



## 2023 Sustainability Research Projects

In Holland, we believe that in order to become a vibrant, world-class community we must look at all aspects of our community. This includes the economic, social and environmental impacts we all have. The [City of Holland Sustainability Committee](#) created a seven-pillar framework with “lenses” to help us evaluate and make more sustainable choices.

### Framework Categories

SMART ENERGY | ECONOMIC DEVELOPMENT | TRANSPORTATION | COMMUNITY & NEIGHBORHOOD  
QUALITY OF LIFE | COMMUNITY KNOWLEDGE | ENVIRONMENTAL ACTION & AWARENESS

This framework incorporates a triple bottom line evaluation approach and the [Hope College Sustainability Institute](#) has used this model as a way to formally recognize the 2023 Sustainability Research Projects at this year’s [Celebration of Undergraduate Research and Creative Activity](#).

**SMART ENERGY |** Our way of living requires a stream of energy to operate personal and infrastructure devices. We know that energy is produced with scarce resources and the byproducts impact our environment. We need to use both conservation and efficiency measures to manage the resources we have to provide access to reliable and cost effective energy.

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**ECONOMIC DEVELOPMENT |** The business community is the driving engine within the area. While it is dependent on community resources and structure for support, it generates capital essential to growth and development.

Juliana Struyk	Dr. Rachel Spooner, Political Science	Is China Steel-ing all of the Manganese?: A Case Study of China's Belt-and-Road Initiative and the State of the U.S.'s Defense Supply Chains
Kaylee Stanton	Dr. Sarah Kornfield, Women and Gender Studies	Walking the Digital Line of Profit and Empowerment: Period Products on Social Media

**COMMUNITY & NEIGHBORHOOD |** The fiber of our lives can be traced to the places we live and the individuals we interact with on a daily basis. The places we live support the development of our personalities and perspectives on life. Communities at all scales have a vital role to play. Encouraging vital and effective communities is an important element.

Natalie Prestegaard	Dr. Lauren Janes, History	The Debate on Blackness: Deliberations of Scientific Racism in the British West Indies (1750-1840)
Caleb Van Appledorn	Dr. Lauren Janes, History	Desmond Holdridge's Expeditions in South America
Per-Erik Gierlach	Dr. Lauren Janes, History	The Coup in Iran
Mikayla Roman	Dr. Olufemi Oluyedun, Kinesiology	Examination of athletic identity, perfectionism, and sport commitment among collegiate athletes
Kayla Wolma	Dr. Olufemi Oluyedun, Kinesiology	Association of COVID-19 Concern, Psychological Well-Being, and Sport Commitment



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Jesse Cooke	Dr. Olufemi Oluyedun, Kinesiology	Team Dynamics Among Collegiate Athletes in Sports
Bergen Johnson, Gabe DeYoung, Matthew Stafford	Dr. Mark Pearson, Mathematics	Identity Development and Empathy Among Pre-Health Students: A Longitudinal Study Employing Latent Class Analysis
Joy Gregson	Dr. David Keep, Music	Re-Indigenization of Song, Chant, and Dance in the Pacific
Caleb Smith	Dr. Rachel Spooner, Political Science	How Transnational Criminal Organizations Affect the Opportunities of the State and its People
Alexis Koehl	Dr. Sonja Trent Brown, Psychology	First Connect: Open Hearts and Open Minds through Racial Healing Circles
Abigail Bilisko	Dr. Tatevik Gyulamiryan, Spanish	Scientific Advancements Inspired by Religion in Early Modern Spain
Nicole Galloway	Dr. Sarah Kornfield, Women and Gender Studies	Beyond the Binary: Considering Gender, Leadership, and Femmephobia

**QUALITY OF LIFE |** Ultimately, it is the feelings and state of mind of individuals in the collective that make up a community's quality of life. The community through governmental, religious, business and social organization, makes decisions and supports actions that contribute to the community's well being.

