



# **STUDENT DIRECTED RESEARCH PROJECTS**

Titles and Authors

Fall 2019

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## **Australia: SFS Center for Rainforest Studies**

The Centre for Rainforest Studies' Strategic Research Plan addresses the question: *How can the future of the Wet Tropics in a changing world be ensured?*

*Principal Investigator: David Tng, Ph.D.*

**Development of Syntropic Agriculture at the Center for Rainforest Studies.** Ajah Ellis [College of the Holy Cross]; Jesse Gilman [Rochester Institute of Technology].

**The Centre for Rainforest Studies Historical Land Management: A Pilot Study of Syntropic Land Use Planning.** Delaney Brubaker [Reed College]; Jack Dimmock [University of Redlands].

**Flora Biodiversity in Rainforest Successional Plots at the Centre for Rainforest Studies, Northeast Queensland.** Marley Mullin [Grinnell College]; Emmanuela Feliz Salecki [Elon University]; Ruojin Li [University of Connecticut/Storrs].

**Syntropic Farming Systems and their Implications for Improving Soil Health: A Pilot Study.** Matthew P. LaFemina [University of Denver].

**Bridging the Gap Between Sustainable and Conventional Agriculture: A Feasibility Analysis for a Pilot Syntropic Garden System.** Sophie M. Baker [Scripps College]; Robert W. Garrett [Wake Forest University]; Mitchell R. Marcinauskis [College of the Holy Cross].

*Principal Investigator: Catherine Pohlman, Ph.D.*

**Carbon Storage and Plant Biodiversity in Primary vs. Secondary Rainforest.** Anna M. Avinger [Davidson College]; Ethan W. Landen [Davidson College]; Jade S. Thurnham [Occidental College].

**Water Quality Monitoring in the Barron River Catchment within the Tablelands Regional Council.** Stetson Dierlam [Texas A&M University/College Station], Molly Nelson [University of Minnesota/Twin Cities]; Reanna Unwalla [University of Redlands].

**Integration of Macroinvertebrates into a Future Water Quality Monitoring System for the Upper Barron River Catchment.** Wylie Cassinelli [University of Redlands]; Olivia Konieczny [Grinnell College].

*Principal Investigator: Sigrid Heise-Pavlov, Ph.D.*

**Settling Down and Starting a Family: Home Range Establishment in a Rehabilitated Lumholtz's Tree-Kangaroo (*Dendrolagus lumholtzi*).** Chang Gao [University of Wisconsin/Madison]; Isabell Ruff [Dickinson College]; Luke Ullmann [Muhlenberg College].

## **Bhutan: Center for Himalayan Environment and Development Studies**

The Center for Himalayan Environment and Development Studies' research addresses the question: *How can Bhutan secure its culture, biodiversity, and environment in the face of transition?*

*Principal Investigator: Robert Beazley, Ph.D.*

**Roadside Plant Inventory: Assessing Ecological Impact of Paved and Dirt Roads on Flora in Paro.**

Yuxuan Chen [Duke University].

**Policies and Paddies: Farmers' Perceptions of Land Management Policy Implementation and Aid in the Paro Valley.** Carin Cleveland [Fort Lewis College]; Britte Harder [Gonzaga University]; William Sherwood [Tufts University].

**Road Quality in the Paro Valley and its Impact on Farmland Degradation.** Olivia Etherton [Wake Forest University]; Hannah Fishman [University of Colorado/Boulder]; Zebulun Klement [Gonzaga University]; Alexandra Nazzaro [College of the Holy Cross].

*Principal Investigator: Kuenga Wangmo, Ph.D.*

**Assessing Municipal Solid Waste Management, Policies, and Infrastructure along an Urban-Rural Gradient in Paro Valley, Bhutan.** Gillian Hall [SUNY/College of Environmental Science and Forestry]; Micat Po [Boston University]; Carolyn Merriam [University of Massachusetts/Amherst].

**Mentalities and Realities of Informal Waste Management Systems in the Paro Valley.** Cooper Dart [Bowdoin College]; Maya Dru [Grinnell College]; María Leonor Rodríguez [Davidson College].

