Ian R. McGregor

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EDUCATION

North Carolina State University, Center for Geospatial Analytics — *Raleigh, NC*
- PhD Geospatial Analytics — August 2023
- NASA Future Investigator in Earth and Space Science and Technology

University of Oxford, School of Geography and the Environment — *Oxford, UK*
- MSc Environmental Change and Management — September 2017
- Dissertation (Distinction): Fire in the Savannah – Assessing the Applicability of Modelling in Lopé National Park, Gabon

University of California, Berkeley, College of Natural Resources — *Berkeley, CA*
- BSc Conservation and Resource Studies, Society and Environment — May 2015
- Dean's Honors

RESEARCH EXPERIENCE

Cary Institute for Ecosystem Studies — Millbrook, NY
Postdoctoral Research Associate — Aug. 2023 – present
- Contribute to pan-tropical research project focusing on biodiversity impacts from lightning strikes and characterizing change detection signals from near and remote sensing data

North Carolina State University — Raleigh, NC
Ph.D. student with Dr. Josh Gray — Aug. 2019 – July 2023

Dissertation
- Developed a near real-time change detection method to identify deforestation quickly and accurately in a tropical dry forest (Myanmar) via the aggregation of Landsat-8, Sentinel-2, and Sentinel-1 data
- Incorporated landscape characteristics to change detection estimates using a novel Bayesian approach
- Integrated adaptive capacity into the change detection model by iteratively updating detection estimates using simulated, field-based validation data such that the model continuously improves
- Conduct research using a mix of R, Python, GitHub, and Google Earth Engine Javascript

Research Assistantship
- Contributed code and analysis for phenology research comparing ground-based eddy-covariance flux tower data with satellite (MODIS) data.
- Obtained primary footage and B-roll for National Park Service communications project at New River Gorge National Park

Smithsonian Conservation Biology Institute — Front Royal, VA
Research Analyst, Ecosystems and Climate Change Lab — Sep. 2018 – Aug. 2019
- Managed a long-term ecological forest study consisting of field dendrology surveys and data analysis
- Established dendrological research methods in R and GitHub for the lab
- Developed independent research project quantifying tree drought responses under climate change

ForestGEO Technician, Ecology Lab and Conservation Ecology Center — Mar. – Sep. 2018
- Collaborated with field crew in surveying the Forest Global Earth Observatory (ForestGEO) study plot via the application of standardized protocols
- Created field maps for Smithsonian animal survey projects, and assisted with eMammal camera trap deployments

University of Oxford Oxford, UK
Lab Assistant Sep. 2017 – Mar. 2018

- Chemically prepared leaf samples and transcribed venation for a pan-tropical research project.
- Applied MatLab scripts for image analysis

Graduate student with Drs. Imma Oliveras and Yadvinder Malhi May – Aug. 2017

- Developed research project assessing the effect of fuel gradients in central Gabon for prescribed fire policy via both field work and data analysis in R
- Submitted findings and recommendations to staff of Lopé National Park for management of savannah-rainforest mosaic biome.

Orange Coast College Costa Mesa, CA
Continuing student in GIS Mar. – June 2016

- Produced fire history maps for study region in Yosemite National Park, and analyzed the spatiotemporal severity of fire spread in support of a UC Berkeley doctoral thesis

OTHER ENVIRONMENTAL WORK

Bolsa Chica Conservancy Huntington Beach, CA
Program and Administrative Coordinator Jan. – Sep. 2016

- Managed the revision of a botanical guide for the wetland reserve, via field surveying, mapping, and cataloguing species in a new database.
- Edited the quarterly newsletter, drafted science communication articles for local publication, drafted content for social media, supported grant applications.
- Coordinated and led wetland ecology education outreach, service projects with volunteers, and guided public tours of the reserve

Student Conservation Association Adirondack State Park, NY
Crew Member, Adirondack Corps May – Aug. 2015

- Led field projects for backcountry trail crew, involving active risk assessment and mitigation, conflict management, and drafting project-specific emergency response plans.
- Partnered with state agency to repair trails, construct bridges, and various tasks using forestry best practices and tools, including certified chainsaw use.

