International Collaborations in Afforested Landscapes, Cities, and Botanical Collections Around the World

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What is USDA Forest Service, International Programs?

Mostly internationally-focused program areas

- Forest management, climate adaptation, migratory spp, etc.
- **Invasive** species (initially US focused, unlike other programs)

What is Fulbright?

**FULBRIGHT Argentina**

“The Fulbright Program offers grants to study, teach and conduct research for U.S. citizens to go abroad and for non-U.S. citizens to come to the United States.” (eca.state.gov/fulbright)

**Facts**

- Funds students, post-docs, and professors
- 160 countries on 5 continents
- **Alumni include forest pathologists & entomologists**
Why International Collaboration on Forest Health Research?

- **Focus on US forests limits** scientific perspectives and progress in US

- Forests are a **global common good**
  - Local sustainability → global economies
  - Trade in forest products
  - Benefits like carbon fixation, water, biodiversity, etc.
Why International Collaboration on Forest Health Research?

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- **Biotic invasions** link natural resources across the world – international problems need international solutions & advocates
  - *e.g.* sentinel trees

- **Local experts & knowledge** are critical
Challenges in Int’l Collaboration to do Research on Forest Health in Other Countries:

- $$$$  
- One-sidedness (US focus)  
- Trust & engagement
Challenges in Int’l Collabs to do Research on Forest Health in Other Countries:

- $$$$$$
  - Limited resources
  - US-focused funding

- One-sidedness
  - Typical funding focus is on US biosecurity**
  - Find intersecting interests – collaborators may be focused elsewhere
  - Conflicts of interest arising from trade considerations, data sharing

- Engagement
  - Historical disregard for local knowledge and science (language)
  - Trust and legacies (colonialism & parachute science)
  - Lack of rep. in int’l societies: N. America/Europe vs. rest of world
(Some) Ways USFS-IP Invasive Species Program Finds Intersecting Interests in Int’l Forest Health Collaborations

- International Sentinel Plant Network (Kew Gardens, UK)
  - Focus is learning about emergent threats to US species
  - Currently in Poland & Argentina
  - Also builds capacity for phytosanitary practices in botanical gardens
  - Work with National Plant Protection Organizations (NPPOs)

- Fully reciprocal sentinel gardens – Sweden, Italy, China, US gardens + spp. provides information on potential invasive species to other countries (Bonello)

- Synergy with Fulbright in Argentina and USFS-IP (exotic & native forests)

- Potential future projects (urban forests, improvement, non-US focused)
Patagonia
Centro de Investigacion y Extension Forestal Andino Patagonico

Studying expanding disease centers in *Nothofagus* forests
- Related to beeches, oaks, etc.

Also: biodiversity of ambrosia beetles and their fungi
- Reference collection stays in Argentina- will grow and support future research

MinIon sequencing – no need to ship samples internationally

Also problems with invasive insects and pathogens in *Austrocedrus*
Sentinels: Pine afforestation in Patagonia

- *Pinus radiata*
- *Pinus contorta*
- *Pinus ponderosa*
- *Pseudotsuga menziesii*
Native range *P. contorta* and *P. ponderosa*

Current range of *Sirex noctilio* in North America
Sirex noctilio causes up to 80% mortality of lodgepole and ponderosa pine in Argentina.
USFS-IP Consulting Experts & Developing Collabs on Pine Forests in Patagonia

• **Sentinels** - what are the major pests of pines in Argentina?
  • *Sirex noctilio* monitoring program
  • Potential for resistance improvement program

• **Review**
  • Social, genetic, historical context

• **Controversies**
  • E.g., invasiveness, fire

• **Genetics**
  • What species/subspecies represented?

Juan Corley, Fulbright Alum
Think Global, Act Local via Urban Forest Health Monitoring

• 80% of world population lives in urban areas

• Entry points prone to emergent issues
  • Exotics & native trees – monitor both
  • Reciprocal sentinel approach

• Citizen Science
  • Engage public
  • Public data
  • Master workshops in botanical gardens
  • Neighborhood organized monitoring campaigns
  • Can incorporate urban tree care into workshops
  • Proposal to pilot in Buenos Aires

Juan Corley, Fulbright Alum
How can we engage the international community more broadly?

- Incorporate genetic designs into global reforestation schemes (selections, seed orchards), eg funded by USAID

- Research and/or travel grants (supported by industry??)
  - Long-term benefit of int’l forest health research

- IUFRO (7th International Workshop on Genetics of Tree-Parasite Interactions) - Pontevedra, Spain (September 12-16, 2022)
  - Discussed lack of attendees outside Euro/NA
  - Have a plan (invite 2024 so can host in 2026)

- Engagement with SAF
  - International Forestry Working Group (IFWG)
  - Forestry Source Articles
Acknowledgements

• Collaborators in Argentina
  • Fulbright
  • CIEFAP
  • INTA
  • Chubut, Ministry of Forests
  • GCABA (Gov. of Buenos Aires)
  • Jardin Botanico Carlos Thays
  • Lara Salido (Botanic Garden International)

• Collaborators in Spain + IUFRO
  • Rafa Zas & Luis Sampedro
  • Caterina Villari

• USFS-IP project and program leaders/advisors
  • Richard Sniezko
  • Beth Lebow and Elise DeRiel