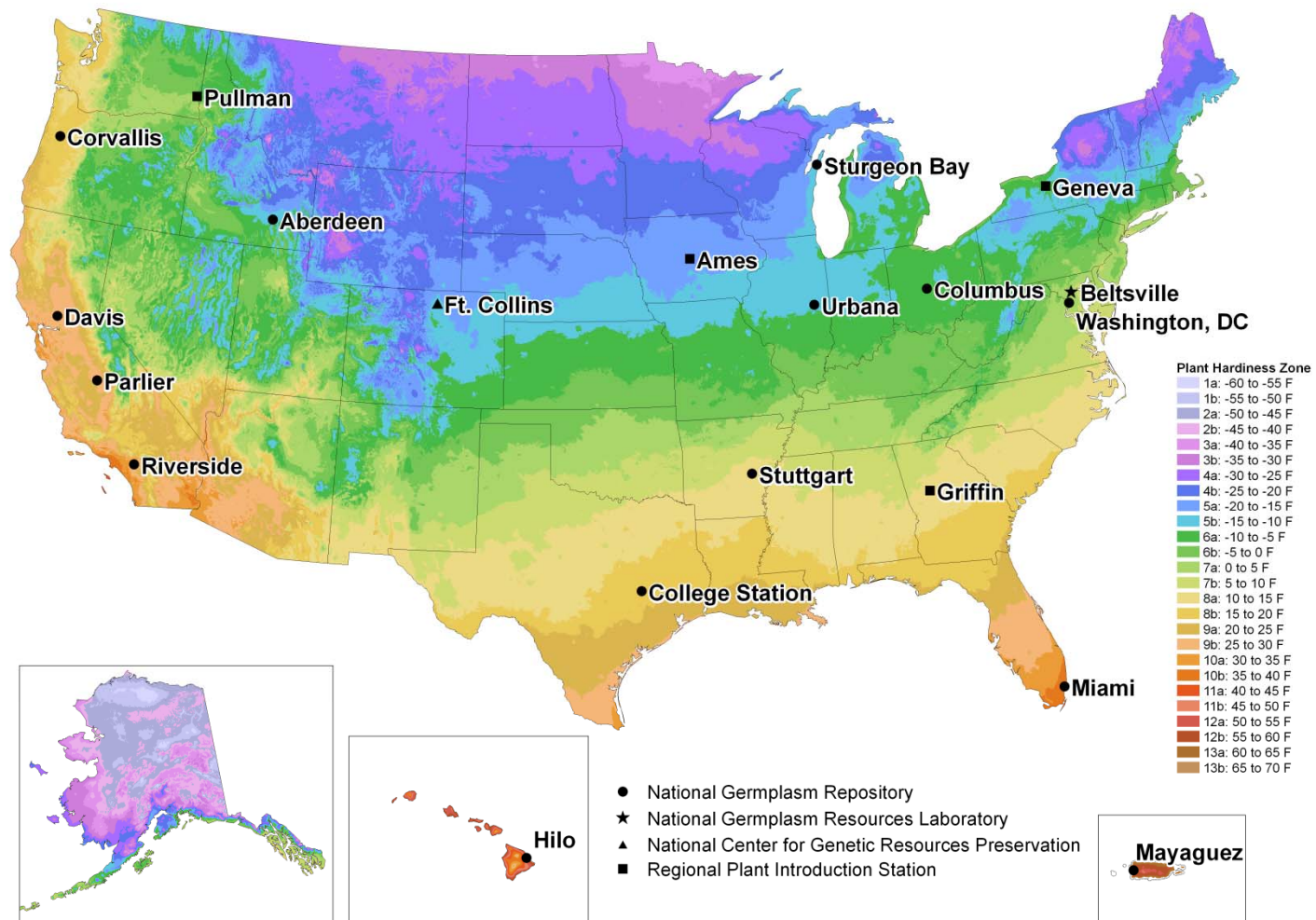


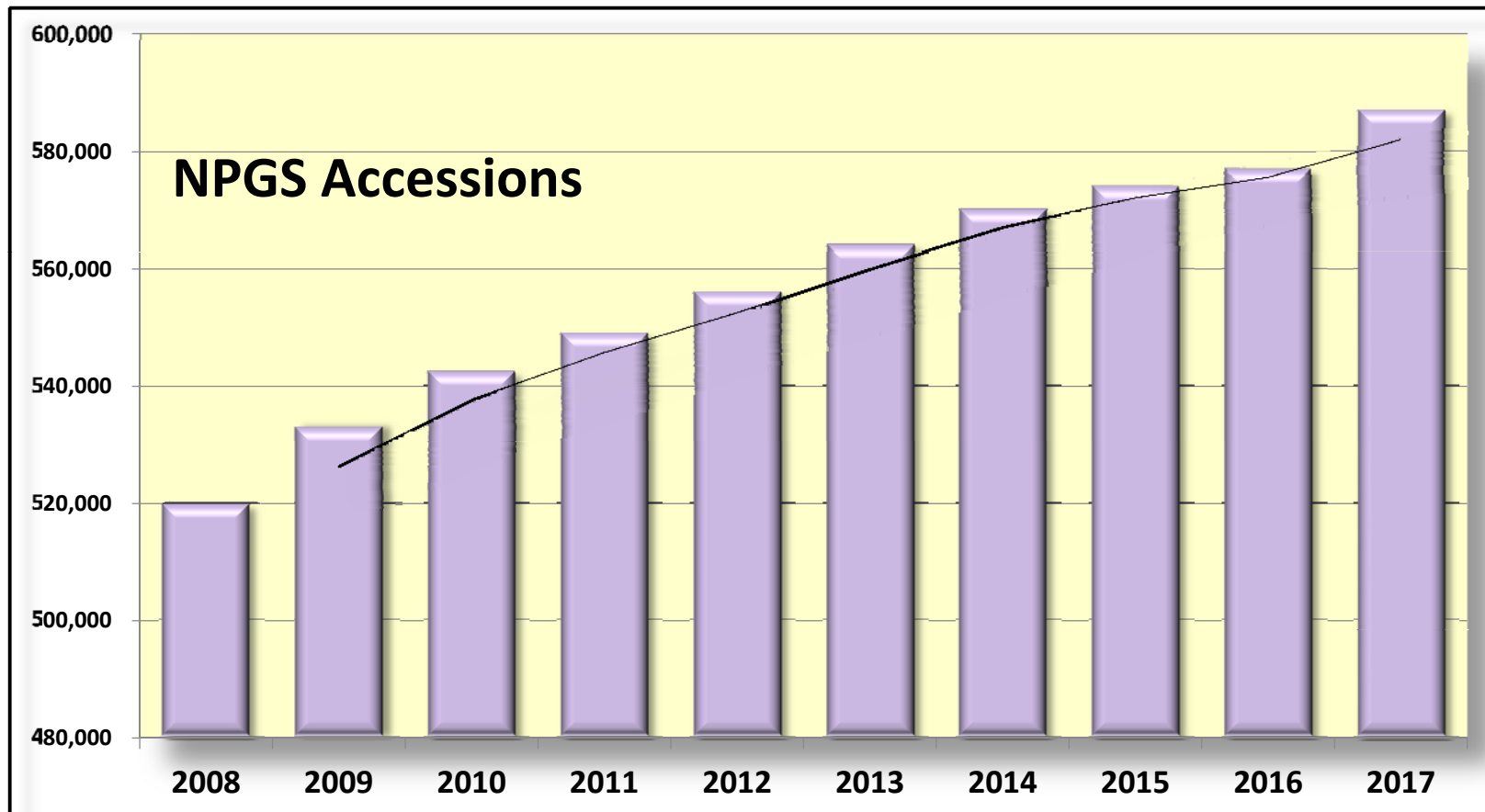
The National Plant Germplasm System: 2018 Status, Prospects, and Challenges

Peter Bretting
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1.301.504.5541

