

# EMIL A. CHERRINGTON, Ph.D.

## PROFILE

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Emil Cherrington is a Research Scientist at the Earth System Science Center (ESSC) of the University of Alabama in Huntsville (UAH) and serves as the Regional Science Coordination Lead for West Africa for the SERVIR program of NASA and the U.S. Agency for International Development (USAID). He has almost nineteen years of professional experience working with geographic information systems (GIS) and remote sensing, with his work focusing on the use of such technologies for land cover change detection, ecosystem monitoring, disaster response, and integrated water resource management. He holds a joint Ph.D. in forest ecology (with an emphasis in remote sensing) from AgroParisTech (France) and the Technische Universität Dresden (Germany), under the auspices of a fellowship from the European Commission's Erasmus Mundus program. He holds a master's degree in forest resources from the University of Washington's College of Forest Resources (where he was an Organization of American States Fellow) and a bachelor's degree in biology from Loyola University Maryland.

## EDUCATION

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Doctor of Philosophy, Forest ecology, École nationale du génie rural, des eaux et des forêts (ENGREF), L'Institut des sciences et industries du vivant et de l'environnement (AgroParisTech), Montpellier, France, 2016

Doctor of Philosophy (*Doktor rerum silvaticarum, magna cum laude*), Forest science, Institute of Forest Growth and Computer Sciences, Department of Forest Sciences, Technische Universität Dresden (TUD), Dresden, Germany, 2016

Master of Science, Management & Engineering Division, College of Forest Resources, University of Washington, Seattle, Washington, 2004

Bachelor of Science (*summa cum laude*), Biology, College of Arts & Sciences, Loyola University Maryland, Baltimore, Maryland, 2001

## PROFESSIONAL EXPERIENCE

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September 2016 – present, Earth System Science Center (ESSC), University of Alabama in Huntsville (UAH), Huntsville, Alabama, USA

### *Research Scientist*

- Contracted by UAH to directly support implementation of SERVIR, an Earth observation initiative implemented jointly by NASA and USAID since 2005
- Serves as SERVIR's Regional Science Coordination Lead (RSCL) for West Africa, coordinating with researchers at partner agencies in six pilot countries (Burkina Faso, Ghana, Mali, Niger, Nigeria, Senegal) during its second phase (2022-2027), and four pilot countries (Burkina Faso, Ghana, Niger, Senegal) during its first phase (2016-2021)
- Since mid-2021, has served as the lead scientist for the ongoing SERVIR Carbon Pilot (S-CAP) activity which focuses on strengthening the integration of greenhouse gas estimation capabilities into land cover monitoring services across the SERVIR network
- Serves as a thematic expert for SERVIR in the areas of land cover change, ecosystem monitoring, and disaster response, and specifically as the thematic support point of contact for the SERVIR Science Coordination Office's Land Cover, Land Use, and Ecosystems thematic area (one of four SERVIR thematic priority areas)
- Recognized for his expertise in Earth observation, data science, and cloud computing by Google by being formally designated a Google Developer Expert (GDE) for the Google Earth Engine (GEE), in early 2022, and being a member of the initial cohort of GEE GDEs
- Has provided Earth observation capacity building activities in numerous in-person and virtual training events for audiences in Belize, Central America, and West Africa