Baker Conley, Jared Evans, Colin Salamone	Dr. Olufemi Oluyedun, Kinesiology	The Effect of Motivational Music on Power in an Anaerobic Sprint Test
Mackenzie Halton, Riley Checkley	Dr. Olufemi Oluyedun, Kinesiology	Physical Activity Behavior and Cognition in Collegiate-Aged Students
Owen Leibrock	Dr. Chad Carlson, Kinesiology	A Christian Framework for Competitive Sport
Leah Reinardy	Dr. David Keep, Music	Neither "Mad Genius" Nor "Man-Child": Reframing Popular Discourse Around Thelonious Monk's Music and Madness
Alexis Potapczak	Dr. Rachel Spooner, Political Science	Religion's Impact in Foreign Policy
Jackson Uyl	Dr. Rachel Spooner, Political Science	Political Biases in State Supreme Courts
Chloe Bares	Dr. Rachel Spooner, Political Science	Help or Hindrance: A Study on Neurodiversity and Social Perception
Morgynn Vallieres	Dr. Rachel Spooner, Political Science	Gubernatorial and Presidential Campaign Strategies in Swing States v. Non-Swing States
Helen Weston	Dr. Rachel Spooner, Political Science	Exploring the Intersection of Political Ideological Norms and a Congress Member's Criminal Justice Reform Beliefs: An EQUAL Act Case Study
Zoe Ritsema	Dr. Rachel Spooner, Political Science	Amicus Briefs and the US Supreme Court
Haley Bennett	Dr. Rachel Spooner, Political Science	Eighth Amendment Violations Among Mentally Ill Inmates
Luke Ruitter	Dr. Rachel Spooner, Political Science	Fascist or Fash-ish? Using the F Word in Contemporary Discourse
Leah Renkema	Dr. David Ryden, Political Science	Religious Liberty in Modern American Constitutional Law
Reed Rosado	Dr. Rachel Spooner, Political Science	Campaign Strategies: How to Get Voters to Vote



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Mark Fields	Dr. Rachel Spooner, Political Science	Religiosity and Conspiracy Theories
Alyssa Hrcka	Dr. Rachel Spooner, Political Science	Partisan Media and Political Polarization
Erin Moran, Brendyn Mroz	Dr. Mary Inman, Psychology	The Effect of Social Affirmation on Emotions and Body Evaluations
Chloe Swanson, Hannah Fuller, Carmen Casper, Isabella Brady	Dr. Daryl Van Tongeren, Psychology	Humbly More Religious: The Role of Humility in Religious Change
Carmen Casper, Chloe Swanson, Isabella Brady	Dr. Daryl Van Tongeren, Psychology	Can't escape Hell: Negative religious beliefs persist among religious donees
Isabella Brady, Chloe Swanson, Carmen Casper	Dr. Daryl Van Tongeren, Psychology	Scared Toward the Sacred? Existential Fear and Religious Residue
Cameron Houck, Sacia Gilbertson	Dr. Andrew Gall, Neuroscience	Adherence to COVID-19 Guidelines and Negative Associations with Sleep Health and Socialization
MacKenna Shampine	Dr. Lindsey Root Luna, Psychology	Relationships in the Aftermath of Suffering: Evaluating Social Support, Perceived Control, and Coping as Predictors of Resilience in Individuals with Trauma History
Katherine Yakes, Nhi Hoang, Erin Moran	Dr. Kendra Thomas, Psychology	Evaluating hope as a virtue in participants from Brazil, South Africa, and Hope College
Isabella Musherure, Esther Turahirwa	Dr. Kendra Thomas, Psychology	Conceptualizing Hope as a Virtue
Corri Zimmerman, Rita Kagaju	Dr. Rodrigo Serrao, Sociology	The Beyond Ethnicity Project
Paige Buckberry	Dr. Aaron Franzen, Sociology	Who Cares About Their Friends? The propensity to emphasize protection of self or protection of others during the Covid-19 Pandemic
Bergen Johnson, Grace Rellinger	Dr. Aaron Franzen, Sociology	Exploratory Study of Undergraduate Pre-health and Nursing Student Differences in Development
Allison Graver	Dr. Aaron Franzen, Sociology	Ideal Professional Self Descriptions in Nursing and Pre-Health Undergraduate Students
Bergen Johnson	Dr. Aaron Franzen, Sociology	Effects of Religion and Health on Humility in Undergraduate Pre-health and Nursing Students
Callalily Britt	Dr. Aaron Franzen, Sociology	Evaluating the Differences in Empathy of Nursing Students and Pre-Health Students: A Prospective, Cross-Sectional Study
Sutton Steensma	Dr. Sarah Kornfield, Women's and Gender Studies	How Students at Hope College Reflect on Their Relationship with Their Own Bodies and Perception of Body Positivity

**COMMUNITY KNOWLEDGE |** The collective knowledge of the community is an incredible resource. The ability to tap into this wisdom is essential for continued growth. In both formal and informal channels, the community's knowledge and energy must be channeled to where it is needed.

