The National Plant Germplasm System: 2016 Status, Prospects, and Challenges

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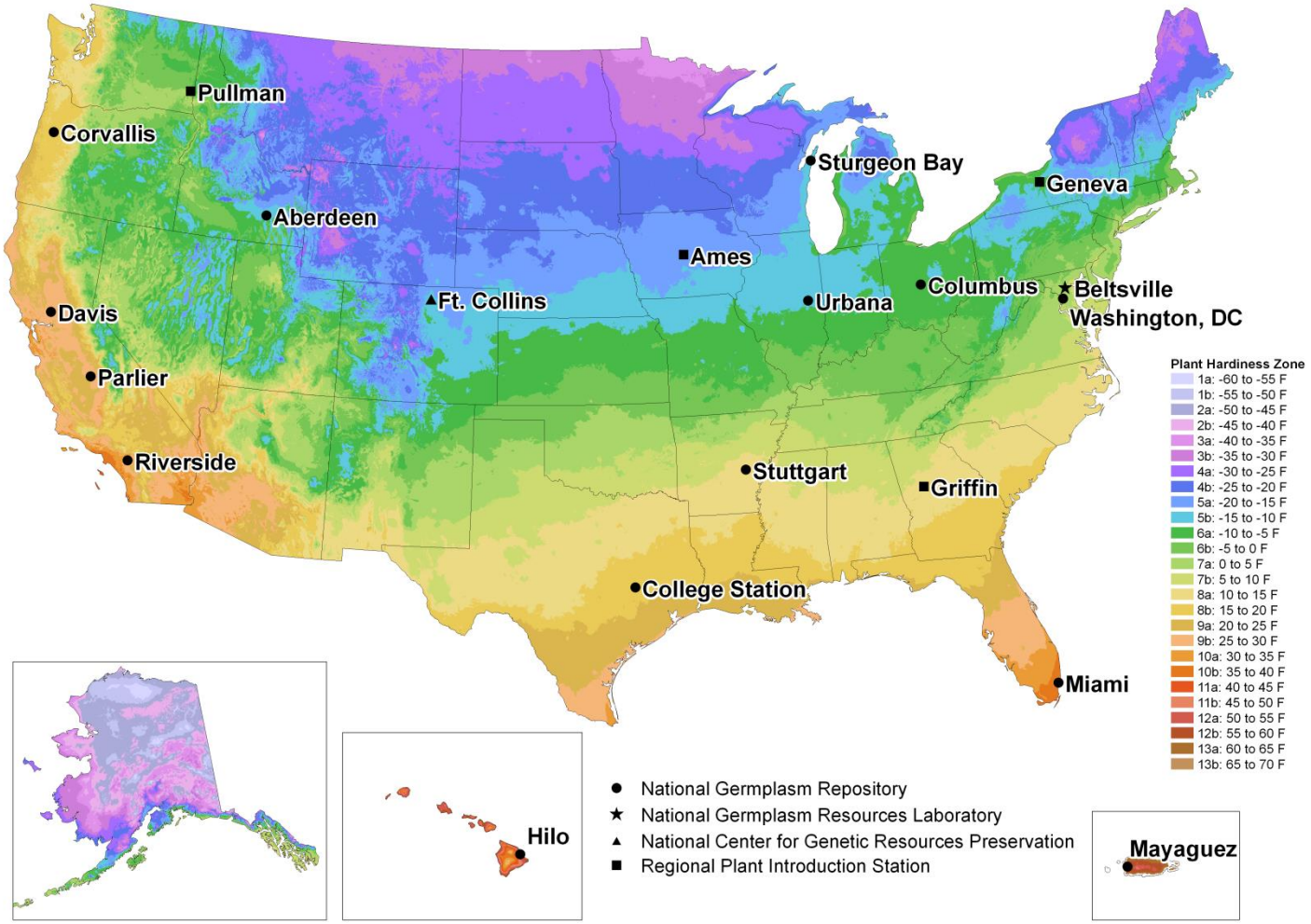
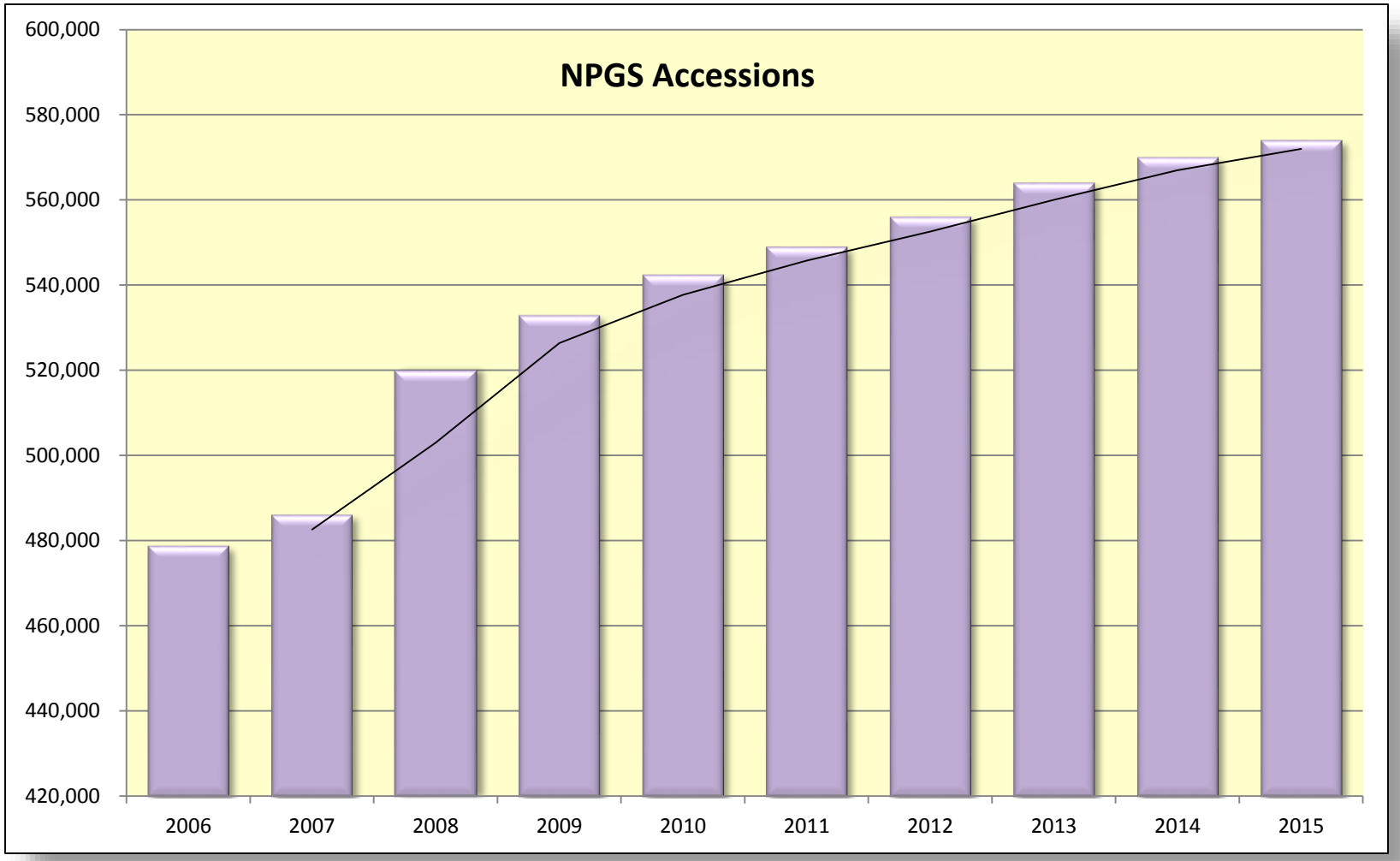