- Serves as Science Principal Investigator and co-Investigator on an ongoing 2018-2022 NASA-funded project on “Climate-influenced Nutrient Flows and Threats to the Biodiversity of the Belize Barrier Reef Reserve System” (implemented by UAH, the Wildlife Conservation Society, the University of Georgia, and the NASA Jet Propulsion Lab)
  - Serves as a co-Investigator on the ongoing 2018-2022 NASA-funded Synthetic Aperture Radar virtual Capacity Building Center (SAR-CBC) project implemented by the University of Alaska-Fairbanks, UAH, and the NASA Jet Propulsion Lab
  - Supervision (jointly with other UAH faculty) of SERVIR-affiliated graduate students in the Atmospheric & Earth Science master’s degree program of UAH
  - Since April 2017, has served as an affiliate member of the graduate faculty of UAH’s School of Graduate Studies, and has served as the instructor for the Land Use Applications & Sustainability (ESS 610) graduate level course for the Spring 2020 and Spring 2022 terms at UAH
  - Has served as a science advisor on multiple projects of the NASA DEVELOP program, from summer 2019 through spring 2022
  - Supports Earth system science research of the ESSC, including participation in a Synthetic Aperture Radar (SAR) processing group at the Center
  - Has held the positions of Research Scientist I (Sept. 2016-May 2017), Research Scientist II (May 2017-May 2021), and Research Scientist III (May 2021-present)
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October 2013 – September 2016, *Institut de recherche pour le développement (IRD) / botanique et Modélisation de l’Architecture des Plantes (AMAP)*, Montpellier, France

***Doctoral researcher, Organization & Dynamics of Plant Populations & Landscapes team***

- Contracted through AgroParisTech
  - Implementation of the €130,000 European Commission Erasmus Mundus-funded “Assessing forest composition and dynamics of closed tropical forest in French Guiana using modelling and multispectral imagery” doctoral research project (2013-2016)
  - Development of peer-reviewed publications based on doctoral research
  - Support for the French government (BGF)-supported DYNFORDIV project looking at dynamics within montane forests in French Guiana’s national parks
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July 2008 – October 2013, *Water Center for the Humid Tropics of Latin America & the Caribbean (CATHALAC)*, City of Knowledge, Panama City, Panama

***Senior Scientist / Manager, Division of Applied Research & Development***

- Coordination / supervision of other CATHALAC scientists and technical personnel working on the implementation of the SERVIR Mesoamerica initiative
  - Served as the scientific and technical liaison for a number of initiatives, such as Central America’s Authorized User for NASA’s Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) sensor and the Earth Observing One (EO-1) satellite (the latter now defunct)
  - Point of contact at CATHALAC for the Regional Support Office (RSO) established at CATHALAC for the United Nations Space-based Platform for Information for Disaster Management and Emergency Response (UN-SPIDER)
  - Works in the development of geospatial and satellite-derived products, utilizing standard GIS and remote sensing processing platforms such as ERDAS Imagine and ESRI ArcGIS
  - Project management duties related to the implementation of the USAID’s Global Development Alliance-funded *Mainstreaming Climate Indices and Weather Derivatives into Decision-Making for Adaptation to Climate Change in Central America, Mexico, and the Dominican Republic* project
  - Responsible for promotion of the SERVIR initiative, and the development of grants and projects in support of the development of regional and national capacities in the application of geospatial technologies to integrated environmental management
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January 2006 – June 2008, *Water Center for the Humid Tropics of Latin America & the Caribbean* (CATHALAC), City of Knowledge, Panama City, Panama

***Geographic Information Systems, Remote Sensing and Natural Resources Specialist***

- Main CATHALAC point-of-contact regarding implementation of the *Regional Visualization & Monitoring System* (SERVIR) for Mesoamerica
- Mainstreaming the role of CATHALAC at the national level by liaising with national institutions and providing technical assistance and training
- Responsible for promoting and expanding regional use of geographic information technologies as management tools
- Formulation, design and implementation of programs and projects aimed at building regional and national capacities to promote integrated environmental management
- Maintenance of a network of regional contacts with national partner institutions

January – December 2005, *Coastal Zone Management Authority & Institute* (CZMAI), Ministry of Agriculture, Fisheries and Cooperatives, Belize City, Belize