SKILLS and TECHNIQUES

- Programming: R, Python, Google Earth Engine, GitHub
- Processing remote sensing data
- Research: Project management, data maintenance, qualitative and quantitative analyses
- Field: Botanical identification, data collection, field surveying, following and establishing protocols
- Outreach: Presenting research (conference, public, etc), environmental education with guided tours
- Language: Spanish [intermediate], Arabic [intermediate]

LEADERSHIP

North Carolina State University Raleigh, NC
Secretary, Geospatial Graduate Student Organization May 2020 – May 2022

- Supported geospatial student body, keep organized minutes
- Coordinated Lunch and Learn Seminar Series, including planning, securing speakers, advertising, hosting in-person and virtual events, and moderating panel discussion
- Led graduate student feedback sessions to provide advice for department leadership
- Assisted with coordinating speaking and outreach events for GIS Week

Secretary, International Society for Tropical Forestry club Jun. 2020 – May 2022

- Supported group agenda and keep notes; send weekly emails; host guest speakers
- Co-led diversity, equity, and inclusion workshop for the 2021 ISTF Annual Meeting

Spatial Analysis and Ecosystems Lab Aug. 2021 - Present

- Helped create the research lab's website, and coordinated the posting of research blogs and project updates

Smithsonian Conservation Biology Institute Front Royal, VA
Coordinator – Meet the Scientist Sep. 2018 – Aug. 2019

- Coordinated biweekly seminar series for interns, scheduled talks with Smithsonian researchers

CONFERENCES

- **McGregor, I.R.** & Gray, J. 2022. ASAP or AAAP? The importance of tradeoffs between detection time and accuracy for multisource deforestation monitoring. *American Geophysical Union Annual Meeting, 12-16 Dec., Chicago, IL*. [poster presentation]
- **McGregor, I.R.** & Gray, J. 2022. Beyond the binary – improving near real-time deforestation monitoring by understanding trade-offs between latency and accuracy. *Forest Disturbance and Ecosystem Dynamics Symposium, 19-22 Sep., Berchtesgaden, Germany.* [poster presentation]
- **McGregor, I.R.** & Gray, J. 2022. Tortoise or hare? Leveraging trade-offs in multi-source, near real-time deforestation monitoring to benefit resource managers. *Ecological Society of America Annual Meeting, 14-19 Aug., Montreal, Canada* [oral presentation]
- **McGregor, I.R.** & Gray, J. 2021. We Can't Have It Both Ways – Accepting the Trade-off of Detection Time and Accuracy in Multi-Source, Near Real-time Deforestation Monitoring. *American Geophysical Union Annual Meeting, 12-17 Dec., New Orleans, LA*. [virtual, oral presentation]
- **McGregor, I.R.** & Gray, J. 2021. Leveraging multi-source data to improve near real-time forest disturbance monitoring. *North Carolina Space Symposium, 16 Apr., Raleigh, NC*. [virtual, lightning talk]
- **McGregor, I.R.,** Gao, X., Gray, J. 2020. Satellite vegetation phenology reliably captures timing of carbon fluxes. *Ecological Society of America Annual Meeting, 3-8 Aug., Salt Lake City, UT*. [virtual, poster]
- **McGregor, I.R.,** Gao, X., Gray, J. 2020. The Correspondence of MODIS Land Surface Phenology and GPP. *International Association for Landscape Ecology North America, Toronto, Canada*. [virtual, poster]

OTHER TALKS

- *International Society of Tropical Forestry 2021 Annual Meeting*, Inclusivity Starts with our Design! Participatory Design Workshop for Inclusion, Diversity, Equity, and Accessibility (IDEA) in Tropical Forestry and Natural Resources [workshop co-lead]
- *Research Triangle Institute, International (RTI) Brown Bag Lunch Seminar Series, Jan. 2021.* Near real-time monitoring of forest disturbance using multi-source imagery [invited talk]

FUNDING

NASA
Future Investigator in NASA Earth and Space Science and Technology 2020 – 2023

- $135,000

North Carolina Space Grant Research Fellow 2020 – 2021

- $10,000

United States Geospatial Intelligence Foundation
Doctoral Scholarship 2020 – 2021
- $5,000

International Association for Landscape Ecology, North America
Annual Meeting Student Travel Award Spring 2020
- $700

North Carolina State University
Center for Geospatial Analytics Travel Award Spring 2020
- $800