**Useless, Toxic, Lucrative: Perceptions and Values on Waste, Disposal, and Development in the Paro Valley.** Oaklea Elfström [Bates College]; Anna-Elena Maheu [Bates College]; Elliot Wilson [Bates College].

*Principal Investigator: Purna Chhetri, Ph.D.*

**Assessment of recent bluepine die back in Western Bhutan.** Alana Joseph [Macalester College]; Nicole Lanton [University of Colorado/Boulder]; Shaylan Kolodney [Skidmore College]; Julius Stoma [Franklin & Marshall College]; and Quincy Williams [University of Wisconsin/Platteville]; Olivia Richart [Pennsylvania State University/State College].

## **Cambodia: SFS Center for Conservation and Development Studies**

The Center for Conservation and Development Studies' research addresses the question: *How is Cambodia addressing pressing environmental concerns, especially those related to the conservation of biodiversity and the changing dynamics of rural livelihoods that depend on diminishing natural resources?*

*Principal Investigator: Megan English, Ph.D.*

**Fish Species Diversity and Abundance in Chamkar Youn village, Kompong Khleang Commune, Cambodia.** Jyoti Thapa [Hollins University].

**Watersnake Biodiversity: Assessment of Current Species Richness and Abundance on the Tonle Sap Lake.** Mary Lasater [Davidson College]; Kameron Winters [Bucknell University].

**Macroinvertebrates as Bioindicators in the Tonle Sap Lake, Kampong Khleang Commune, Cambodia.** Mattea Pulido [University of Redlands].

*Principal Investigator: Lisa Arensen, Ph.D.*

**Spirits, shrines, and pilgrimages: A documentation of religious heritage tourism on Phnom Kulen.** Madison Gray [Elon University]; Keeley Harris [University of Richmond].

**Documenting Botanical Traditional Khmer Medicine and other Non-Timber Forest Products Along the Kulen Nature Trail in Phnom Kulen National Park.** Ashley Baillie [Santa Clara University]; Jane Ellsworth [Whitman College].

**A Record of Migration, Settlement, and Religious Belief in Three Sites within Phnom Kulen National Park.** Jozlyn Velazquez [Purdue University/West Lafayette].

*Principal Investigator: Ming Li Yong, Ph.D.*

**Assessing Climate Change Vulnerability on the Tonle Sap Lake: A Study of Prek Sromoach Village, Kampong Khleang Commune, Cambodia.** Robyn Lee [Tufts University]; Bella Solano [Seattle Pacific University].

**Public Perceptions of Climate Change in Prek Sromoach Village within Kampong Khleang Commune on the Tonle Sap Lake.** Victoria Limon [University of California/Santa Barbara].

**Knowledge, Perceptions, and Attitudes Towards Solid Waste Management in Kampong Khleang Commune on the Tonle Sap Lake.** Lilah Foster [Santa Clara University].

## Chile SFS Center for Climate Studies

The Center for Climate Studies' research addresses the question: *How can Chile respond to local and global challenges while securing the functionality of its natural and human systems?*

**Principal Investigator: Gregory Zielinski, Ph.D.**

**Postglacial Soils in Patagonia Bagual, Chile: Dominant Soil Controls and the Implications of the Soil Catena.** Calinda Baker [Occidental College].

**Precipitation Rates as Growth Control for *Nothofagus pumilio* at Patagonia Bagual, Chile, with Implications for Climatic Change.** Rémy Barbiéro [Occidental College].

**Genesis of late-glacial sediments in Patagonia, Bagual, Chile, and evidence of initial lithification.** Giuseppe Inglema [Franklin & Marshall College]; Phoebe Murray [Vassar College].

**Potential microclimatic controls of *Nothofagus pumilio* growth in Patagonia Bagual and implications for climate change.** Christina Janulis [Harvard University].

**Dendroclimatological studies of *Nothofagus pumilio* in Patagonia Bagual, Chile, and the role of atmospheric teleconnections in forcing climatic conditions.** Kaleigh Molinari [University of San Diego].

**A Geology-Based Index of Alpine Trail Vulnerability as Applied to the Paine Grande-Glacier Grey Trail and to the Impact of Extreme Precipitation Events, Torres del Paine, Chile.** Reghan Ruf [University of Richmond].

