

THE SCHOOL FOR FIELD STUDIES

DIRECTED RESEARCH AUSTRALIA

Center for Rainforest Studies · Yungaburra, Queensland. A complete record of student research projects from the four most recent semesters.



SPRING 2026

6 projects · 28 student authors

FALL 2025

4 projects · 16 student authors

SPRING 2025

6 projects · 23 student authors

FALL 2024

9 projects · 26 student authors

25

RESEARCH PROJECTS

93

STUDENT AUTHORS

4

FACULTY ADVISORS

4

SEMESTERS

FALL 2024 – SPRING 2026

ABOUT THIS GUIDE

Directed Research is the capstone of every SFS semester: students work in small teams with resident faculty on questions set by the needs of the host community and its ecosystems. This guide collects the Directed Research projects completed at the Center for Rainforest Studies in Yungaburra, Queensland, over the four most recent semesters.

Projects are listed newest first. Each entry gives the project title, its faculty advisor or advisors, and the student authors with their home institutions. Each entry closes with a research summary drawn from the Center’s semester final report for that project. Where a project’s final paper carries a formal author abstract, that abstract replaces the summary and is labelled as such.

CONTENTS

SPRING 2026	6 projects · 28 student authors
FALL 2025	4 projects · 16 student authors
SPRING 2025	6 projects · 23 student authors
FALL 2024	9 projects · 26 student authors

FACULTY ADVISORS

Directed Research at the Center for Rainforest Studies was advised by 4 faculty and researchers across these semesters.

ADVISOR	PROJECTS	SEMESTERS
Dr. David Tng	10	All four semesters
Dr. Deborah Apgaua	10	All four semesters
Dr. Sigrid Heise-Pavlov	8	All four semesters
Dr. Mia Derhé	7	All four semesters

Center for Rainforest Studies · Yungaburra, Queensland

01 One Tree Kingdom of the Bryophytic Realm

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua

Aaliyah M. Hahn¹, Josephine S.Y. Low¹, Kaavya Ahuja², Molly J. Wendell-Pearson³, Nova P. Kilbourne⁴, Yinqi Shi²

¹ Swarthmore College, ² University of Wisconsin–Madison, ³ Grinnell College, ⁴ Whitman College

RESEARCH SUMMARY

A tree fall opened access to a rainforest canopy that is normally out of reach, and the project used that window to document the bryophyte community living on a single tree — the “one tree kingdom” of the title. Canopy bryophytes are otherwise difficult to sample in upland Australian rainforest, so the opportunistic setting is unusual. The advisors rate the study among the strongest Directed Research projects the Center has run.

02 Flammability of Mangroves

Faculty advisors: Dr. Deborah Apgaua and Dr. David Tng

Chloe E. Pierce¹, Owen P. Miller²

¹ Skidmore College, ² University of Wisconsin–Madison

RESEARCH SUMMARY

This project extends a running line of plant flammability work at the Center to mangroves, measuring flammability at the leaf level rather than the shoot level used in earlier semesters. Mangroves sit at the wet end of the region’s vegetation gradient, and leaf-level measurement makes their traits directly comparable with those collected for other habitats. The results feed a growing flammability dataset for the regional flora, intended to support comparison across habitat types.

03 Tracing the Source: Water Quality Decline in Peterson Creek on the Atherton Tablelands, Far North Queensland

Faculty advisor: Dr. Sigrid Heise-Pavlov

Alexander Bauer¹, Maren MacLean², Sydney Pichette³, Caspar von Alvensleben⁴, Lilly Wang⁴, Anna Bachenberg⁵

¹ University of Massachusetts Amherst, ² Colby College, ³ Smith College, ⁴ University of Southern California, ⁵ Brown University

RESEARCH SUMMARY

Peterson Creek runs through Yungaburra, and members of the local Landcare group had already flagged an alarming decline in its water quality. This project traced the sources of that decline, sampling along the creek on the Atherton Tablelands to characterise the contamination and where it enters the system. The revised report has been given to the Yungaburra Landcare Group, whose Action Group is carrying out further surveys, and to the local Council in support of ongoing water quality monitoring in Tablelands creeks.