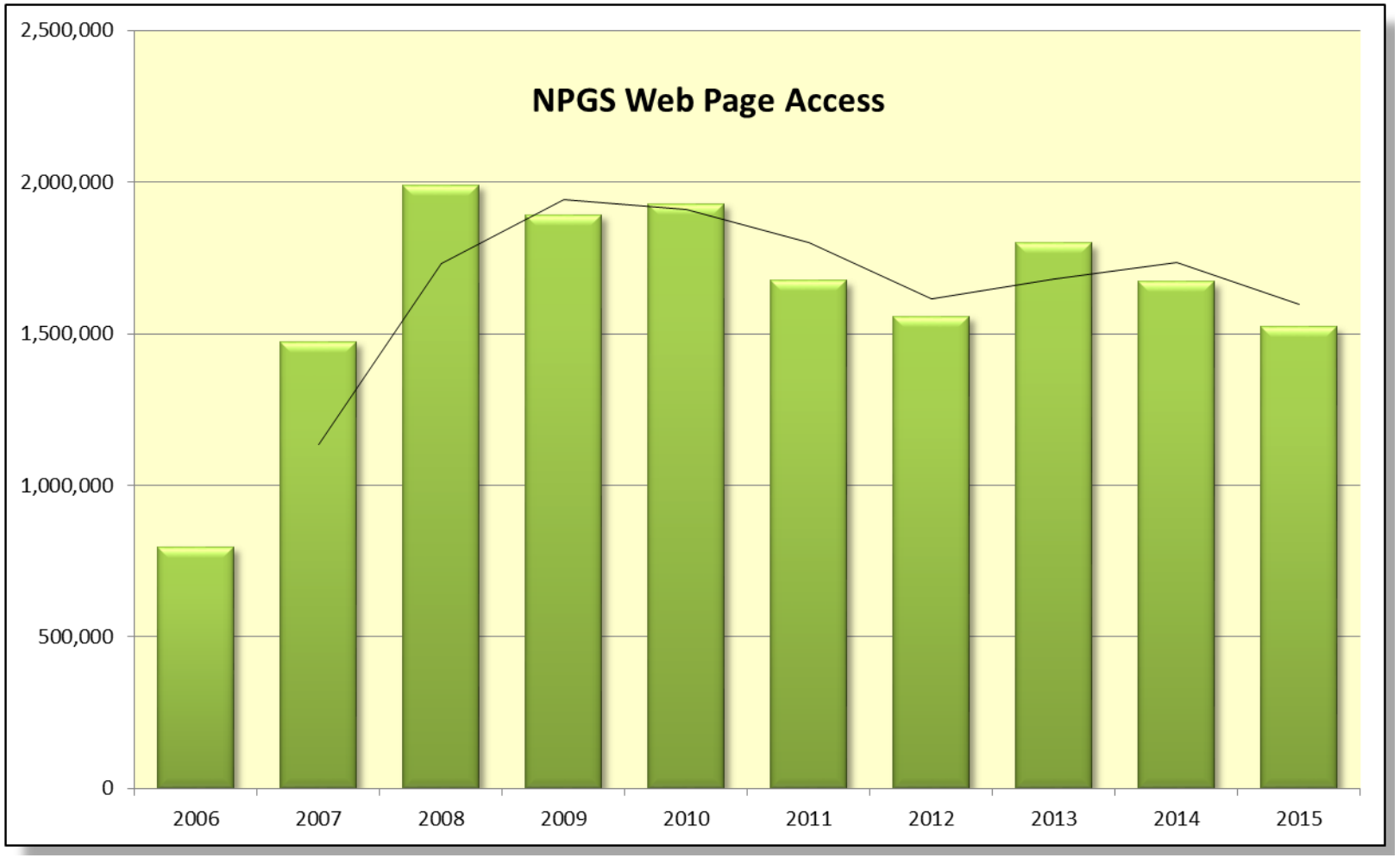
USDA National Plant Germplasm System (NPGS)