***Data Analyst***

- Maintenance of largest national holdings of geospatial data on coastal & marine resources and second-largest Government repository of geospatial data, including data compilation / collation functions and metadata development, making extensive use of the ESRI ArcView 3.3 and ArcGIS 9.0 platforms
- Formerly responsible for the implementation of the *Reefs-at-Risk: Belize* (**WRI Project No. 04359**) collaboration between the CZMAI and the World Resources Institute, aimed at cataloging and improving access to CZMAI's extensive data on coastal & marine resources (Jan. – Sept. 2005)
- Responsible for the implementation of collaboration between CZMAI and the United Nations Environmental Programme-World Conservation Monitoring Centre on the *Improved Watershed Management* component of the United Nations Foundation / USAID-funded Mesoamerican Reef Alliance project of the International Coral Reef Action Network (ICRAN-MAR)
- Project duties in fulfillment of **UNEP-WCMC Project No. 1243** included analysis of regional land use change, and the hydrologic impacts thereof on the reef, in collaboration with other ICRAN-MAR partner agencies and the GEF-funded Mesoamerican Barrier Reef Systems (MBRS) project
- Provision of technical support to national and regional resource-inventory initiatives, including but not limited to: (i) administration of the national databases of the Belize Spawning Aggregation (SPAG) Working Group and the Belize Marine Mammal Stranding Network, and (ii) provision of technical support to the national secretariat of Plan Regional de Pesca y Acuicultura Continental (PREPAC) project in the administration of a database of coastal lagoons

August 2004 – January 2005, *National Land Advisory Committee* (NLAC), Land Management Program (LMP), Ministry of Natural Resources (MNR), Belmopan, Belize

***Coordinator***

- Provision of technical and logistical support to the NLAC, management of the Committee's day-to-day affairs, and responsible for preparation of the work program, budgets and budget performance reports, and the organization & execution of workshops, consultations and meetings agreed upon by the NLAC
- Acted as Secretary to the NLAC, arranging meetings, taking & circulating minutes and other matters arising out of meetings
- Served as a liaison between the NLAC and the LMP, the MNR, and other government agencies and institutions

**LANGUAGES**

**CREOLE (native tongue):** fluency in various English-based Caribbean dialects, as spoken in Belize and Jamaica, among others

**FRENCH:** conversational, and ability to read and write French

**SPANISH:** fluency in conversational and written Spanish

## **TECHNICAL SKILLS**

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- **Geographic Information Systems (GIS):** High proficiency in geoprocessing, hydrologic modeling and other spatial analysis techniques, via the *ArcView 3.x*, *ArcGIS 10.x*, *IDRISI*, and *QGIS* platforms
- **Remote sensing (RS):** Satellite image processing / manipulation and multispectral image classification, via multiple platforms, including *ENVI* and *ERDAS Imagine*
- **Statistical analyses:** Capable of performing descriptive and multivariate statistical analyses via the *R* and *SPSS* platforms
- **Technical writing:** Development of grant proposals, consultancy bid documents, project performance reports, press releases and other technical documents