04 Microbat Acoustic Survey at Bridge Creek Crossings in the Wet Tropics of North Queensland

Faculty advisor: Dr. Sigrid Heise-Pavlov

Nathan Packel¹, Keane Phillips², Layla Silva³, Ariana Raschid Farrokhi⁴

¹ Dickinson College, ² Eckerd College, ³ Bowdoin College, ⁴ Colby College

RESEARCH SUMMARY

Microbats make up a large share of the mammal fauna of the Australian Wet Tropics, yet research on them in the bioregion remains rudimentary. Continuing an earlier fauna survey of creek crossings along an urban road, this project recorded microbat activity acoustically at bridge and creek crossings in North Queensland. The main obstacles were the absence of call analysis software and of regional reference calls; detectors and software were purchased for the project and reference calls made accessible, and students are continuing to match recordings against references to identify species. Acoustic monitoring will continue at the Center, and a manuscript is planned.

05 Investigating the Diel Activity of Dung Beetle Species in the Wet Tropics of Australia; and Changes in Species and Functional Diversity of Dung Beetles in Restoration Plots Across 10 Years

Faculty advisor: Dr. Mia Derhé

Rowan Thomas¹, Samantha Stashower², Zoe Ciabaton³, Zachary Jurdan⁴, Alaina Morrissey⁵, Zoe Roldan-Calvin⁶

¹ Amherst College, ² Pennsylvania State University, ³ Franklin & Marshall College, ⁴ Siena University, ⁵ Missouri State University, ⁶ Skidmore College

RESEARCH SUMMARY

This project examined dung beetle ecology in two linked parts: the diel activity patterns of species in the Wet Tropics, and change in dung beetle species and functional diversity across restoration plots over ten years. Diel activity had not previously been studied in the region, and the restoration component builds directly on surveys run at the Center a decade earlier. Fieldwork ran day and night across five consecutive days and yielded 1,133 individual dung beetles, with diel activity patterns identified for six species. Both components are being developed into manuscripts for submission to academic journals.

06 The Impacts of Short-Term Nature-Based Environmental Education on Rural Participants in Far North Queensland, Australia

Faculty advisor: Dr. Mia Derhé

Hannah Chase¹, Chloe Doyle², Martin Krueger³, Luiz Stern⁴

¹ Mount Holyoke College, ² College of Charleston, ³ University of Minnesota/Twin Cities, ⁴ Washington State University/Pullman

RESEARCH SUMMARY

This project examined how short-term, nature-based environmental education influences children's knowledge, connection to nature, and pro-environmental behaviour in rural Far North Queensland. Students designed and delivered a two-day program and used pre- and post-surveys to measure change. Community enthusiasm was strong and the surveys showed clear increases in environmental knowledge and attitudes; the principal challenge was completing design, delivery, data collection, analysis, and write-up within a single semester. The project is intended to run in future semesters to build a longer-term dataset, and is being developed into a manuscript.

Center for Rainforest Studies · Yungaburra, Queensland

01 **A preliminary survey of the plant and animal biodiversity of a regenerative agroforest in northeast Queensland, Australia**

Faculty advisors: Dr. Deborah Apgaua and Dr. David Tng

Oliver Zach Sacher¹, Robert Chase Van Vranken², Dingyi Yu³

¹ Colby College, ² University of Vermont, ³ University of Minnesota – Twin Cities

RESEARCH SUMMARY

This preliminary survey documented the plant and animal biodiversity of a regenerative agroforest in northeast Queensland, establishing a first account of what such a system supports. Regenerative agroforestry is promoted as a land use that can carry biodiversity alongside production, but baseline records from these properties are scarce in the region. The advisors note that several groups — fungi and other invertebrates among them — remain to be surveyed in more detail.

02 **A Snapshot of Biodiversity on Australian Savannah: Surveying the Faunal Diversity of Watsonville in North Queensland on Mbabaram Managed Land**

Faculty advisor: Dr. Mia Derhé

Diana Kettler¹, Ida Landecker², Lily Malkus³, Mohammed Rzane⁴, Meilynn Smith⁵, Tatianna Velicer⁶

¹ Austin College, ² Reed College, ³ Franklin and Marshall College, ⁴ University of Alaska Anchorage, ⁵ Grinnell College, ⁶ University of Southern California

RESEARCH SUMMARY

This project surveyed the faunal diversity of Watsonville, an area of Australian savannah on Mbabaram managed land in North Queensland, producing a snapshot of the species the site supports. Savannah country of this kind is under-surveyed relative to the neighbouring Wet Tropics rainforest, and the record contributes to the Mbabaram community's knowledge of their own land. The paper is being prepared for publication in *North Queensland Naturalist*.

