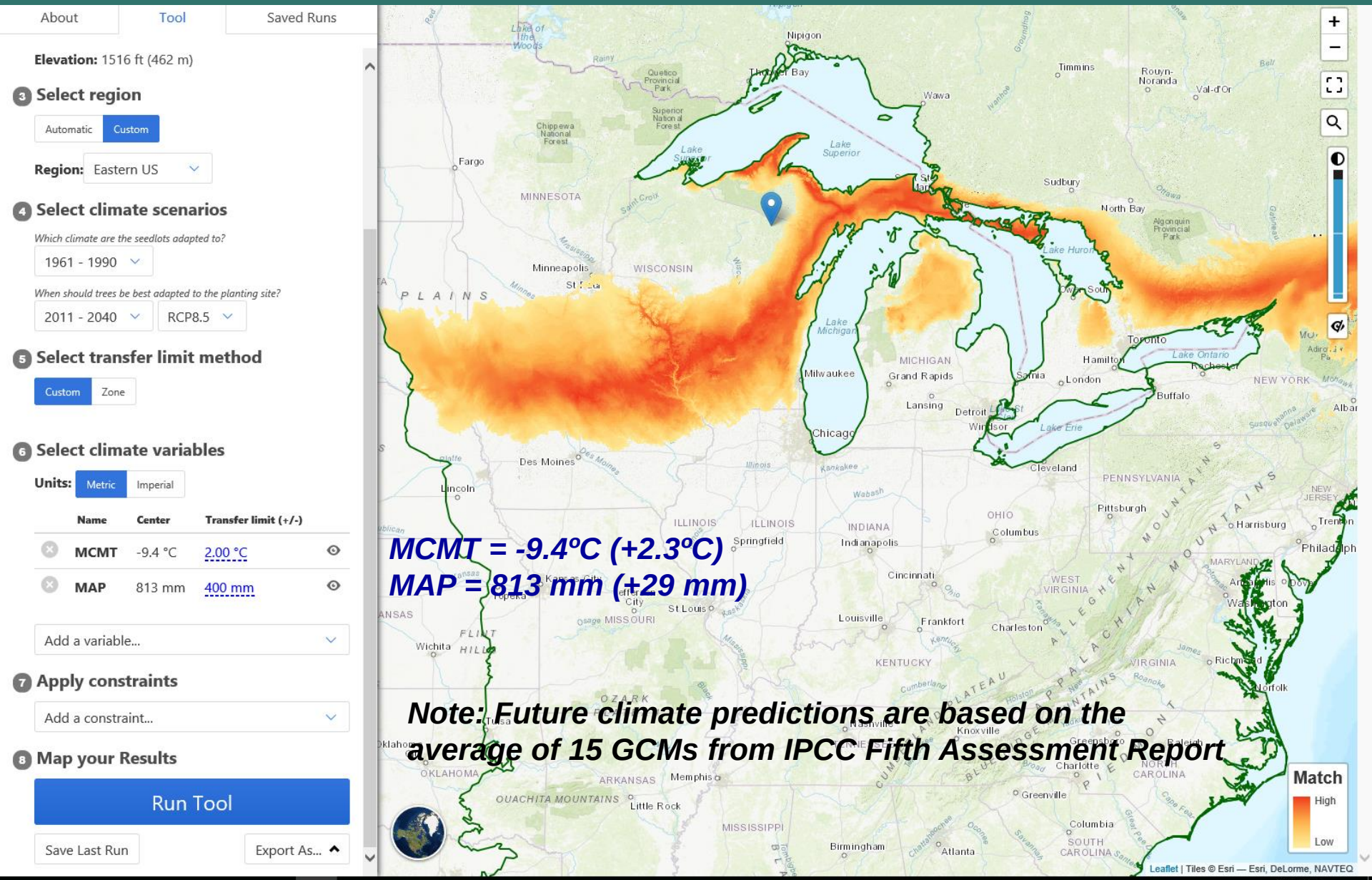
Seedlots for planting site – no climate change



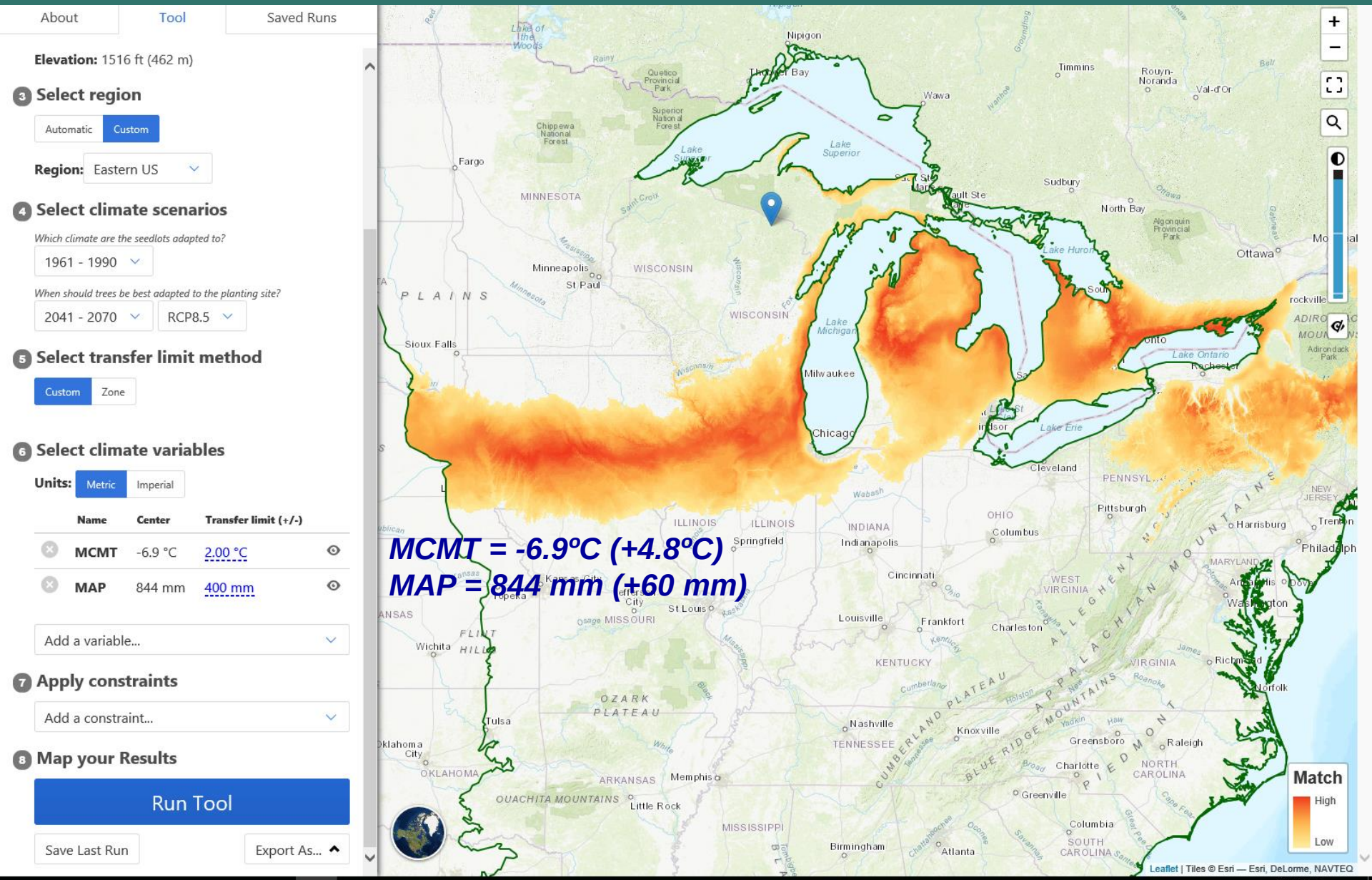
Seedlots for planting site – recent climate



