



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]; Emily 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 Cambroner, 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].

Campeños, 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 McKnelly [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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