03 **How to Restore Mabi Rainforest on a Cinder Cone in the Atherton**

Faculty advisor: Dr. Sigrid Heise-Pavlov

Eden J. Leak¹, Nicholas V. McCarver²

¹ Mount Holyoke College, ² Grinnell College

RESEARCH SUMMARY

Mabi rainforest is a critically endangered vegetation type on the Atherton Tablelands, and this project addressed how to restore it on a cinder cone, a site whose volcanic soils and exposure make revegetation difficult. The work continues a multi-semester restoration trial at the site, tracking seedling mortality and growth alongside change in soil attributes and invertebrate communities. Monitoring of these measures continues in subsequent semesters.

04 **Urban Ecology and Diversity of Epiphytes on Street Trees in the Australian Wet Tropics**

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua

Hannah L. Flis¹, Javier Olmedo², Martin M. Kacin³, Niseya L. Guerra⁴, Shaylen C. Roell⁵

¹ Trinity College, ² University of Southern California, ³ Davidson College, ⁴ University of the Redlands, ⁵University of Massachusetts Amherst

RESEARCH SUMMARY

Street trees carry epiphyte communities that are rarely recorded. This project surveyed the diversity of epiphytes growing on street trees in towns of the Australian Wet Tropics, giving a first account of how much epiphytic diversity an urban tree population supports in the region. The advisors intend to extend sampling to more trees and more towns, and to add bark traits as an explanatory variable.

Center for Rainforest Studies · Yungaburra, Queensland

01 **A Comparative Study of Biodiversity at a Monoculture Farm, Regenerative Agricultural Farm, and Reference Forest in Queensland, Australia**

Faculty advisors: Dr. Deborah Apgaua and Dr. David Tng

Elizabeth Carlson¹, Gray Dallaire¹, James Leone², Caroline White³, Dominika Zdzeibko⁴, Camryn Zoeller⁵

¹ Iowa State University, ² University of San Diego, ³ University of North Carolina/Chapel Hill, ⁴ University of Southern California, ⁵ Whitman College

RESEARCH SUMMARY

This project compared biodiversity across three land uses in Queensland — a monoculture farm, a regenerative agricultural farm, and a reference forest — to test how far regenerative practice narrows the gap between production land and intact forest. Surveying all three in the same landscape allows the comparison to be made without confounding regional differences. The advisors plan to repeat the survey in the dry season, with particular attention to the regenerative farm, to capture seasonal variation.

02 **An Exploration of the Bryofauna in Upland Rainforests in the Australian Wet Tropics**

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua

Stella Lindbergh¹, Benjamin Gravel²

¹ Sarah Lawrence College, ² Southern Methodist University

RESEARCH SUMMARY

Bryophyte mats in upland rainforest hold their own miniature fauna, a habitat seldom sampled in the Australian Wet Tropics. This project explored the invertebrate communities living within bryophytes in upland rainforest and described what the mats support. It contributes to the Center's continuing work on bryophytes and the organisms associated with them.

03 **Variation in Vascular and Non-Vascular Plant Communities of Two Distinct Remnant Mabi Rainforest Patches on the Atherton Tablelands, Queensland, Australia**

Faculty advisors: Dr. Deborah Apgaua and Dr. David Tng

Ellery Stanzel¹, Caelon Shugrue², Sophie Colbert², Jalynette Sanchez³

¹ Smith College, ² Connecticut College, ³ University of New Haven

RESEARCH SUMMARY

Mabi rainforest survives on the Atherton Tablelands only as scattered remnant patches. This project compared the vascular and non-vascular plant communities of two distinct remnants, showing how much variation persists between fragments of the same endangered rainforest type. The work adds to the Center's continuing record of Mabi remnant vegetation.

