Early Assessment of Local Adaptation in Juvenile Prairie Grasses

Healthy Prairies Project

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ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

National Native Seed Conference
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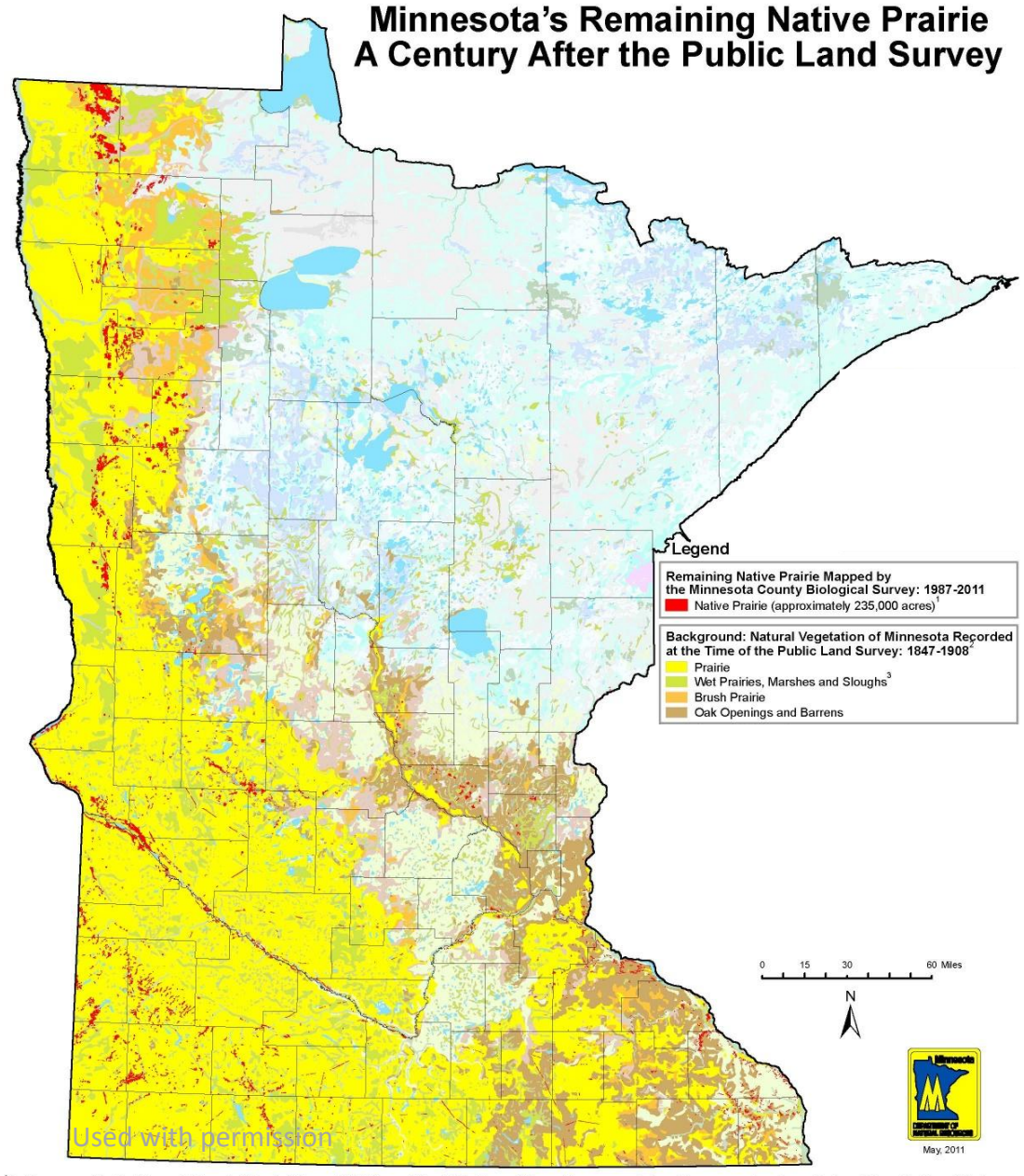
Prairies & why they matter



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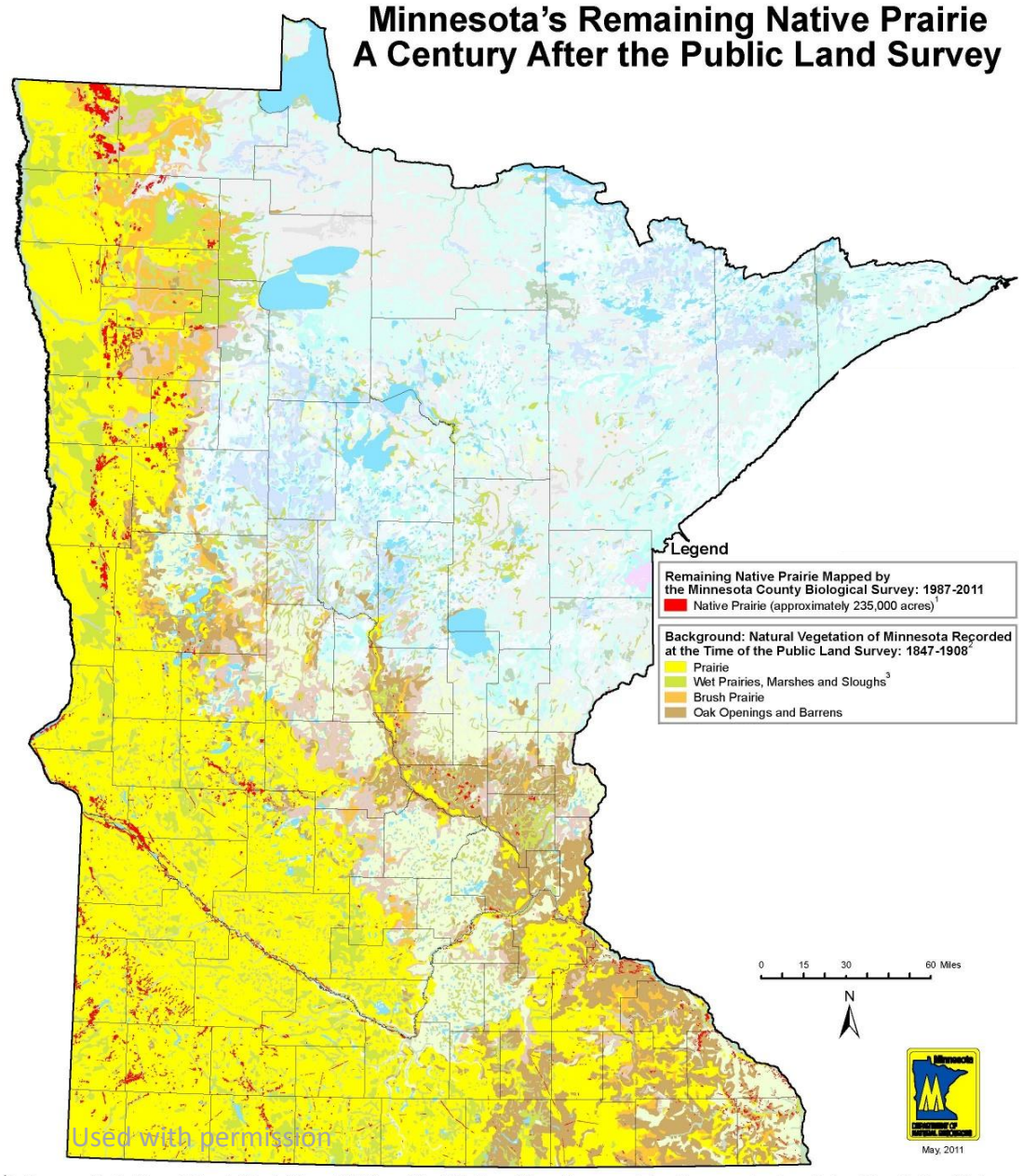
Prairies & why they matter