## **PUBLICATIONS**

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1. Martin-Arias, V., Evans, C.A., Griffin, R.E., **Cherrington, E.A.**, Lee, C.M., Mishra, D.R., Auil-Gomez, N., Rosado, A., Callejas, I.A., Jay, J.A., Rosado, S. 2022. Modeled Impacts of LULC and Climate Change Predictions on the Hydrologic Regime in Belize. *Frontiers in Environmental Science* 10:1. DOI: 10.3389/fenvs.2022.848085.
2. Adams, E.C., Parache, H.B., **Cherrington, E.A.**, Ellenburg, W.L., Mishra, V., Lucey, R., Nakalembe, C. 2021. Limitations of Remote Sensing in Assessing Vegetation Damage Due to the 2019–2021 Desert Locust Upsurge. *Frontiers in Climate* 3:714273. DOI: 10.3389/fclim.2021.714273.
3. Mensah, F., Bartel, P., **Cherrington, E.A.**, Singh, A., Henry, M., Muchoney, D., Brink, A., Mamane, B., Judge, J., Olofsson, P., Dieye, A.M., Muench, R.E., Abramowitz, J., Mahamane, M., Hackman, K., Neya, O. 2021. The key role land use/land cover monitoring plays in West Africa’s development: A white paper by the West Africa Land Use / Land Cover Task Force for ECOWAS. Technical paper. Accra, Ghana. 16 pp.
4. Callejas, I.A., Lee, C.M., Mishra, D.R., Felgate, S.L., Evans, C., Carrias, A., Rosado, A., Griffin, R.E., **Cherrington, E.A.**, Ayad, M., Megha, R., Page, B., Jay, J.A. 2021. Effect of COVID-19 Anthropause on Water Clarity in the Belize Coastal Lagoon. *Frontiers in Marine Science* 8. DOI: 10.3389/fmars.2021.648522.
5. Mishra, V., Limaye, A.S., Muench, R.E., **Cherrington, E.A.**, Markert, K.N. 2020. Evaluating the performance of high-resolution satellite imagery in detecting ephemeral water bodies over West Africa. *International Journal of Applied Earth Observation and Geoinformation* 93(2):102218. DOI: 10.1016/j.jag.2020.102218
6. **Cherrington, E.A.**, Griffin, R.E., Anderson, E.A., Hernandez Sandoval, B.E., Flores-Anderson, A.I., Muench, R.E., Markert, K.E., Adams, E.C., Limaye, A.S., Irwin, D.E. 2020. Use of public Earth observation data for tracking progress in sustainable management of coastal forest ecosystems in Belize, Central America. *Remote Sensing of Environment*, 245, 111798.
7. Herndon, K.E., Muench, R.E., **Cherrington, E.A.**, Griffin, R.E. 2020. An assessment of surface water detection methods for water resource management in the Nigerien Sahel. *Sensors*, 20(2), 431. DOI:10.3390/s20020431
8. Flores-Anderson, A.I., Griffin, R.E., Dix, M., Romero-Oliva, C.S., Ochaeta, G., Skinner-Alvarado, J., Ramirez Moran, M.V., Hernandez Sandoval, B.E., **Cherrington, E.A.**, Page, B., Barreno, F. 2020. Hyperspectral Satellite Remote Sensing of Water Quality in Lake Atitlán, Guatemala. *Frontiers in Environmental Science*, 8:7. DOI: 10.3389/fenvs.2020.00007.
9. Flores-Anderson, A.I., Herndon, K.E., Thapa, R.B., **Cherrington, E.A.** (Eds.) 2019. The SAR Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation. First edition. U.S. National Aeronautics & Space Administration (NASA). DOI:10.25966/nr2c-s697. 307 pp.
10. Flores-Anderson, A.I., Herndon, K.E., **Cherrington, E.A.**, Thapa, R.B., Kucera, L., Quyen, N.H., Odour, P., Wahome, A., Tenneson, K., Bako, M., Saah, D., Chishtie, F., Limaye, A.S. Chapter 1: Introduction and Rationale. In: Flores-Anderson, A.I., Herndon, K.E., Thapa, R.B., **Cherrington, E.A.**