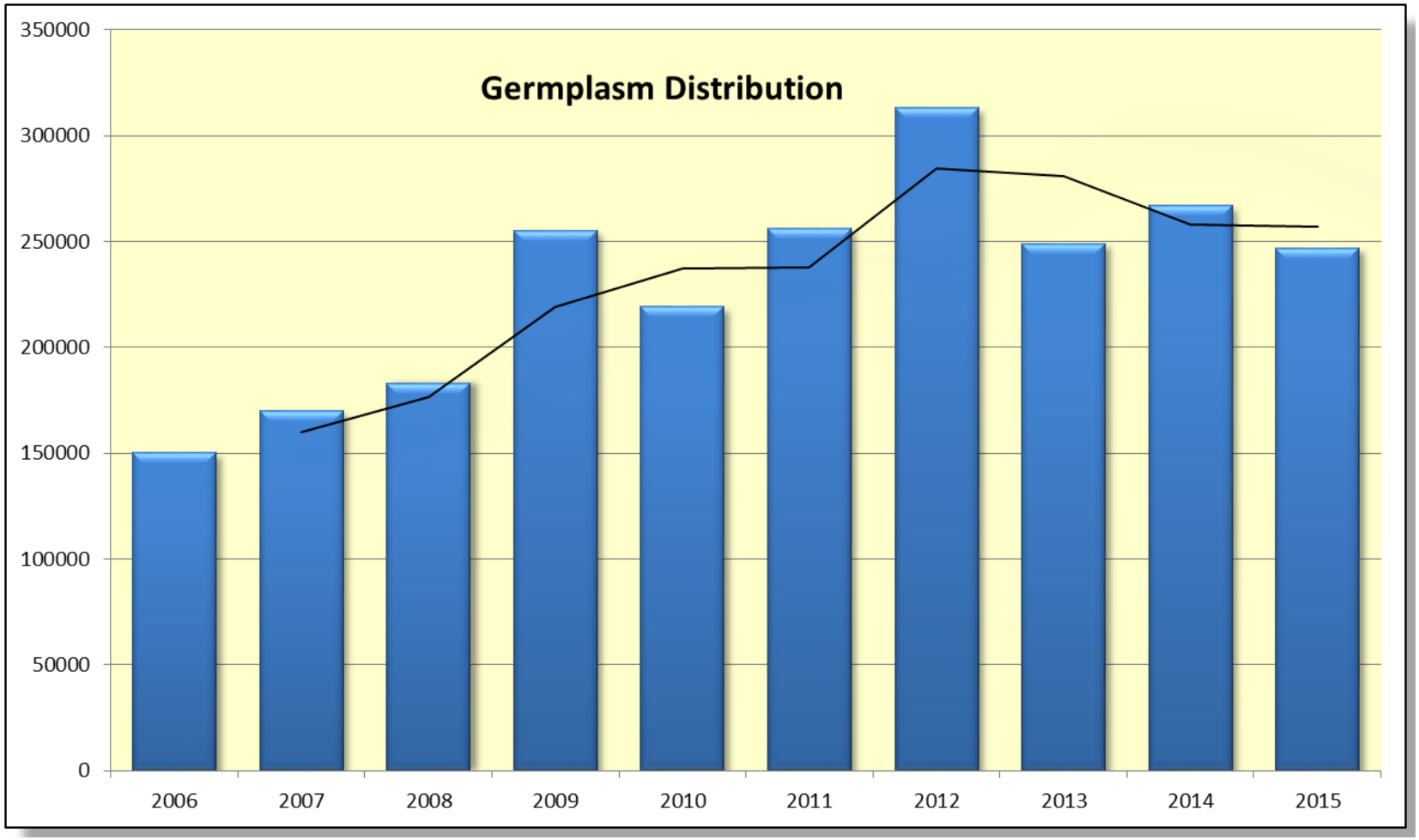
Number of NPGS Accessions 2006-2015



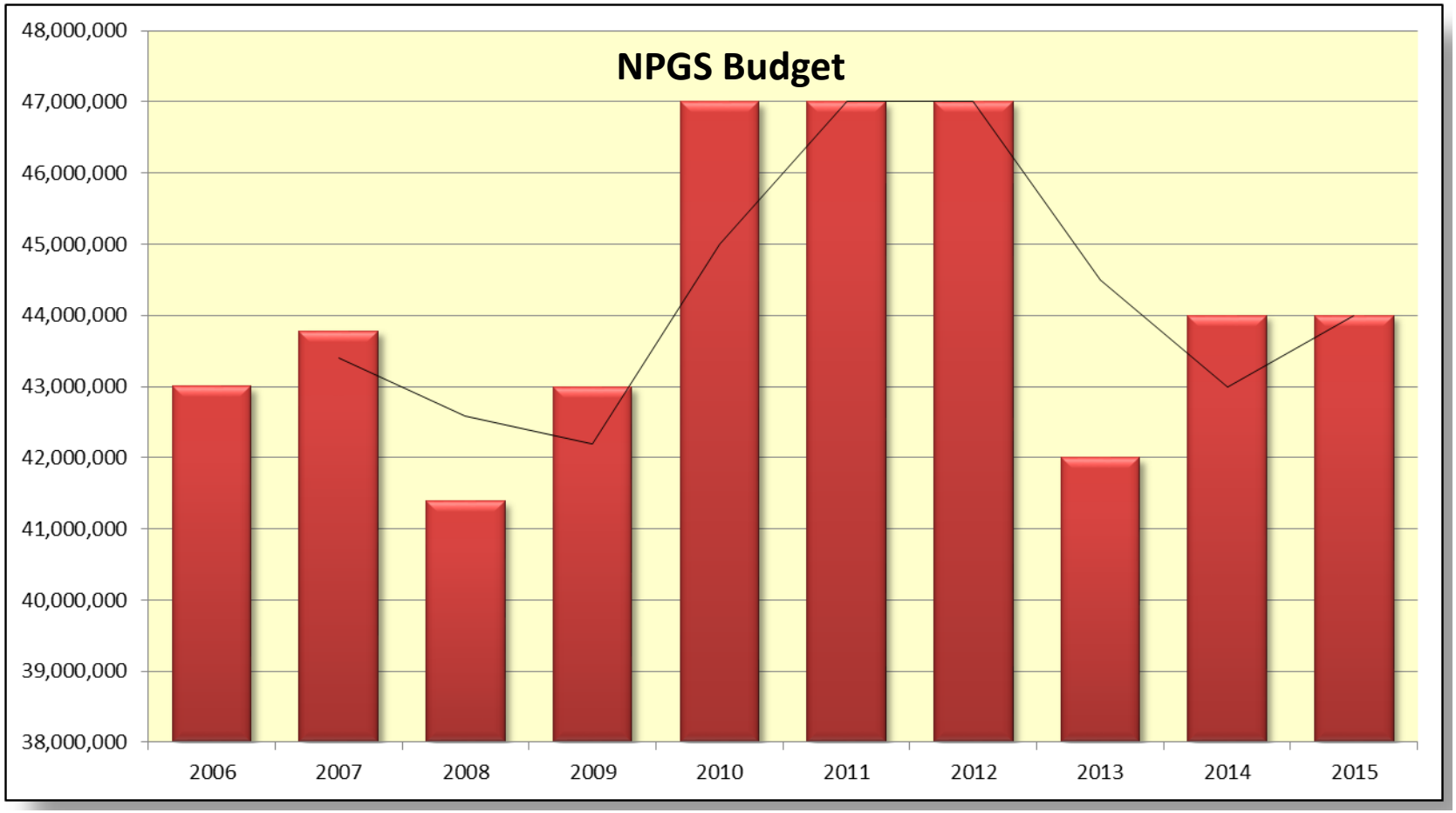