(Some) ecosystem services:

- Reduce erosion
- Improve water quality
- Store carbon
- Wildlife, pollinator habitat
- Renewable bioenergy
- Aesthetic, recreation



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Restoring prairies – locally-adapted seed

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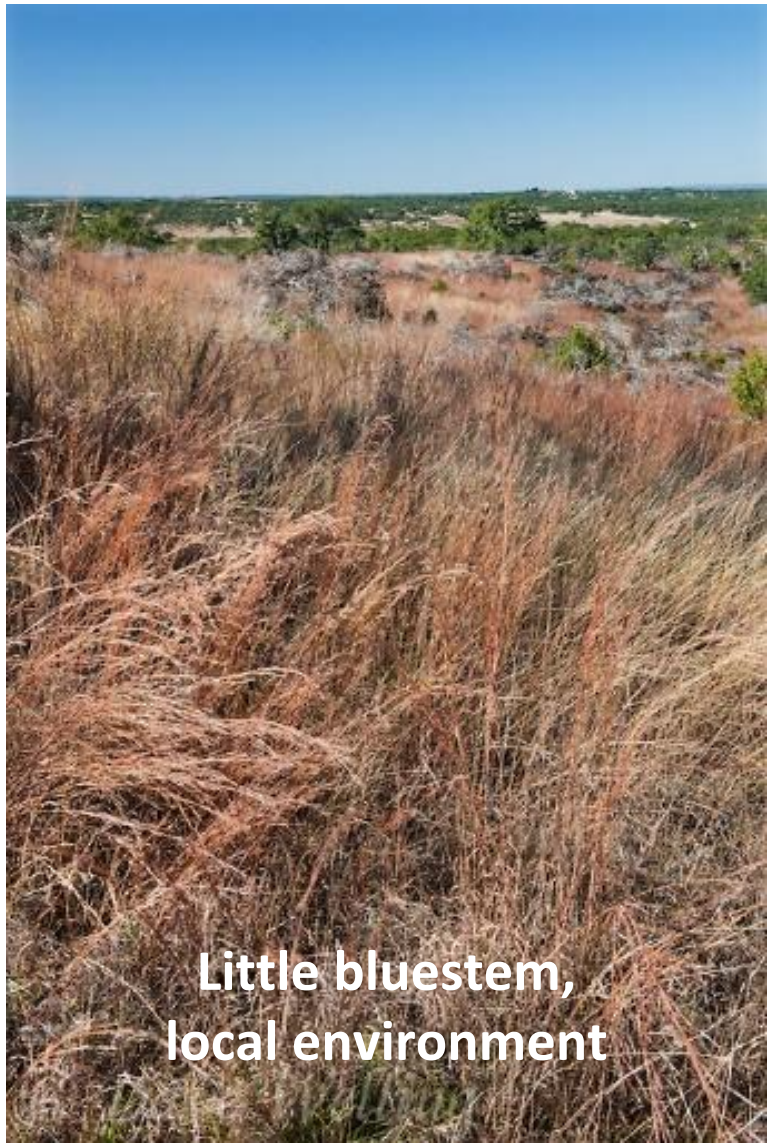
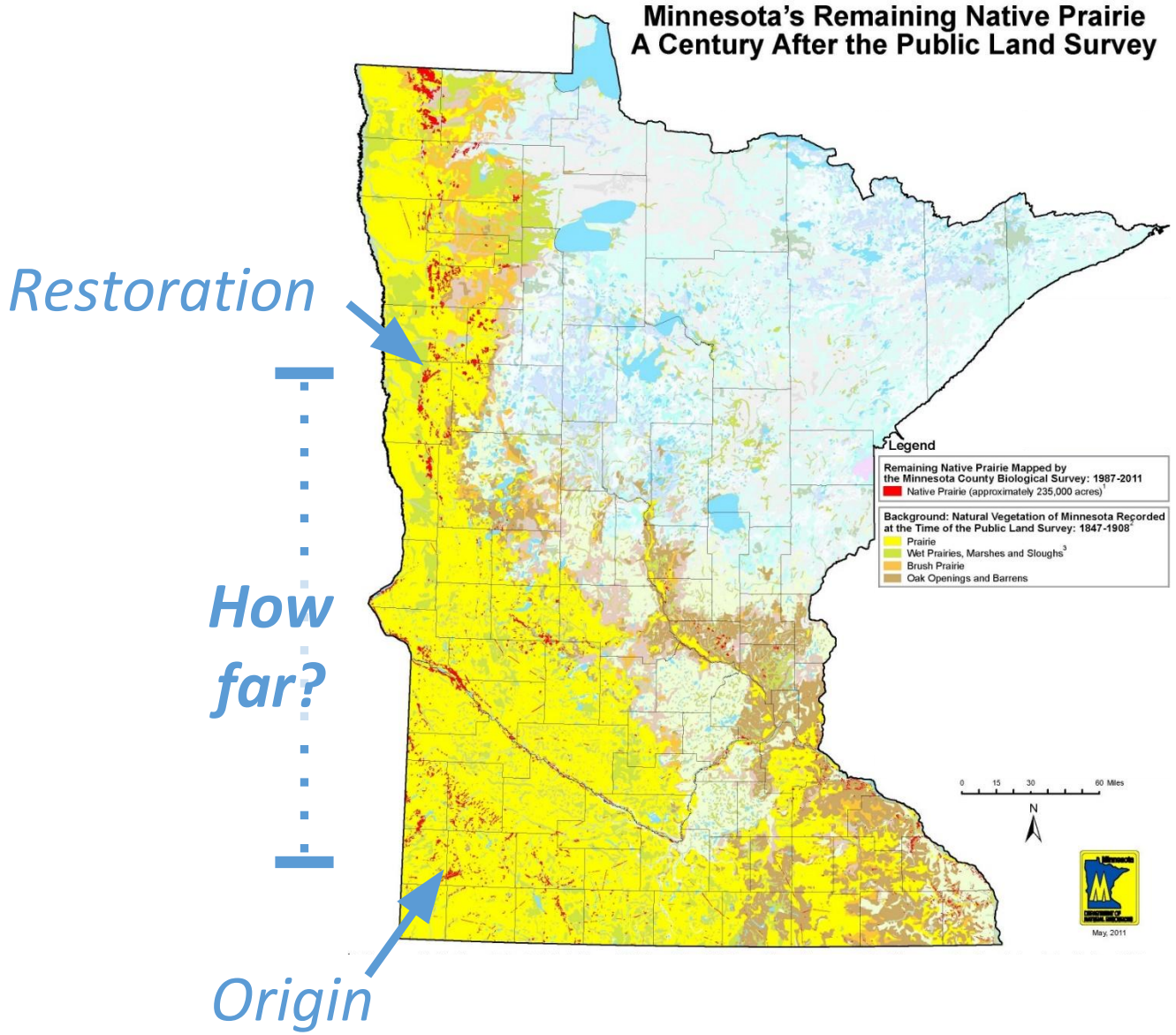
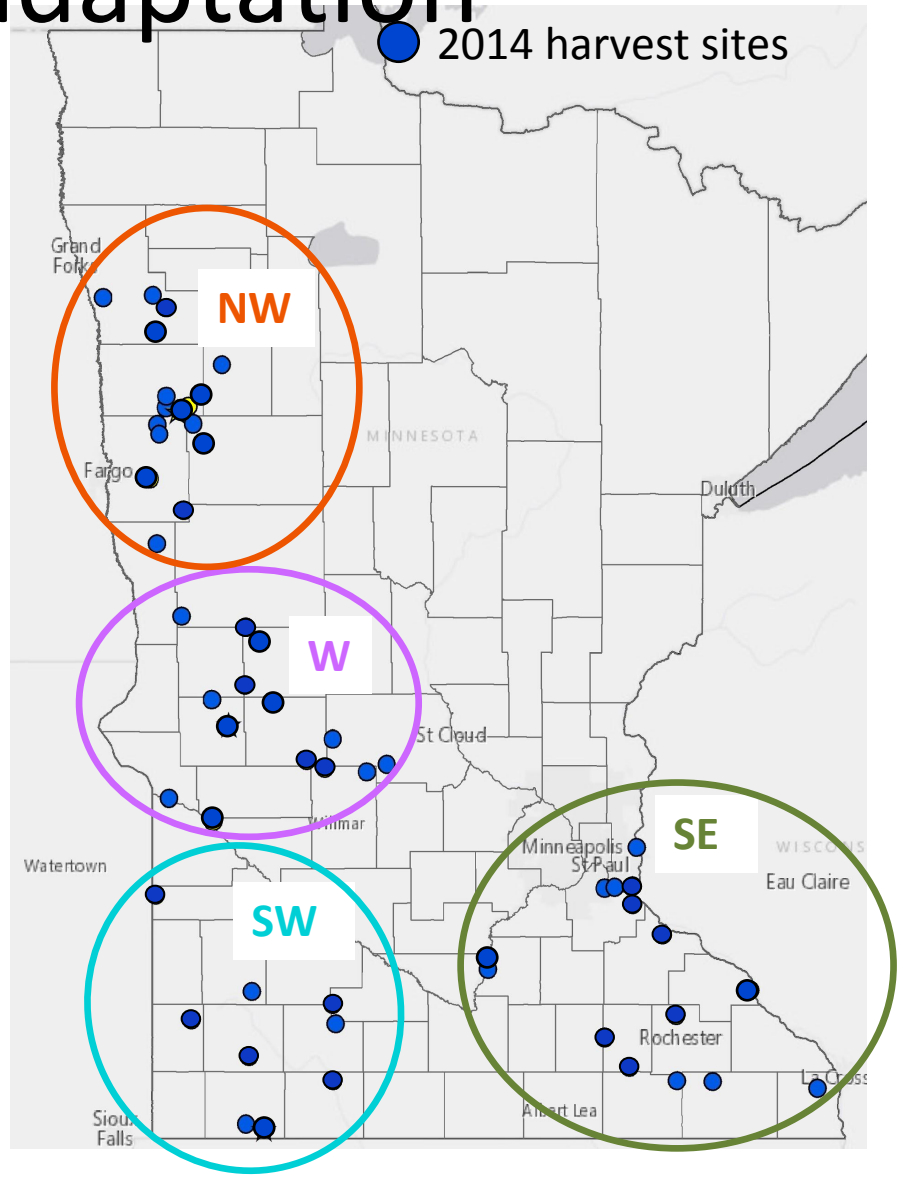