**Principal Investigator: Shaw Lacy, Ph.D.**

**Efficacy of Using Smartphone Cameras to Develop Foliage Measurements in Mixed Southern Beech Forest.** Claire Connors [The College of William and Mary].

**Evaluation of *Nothofagus pumilio* Growth Curves at Patagonia Bagual.** Dayla Woller [Scripps College]; Celeste DeLancey [Mount Holyoke College].

**Factors of Stream Discharge as Related to Macroinvertebrate Biodiversity in Chilean Patagonia.** Rebecca Kuttner [Saint Michael's College].

**Evaluating effect of DBH and distance of neighboring trees on individual tree height for *N.pumilio* and *N.antarctica*.** Erik E. Makic [Colorado State University].

**Two Habitat Heterogeneity Proxies for Macroinvertebrate Beta Diversity in Patagonia Bagual.** Sam McKlin [Davidson College].

**Modeling *Nothofagus* Habitat in the Serrano River Basin.** Alex Simons [Williams College].

**Species dominance within water systems relating to bankfull discharge.** Luke Stover [North Carolina State University].

*Principal Investigator: Katherine Goodall, Ph.D. and Elliott Oakley, Ph.D.*

**Trail Erosion in Torres del Paine National Park: Inventory and Assessment of Trail Conditions from Paine Grande to Refugio Grey in Torres del Paine National Park.** Barbara Kaftan [University of Wisconsin/Milwaukee]; Paul Kalifatidi [University of Minnesota/Twin Cities].

**Effects of hiker trampling on vegetation in Torres del Paine National Park, Chile.** Brynne Merkle [Cornell University]; Lauren Kohout [College of William and Mary].

**Behavior Regarding Trail Erosion and Effective Management Efforts in Torres del Paine National Park.** Aubrie Leonard [Wake Forest University]; Emilya Ramsey [Gonzaga University]; Isabel Zimmerman [Gonzaga University].

**Hiker Awareness of Trail Markers and Erosion Events, and Impact of Trail Conditions on Hiker Perceptions in Torres del Paine National Park.** Tess Cullaz [University of Massachusetts/Amherst].

## **Costa Rica: SFS Center for Sustainable Development Studies**

The Center for Sustainable Development Studies' Strategic Research Plan addresses the question: *How can Costa Rica respond to local and global challenges while securing the functionality of its natural and human systems?*

**Principal Investigator: Milena Cambronero, M.Sc.**

**Assessing vegetation coverage in relation to urban growth along the Matias stream (Alajuela, Costa Rica).** Zoe M. Kusnick [George Washington University]; Maria M. Galatis [University of Massachusetts/Amherst]; Jaden R. Hutchins [University of Denver].

**Using aquatic macroinvertebrates to assess the water quality of the Matías Stream (Atenas, Alajuela, Costa Rica).** Jada Csikos-Monroe [University of Minnesota/Twin Cities]; Lindsey Papa [Colby College]; Sarah Schanwald [Pennsylvania State University/State College].

**2020-2024 Action Plan: Recuperation of the Matías Stream Atenas, Alajuela, Costa Rica.** Autumn Gomez-Tagle [Kenyon College]; Hannah Paolucci [Skidmore College].

**Principal Investigator: J. Edgardo Arévalo, Ph.D.**

**Strength of dawn chorus activity varies seasonally in premontane wet forests.** Jeremiah Kaplan [Franklin & Marshall College], David Larson [Amherst College]; and Julia Windham [Brown University].

**Bioacoustics time of Grey-breasted Wood Wren increases during the breeding season (5/5).** Cristina Errickson [Lawrence University]; Mario Seaman [Lawrence University].

**Song recognition by *Catharus fuscater* invokes different responses to territorial intrusions.** Madelyn Peterson [Augsburg University].

**Grey-breasted Wood Wren discriminates between local and nonlocal conspecific populations.** Kaylie-Anna J. Vallee [Colby College].

**Principal Investigator: Mary Little, LL.M.**

**Sustaining Mastatal, Costa Rica: a case study in community-based ecotourism and development.** Sammie Trvalik [Dickinson College]; Anthony Luis Perez [Columbia University].

**Gender Development in the Growing Tourist Economy of Mastatal, Costa Rica.** Alyssa McGillivray [University of Wisconsin/Madison]; Kate Godsil-Freeman [Hampshire College].