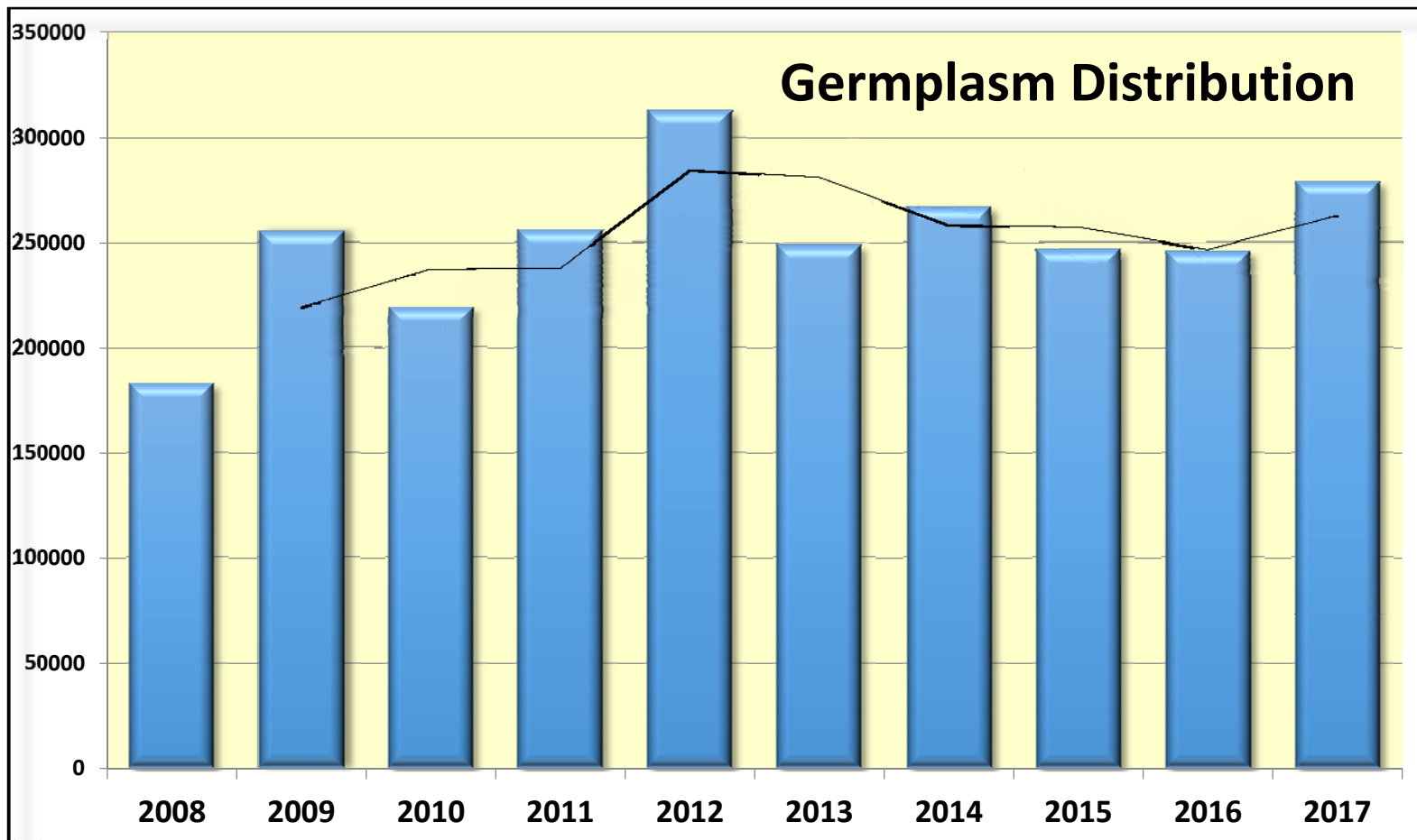
USDA National Plant Germplasm System (NPGS)