Healthy Prairies Project – Scale of local adaptation



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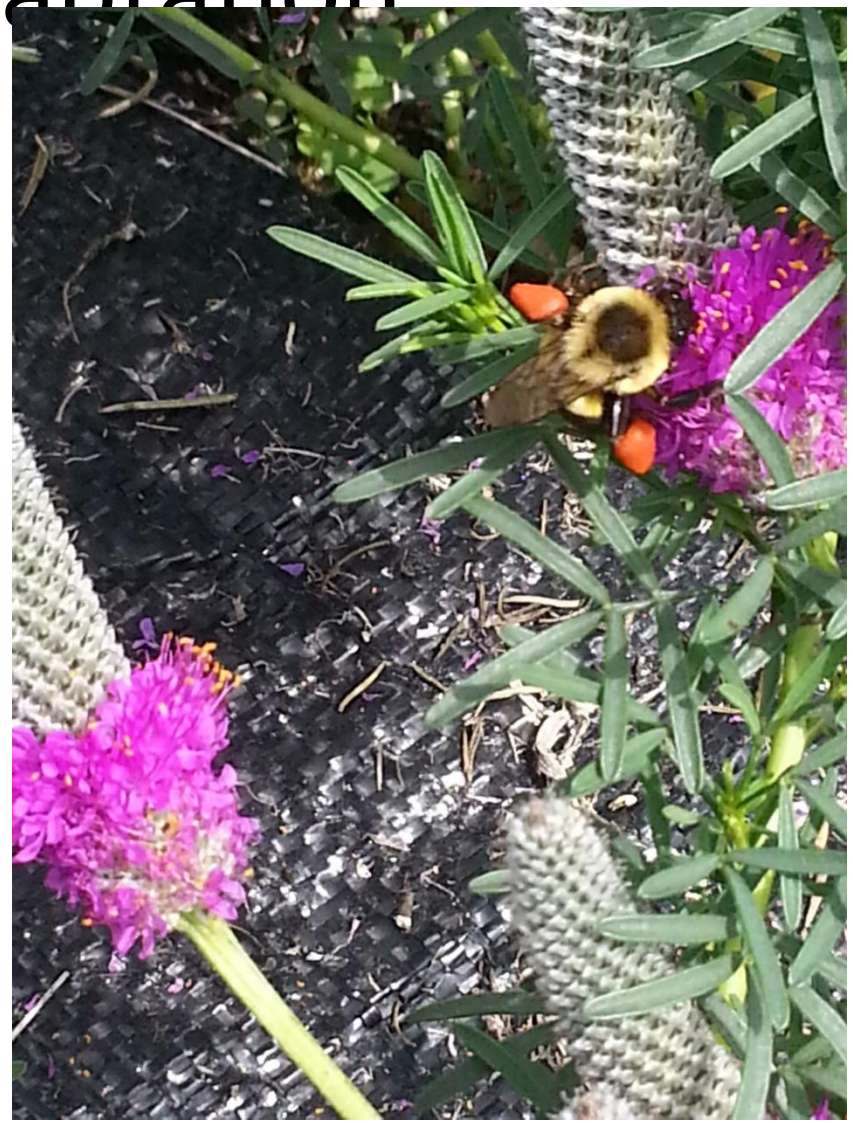
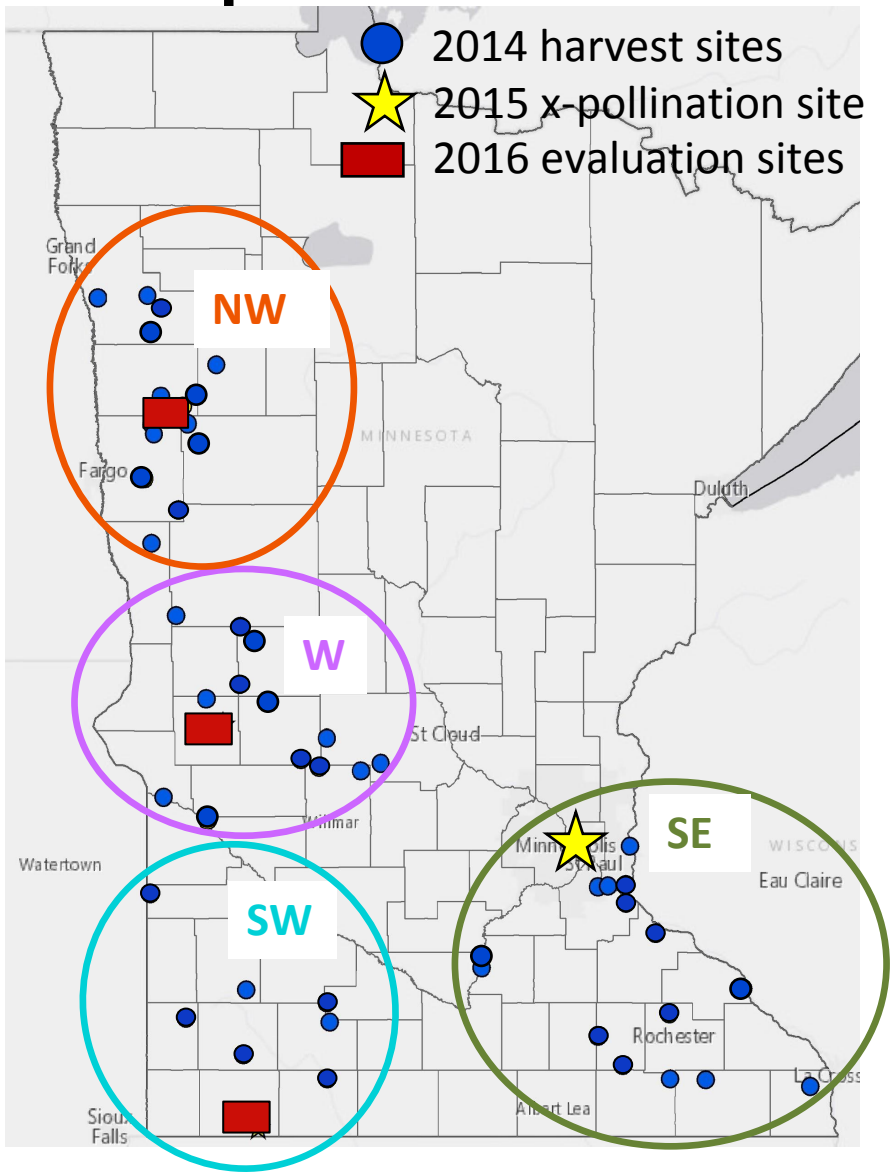
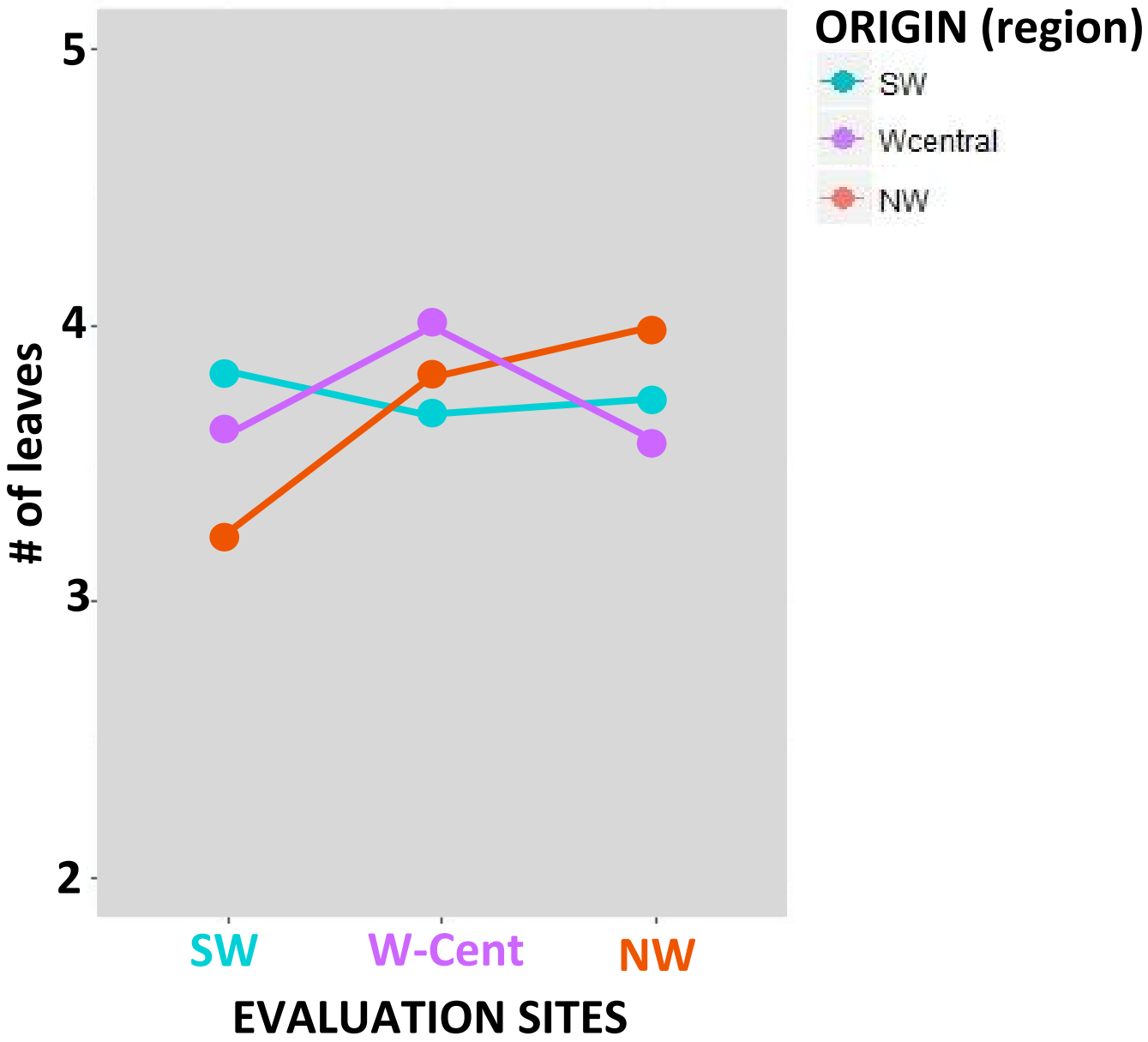