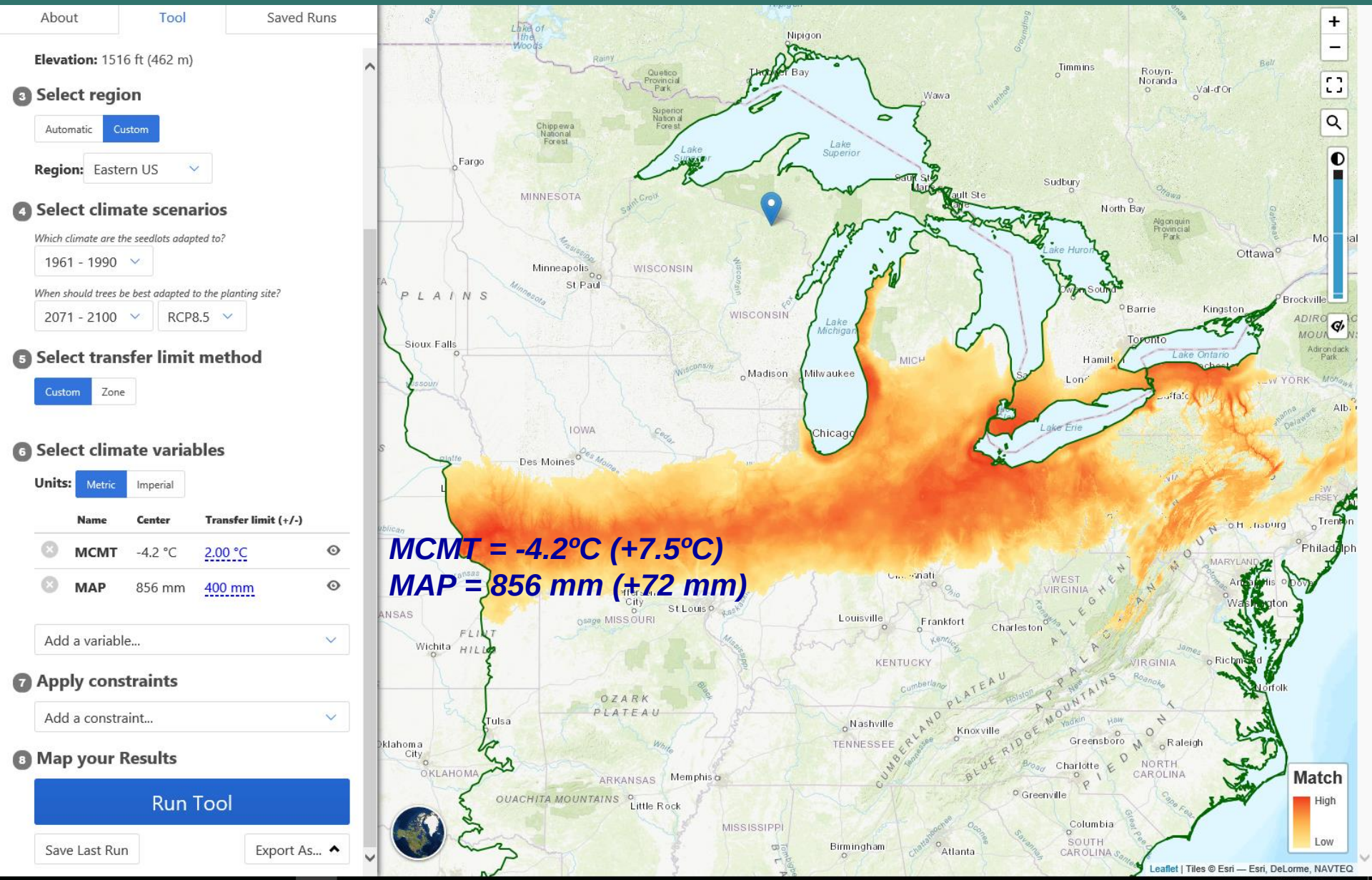
Seedlots for planting site – 2020s + RCP8.5



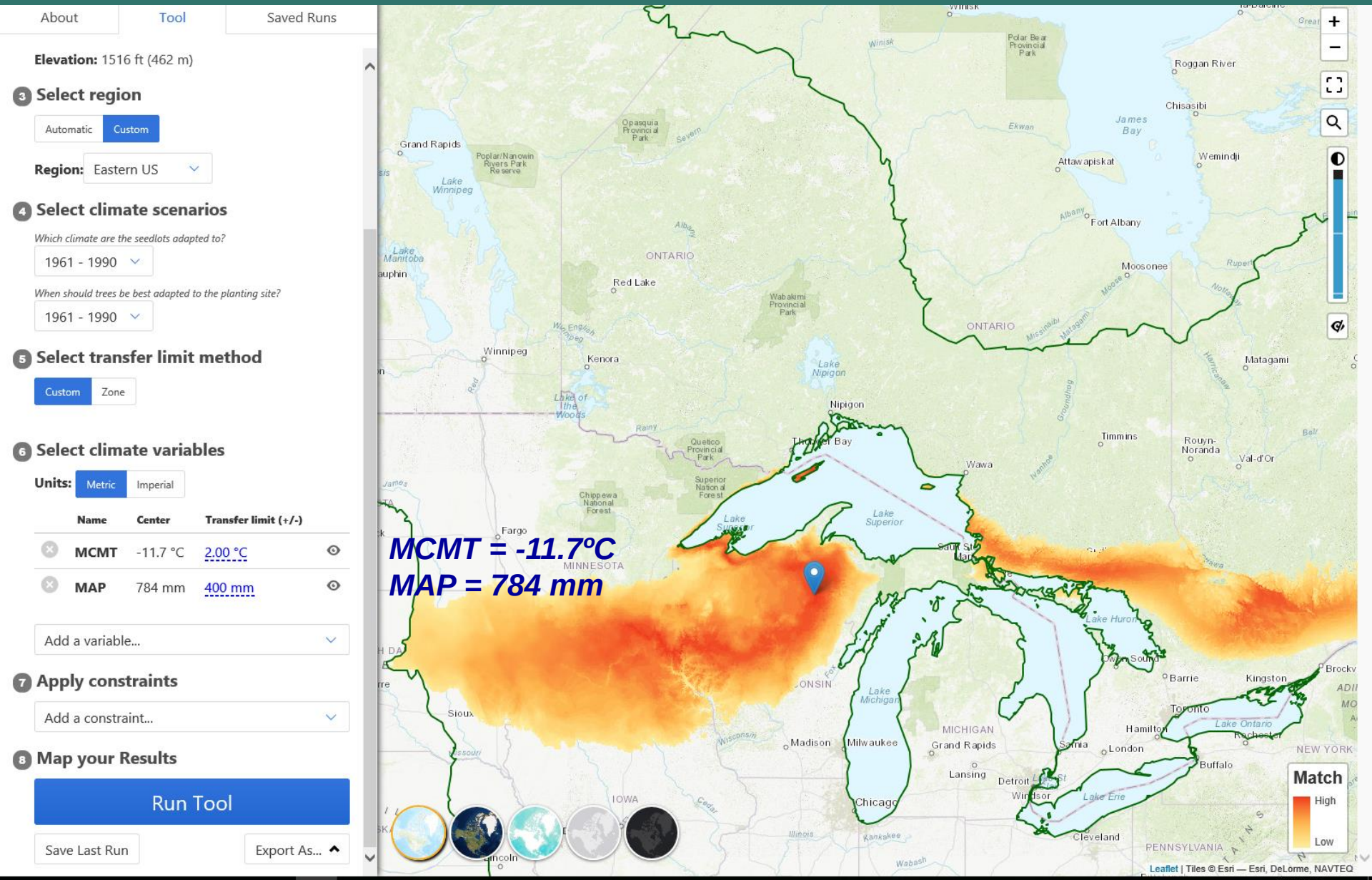
Seedlots for planting site – 2050s + RCP8.5



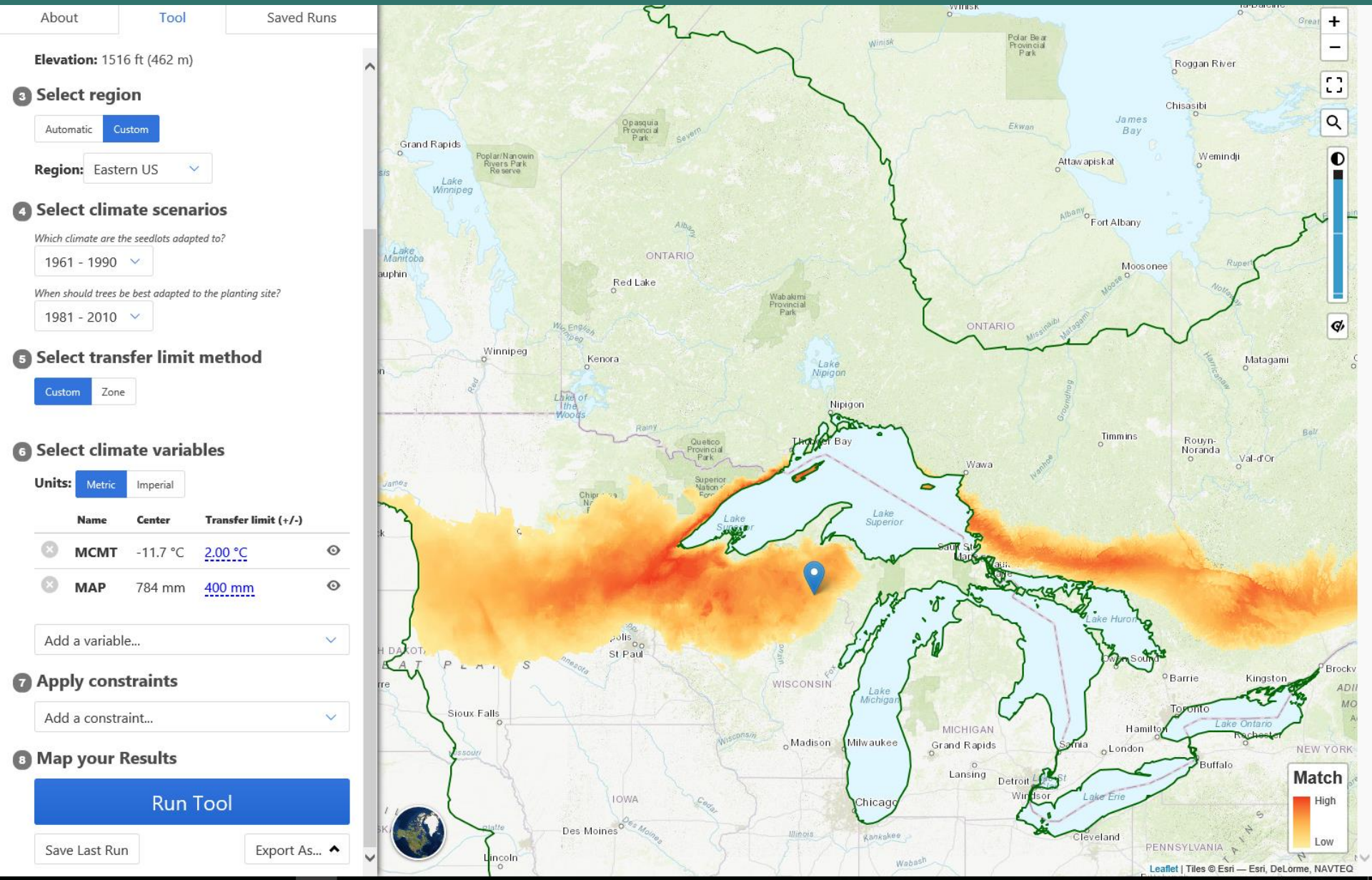
Seedlots for planting site – 2080s + RCP8.5