NUMBER OF NPGS ACCESSIONS 2008-2017



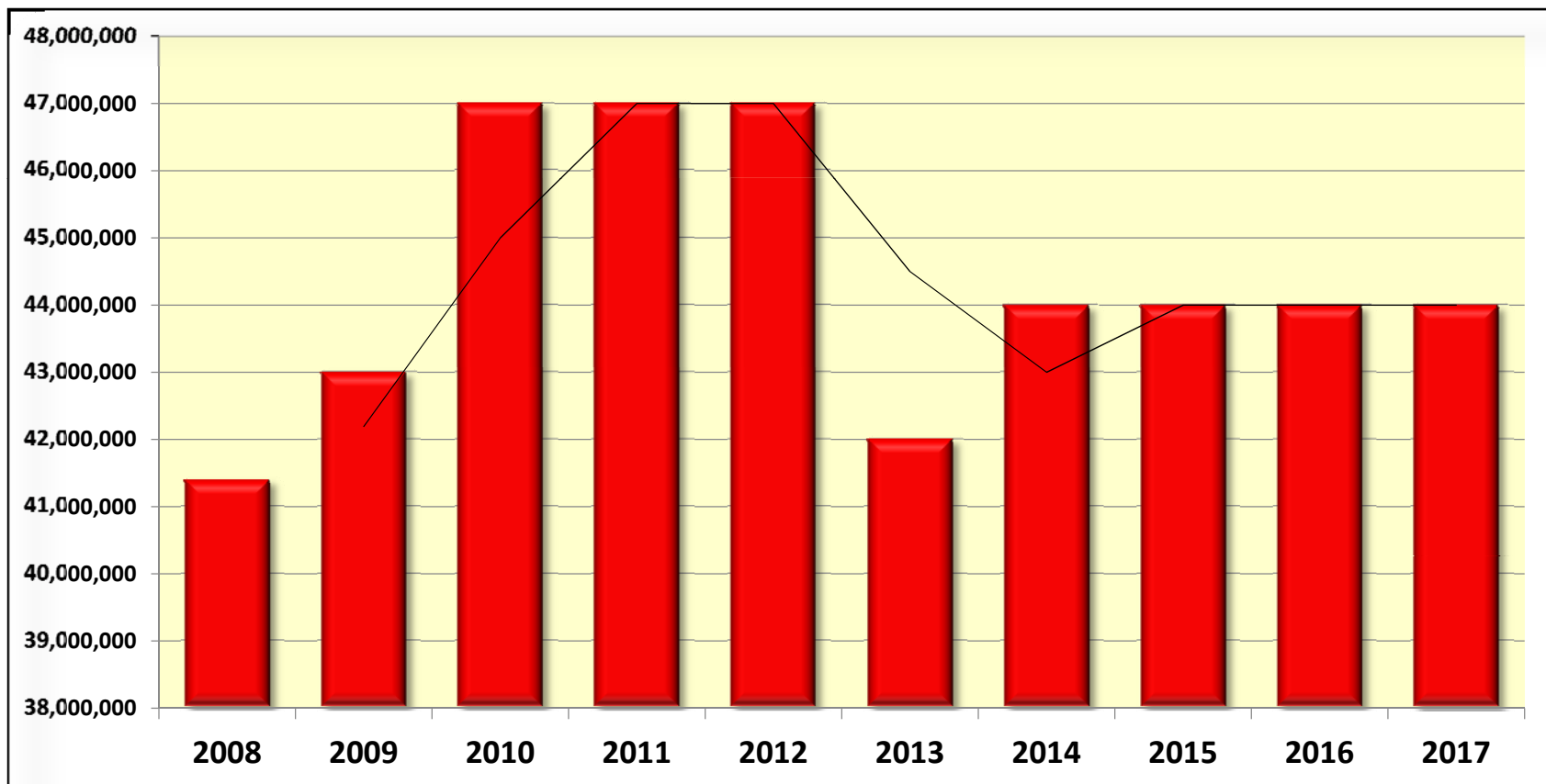
DEMAND FOR NPGS GERMPLASM 2008-2017



ARS NATIONAL PLANT GERMPLASM SYSTEM

BUDGET

2008-2017



Some key challenges for the NPGS

- **Managing and expanding the NPGS operational capacity and infrastructure to meet the increased demand for germplasm and associated information.**
- **Recent and upcoming NPGS personnel retirements.**
- **Developing and applying cryopreservation and/or in vitro conservation methods for clonal germplasm.**
- **BMPs and procedures for managing accessions (and breeding stocks) with GE traits and the occurrence of adventitious presence (AP).**
- **Acquiring and conserving additional germplasm, especially of crop wild relatives.**

Genetic Resource Management Priorities

- Acquisition
- Maintenance
- Regeneration
- Documentation and Data Management
- Distribution
- Characterization
- Evaluation
- Enhancement
- Research in support of the preceding priorities