**Environmental effects of tourism in Mastatal, Costa Rica.** Riley Greenwood [Western Washington University]; Uli Schwendener [Kenyon College]; Noah Menin [University of Massachusetts/Amherst].



## **Kenya: SFS Center for Wildlife and Water Studies**

The Center for Wildlife and Water Studies' Strategic Research Plan addresses the question: *How can changes in land use, natural resources utilization and availability in the Amboseli Ecosystem be managed to promote socio-economic well-being of local communities whilst safeguarding and promoting natural resources conservation?*

**Principal Investigator: John Kioko, Ph.D.**

**A natural history guide for Kimana Sanctuary.** Alina Waldo [University of Redlands]; Alli Bassman-Lyons [Colby College]; Nathaniel Villa [University of California Santa Barbara].

**Principal Investigator: Kendi Borona, Ph.D.**

**Understanding the efficacy of the conservancy/sanctuary model in improving community livelihoods in Kenya: A case study of the Kimana Sanctuary.** Gabrielle Gundry [Iowa State University]; Ema Liria Chomsky [Reed College]; Natalie Moon [Bates College].

**Principal Investigator: John Kiringe, Ph.D.**

**The relationship between gender and climate change awareness and perceptions of its impacts on water resources, food security, and local livelihoods in the Kimana area of the Amboseli Region.** Emma Brentjens [Davidson College].

**Community perceptions of climate change, usage of solar technology and improved cooking stoves as a mitigation strategy in the Amboseli region, Kenya.** Cameron Bonnell [University of Massachusetts Amherst].

**Climate Change Perceptions and Impacts on Local Livelihoods in the Amboseli region of Kenya.** Gabriel Wilkins [University of Maryland].

**Climate change perceptions and impacts on food security and local livelihoods in the Kimana Area of the Amboseli region, Kenya.** Mia Craven [Austin College].

## **Panama: SFS Center for Tropical Island Biodiversity Studies**

The Center for Tropical Island Biodiversity Studies' research addresses the question: *What is the status of key island systems, both natural and human, and what are the pressures that threaten the delicate balance of the island system?*

*Principal Investigator: Cinda Scott, Ph.D.*

**Effectiveness of the Isla Bastimentos National Marine Park Importance of Mangrove Islands on Fish and Invertebrate Assemblages in Bocas del Toro, Panama.** Emma Greenberg [Whitman College]; Jenna Shea [University of Massachusetts/Amherst]; Rachel Schneider [University of Wisconsin/Madison].

**Habitat Complexity of Mangrove Island Seascapes in Relation to Anthropogenic Influence and Connectivity in the Bocas del Toro Archipelago.** Maximilian R. Vierling [Davidson College]; Samantha E. Krause [University of California/Davis]; Toni C. Trinh [Oregon State University].

*Principal Investigator: Carolyn Kovacs, M.Sc.*

**The Goldilocks zone: Searching for optimal environmental conditions for coral restoration projects in Bocas del Toro.** Natalie Mansergh [California Lutheran University]; Meredith Hespe [Middlebury College]; Meghan MacDonald [College of the Holy Cross].

**Caribbean Coral Restoration: The differences of fish assemblages between artificial reefs and natural reefs.** Sara Erzini [Eckerd College]; William Harrigan [Kenyon College]; Hazel Zink [Morningside College].

*Principal Investigator: Leon Mach, Ph.D.*

**Analyzing Demand for Indigenous-led Tourism Experiences in Bocas del Toro, Panama.** Andrei Pinkus [Wesleyan University]; Diana Tapia [University of Wisconsin/Madison]; David Brown [University of San Diego].

**Unpacking success in Indigenous tourism: Case studies in Bocas del Toro, Panama.** Rita Flanagan [University of Pittsburgh/Main]; Maggie Lee [University of Vermont]; Sasha Mizenin [University of California/Berkeley].

*Principal Investigator: Ted Lawrence, Ph.D.*

**Assessing land use impacts on biodiversity across Bastimentos Island National Marine Park.** Shelby Bocks [University of San Diego]; Casey Hart [Gonzaga University]; Kate Petty [University of Denver].