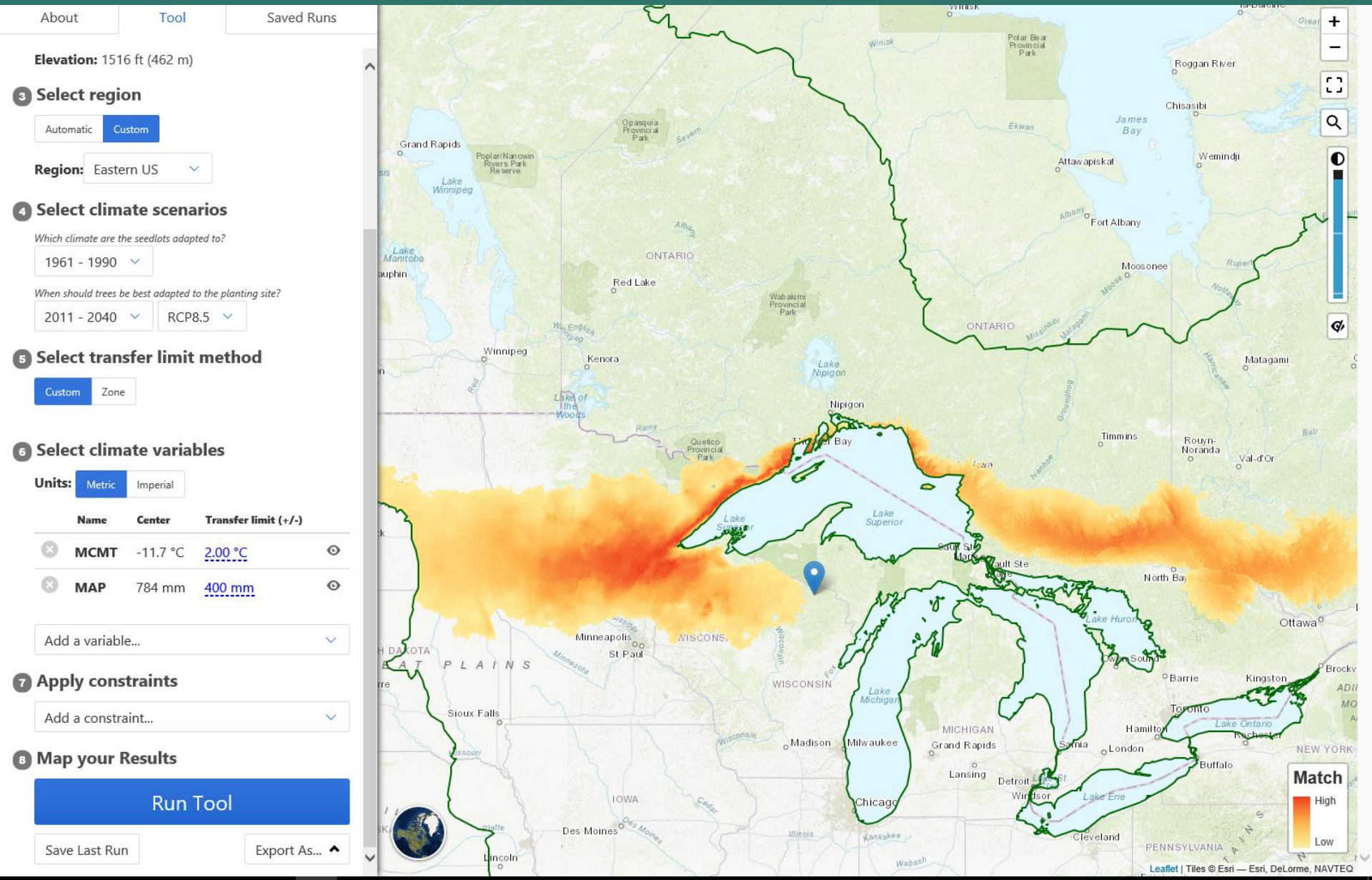
Planting sites for seedlot – no climate change



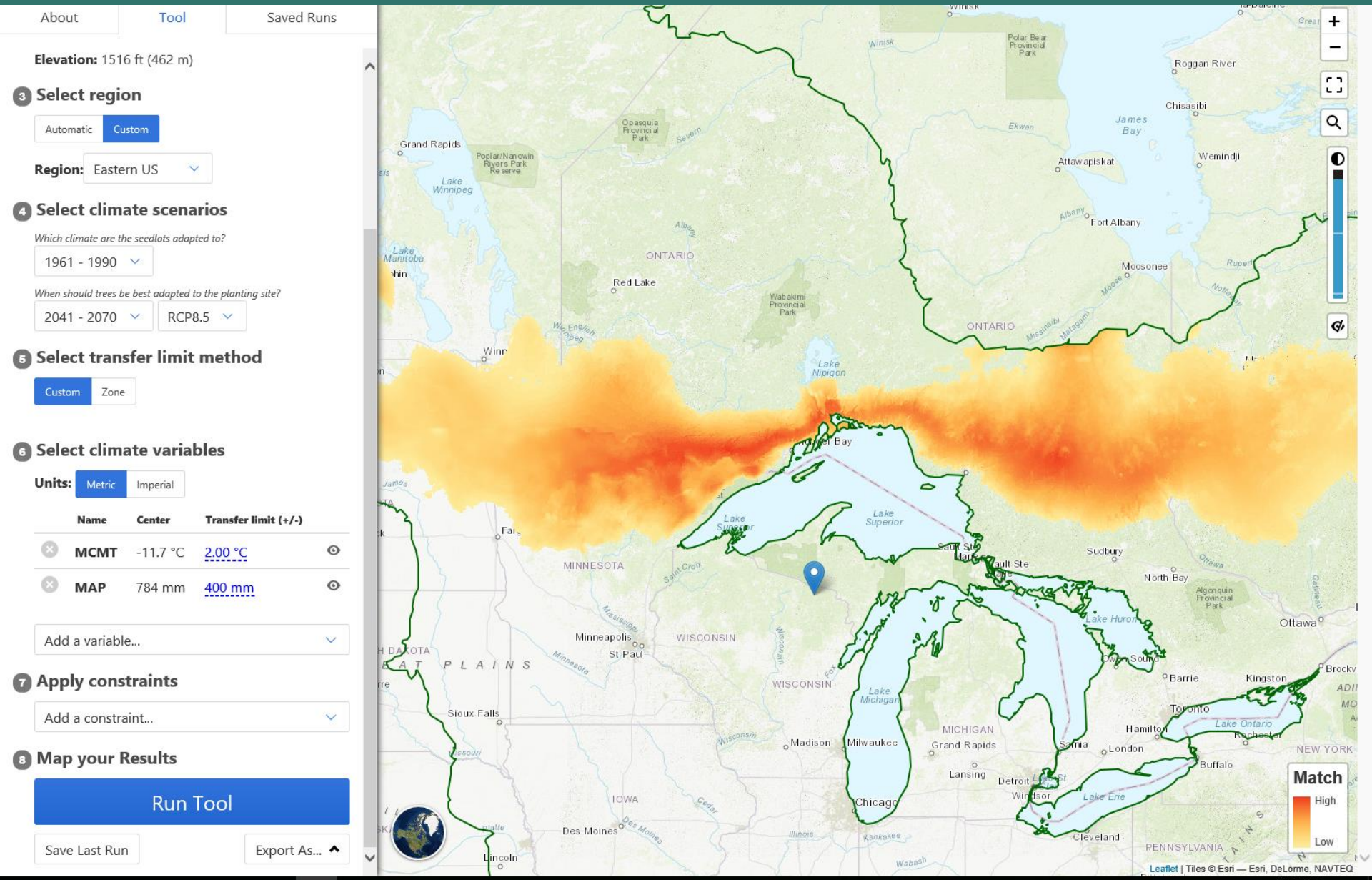
Planting sites for seedlot – recent climate