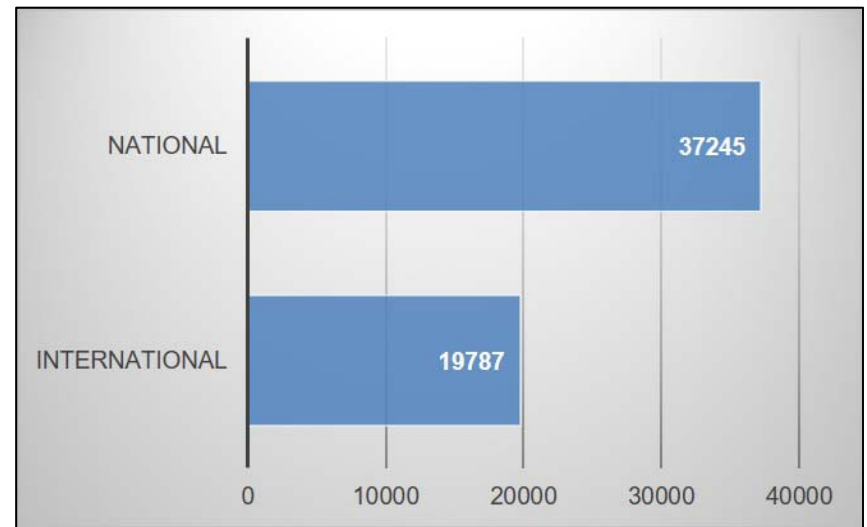
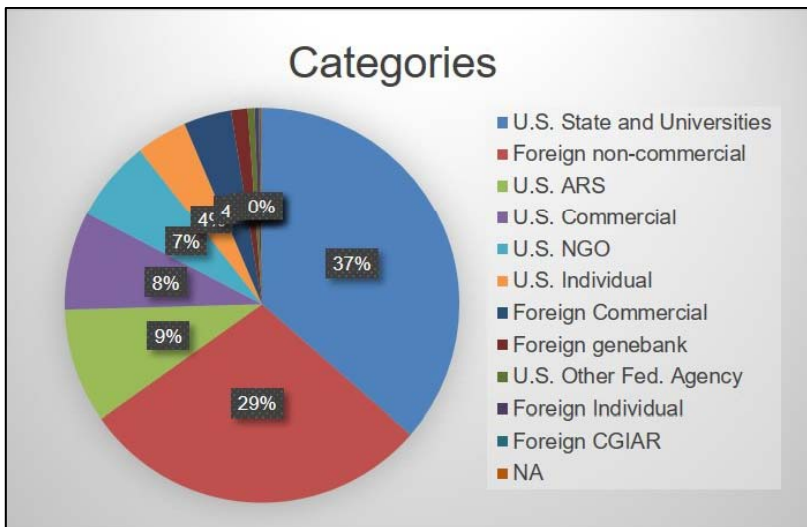
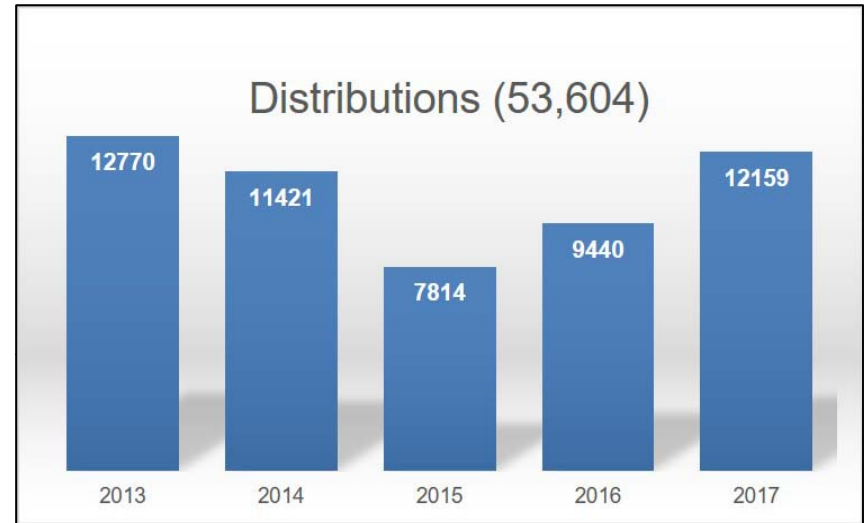
How are NPGS goals achieved?

- Project Plans developed, approved, implemented
- Acquisition, propagation, distribution, **RESEARCH**
 - Research focuses on effective management
 - Characterization, evaluation, genetic integrity and diversity, viability and long-term storage, geneflow, ...
- Curators are crop managers (Plant Scientists)
 - Horticulture, Agronomy, Plant Physiology, Entomology, Pathology, Soil Science, Systematics, Botany, Genetics, Molecular Biology, ...
- Database information management
- Effective communication