- (Eds.) 2019. *The SAR Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation*. First edition. U.S. National Aeronautics & Space Administration (NASA). DOI:10.25966/nr2c-s697. 307 pp.
11. **Cherrington, E.A.**, Flores-Anderson, A.I., Thapa, R.B., Herndon, K.E., Wahome, A., Oduor, P., Mubea, K., Ouko, E., Quyen, N.H., Saah, D., Bako, M., Bartel, P., Mensah, F., Ofori-Ampofo, S., Anderson, E.R., Adams, E.C., Muench, R.E., Markert, A., Nicolau, A., Ellenburg, W.L., Markert, K.N., Hernandez Sandoval, B.E., Limaye, A.S., Griffin, R.E., Irwin, D.E. 2019. Chapter 8: Perspectives on the Future Application of SAR in Forest and Environmental Monitoring. In: Flores-Anderson, A.I., Herndon, K.E., Thapa, R.B., **Cherrington, E.A.** (Eds.) 2019. *The SAR Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation*. First edition. U.S. National Aeronautics & Space Administration (NASA). DOI:10.25966/nr2c-s697. 307 pp.
  12. **Cherrington, E.A.**, Barbier, N., Ploton, P., Vincent, G., Sabatier, D., Berger, U., and R. Pélissier. 2016. “BRDF-corrected vegetation indices confirm seasonal pattern in greening of French Guiana’s forests.” *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, Vol. 9, No. 8, 3505-3511.
  13. **Cherrington, E.A.**, Vincent, G., Sabatier, D., Barbier, N., Berger, U., and R. Pélissier. 2016. “BRDF-corrected vegetation indices confirm seasonal pattern in greening of French Guiana’s forests.” *Revue Française de Photogrammétrie et de Télédétection*, no. 211-212, 3-9.
  14. **Cherrington, E.A.**, Barbier, N., Vincent, G., Sabatier, D., and R. Pélissier. 2015. Unravelling the Green Carpet: Use of Remotely Sensed Data for Improved Inventorying & Monitoring of French Guiana's Forest.” *Proceedings of the XIV World Forestry Congress*. Durban, South Africa. September 2015.
  15. Hernandez-Sandoval, B. and **E. A. Cherrington**. 2014. “Los Impactos Potenciales del Cambio Climático en los Recursos Hídricos de Mesoamérica y el Caribe: La Perspectiva Regional, Parte I.” Water Center for the Humid Tropics of Latin America and the Caribbean / International Development Research Center. June 2014. 37 pp.
  16. Anderson, E., Irwin, D., Delgado, M., Molina, G., and **E.A. Cherrington**. 2012. “Evaluation of space-based support through SERVIR during floods and landslides in El Salvador.” *Proceedings of the 63<sup>rd</sup> International Astronautical Congress*. Naples, Italy. October 2012.
  17. Flores Cordova, A., Anderson, E., Irwin, D., and **E.A. Cherrington**. 2012. “Contributions of SERVIR in promoting the use of space data in climate change and disaster management.” *Proceedings of the 63<sup>rd</sup> International Astronautical Congress*. Naples, Italy. October 2012.
  18. **Cherrington, E.A.**, Percival P.P., Waight, I. Santos, T.Y. Escalante, A.E., Nabet, J. and L. Usher. 2012. “Executive Summary: Forest Cover Change and Deforestation in Belize: 2010-2012.” Water Center for the Humid Tropics of the Latin America and the Caribbean, Lancaster University, Environmental Research Institute of the University of Belize, Forest Department of the Ministry of Forestry, Fisheries, and Sustainable Development. Belmopan, Belize. 6 pp.
  19. Hernandez, B., Flores, A., Garcia, B., Clemente, A., Moran, M., **Cherrington, E.A.**, Oyuela, M., Smith, O., and J.M. Guardia. 2011. “Satellite Monitoring of Lake Atitlan in Guatemala.” *Proceedings of the Second International Symposium on Building Knowledge Bridges for a Sustainable Water Future*: 234-238. Panama City, Panama. November 2011.
  20. Anderson, E.R., Limaye, A., Flores, A.I., and **E.A. Cherrington**. 2011. “Climate Change Impacts on Surface Water in Central America and Hispaniola.” Technical report. Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) / Regional Visualization & Monitoring System (SERVIR). 33 pp.
  21. **Cherrington, E.A.**, Clemente, A., Hernandez, B.E., Garcia, B.C., and M.O. Oyuela. 2011. “Fires in Central America and the Dominican Republic (2001-2010): Data from Satellite-based Monitoring.” Technical report. Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) / Regional Visualization & Monitoring System (SERVIR). 11 pp.
  22. **Cherrington, E.A.**, Anderson, E.A., Flores, A.I., Hernandez, B., Clemente, A.H., Sempris, E., Picado, F., and D.E. Irwin. 2011. “Implications of Climate Change for Forest Structure and Carbon Storage in