PROFESSIONAL MEMBERSHIP

- Ecological Society of America
- Forest Stewards Guild

PUBLICATIONS

- Gao, X., **McGregor, I.R.,** Gray, J.M., Friedl, Mark, Moon, Minkyu, 2023. Observations of satellite land surface phenology indicate that maximum leaf greenness is more associated with global vegetation productivity than growing season length. Global Biogeochemical Cycles 37, e2022GB007462. DOI
- Vinod, N., Slot, M., **McGregor, I.R.,** Ordway, E.M., Smith, M.N., Taylor, T.C., Sack, L., Buckley, T.N., Anderson-Teixeira, K.J., 2023. Thermal sensitivity across forest vertical profiles: patterns, mechanisms, and ecological implications. New Phytologist 237, 22–47. DOI
- Kim, A.Y., Herrmann, V., Bareto, R., Calkins, B., Gonzalez-Akre, E., Johnson, D.J., Jordan, J.A., Magee, L., **McGregor, I.R.,** Montero, N., Novak, K., Rogers, T., Shue, J., Anderson-Teixeira, K.J., 2022. Implementing GitHub Actions continuous integration to reduce error rates in ecological data collection. Methods in Ecology and Evolution. DOI
- Dow, C., Kim, A.Y., D'Orangeville, L., Gonzalez-Akre, E.B., Helcoski, R., Herrmann, V., Harley, G.L., Maxwell, J.T., **McGregor, I.R.**, McShea, W.J., McMahon, S.M., Pederson, N., Tepley, A.J., Anderson-Teixeira, K.J., 2022. Warm springs alter timing but not total growth of temperate deciduous trees. Nature 608, 552–557. DOI
- Gao, X., **McGregor, I.R.,** Smith, O., Hinks, I., Shisler, M., 2022. The blsp R package with a Bayesian land surface phenology model. Zenodo. DOI
- Sedio, B.E., Spasojevic, M.J., Myers, J., Wright, S.J., Person, M.D., Chandrasekaran, H., Dwenger, J.H., Prechi, M.L., López, C.A., Allen, D.N., Anderson-Teixeira, K.J., Baltzer, J.L., Bourg, N.A., Castillo, B.T., Day, N., Dewald-Wang, E., Dick, C.W., James, T.Y., Kueneman, J., Lamanna, J., Lutz, J.A., **McGregor, I.R.**, McMahon, S.M., Parker, G.G., Parker, J.D., Vandermeer, J., 2021. Chemical similarity of co-occurring trees decreases with precipitation and temperature in North American forests. Front. Ecol. Evol. 9. DOI
- **McGregor, I.R.**, Helcoski, R., Kunert, N., Tepley, A.J., Gonzalez-Akre, E.B., Herrmann, V., Zailaa, J., Stovall, A.E.L., Bourg, N.A., McShea, W.J., Pederson, N., Sack, L., Anderson-Teixeira, K.J., 2021. Tree height and leaf drought tolerance traits shape growth responses across droughts in a temperate broadleaf forest. New Phytologist, 231, 601-616. DOI
- Yoshizumi, A., Coffer, M.M., Collins, E.L., Gaines, M.D., Gao, X., Jones, K., **McGregor, I.R.**, McQuillan, K.A., Perin, V., Tomkins, L.M., Worm, T., Tateosian, L., 2020. A Review of Geospatial Content in IEEE Visualization Publications. arXiv:2009.03390 [cs]. DOI
- Anderson-Teixeira, K., Gonzalez, B., Gonzalez-Akre, E., **McGregor, I.**, Helcoski, R., Herrmann, V., Kim, A.Y., Terrell, A., Dow, C., 2020. forestgeo/Climate: Initial release. Zenodo. DOI
- Anderson-Teixeira, K.J., Herrmann, V., Cass, W.B., Williams, A.B., Paull, S.J., Gonzalez-Akre, E.B., Helcoski, R., Tepley, A.J., Bourg, N.A., Cosma, C.T., Ferson, A.E., Kittle, C., Meakem, V., **McGregor,**

I.R., Prestipino, M.N., Scott, M.K., Terrell, A.R., Alonso, A., Dallmeier, F., McShea, W.J., 2020. Long-Term Impacts of Invasive Insects and Pathogens on Composition, Biomass, and Diversity of Forests in Virginia's Blue Ridge Mountains. Ecosystems 24, 89–105. DOI

- Gonzalez-Akre, E., **McGregor, I.**, Anderson-Teixeira, K., Dow, C., Herrmann, V., Terrell, A., Kim, A.Y., Vinod, N., Helcoski, R., 2020. SCBI-ForestGEO/SCBI-ForestGEO-Data: first release with hydraulic traits data. Zenodo. DOI
- Cardoso, A.W., Oliveras, I., Abernethy, K.A., Jeffery, K.J., Lehmann, D., Edzang Ndong, J., **McGregor, I.**, Belcher, C.M., Bond, W.J., Malhi, Y.S., 2018. Grass Species Flammability, Not Biomass, Drives Changes in Fire Behavior at Tropical Forest-Savanna Transitions. Front. For. Glob. Change 1. DOI