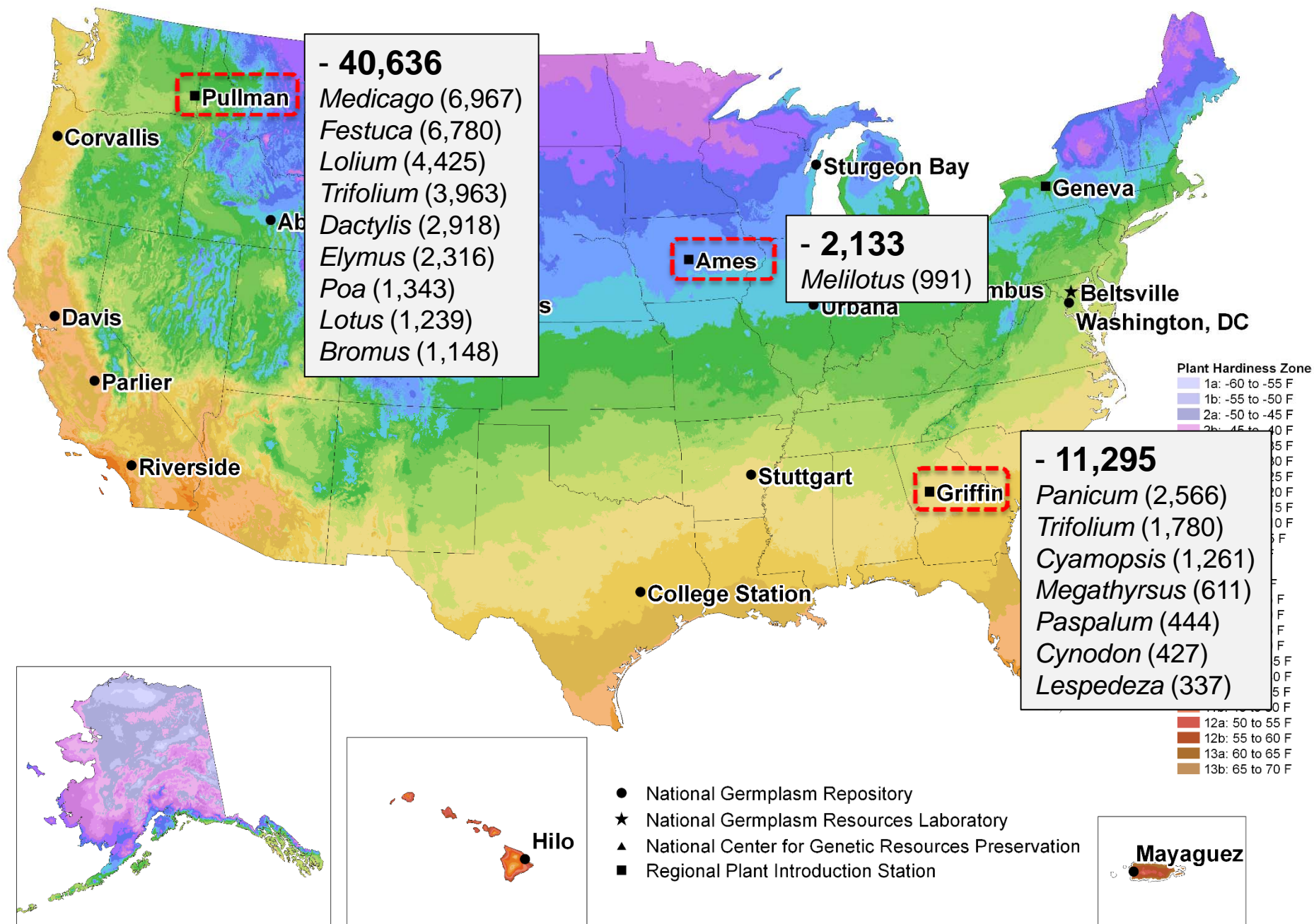
NPGS forage statistics

Very difficult to determine exactly how many 'forage' germplasm accessions are actually conserved in the NPGS

- Conservative estimate ~ 50,000
- Many plants are traditionally used as forage/fodder, but many more have the potential as forages
- Some forages used for other purposes including cover crops
- Alfalfa is primarily a forage, but also has human food use*



Endress/Wiersema



Pullman - *Vicia* and *Lathyrus* spp.