DEMAND FOR NPGS INFORMATION 2006-2015



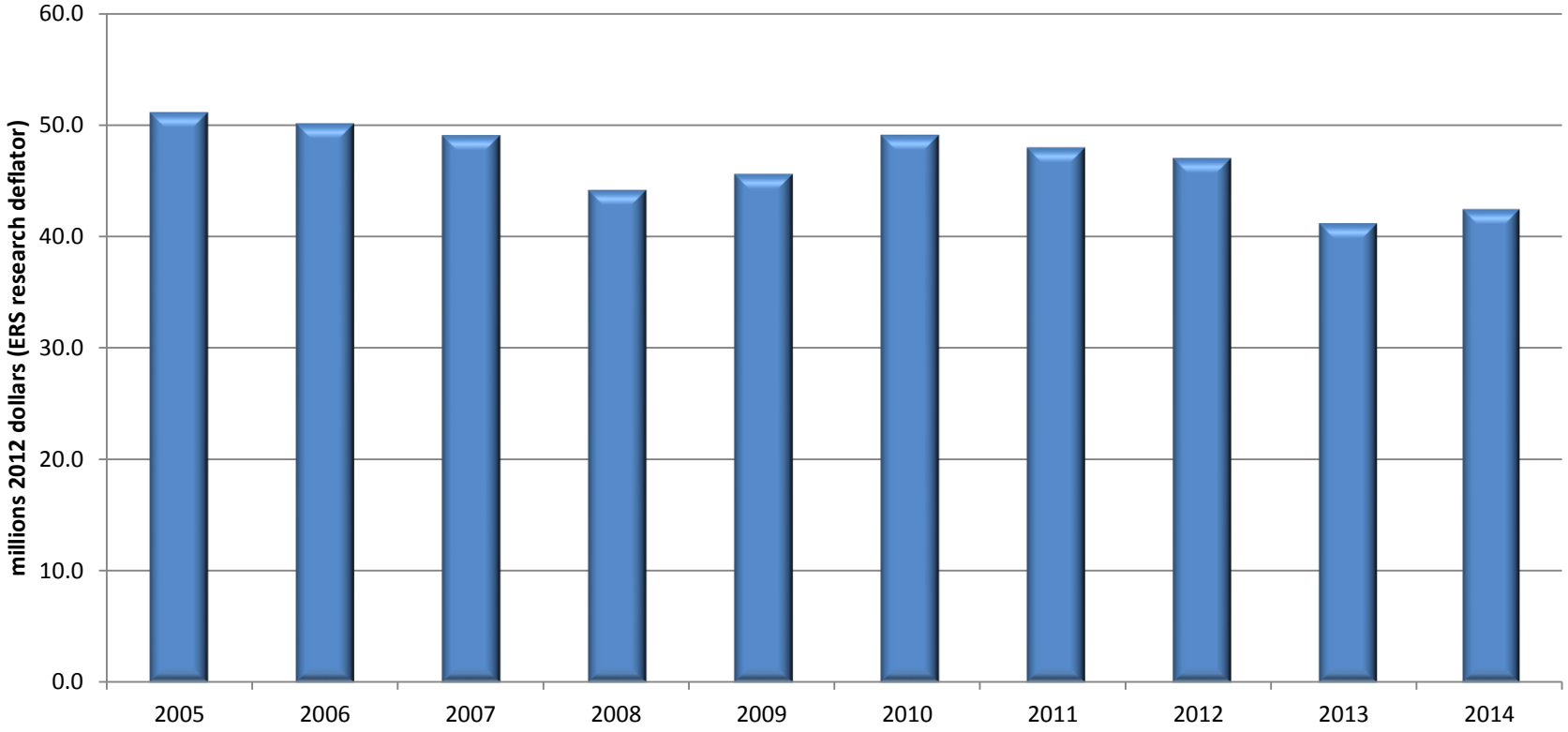
Demand for NPGS Germplasm 2006-2015



ARS National Plant Germplasm System budget 2006-2015



Real ARS National Plant Germplasm System Budget, 2005-2014 converted to 2012 dollars with ERS research deflator