- the Tropical Zones of Latin America and the Caribbean.” Technical report. Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) / Regional Visualization & Monitoring System (SERVIR). 19 pp.
23. **Cherrington, E.A.**, Clemente, A., Hernandez, B.E., Garcia, B.C., and M.O. Oyuela. 2011. “Land Cover Change and Deforestation in Central America: 1990-2008.” Technical report. Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) / Regional Visualization & Monitoring System (SERVIR). 11 pp.
  24. **Cherrington, E.A.**, Hernandez, B.E., Garcia, B.C., Clemente, A., and M.O. Oyuela. 2011. “Sea Surface Temperature Trends in the Caribbean Sea and the Eastern Pacific Ocean.” Technical report. Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) / Regional Visualization & Monitoring System (SERVIR). 11 pp.
  25. **Cherrington, E.A.**, Hernandez, B.E., Trejos, N.A., Smith, O.A., Anderson, E.R., Flores, A.I., and B.C. Garcia. 2010. “Identification of Threatened and Resilient Mangroves in the Belize Barrier Reef System.” Technical report to the World Wildlife Fund. Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) / Regional Visualization & Monitoring System (SERVIR). 28 pp.
  26. **Cherrington, E.A.**, Ek, E., Cho, P., Howell, B.F., Hernandez, B.E., Anderson, E.R., Flores, A.I., Garcia, B.C., Sempris, E., and D.E. Irwin. (2010) “Forest Cover and Deforestation in Belize: 1980-2010.” Technical report. Water Center for the Humid Tropics of Latin America and the Caribbean / NASA / Belize Ministry of Natural Resources and the Environment. Panama City, Panama. 43 pp.
  27. **Cherrington, E.A.** 2010. “Fire Trends for Belize (2003-09): Data from Satellite-Based Monitoring.” CATHALAC. Panama City, Panama. 10 pp.
  28. Perez, J.B., **Cherrington, E.A.**, Anderson, E.R., Moran, M., Flores, A.I., Trejos, N., and E. Sempris. 2009. “The Experience of the Mesoamerican Region in Climate Change Adaptation.” in: Sepulveda, C.J. & M. Ibrahim (Eds.) “Policies and Incentive Systems for the Growth and Adoption of Agricultural Practices: A Measure of Climate Change Adaptation in Central America.” CATIE / UNEP / CATHALAC / UNCCD. CATIE Technical Series No. 377. Turrialba, Costa Rica. ISBN 978-9977-57-485-1. 272 pp.
  29. **Cherrington, E.A.** 2008. “Modeling the Vulnerability of Biodiversity to Climate Change in Mesoamerica and the Dominican Republic.” in: Dubrie, A., Corbin, C., Nagatani, K., Metternicht, G., Giada, S., Griffith, M. and S. Sosa (Eds.) “Climate Change in the Caribbean and the Challenge of Adaptation.” United Nations Environment Programme Regional Office for Latin America and the Caribbean. Panama City, Panama. 91 pp.
  30. Anderson, E.R., **Cherrington, E.A.**, Tremblay-Boyer, L., Flores, A.I, and E. Sempris. 2008. “Identifying Critical Areas for Conservation using measures of Biodiversity and Climate Change in Central America, Mexico, and the Dominican Republic.” *Biodiversity* 9 (3 & 4): 89-99
  31. Anderson, E.R., **Cherrington, E.A.**, Sempris, E., Flores, A.I., Perez, J.B. and R. Carrillo. 2008. “Potential Impacts of Climate Change on Biodiversity in Central America, Mexico, and the Dominican Republic.” CATHALAC / USAID. Panama City, Panama. ISBN: 978-9962-8941-1-7. 94 pp.
  32. **Cherrington, E.A.** (editor). 2007. “Capacity Assessment of Geographic Information Systems Capabilities of the Caribbean: Regional Assessment Report.” UNEP / GEF- Integrated Watershed and Coastal Areas Management (IWCAM) Project. 79 pp.
  33. Opadeyi, J. & **E.A. Cherrington** (editors). 2007. “Proceedings of the GEF-IWCAM Regional Geographic Information Systems Workshop on Strategic Approaches to Application of GIS tools in Support of Planning for Watershed and Coastal Areas Management.” UNEP / GEF- Integrated Watershed and Coastal Areas Management (IWCAM) Project. 25 pp.
  34. Meerman, J. & **E.A. Cherrington**. 2005. “Preliminary Survey of Land Degradation in Belize.” Ministry of Natural Resources, Local Government and the Environment. Belmopan, Belize. 64 pp.

