



NGRAC Meeting – August 16, 2023, Meeting Minutes

National Genetics Resources Advisory Council Members Present: Dr. Jim McFerson (Chair), Dr. David Butruille, Dr. Paul Gepts, Mr. Preston Hardison, Dr. Stephen Kresovich, Dr. Margaret Smith, and Dr. Terrence Tiersch – 7

Members Absent: Drs. John Buchannan, Chad Dechow, Steven Kerns, and Sarada Krishnan – 4

Ex-Officio Present: Drs. Peter Bretting and Harvey Blackburn – 2

NAREEE Board Staff Present: Ms. Kate Lewis, NAREEE Board Executive Director/Designated Federal Officer (DFO) and Ms. Michele Simmons, Program Support Specialist

Guests Present: Drs. Gayle Volk, USDA-ARS and Brian Irish, USDA-ARS

I. Welcome, Roll Call, Quorum Check, and approval of July 2023 meeting minutes.

DFO Lewis welcomed everyone, took roll call, and noted that the quorum was met. She asked for a motion to approve the meeting minutes from July 26th. All were in favor. Michele will work with the web team to get the July meeting minutes posted to the website.

DFO Lewis provided an update on the FY23 and FY24 nomination packages. She was informed through management from the Office of the Secretary that we should soon receive information on both nomination packages at the same time.

DFO Lewis also provided an update on the National Genetics Resources Program Recommendations Report, the National Plant Germplasm System Recommendations Report, and the Emergency Citrus Disease Report. We now have a different Senior Advisor from the Secretary’s Office that is working on getting acknowledgment from the Secretary. Kate has been told that a briefing will take place to bring the new Advisor up to speed. The briefing should be scheduled the week of August 21st.

II. Remarks from Dr. Jim McFerson, NGRAC Chair

Dr. McFerson – He is working with the NAREEE Advisory Board on the response letter to REE Leadership. More specifically, he is working with Donnell Brown from the National Grape Research Alliance to provide feedback on the USDA Science and Research strategy that was publicly released on May 17th and that was summarized in the NAREEE Advisory Board meeting in June 2023.

Dr. McFerson mentioned that once the new NGRAC members are named, he would like to welcome them and provide an orientation to bring them up to speed as soon as possible.

DFO Lewis turned the agenda over to Dr. Volk to discuss her PowerPoint on a recent article that appeared in Crop Science.

III. Presentation from Dr. Gayle Volk: Findings from the recent National Plant Germplasm System (NPGS) climate change analysis published in the Crop Science article

Dr. Volk presented a PowerPoint overview about a project that she and her colleagues in the NPGS created while they wrote an e-book to complement the “Safeguarding Plant Genetic Resources in the United States During Global Climate Change” publication in Crop Science. She provided an overview of the objectives of the manuscript to describe some of the potential effects of climate change on ex situ plant genetic resource management. Dr. Volk stated that there's a lot of information about climate change, but not much about its effect on genebanks. She and her colleagues thought there was a need to assess potential impacts on the NPGS. Drs. Peter Bretting and Brian Irish are also coauthors on the paper.

Summary of the PowerPoint

Objectives:

- Document potential effects of climate change on ex situ PGR maintenance
- Describe an application that provides U.S. temperature and precipitation predictions for NPGS genebanks
- Provide case studies demonstrating instances of climate change impacting the NPGS
- Highlight NPGS management responses

Slide #1: NPGS Purpose – The USDA NPGS is a resource that provides and visualized Future climate data for NPGS locations where plant genetic resources are maintained or Regenerated. This information may be used to help guide genebank efforts to adapt to a change climate.

Slide #2: Windstorms affect sunflower seed regenerations in Ames, IA

Slide #3: Maize is regenerated in the field and hand pollinated

Slide #4: Heat dome in June 2021 caused 46°C temperatures in Eastern Washington

Slide #5: Davis, CA (Prunus collections) has warmer shorter winters
Sweet cherry accessions are not achieving full dormancy

Slide #6: Pecan collection in College Station, TX

Slide #7: Climate change is causing warmer temperatures and increased precipitation in the tropics

Slide #8: Apple collection in Geneva, NY has devastating streptomycin-resistant fire Blight. Future warm, wet springs will lead to additional losses due to pathogens

Slide #9: Proposed *in situ* cranberry sites will need to be reviewed as populations shift North

Slide #10: Collection back-up

- Slide #11:** Conserving and using climate-ready plant collections
- Slide #12:** Climate change impacts agricultural productivity and food security
- Slide #13:** Importance of plant for mitigating and adapting to the effects of climate change
- Slide #14:** Climate change affects plant interactions with pollinators, pathogens, and pests
- Slide #15:** Regeneration: Heat stressed pollinators have reduced efficiency
- Slide #16:** Biological controls agents may avoid warm temperatures
- Slide #17:** Plant breeding for climate change: Opportunities for adaptation and mitigation
- Slide #18:** Climate change impacts managements of plant genebanks and botanic gardens
- Slide #19:** Climate adaptation planning for plant collections and conservation
- Slide #20:** NGPS planning

Dr. Volk asked if there were any questions or comments.

Dr. Irish – You talked about the pecan collections at Texas A&M in College Station. Texas is having abnormal temperatures right now. Have we heard anything about what's going on in the pecan collection for 2023?

Dr. Bretting - I haven't heard about any recent reports, but I could follow up on that if you want.

Dr. Irish - It was talking about pollinations and pecans, right?

Dr. Bretting - It's like maize. You bag them. And that's one of the issues with maize. When you bag a maize tassel, the temperature within that bag is 10 to 15 degrees warmer. So it's similar with pecans and that's for the breeding efforts.