Genetic Resource Management Priorities

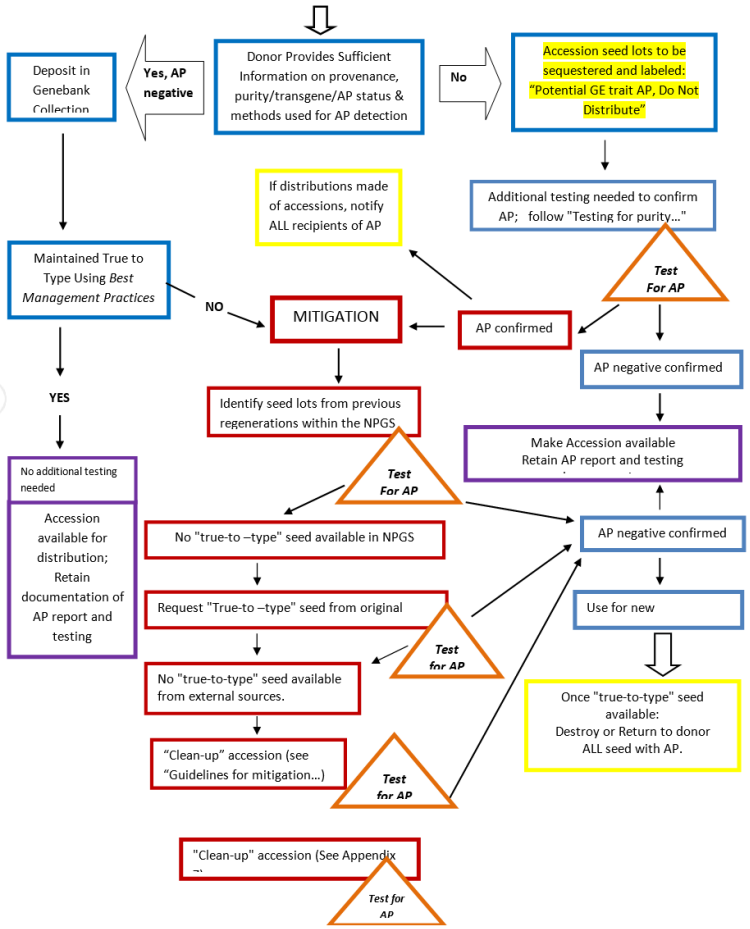
- Acquisition
- Maintenance
- Regeneration
- Documentation and Data Management
- Distribution
- Characterization
- Evaluation
- Enhancement
- Research in support of the preceding priorities

Some key challenges that stretch the NPGS's resources

- **Managing and expanding the NPGS operational capacity and infrastructure to meet the increased demand for germplasm and associated information**
- **Fulfilling the demand for additional germplasm characterizations/evaluations**
- **Acquiring and conserving germplasm of crop wild relatives**
- **BMPs and procedures for managing accessions (and breeding stocks) with GE traits and the occurrence of adventitious presence (AP)**

BMPs and procedures for managing accessions (and breeding stocks) with GE traits and the occurrence of adventitious presence (AP)

Figure 1: Decision tree and critical control points for assessing probability of and testing for AP in NPGS genebank accessions. Blue =processes for determining/confirming AP and maintaining true-to-type. Yellow=action needed. Orange=potential critical control points for AP testing. Red= processes associated with AP-positive findings and mitigation of AP. Purple= processes associated with AP-negative findings.



- **Written by ARS genebank curators, breeders, geneticists, statisticians, NPLs, and ADs.**
- **Reviewed by 100 + scientists—ARS, academic, private-sector, and regulatory agencies.**
- **Will be implemented in ARS soon; precise details TBD.**

A key priority: Crop Vulnerability Statements (CVS)

- **Assessing crop genetic vulnerability and setting NPGS priorities accordingly.**
  - **Template for constructing crop vulnerability statements**
  - **Some CGC have published, or plan to publish, their CVS—e.g., Volk et al. 2014 The vulnerability of US apple (Malus) genetic resources. Genet. Resour. Crop Evol. DOI 10.1007/s10722-014-0194-2.**
  - **But, CVS need not be as formal as that. Web-style content is fine.**
  - **It's more important that the CVS be updated frequently; perhaps devote the first part of each CGC meeting to briefly reviewing and updating the CVS.**