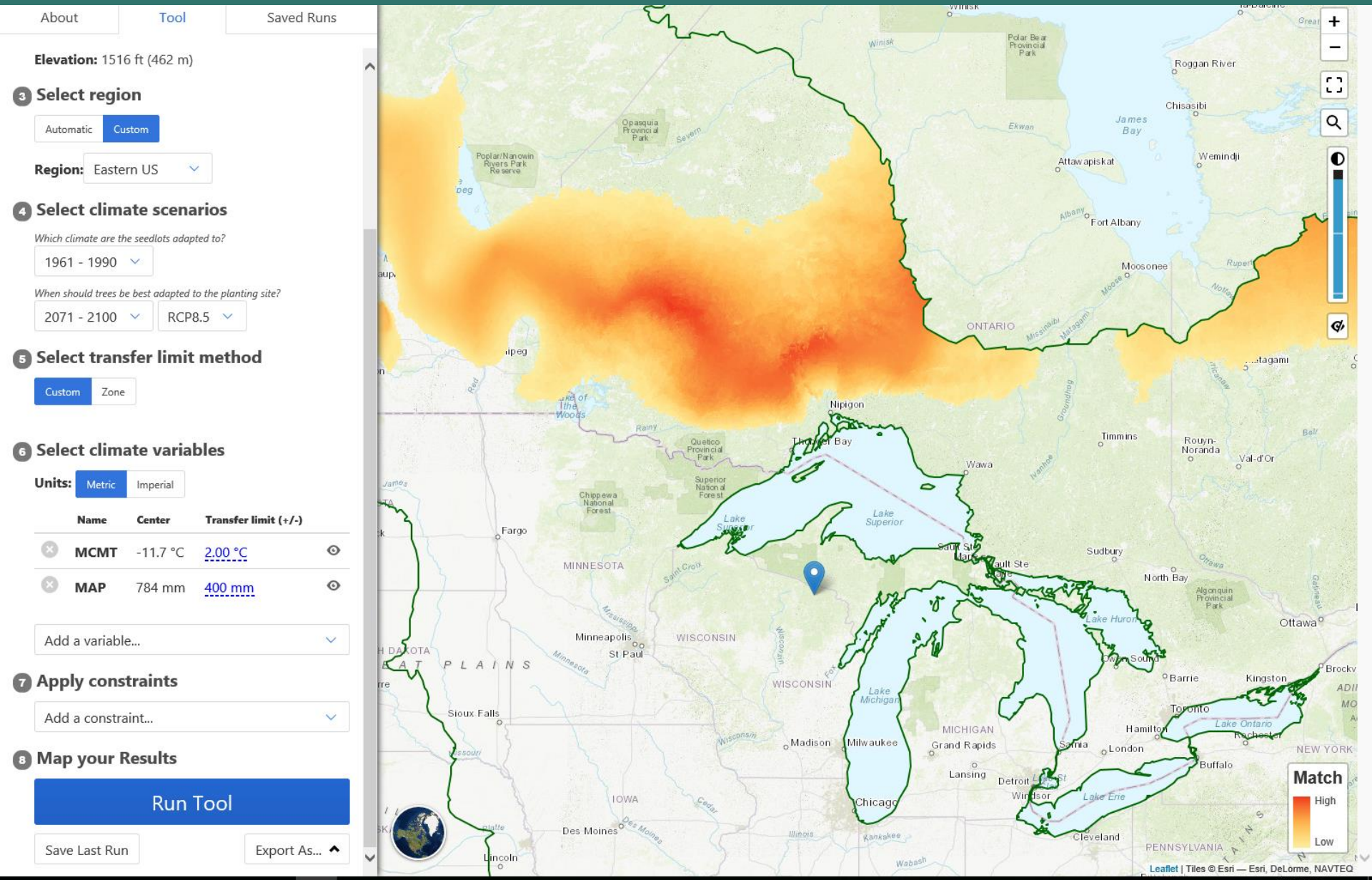
Planting sites for seedlot – 2020s + RCP8.5



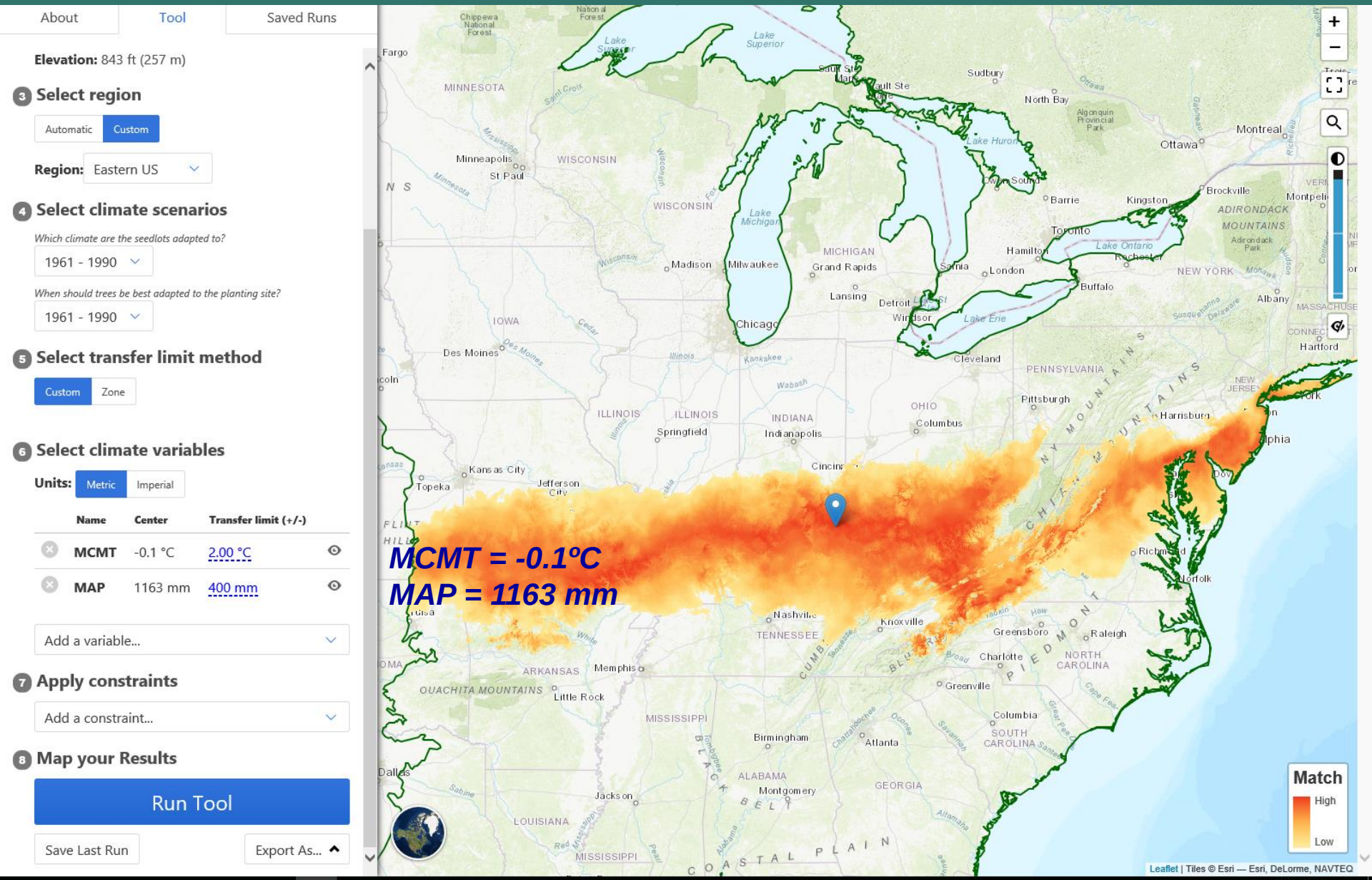
Planting sites for seedlot – 2050s + RCP8.5