Dr. Butruille - When you're considering backup collections or relocating collections, talking about clonal and orchard, every decade is going to be different. Do you need to have a dynamic plan of backing things up?

Dr. Bretting - That's something that we have to consider. Land is an issue for us. For our agency, unless we have a specific congressional authorization, the total amount of money to buy any piece of land that we can spend is \$10. So in many cases we are dependent on long term leases through universities or other entities.

Dr. Tiersch – He thanked Dr. Volk and her colleagues for their efforts on the manuscript and the e-book. It's going to influence what we're going to do with aquatic species.

Dr. Smith – Were there any questions that came up, for instance, we have species at place X and we're going to have nowhere that we can work with this in the next 5 or 10 years. Were there any obvious things like that that surfaced, or was it more just a gradual evolving process that we can probably accommodate?

Dr. Bretting - For me, the most striking piece of new information that came out was the analysis over time by our maize curators with respect to the success of bag pollination.

When you reach 34°C, it just drops off the table. Then to compare that with what the best case scenario forecasts are in the future.

Dr. Smith - Is there another place to put that maize?

Dr. Bretting – It's a matter of having the resources and the ability to reallocate those resources where we need it. That can be a challenge. We've done it in the past. Hopefully when the Congress receives the NPGS Plan, they'll react in a positive way that would enable us to have the resources to make those sorts of adjustments.

Dr. McFerson – Dr. Volk, on your last slide there were items that we discussed in our response to the strategic plan that we made specific recommendations for. This is another goal for us to get suggestions out there. It was interesting to me how it may or may not apply to other species, life forms, microbes, algae, fish, or livestock. Each has a different thing happening there. Thanks to all of you and the coauthors for spending the time to put this together.

Mr. Hardison - How we are going to respond to changes in agro suitability and so on? Are there opportunities for land donations when federal facilities are put into excess? It could be possible that a development could be made through the National Conservation Research Service, a land donation system, something like what the Nature Conservancy does. There are farmers that are abandoning their lands and those lands could be used for future suitability. We really do have to deal with the changing agricultural suitability issues.

Dr. Butruille – It's possible to collaborate with non-government organizations that own land or easement to get long-term and low-cost leases. I'm thinking Iowa. A good example would be Whiterock Conservancy in Northern Iowa.

Dr. McFerson thanked everyone for their comments and questions. He suggested that we move on for the sake of time. He thanked Drs. Volk, Bretting, and Irish for their presentations.

IV. Next steps on initiatives and action items identified at NGRAC FY23 annual meeting

- Deployment document update
- Tribal document
- NPGS Crop Vulnerability Statements
- Aquaculture initiative update

Dr. Butruille thanked all who met this week to discuss the deployment document. He felt that it was a productive discussion. Most of the team read the 3rd draft version of the document and provided comments, feedback, and edits. We've tried to include all of those modifications. If you would like to provide recommendations emerging from this document that could help us focus and identify it as something that's important to you, please consider volunteering to help develop the rationale for that recommendation. I'll compile that and schedule the next meeting.

Dr. McFerson thanked Dr. Butruille for leading the deployment effort and everybody that's participating. He then asked for Mr. Hardison to talk about the tribal document.

Mr. Hardison stated that he is making progress on the tribal document. He has reviewed all of the comments and will be addressing them. The document will most likely be completed by November or December.

Dr. Bretting wanted to thank Mr. Hardison on the tribal draft that he circulated. He found it to be a really educational document for those who are involved in genetic resource management. It will also help to guide us as we interact with tribal nations, hopefully more closely in the future.

Mr. Hardison thanked Dr. Bretting for his compliments. He's dedicated to getting the final tribal report done this year.

Dr. McFerson asked if there were any additional questions or comments for Mr. Hardison. There were none.

Dr. McFerson is working with Paul, Margaret and Sarada on the NPGS Crop Vulnerability Statements. He has gone through the draft report from many years ago and now has a first draft. He will be sharing that with folks that wanted to work on it in the next couple of weeks. Dr. McFerson stated to Dr. Bretting that we went through a number of iterations of the spreadsheet about where the vulnerability statements are at by the Committee. He asked Dr. Bretting if he's done any updating on the spreadsheet and what is the most recent data set?

Dr. Bretting will provide the most recent spreadsheet. The Barley Crop Germplasm Committee is now writing the vulnerability statement.

Dr. McFerson - There is progress as long as barley and hops are staying close to things, we're in good shape.

Dr. McFerson thanked Dr. Bretting. He asked Dr. Tiersch for updates on the aquaculture initiative.

Dr. Tiersch stated there's a lot of momentum, largely driven by Dr. Harvey Blackburn and Dr. Caird Rexroad, who is the National Program Leader in ARS for aquaculture. We've been meeting at least weekly to try to get everything organized for a meeting to be held at the National Agricultural Library September 6th and September 7th. We're trying to stay at a very high level. There's not much time to produce a national blueprint for inter-agency cooperation. There are three to four agencies right now that are actively involved in this meeting. We hope to get a few more and will provide a summary to bring to this Committee. Dr. Tiersch asked if there were any questions. There were none.

Dr. McFerson asked if there were additional comments or questions. There were none.

V. **Wrap-up/Adjourn**

The meeting adjourned at 1:55 p.m. EDT

The next meeting will be held on Wednesday, September 20, 2023, at 1 p.m. EDT.

Acronyms: DFO: Designated Federal Official; NLGRP: National Laboratory for Genetic Resource Preservation; NAREEEAB: National Agricultural Research, Extension, Education, and Economics Advisory Board; NPGS: National Plant Germplasm System; OBPA: Office of Budget & Program Analysis; OCS: Office of the Chief Scientist; OGC: Office of the General Counsel; OCR: Office of Congressional Relations.