Healthy Prairies Project – Scale of local adaptation

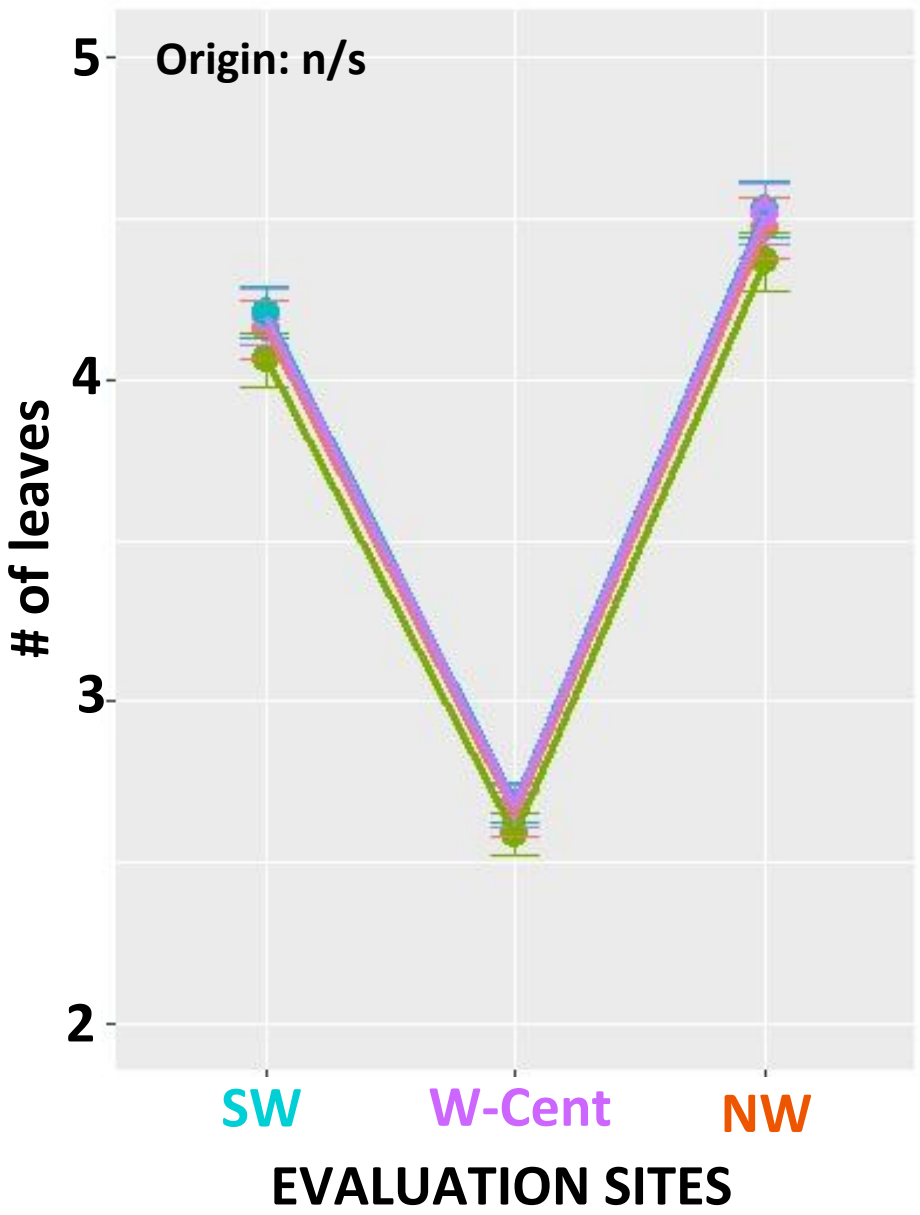


Healthy Prairies Project – Scale of local adaptation

Hypothetical – evidence of local adaptation



Preliminary results – sideoats grama



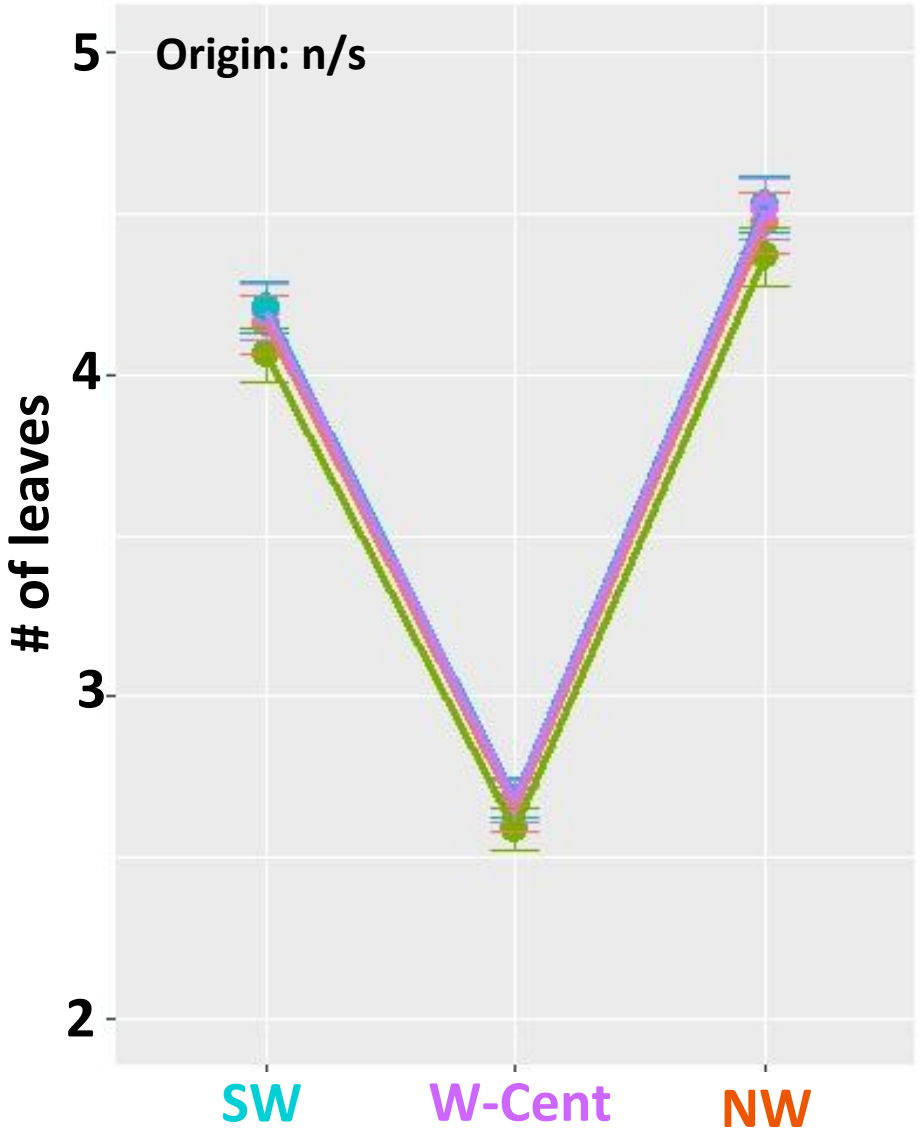