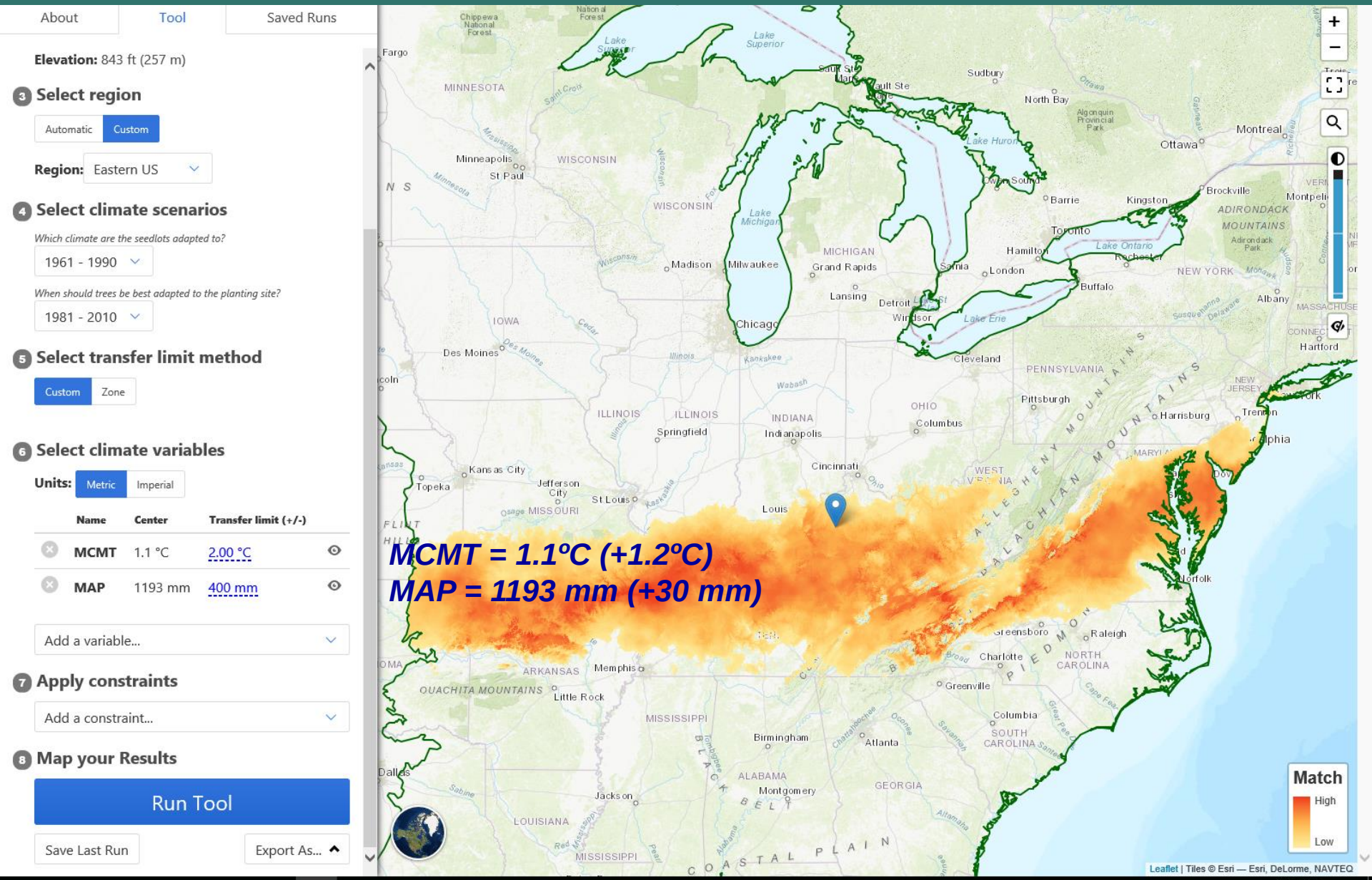
Planting sites for seedlot – 2080s + RCP8.5



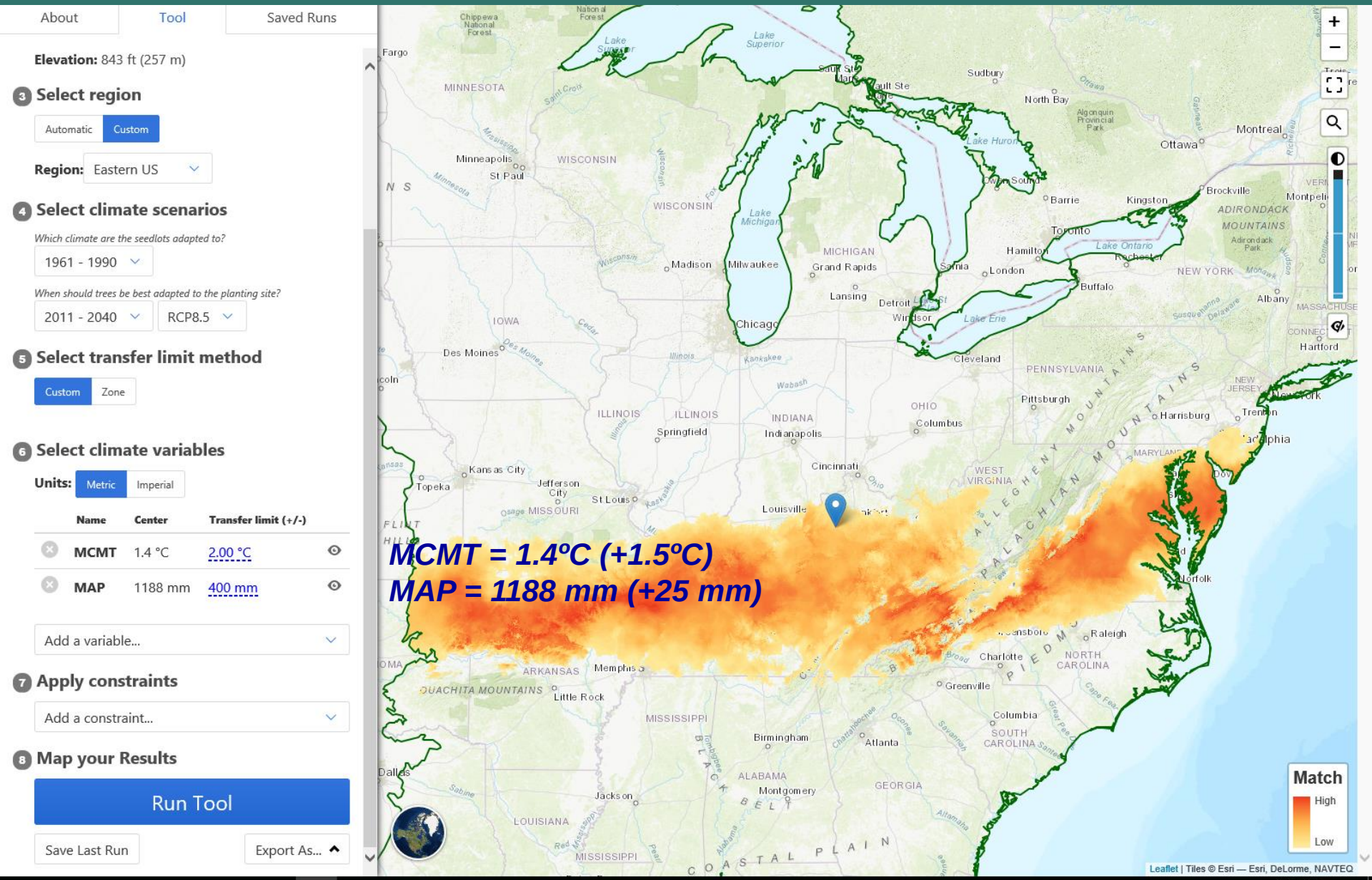
Seedlots for planting site – no climate change