## **Peru: SFS Center for Amazon Studies**

The Center for Amazon Studies' research addresses the question: *What conditions are necessary for effective conservation and sustainable socioeconomic development in Peru?*

*Principal Investigator: Laura Morales, Ph.D.*

**The effects of reforestation mode and age on carbon storage of trees in the NE Peruvian Amazon**  
Eileen Fitzgerald [Siena College]; Madeline Latimore [Colby College].

**Carbon stock contributions of small woody stems in agroforests and natural rainforests in the Peruvian Amazon.** Jillian O'Toole [College of the Holy Cross]; Claire Thomas [University of Minnesota/Twin Cities].

**Variation in Necromass Carbon Stock Pools Across Different Land Uses in the Lowland Peruvian Amazon.** Adeline R. McCullough [College of the Holy Cross].

**Vertical Distribution of Soil Organic Matter Under Different Land Uses in Loreto, Peru**  
Julia Petty [University of Vermont].

*Principal Investigator: Steven Sevillano, Ph.D.*

**"We Could Turn This Whole Jungle into a City": Regional and Local Land-uses and their Effects on Peruvian Amazon Deforestation.** Taylor Furrh [University of Colorado/Boulder]; Cole Skeffington [University of Colorado/Boulder]; Kayla Takakura [University of Redlands]; Phoebe Eisenbeis [Lawrence University].

*Principal Investigator: Rafael Mendoza, Ph.D.*

**Talking to People, Learning Things: Communication Networks Along the Carretera Iquitos-Nauta.** Elizabeth Allen [Duke University]; Tess Buchanan [Reed College].

**Campesinos, Reforestation, and Non-Monetary Value: The case of reforestation in the Peruvian Amazon.** Noah Mann [Georgia State University].

**Valuation of proposed agroforestry systems along the Iquitos-Nauta highway in Loreto, Peru**  
Ryan Weiskopf [Elon University].

## **Tanzania: SFS Center for Wildlife Management Studies**

The Center for Wildlife Management Studies' Strategic Research Plan addresses the question: *How can wildlife conservation and socio-economic conditions be enhanced in a changing socio-ecological system within the Tarangire-Manyara Ecosystem?*

*Principal Investigator: Christian Kiffner, Ph.D.*

**REDD+ Co-benefits for Mammal Conservation in Yaeda Valley, northern Tanzania.** Phelps Hawley [Drake University]; Mika O'Shea [Occidental College]; Andrew Pettit [University of California/Santa Barbara].

**Tracker Tracking: Inter-Observer Assessment of Indigenous Trackers and Camera Traps in Yaeda Valley.** Evan Conklin [Whitman College]; Eden Forbes [Vassar College].

**Long term population dynamics of wildlife species in a multiple use area of northern Tanzania.** Camille Beckwith [Wheaton College]; Craig Brunner [Whitman College]; Megan Moran [College of the Holy Cross]

**Perceptions and Mitigation of Human-Elephant Conflict in Northern Tanzania.** Isabel Schaal [Franklin & Marshall College]; Leah Cass [George Washington University].

*Principal Investigator: Ole Theisinger, Ph.D.*

**Micro-Habitat Preferences and Activity Patterns Assessment of Reptiles in Yaeda Valley, Northern Tanzania.** Genesis Lara Granados [Mount Holyoke College]; Abby Wallace [George Washington University].

**Reptile species richness and diversity across land-use zonations and varying levels of habitat degradation in Yaeda Valley, Northern Tanzania.** Cole Usdan [Colby College]; Ben Stratton [Bates College].

**Range Expansion, Data Deficient, and Newly Described Reptile Species in Yaeda Valley, Tanzania.** Nico Heyning [University of Puget Sound].

**Telling Tales on Many Scales: Human Perceptions of Reptiles in Yaeda Valley, Tanzania.** Madalyne Buco [College of the Holy Cross]; Kayleigh Limbach [Santa Clara University].

**Examining the Impact of Browsing on Ant-Acacia Mutualism.** Erin Payne [Delaware Valley University]; Rebecca Downer [Wesleyan University]; Cheyana Bassham [North Carolina State University].