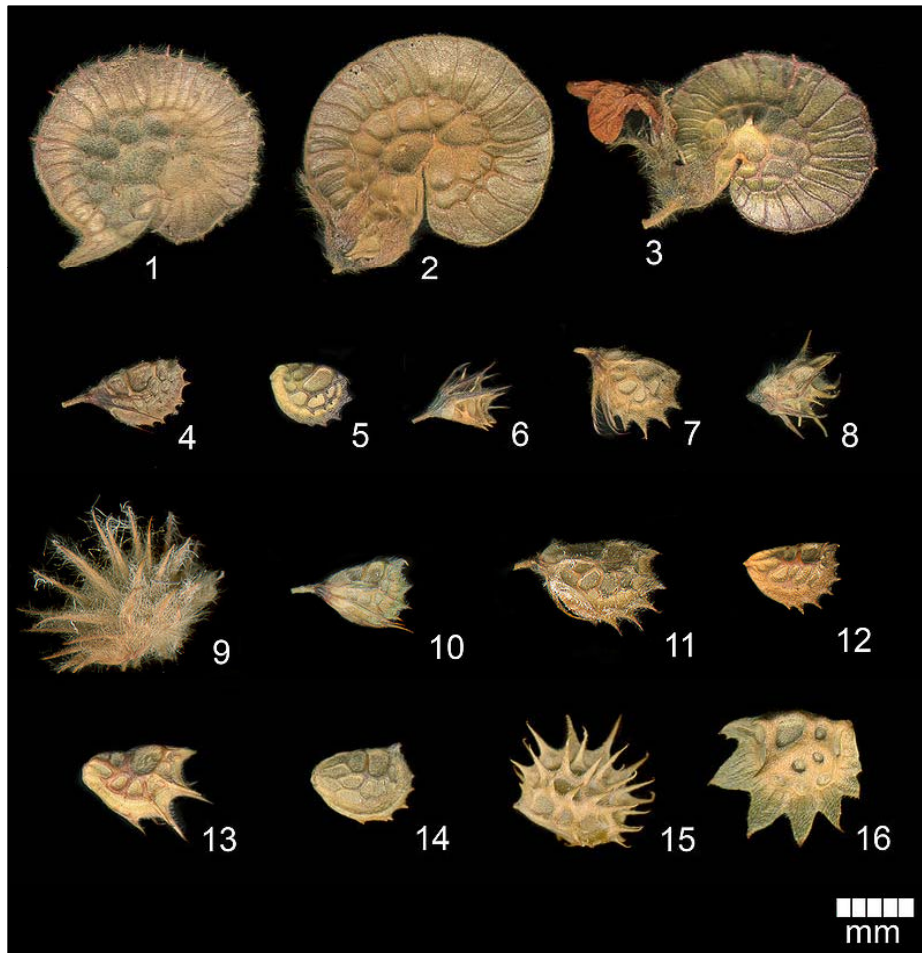


- Common vetch
 - *Vicia sativa* (765)
- Hairy vetch
 - *Vicia villosa* – (184)
- Other vetches
 - *V. monantha* and *V. pannonica*
- Grasspea
 - *Lathyrus sativus* (295)

‘AU EarlyCover’ hairy vetch was derived from a composite of PI 561945, PI 561946, and PI 561947