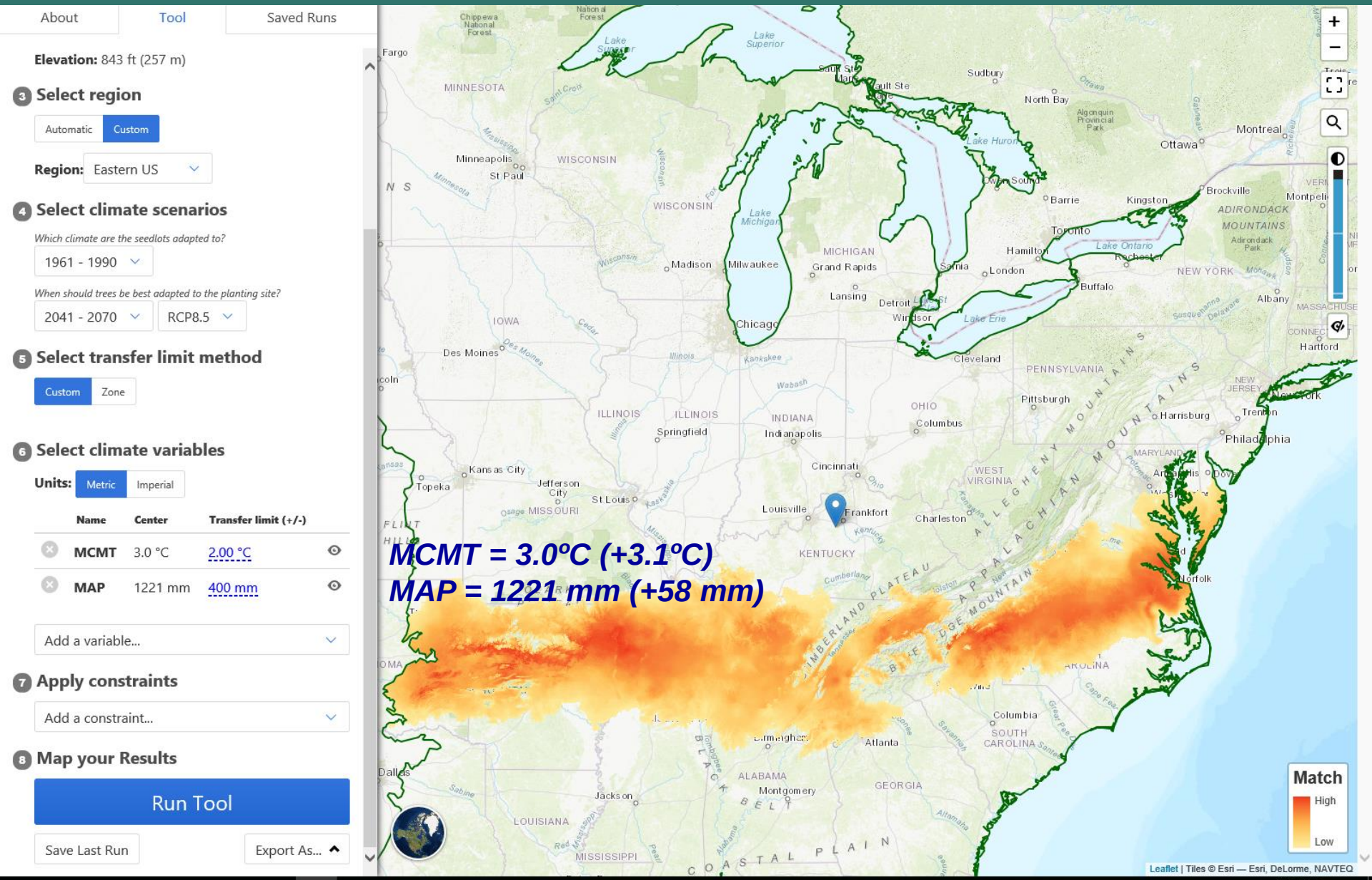
Seedlots for planting site – recent climate



Seedlots for planting site – 2020s + RCP8.5



Seedlots for planting site – 2050s + RCP8.5



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...

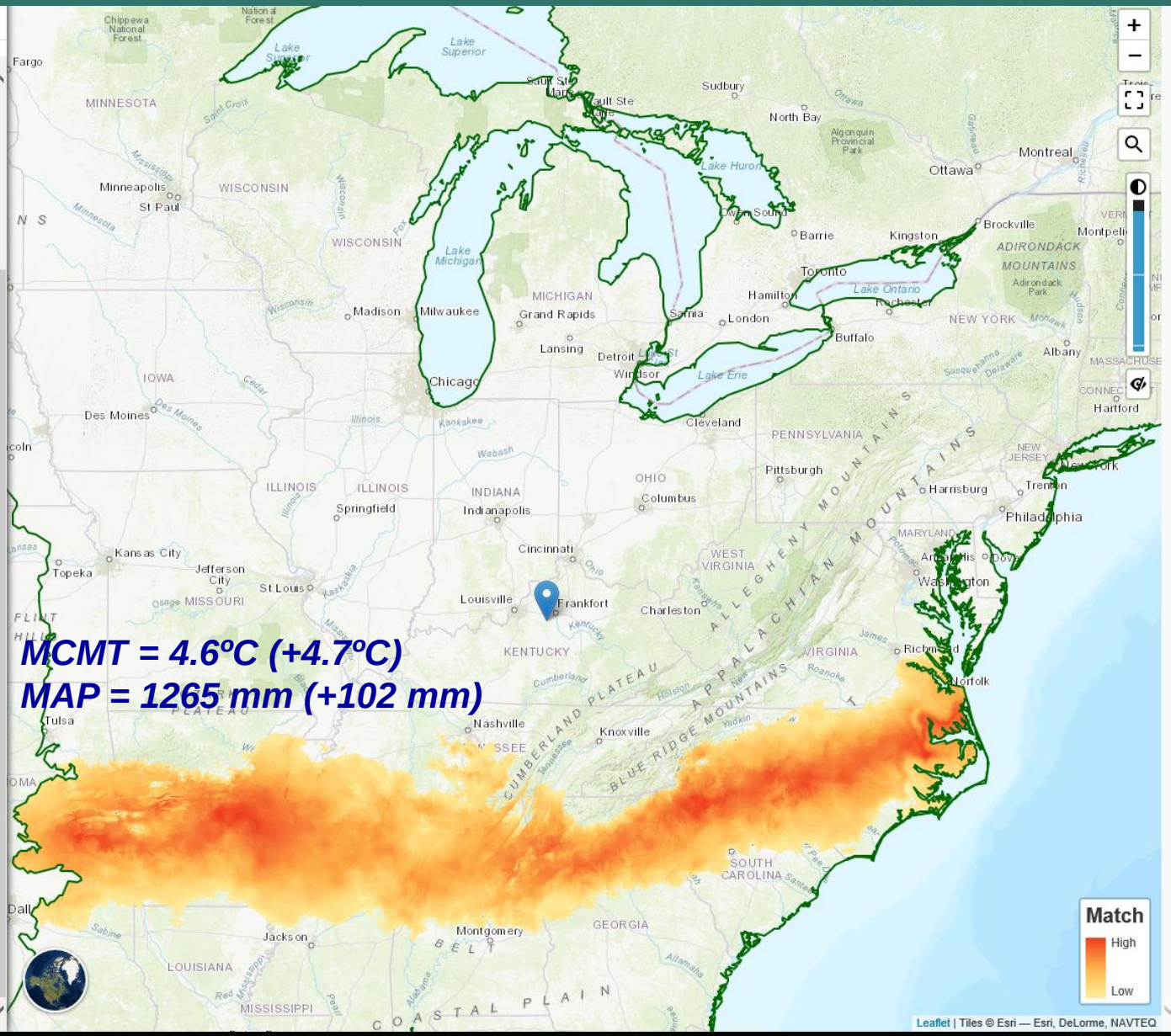
7 Apply constraints

Add a constraint...