ORIGIN (region)

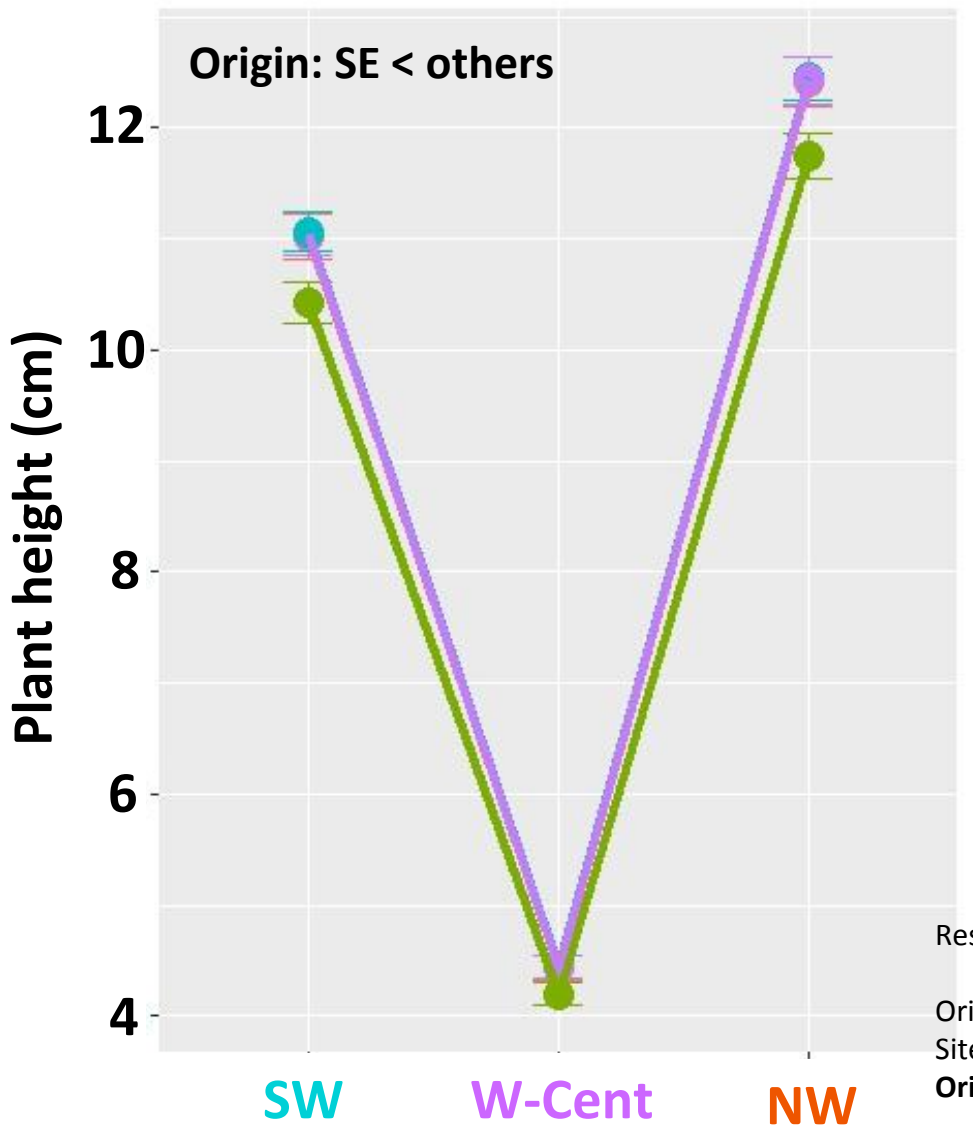
- SW
- Wcentral
- NW
- SE

Response: # of leaves. GLM, log link

	Resid. df	Resid. dev	dAIC	weight
Origin	3458	2349.9	573.8	0.0
Site	**3459**	**1778.0**	**0.0**	**0.8**
Orig.+ Site	3456	1775.3	3.3	0.2