NP 301 Retrospective Review and subsequent milestones

- **Thanks for all the slides and information!**
- **Retrospective Review (external reviewers; webinar format) 27-28 June**
- **Customer/Stakeholder Workshop and ARS NP 301 Scientists Workshop in August; webinar format, dates TBD**
- **New NP 301 Action Plan developed in September/October**
- **PDRAMs written December-March, TBD by NP 301 subgroup**
- **New Project Plans due late April-late June, TBD by NP 301 subgroup**

Personnel Changes

- **Farewell and best wishes to Barbara Reed (NCGR-Corvallis), RC Johnson (WRPIS-Pullman) and Dan Barney (NCRPIS-Ames) for their retirements.**
- **Congratulations and best wishes to Richard Olsen, formerly lead scientist for the USNA-Washington, DC genebank project, on becoming the new Director, USNA.**
- **Best wishes to Brian Irish who moved from TARS-Mayagüez to WRPIS-Pullman/Prosser to be the new alfalfa and clover curator.**
- **Welcome and best wishes to Shyam Tallury, new peanut curator at SRPIS-Griffin; Claire Heinitz, new curator at NALPGR–Parlier; and Mary Lou Polek, the new RL for the NCGR-Riverside.**

FAO International Treaty (IT) on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol (NP) of the Convention on Biological Diversity (CBD)

- **The IT is a legally-binding Treaty under the UN Food and Agriculture Organization.**
- **The objectives of the IT are:**
  - **the conservation and sustainable use of PGRFA (Plant Genetic Resources for Food and Agriculture) and**
  - **the fair and equitable sharing of the benefits arising out of their use.**
  - **The IT is in harmony with the CBD, and <u>focused on sustainable agriculture and food security.</u>**
- **The US signed (2002) but has not yet ratified the IT.**
- **Update: The Senate Committee on Foreign Relations held a hearing regarding US ratification on 19 May 2016. Further Senate action is awaited.**

Effects of the US ratifying and becoming a Party to the IT

- **US PGRFA users, both public and private-sector, would have guaranteed access to PGRFA from other nations and IARCs: if needed, international law would be a tool for asserting that right.**
- **Terms of access specified by the SMTA.**
- **US government obliged to provide PGRFA access to non-US users essentially via current NPGS practices, but accompanied by the SMTA.**
- **Terms of access to NPGS PGRFA would not change for US users.**

Effects of the US ratifying and becoming a Party to the IT

- **Thus, if the US were a Party to the IT, the NPGS would incur additional obligations for reporting, information-sharing and curation, but it is already fulfilling nearly all of those. Other public and private-sector PGRFA users would incur no additional obligations.**
- **As a Party, the US government could effectively represent US germplasm users at the IT's Governing Body, advance US priorities and interests, and strive to improve some aspects of the IT and the SMTA.**

The Nagoya Protocol (NP) of the Convention on Biological Diversity (CBD)

- **The CBD is a legally-binding Convention, with the objectives:**
  - **the conservation of biological diversity**
  - **the sustainable use of its components and**
  - **the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.**
- **US is not a CBD Party, so we cannot be a Party to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from their Utilization which will implement the CBD benefit-sharing objective.**

- **Benefit-sharing under the CBD:**
  - **Negotiated by providers and recipients (e.g., in contracts for exchanging genetic resources); in some cases national governments are involved.**
  - **In many nations, access and benefit-sharing (ABS) policies will be guided by the NP, which came into force in October 2014.**
  - **As always—but especially now--GR users should obtain and maintain clear documentation for the terms under which GR were collected and utilized.**

The Nagoya Protocol (NP) of the Convention on Biological Diversity (CBD)

- **Access to genetic resources (GR) subject to prior-informed consent (PIC) of providing country.**
- **Benefits arising from GR use will be shared in a fair and equitable way based on mutually-agreed terms (MAT) between provider and recipient.**
- **Parties to the NP must ensure that GR is accessed according to PIC-MAT.**
- **The NP applies to all GR except those covered by other international agreements consistent with the CBD and NP, e.g., the IT.**
- **National implementation procedures are key to the NP's effects on GR access.**
- **See the CBD Access and Benefit-Sharing Clearinghouse for info: https://absch.cbd.int/**