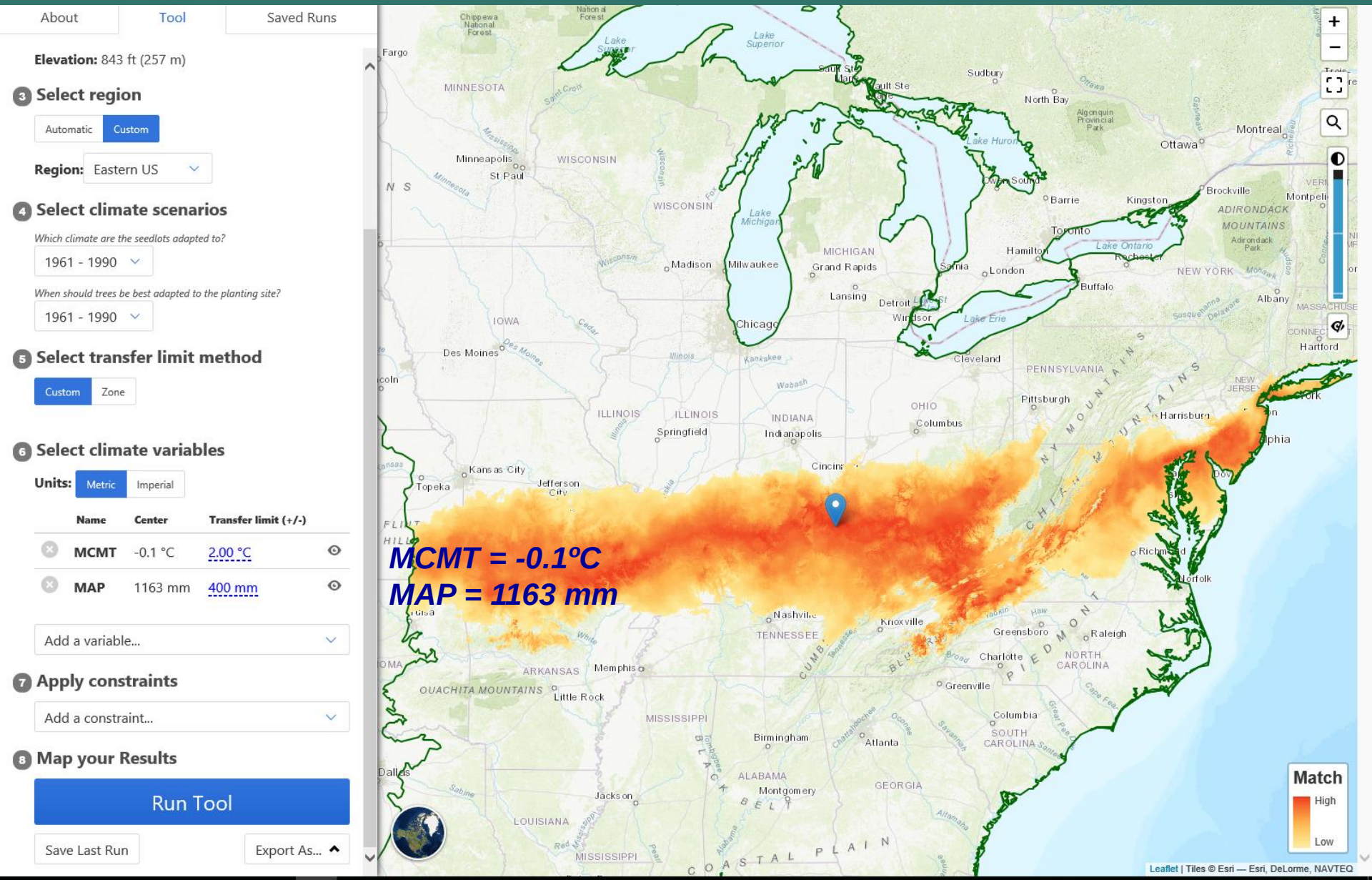
8 Map your Results

Run Tool

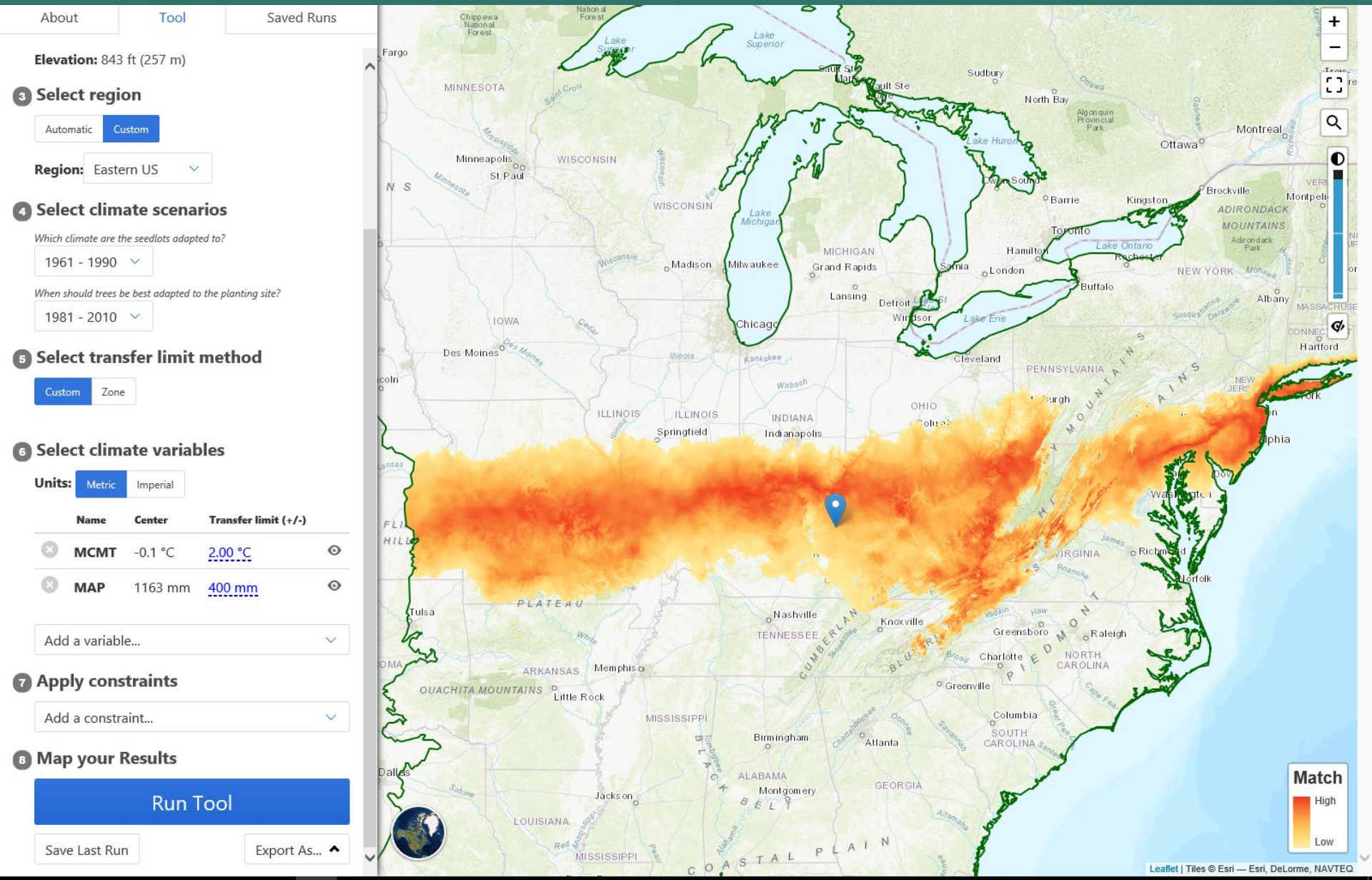
Save Last Run | Export As...



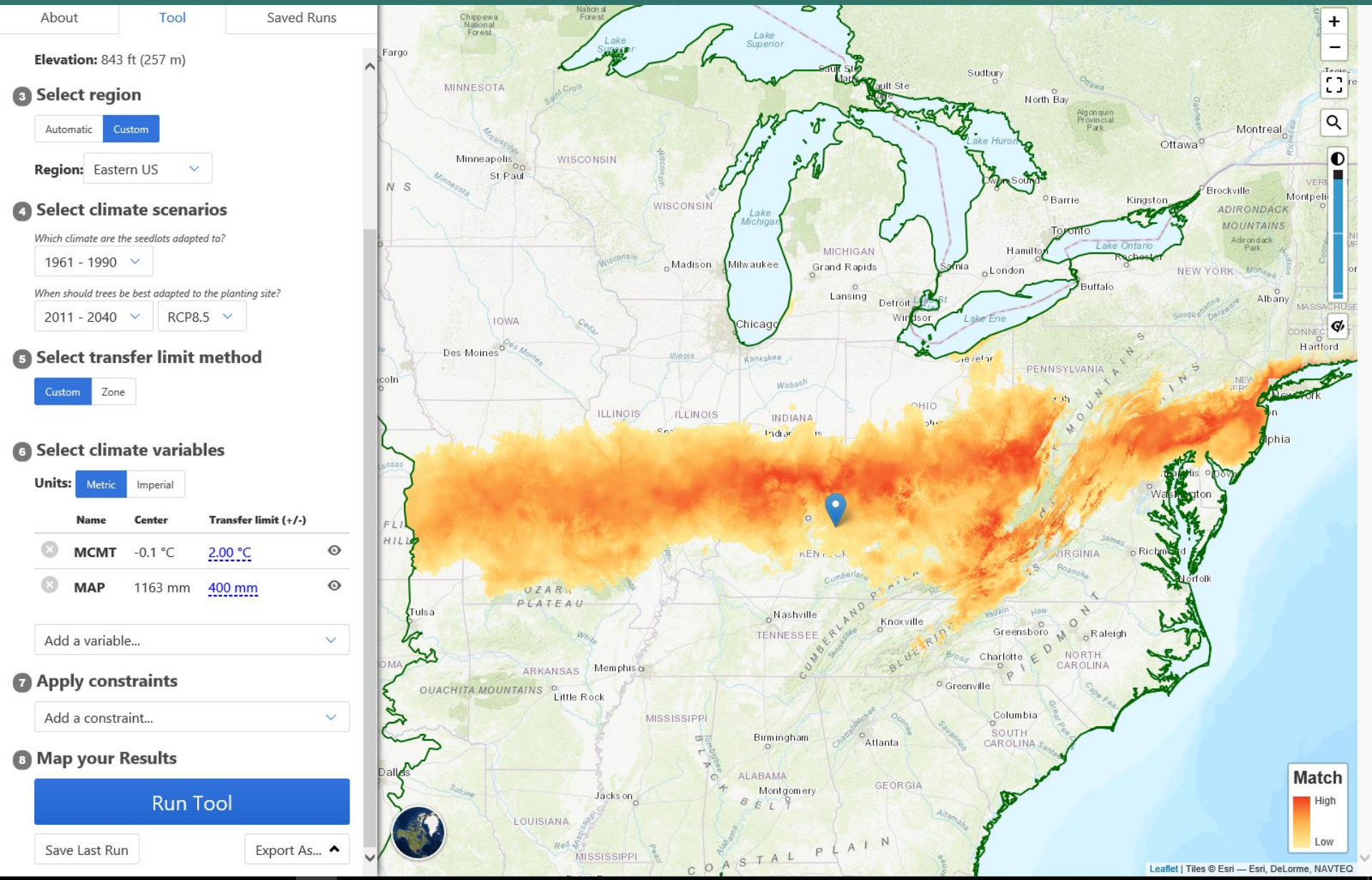
Seedlots for planting site – no climate change