## **GRANTS / PROJECTS AWARDED**

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- Co-Investigator, “GEEmap: Interactive mapping and intelligent analysis of geospatial big data with Google Earth Engine,” Award A23-0375-S001, NASA – **US \$36,603** [10/22 – 09/24]
- Science Principal Investigator, “Climate-Influenced Nutrient Flows and Threats to the Biodiversity of the Belize Barrier Reef Reserve System,” Cooperative Agreement No. NNH18ZDA001N-SLSCVC – **US \$724,390** [11/18 – 11/22]
- Co-Investigator, “Forecasting Harmful Algal Blooms through AI to Mitigate Environmental Impact: A Case Study for Lake Atitlan, Guatemala,” Award NGS-57036T-18, Microsoft – **US \$128,073** [11/18 – 11/20]
- Principal Investigator, “Assessment of the total mangrove and littoral forest cover within the Belize Barrier Reef Reserve System-World Heritage Site,” Contract No. BAS-UAH-2017-01, Belize Audubon Society – **US \$22,758** [09/17 – 03/18]
- Lead Consultant, “Strengthening of Disaster Preparedness and Emergency Response Capacity in Belize,” Contract No. UNDP/BCPR/NEMO 2013-001, National Emergency Management Organization (NEMO) - **US \$36,000** [06/13-12/13]
- Lead Consultant, “Development of Land Use Change Scenarios for the Belize Central Corridor, in the context of the REDD-CCAD-GIZ project,” Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) - **US \$17,920** [01/13-04/13]
- Lead Consultant, “Baseline Assessment of Seagrass and Mangrove Cover and Dynamics in the Port Honduras Marine Reserve, Belize,” Toledo Institute for Development and the Environment (TIDE) - **US \$2,500** [01/13-02/13]
- Lead Consultant, “Support to the UN REDD project for Establishing a Geographic Information System, Data Compilation, and Training,” SSFA/REDD 002 / 2011, United Nations Environment Programme - **US \$50,000** [09/11-12/12]
- Lead Consultant, “Development of the First Phase of a Data Bank to Support REDD-related Monitoring, Reporting, and Verification activities in Central America and the Dominican Republic,” Deutsche Gesellschaft für Technische Zusammenarbeit (GIZ) - **US \$20,000** [10/10-12/10]
- Lead Consultant, “Development of an Interactive Map-Based Information Platform to Disseminate CEP-related and REPCar-related Information on the Web,” Agreement No. GFL-2324-4880-2760-1203 / QCL-2324-2288-2661-2219, United Nations Environmental Programme - **US \$12,000** [07/08-04/09]
- Principal Investigator, “Expansion of the Regional Visualization & Monitoring System (SERVIR) to other Geographic Areas including the Dominican Republic, Gulf of Mexico, Africa, Asia and South America,” Contract No. NNM07AB02C, National Aeronautics & Space Administration (NASA) - **US \$1,115,892** [09/07-10/11]
- Principal Investigator, “Rapid Prototyping of Global Precipitation Measurement (GPM) Instrument Data into the Regional Visualization & Monitoring System, SERVIR,” Subcontract No. 08-11-051, University of Mississippi – **US \$50,000** [12/07-05/08]
- Principal Investigator, “Rapid Prototyping of NASA Next Generation Sensors into the Regional Visualization & Monitoring System (SERVIR),” Subcontract No. 03494-1, Universities Space Research Association (USRA) - **US \$40,000** [04/07-08/07]
- Lead Consultant, “Capability Assessment of the Geographic Information Systems (GIS) Capabilities of Countries Participating in the IWCAM Project,” Agreement No. GFL-2324-4834-2731-1202, United Nations Environmental Programme - **US \$47,500** [02/07-08/07]
- Principal Investigator, “Exploring the Efficacy of Market-Based Mechanisms for Conservation Financing in Belize, Central America,” Sigma Xi - Grants-in-Aid of Research program - **US \$500** [5/03]