Preliminary results – sideoats grama



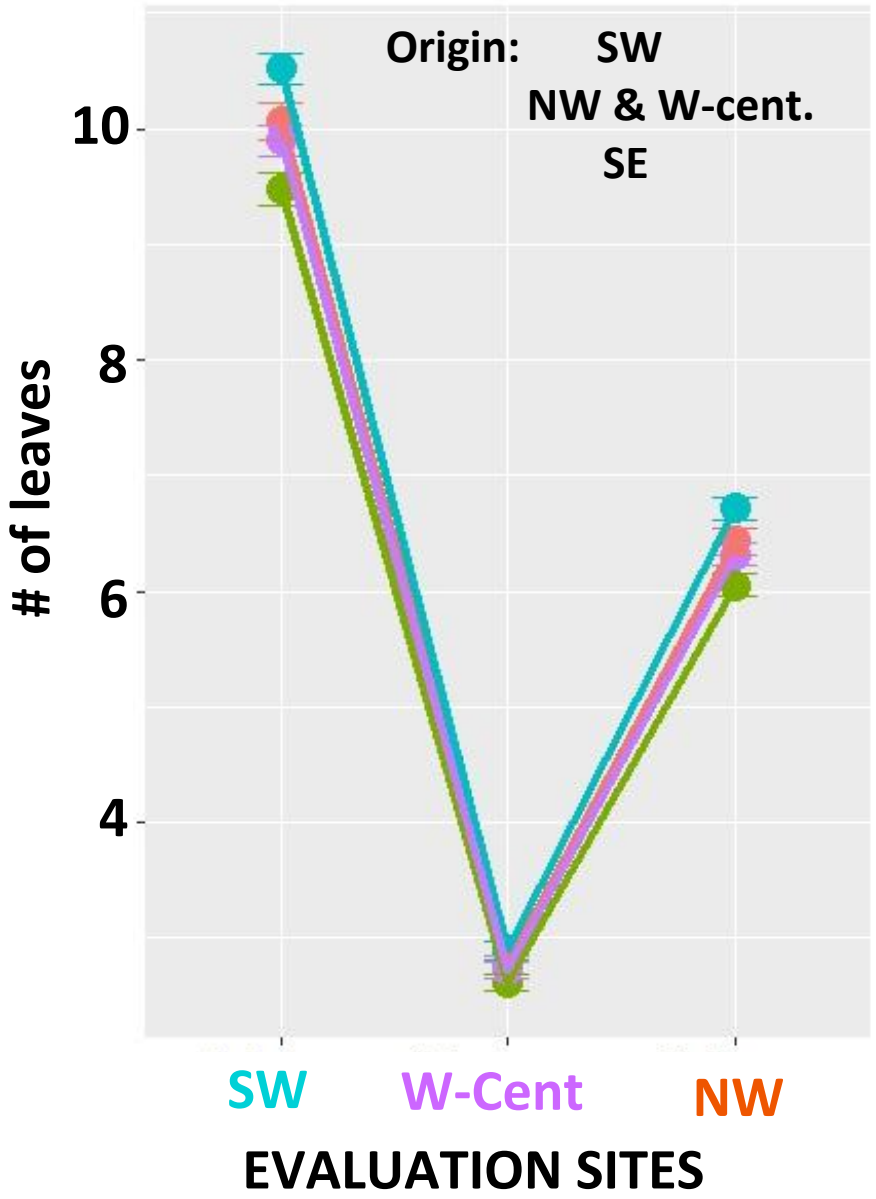


EVALUATION SITES

Response: Plant height GLM, identity link

	Resid. df	Resid. dev	dAIC	weight
Origin	3458	107487	1536.0	0.0
Site	3459	69069	2.9	0.2
Ori.+ Site	**3456**	**68892**	**0.0**	**0.7**

Preliminary results – little bluestem



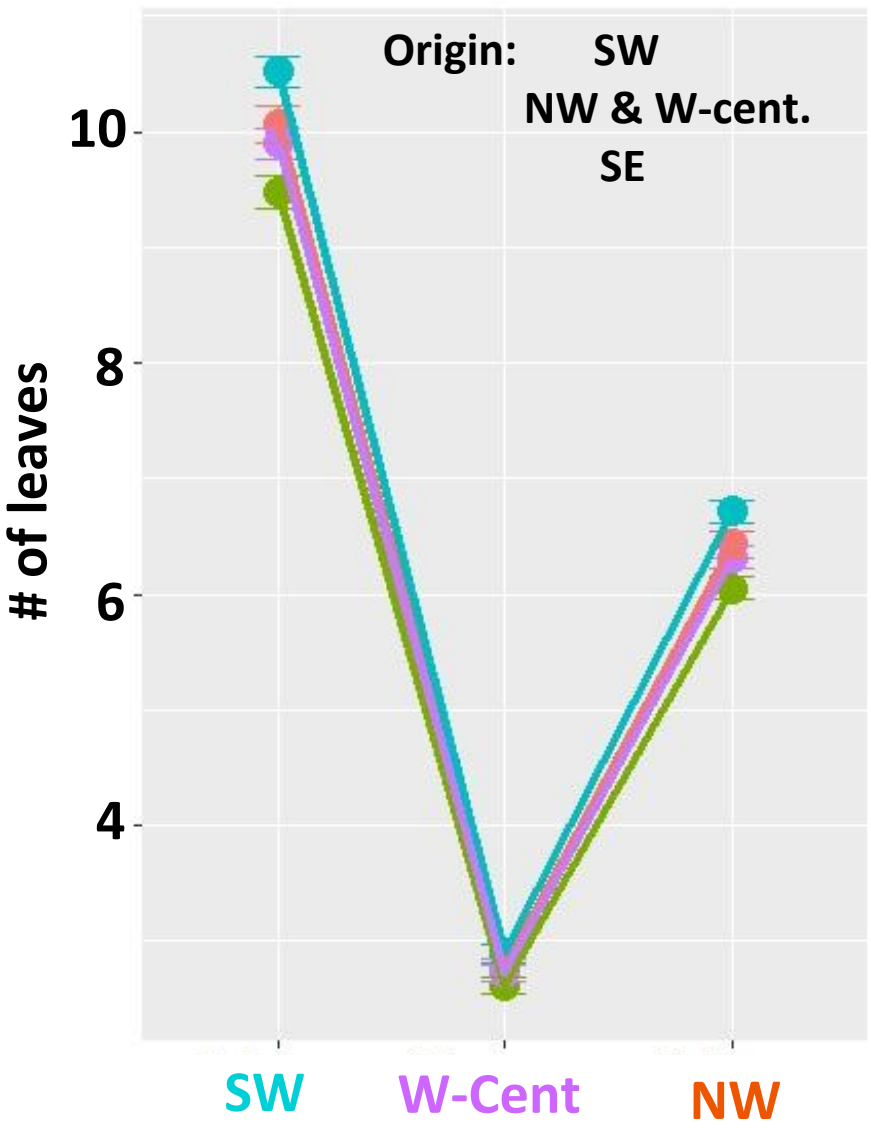
ORIGIN (region)