Planting sites for seedlot – recent climate



Planting sites for seedlot – 2020s + RCP8.5



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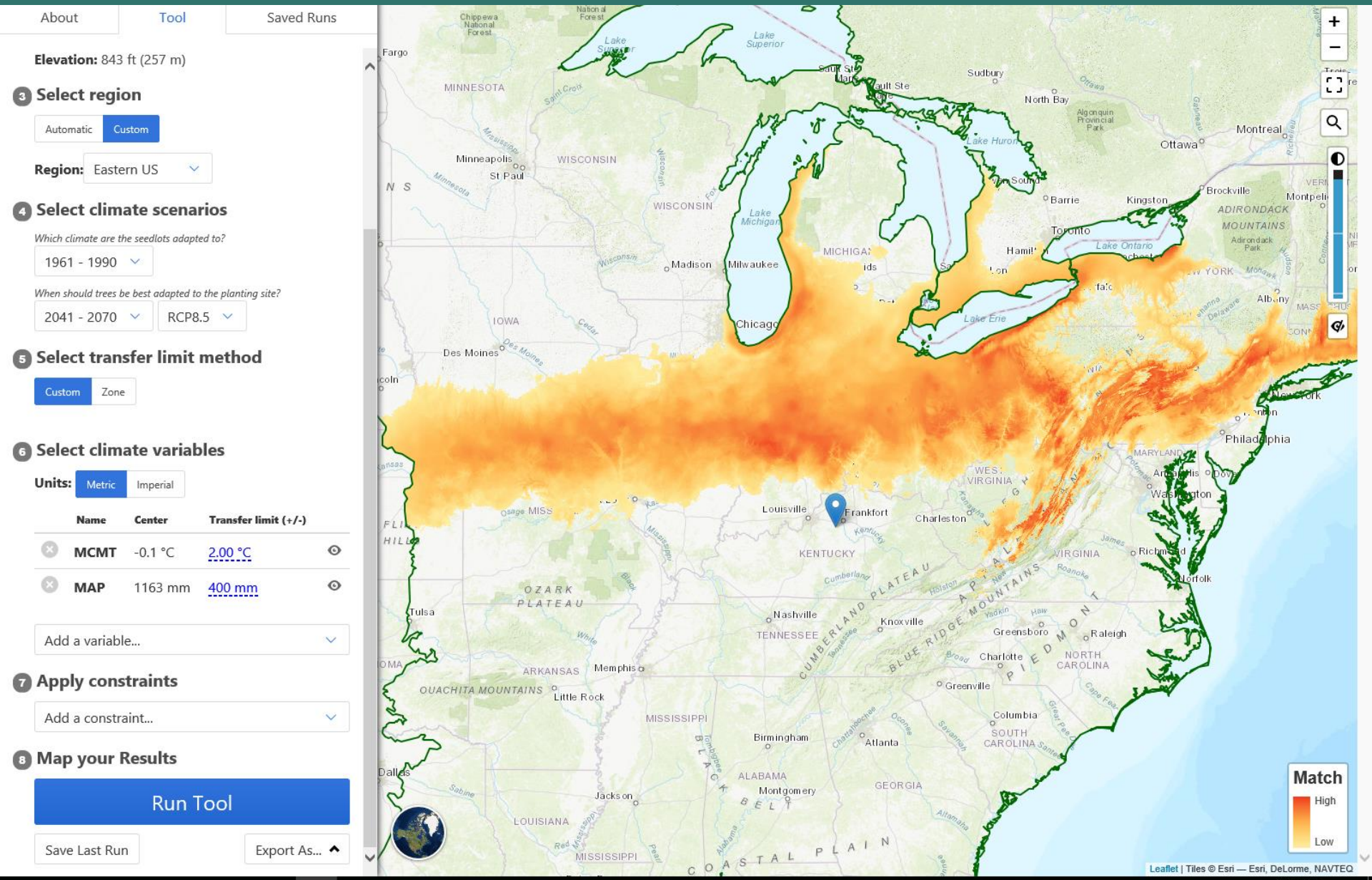

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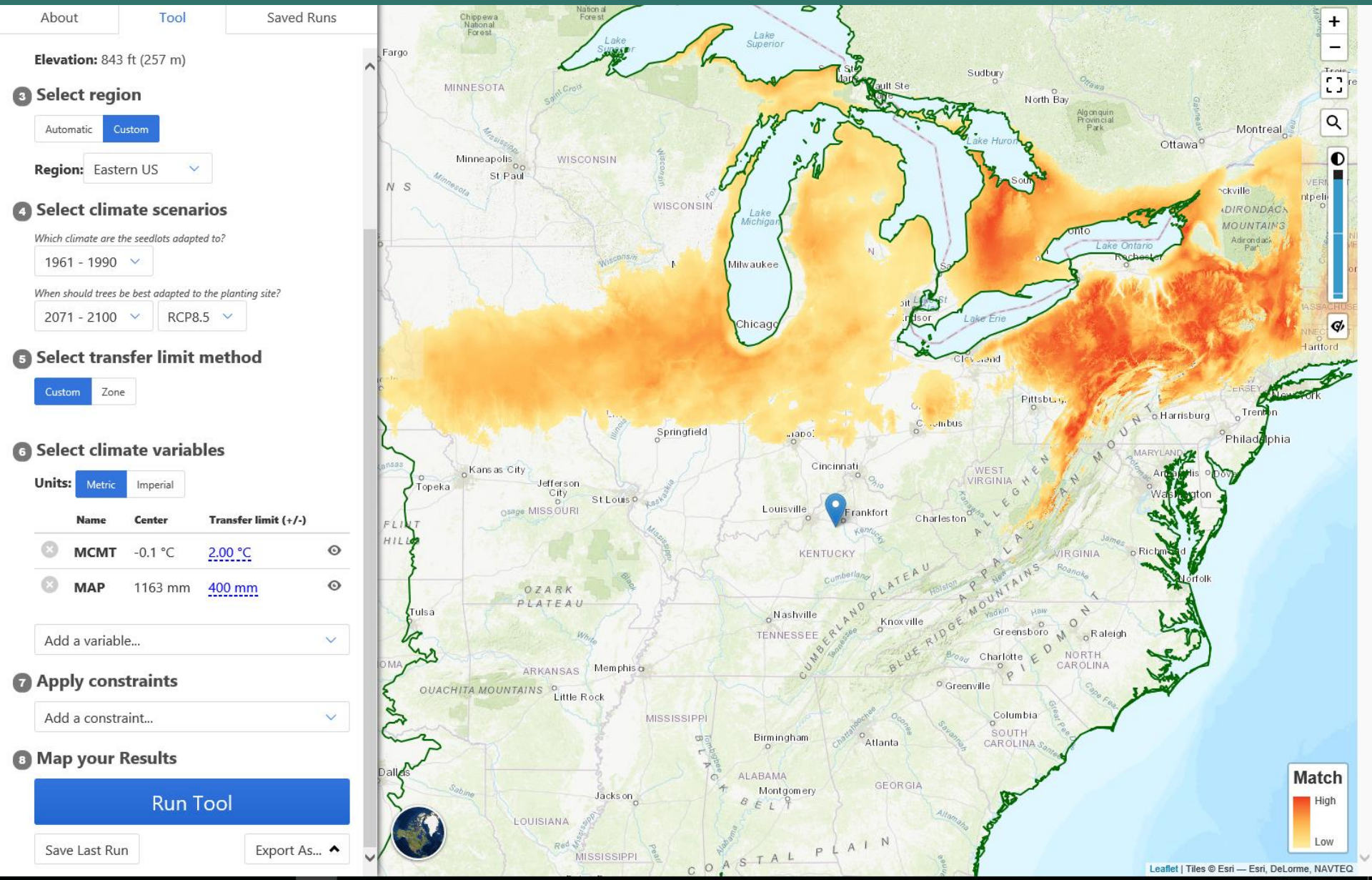


https://seedlotselectiontool.org/sst/