04 **Documenting diversity as a first step to relearning Traditional Ecological Knowledge**

Faculty advisor: Dr. Mia Derhé

Isaac Laumer¹, Annie Thompson², Ellory Dickerson³, Kate Bethel⁴

¹ University of Wisconsin Madison, ² Connecticut College, ³ Trinity University, ⁴ Washington State University

RESEARCH SUMMARY

Working with the Mbabaram community at Watsonville, this project documented the biological diversity of the site as a first step toward relearning Traditional Ecological Knowledge tied to those species. The survey is intended to underpin a biocultural information board for the site, developed with the community. The paper is being written up for submission to an ecological journal, and further biodiversity surveys are planned for the dry season.

05 Preserving Mbabaram Knowledge: The Documentation of Significant Species and Their Traditional Uses in Mbabaram Culture

Faculty advisor: Dr. Mia Derhé

Aida Yoder¹, Brevin Master², Charlotte Peterson³

¹ Denison University, ² Connecticut College, ³ University of Minnesota

RESEARCH SUMMARY

This project documented species of significance to Mbabaram culture and their traditional uses, recording knowledge held by community members at Watsonville. The material developed into a biocultural field guide and bushwalk signage for the site, both to be published and installed with the community. The paper is being prepared for a social sciences journal, and biocultural surveys will continue in future semesters so that the knowledge is documented comprehensively.

06 Exploring Platypus (*Ornithorhynchus anatinus*) Habitat Traits in Far North Queensland, Australia

Faculty advisor: Dr. Sigrid Heise-Pavlov

Lauren Edwards¹, Olivia Levy², Grace Robes-Kenworthy³, Zoe Van der Walt⁴

¹ Barnard College, ² Elon University, ³ Mount Holyoke College, ⁴ Southwestern University

RESEARCH SUMMARY

This project characterised the habitat traits associated with platypus (*Ornithorhynchus anatinus*) presence in waterways of Far North Queensland, working on private land across the Atherton Tablelands. Platypus occupancy in the region is patchily documented, and habitat description of this kind narrows where survey effort is best directed. The report was returned to the landholders who granted access and stands as a reference for future platypus research on the Tablelands.

Center for Rainforest Studies · Yungaburra, Queensland

01 **A snapshot of diversity - North Queensland's first BioBlitz event exploring plant and animal diversity at a reforested urban park in Malanda, Atherton Tablelands**

Faculty advisors: Dr. Deborah Apgaua and Dr. David Tng

Dylan Berr¹, Susanna McDowell², Gibby Heiser³

¹ Bowdoin College, ² James Madison University, ³ Davidson College

RESEARCH SUMMARY

North Queensland's first BioBlitz brought researchers and the public together for a rapid, concentrated survey of plant and animal diversity at a reforested urban park in Malanda. The event produced a species snapshot for a revegetated site that had not previously been catalogued, and doubled as a public engagement exercise. The results are being written up as a multi-authored paper for submission to *North Queensland Naturalist*.

02 **Debunking Da Vinci?**

Faculty advisors: Dr. Deborah Apgaua and Dr. David Tng

Ziann Francis Facey¹, Annika Sellars Haile², Mary Elizabeth Holmes³, Sam Adele Mallon⁴

¹ Williams College, ² Hamilton College, ³ Davidson College, ⁴ Bates College

RESEARCH SUMMARY

The project takes its title from da Vinci's branching rule, the proposition that the combined cross-sectional area of a tree's branches above a fork equals that of the trunk below it. The Australian component was completed with academics from the Universidad Nacional Autónoma de México, part of a wider collaboration in which partners collect comparable data at sites around the world. The global dataset is still being assembled, so the final write-up is some way off.

03 **Plant species composition and structural differences between disturbed and undisturbed tropical rainforest revegetation sites**

Faculty advisors: Dr. David Tng and Dr. Deborah Apgaua

Sydney A. Sharp¹, Emma G. Garman², Mia A. Martin-Fuller³

¹ University of Vermont, ² Scripps College, ³ DePauw University

RESEARCH SUMMARY

This project compared plant species composition and vegetation structure between disturbed and undisturbed tropical rainforest revegetation sites, testing how disturbance shapes the trajectory of replanted forest. The work was carried out with restoration ecologist Nigel Tucker. It has been written up and submitted to the journal *Ecological Management and Restoration*.