Adapted from Clare Coyne

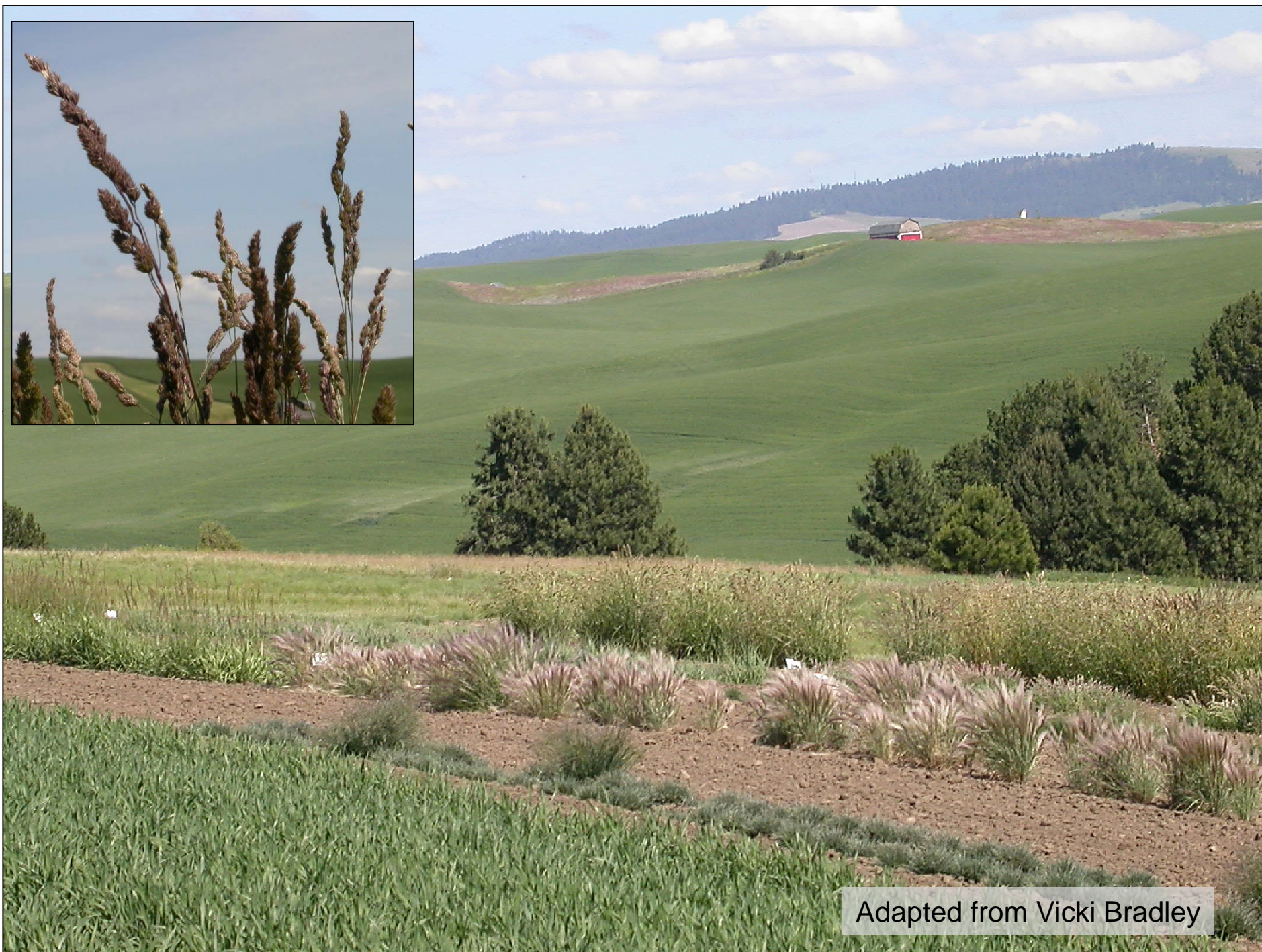
Pullman – *Onobrychis* and *Astragalus* spp.



By Plantsurfer – Own work, CC BY-SA 3.0

- *Onobrychis* spp. (650)
- Sainfoin
 - *O. viciifolia* (188)
 - One of the oldest U.S. cultivars 'Lutana' was derived from PI 66515
- *Astragalus* spp. (1,116)
- Cicer milkvetch
 - *A. cicer* (127)
 - 'Redmont' foundation cultivar has a pedigree of 16 PI accessions

Adapted from Barbara Hellier



Adapted from Vicki Bradley

Ames - *Melilotus* spp.



- Sweetclovers
 - *Melilotus officinalis* (1,004)
- Important forage crops and used in nitrogen fixing green manure in the corn belt
- Potential as a winter covercrop since it is cold tolerant and can function as a winter annual

Rust resistance in 'Silver River' derived from PI 678795

Adapted from David Brenner



Adapted from Brad Morris

Pullman/Prosser – alfalfa, clover and trefoil

- Medic *Medicago* (8,634)
 - *M. sativa* (4,086)
 - *M. truncatula* (406)
- Clover - *Trifolium* (3,757)
- Trefoil - *Lotus* (983)
- 'Trail blazer' a potato leafhopper resistant cultivar derived from alfalfa PIs and three perennial *Medicago* wild relatives - sources of glandular hairs







Stakeholder involvement/contribution

- Participate in specific CGCs and in any other NPGS or genetic resource forums
- Collaborate directly with NPGS SYs
- Provide feedback and interact with Curators
 - Quality of germplasm (viability, integrity)
 - Donate unique/improved germplasm
 - Data on germplasm in characterization/evaluations to be associated with accession in GRIN-Global
- Support service of NPGS by acknowledgement
 - Presentations (research/policy), publications, reports