*Principal Investigator: John Mwamhanga, M.S.*

**From Sticks to Bricks: Assessing the Environmental and Socio-Economic Impacts of Using Fuelwood to Cure Bricks in Karatu District, Northern Tanzania.** Carson Copeland [Davidson College]; Benjamin Grundy [Santa Clara University]; Thanda Newkirk [Wellesley College]; Elle Ping [Skidmore College].

**The Effects of Climate Change on the Health and Livelihood of People Living in the Tarangire-Manyara Ecosystem, Northern Tanzania.** Caroline Stanton [College of the Holy Cross]; Bailey MkNelly [Scripps College]; Carli Nelson [University of Washington/Seattle]; Mikaela Bollag-Miller [Tufts University].

**Assessing Local Community Perceptions of Randilen WMA and Its Impacts on Their Livelihood.** Cameron Foy [University of San Diego]; Chai Simba [Kenyon College].

## **Turks and Caicos: SFS Center for Marine Resource Management Studies**

The Center for Marine Resource Management Studies' Strategic Research Plan addresses the question: *How can SFS-CMRS support the government and South Caicos community to best manage the marine environment and resources to balance biodiversity conservation and economic sustainability?*

*Principal Investigator: Franziska Elmer, Ph.D.*

**Using 3D Modeling to Determine Spread Rates of Stony Coral Tissue Loss Disease Across Individual Corals of South Caicos Island, Turks and Caicos Islands.** Yuliza Cruz [Villanova University]; Christa Dock [SUNY/College of Environmental Science and Forestry].

**Stony Coral Tissue Loss Disease: Monitoring the progression of a newly-found disease off of a Caribbean coast.** Luke Sutton [University of Vermont]; Skylar Wuelfing [Occidental College].

**Effects of Sargassum induced shading and debris on the *Thalassia testudinum* beds of East Bay, South Caicos.** Alexandra Pope [Whitman College]; Cassandra Proctor [Cornell University].

**Sargassum in South Caicos: What the Recent Increase in Abundance Means for the Ecosystems Community.** Gabriela Goncalves [Arizona State University]; Cailyn Joseph [Salisbury University].

*Principal Investigator: Ewa Krzyszczyk, Ph.D.*

**Fishing for the Truth - Changes Over Time in Length and Species Composition of Finfish Caught in South Caicos, Turks and Caicos Islands.** Elayna Daniels [Davidson College]; Lauren Dentinger [College of the Holy Cross].

**Something's Fishy in South Caicos: Fish Community Composition and Abundance in Varying Depths using BRUV and ROV.** Jenny Norcross [Skidmore College]; Jill Spirk [College of the Holy Cross].

**The effects of Linear Rugosity on the Behavior of *Acanthurus tractus* Infected with Black Spot Syndrome.** Max Voehl [Northern Arizona College].

**Predation Suppression: Parasite driven behavioral manipulation in Ocean Surgeonfish displaying black spot syndrome.** Marty Anderson [University of Minnesota/Twin Cities]; Hannah Käufer [Hamilton College]; Echo Wood [University of Washington/Seattle].

**Investigating the Effect of Black Spot Syndrome on Activity Budgets and Foraging Rates of *Acanthurus tractus*.** Madison Jajko [University of Richmond]; Madelyn Hair [Oregon State University]; Alie MacVicar [Lehigh University].

*Principal Investigator: Courtney Pickett, M.P.A*

**The midden hypothesis: Avoidance behavior in *Lobatus gigas* (Queen conch).** Samuel Arnold [Dickinson College]; Oliver Watkins [Hamilton College].

**Behavioral responses of Queen Conch (*Lobatus gigas*) to the scent of dead conspecifics using short-time trial experiments: A pilot study conducted in the Turks and Caicos Islands.** Delaney Lawson [University of Washington/Seattle]; Helen Maslen [Whitman College].

**Population dynamics and status of *Lobatus gigas* (Queen conch) in the East Harbor Lobster and Conch Reserve, South Caicos, Turks and Caicos Islands.** Madison Dunlap [University of Redlands]; Kimmie Dyrvik [Wake Forest University]; Lexi Addison [Santa Clara University].

**Discarded *Lobatus gigas* (Queen conch) Shells as Microhabitats in South Caicos.** Emma Beyer [Whitman College].

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