04 **Baseline Faunal Survey of the Boar Pocket Road-Creek Crossings**

Faculty advisor: Dr. Sigrid Heise-Pavlov

Alexandria Shellhammer¹, Madeline Hart², Alexandria Morales³

¹ University of Virginia, ² Knox College, ³ University of Southern California

RESEARCH SUMMARY

Road-creek crossings interrupt the movement of rainforest fauna, and Boar Pocket Road crosses several. Working with the Tablelands Regional Council, this project surveyed the fauna using the crossings to establish a baseline ahead of restoration work. Weed control and revegetation of the crossings began the following semester along the Tablelands Vegetation Trial, and change in fauna composition will be measured against the baselines recorded here.

05 **Revegetation at Road-Creek Crossings Along Boar Pocket Road: Recommendations for the Tablelands Regional Council**

Faculty advisor: Dr. Sigrid Heise-Pavlov

Zachary A. Blumenfeld¹, Sanaa K. Chakour², Jacob H. Whalen³

¹ Davidson College, ² Wellesley College, ³ Wake Forest University

RESEARCH SUMMARY

Paired with the baseline faunal survey of the same crossings, this project developed revegetation recommendations for the road-creek crossings along Boar Pocket Road and delivered them to the Tablelands Regional Council. The recommendations cover the species and approach suited to the crossings under the Council's Vegetation Trial. Weed control and revegetation following the recommendations began the next semester.

06 **Best Practices for Revegetating a Cinder Cone with Mabi Rainforest**

Faculty advisor: Dr. Sigrid Heise-Pavlov

Colby Jaros¹, Miles Rardin²

¹ Grinnell College, ² Bates College

RESEARCH SUMMARY

This project set out best practices for revegetating a cinder cone with Mabi rainforest, working on land held by stakeholders Ilona and Pieter Moerman. Cinder cones present difficult conditions for restoration, and the recommendations address planting approach and site preparation for this endangered rainforest type. They were incorporated into the planning of the next research planting plots, and seedling growth and soil attributes continue to be monitored against the data collected here.

07 **Evaluation of Environmental Markets Schemes for Mabi Rainforest Restoration on a Cinder Cone**

Faculty advisor: Dr. Sigrid Heise-Pavlov

Sam G. Twitty¹, Brianna L. Stevenson¹

¹ Gonzaga University

RESEARCH SUMMARY

Restoration needs funding, and this project evaluated whether environmental market schemes could pay for Mabi rainforest restoration on a cinder cone. The team assessed the existing carbon market and the biodiversity market then under development against the requirements of the site. Both were found unsuitable as funding sources for this restoration, so other avenues are being pursued — continuing grant applications by the faculty advisor alongside a donation campaign run with SFS headquarters.

08 Using dung beetles as bioindicators for measuring rainforest restoration success

Faculty advisor: Dr. Mia Derhé

Iris Ballard¹, Anya Hoepfinger², Vanessa Norris³

¹ Dickinson College, ² Reed College, ³ Harvard University

RESEARCH SUMMARY

Dung beetles respond quickly to changes in forest condition, which makes them a candidate indicator group for restoration monitoring. This project used dung beetle assemblages to measure rainforest restoration success at replanted sites on the Atherton Tablelands. The paper is being finalised for publication, with *Ecological Management and Restoration* or *North Queensland Naturalist* the intended venues.

09 Changes in Public Attitudes Towards Conservation, Appreciation of Nature, and Understanding of Biodiversity Before and After a BioBlitz

Faculty advisor: Dr. Mia Derhé

Amanda Doty¹, Lucy Hettinger², Leah Veress³

¹ Longwood University, ² Elon University, ³ Smith College

RESEARCH SUMMARY

Paired with the Malanda BioBlitz survey, this project measured what the event changed in its participants — attitudes toward conservation, appreciation of nature, and understanding of biodiversity, recorded before and after the BioBlitz. Public engagement events are widely run on the assumption that they shift attitudes; this study tested that directly. The findings were shared with the Malanda BioBlitz organiser to inform future events, and the paper is being finalised for publication.

THE SCHOOL FOR FIELD STUDIES

Center for Rainforest Studies, Yungaburra, Queensland, Australia. Titles, faculty advisors, student authors, and home institutions compiled from the SFS Directed Research project lists for Fall 2024, Spring 2025, Fall 2025, and Spring 2026.