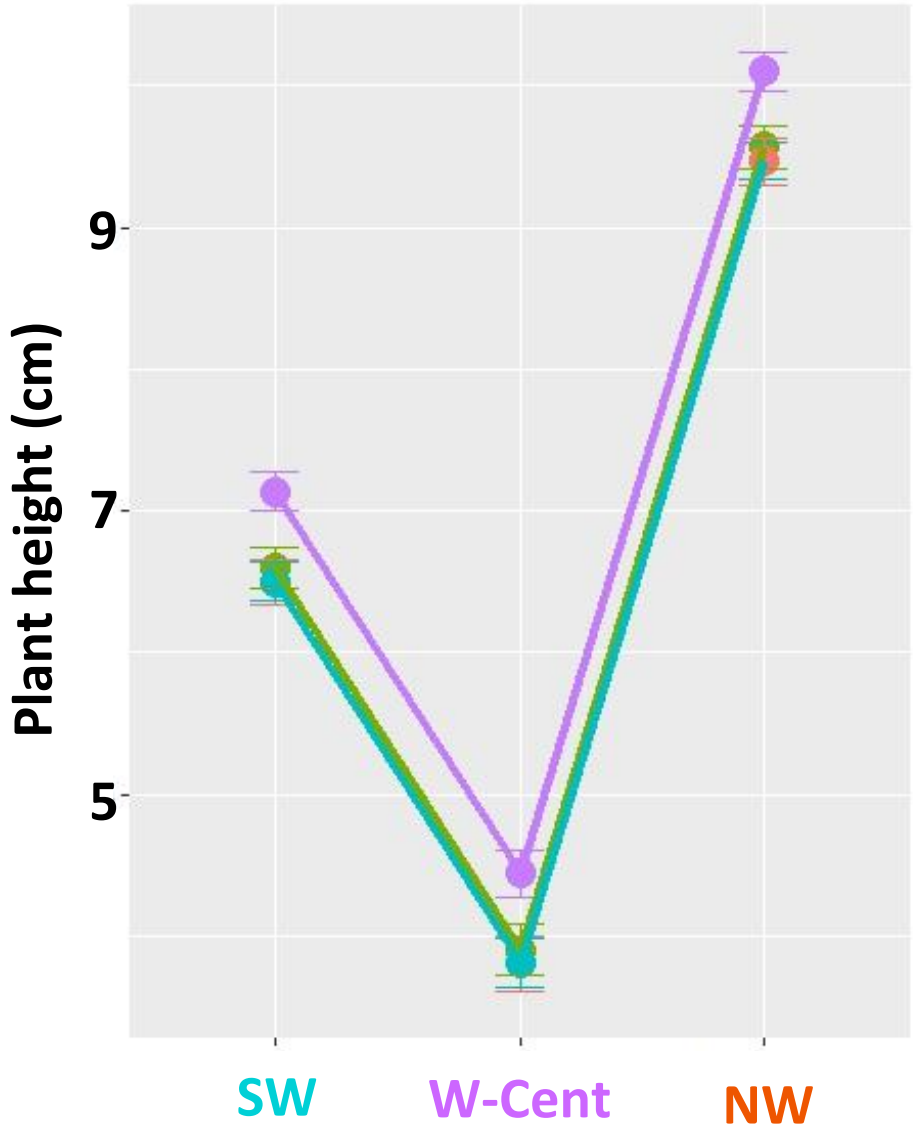
- SW
- Wcentral
- NW
- SE

Response: # of leaves. GLM, log link

	Resid. df	Resid. dev	dAIC	weight
Origin	3271	9611.1	3541.4	0
Site	3272	6100.1	28.4	0
Orig.* Site	**3263**	**6017.9**	**0.0**	**1**

Preliminary results – little bluestem





EVALUATION SITES

Response: Plant height GLM, identity link

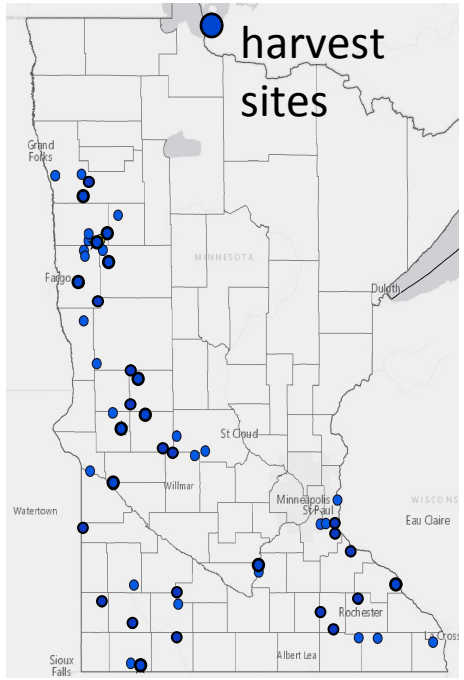
	Resid. df	Resid. dev	dAIC	weight
Origin	3271	55623	980.4	0.0
Site	3272	41435	14.0	0.0
Ori.+ Site	**3269**	**41182**	**0.0**	**0.9**

Summary & next steps

- Sideoats grama –
  - no evidence of local adaptation
  - SE-origin shortest at 2 sites
- Little bluestem –
  - SW, W-cent origin – most leaves, tallest
- Long-term experiment –
  - Local adaptation as lifetime fitness
  - 6 spp. total
- Stay tuned…

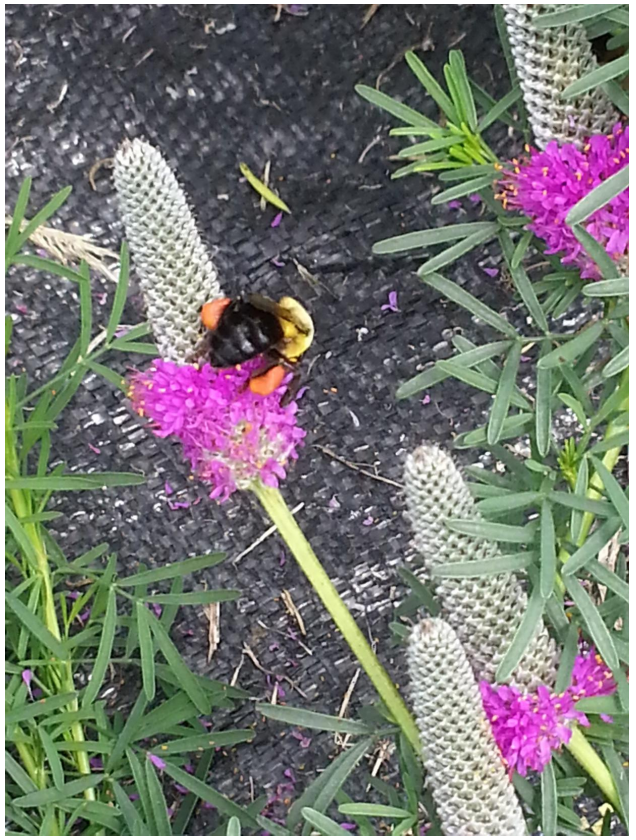
Healthy Prairies Project partners and funders:

Healthy Prairies Project – Seed Conservation



Healthy Prairies Project – Beneficial microbes

Endophytes of native MN prairie



Role that microbes play in local adaptation of plants

Healthy Prairies Project – Adaptive capacity

Genetic variation for fitness in natural populations (little bluestem)

Healthy Prairies Project partners and funders:

The preceding presentation was delivered at the

2017 National Native Seed Conference

Washington, D.C. February 13-16, 2017

This and additional presentations available at http://nativeseed.info

NATIVE SEED NETWORK

Institute for Applied Ecology