Nicole Galloway	Dr. Marissa Doshi, Communication	Decoding Insta-therapy: a case study pediatric therapists'
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		Instagram accounts
Emily Oegema, Grace Critchfield, Jacob Humbert	Dr. Yooyeun Hwang, Education	Culturally Responsive Teaching and Religious Diversity
Marta Johnson, Kambree DeWitt, Macy Kerr	Dr. Jane Finn, Education	Compassion Fatigue within pre-service teachers: An Analysis within Hope College's Education Department
Macy Kerr	Dr. Jane Finn, Education	Empathy and pre-service teachers: How much is too much?
Holly Vincett	Dr. Lauren Janes, History	The Student's Perspective: The American Indigenous Boarding School Experience
Jonah Badanes-Katzman	Dr. Rachel Spooner, Political Science	Federalism and Education: Analyzing the Impact of No Child Left Behind on State Autonomy and Michigan Schools
Emma Hall	Dr. Rachel Spooner, Political Science	Educating the Person: Inexhaustibility, Transcendence, and Place

**ENVIRONMENTAL ACTION & AWARENESS** | The natural and built environments interact with one another over time with intended and unintended consequences. Educating the public on environmental protection and integrating these ideas into our city planning can change negative outcomes of the past and improve our future state.

Grace Vollmert, Brendan Veenstra	Dr. Michael Pikaart, Chemistry	Performance of Microbial Source Tracking Methods: Molecular Markers & qPCR/ddPCR
Kai Francisco, Seth Grove, Carrie Harmeling, Anna Richards	Dr. Kelly Ronald, Biology	Response of House Sparrows ( <i>Passer domesticus</i> ) to Predator-Based Auditory Cues and Consequent Threat Level Assessment
Sarah Grimes	Dr. Kelly Ronald, Biology	Urbanization Alters the Song Propagation of Two Human-Adapted Songbird Species
Linda Nduwimana, Hannah Peterson	Dr. Kelly Ronald, Biology	Can you hear me? The Role of Urbanization on Auditory Sensitivity in the House Sparrow ( <i>Passer domesticus</i> )
Olivia Sprys-Tellner, Peyton Halleemann	Dr. Kelly Ronald, Biology	Effects of Iron Oxide Nanoparticle Exposure on the Auditory Physiology and Iron Bioaccumulation in House Sparrows ( <i>Passer domesticus</i> )
Emma Yonker	Dr. Kelly Ronald, Biology	Auditory Differences between Two Species of Sexually Dimorphic Songbirds
Jacob Bergstrom, Lindsay Jankowski	Dr. Kelly Ronald, Biology	The impact of aerosolized iron oxide nanoparticle exposure on behavior of the house sparrow ( <i>Passer domesticus</i> ).
Madeline Kenney, Sean Slayton, Madison Smith, Hannah Sturgeon	Dr. Kelly Ronald, Biology	Does the House Sparrow ( <i>Passer domesticus</i> ) Prefer Color or Location-based Cues When Exhibiting Foraging Behavior?
Faith Huff, Sydney Hawkins, Ashley Lauraine, Eden Comer	Dr. Kelly Ronald, Biology	A Comparison of Antipredatory Responses to Visual and Olfactory Stimuli in House Sparrows
Nicholas Figueroa	Dr. Natalia González-Pech, Chemistry	Structural investigation of novel supramolecular anion cages with synchrotron X-ray diffraction



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Rachel Thomas	Dr. Natalia Gonzalez-Pech, Chemistry	Mechanistic Understanding of the Synthesis of Clusters of Fe <sub>3</sub> O <sub>4</sub> Nanoparticles by Through Headspace Byproduct Analysis
Caleb Brzezinski	Dr. Brent Krueger, Chemistry	Automating a Data Analysis Pipeline Including Automated Colony Counting
Andrew Reiffer	Dr. Natalia Gonzalez-Pech, Chemistry	Synthesis and characterization of clusters of ZnO-Fe <sub>3</sub> O <sub>4</sub> nanoparticles
Nicholas J. Dawson, Jenna K. Currier	Dr. Brent Krueger, Department of Chemistry	Microbial Community Composition Dependence on Season and E.coli Abundance in the Macatawa Watershed
Avery Reimink, Maddelyn Jannusch	Dr. Kenneth Brown, Chemistry	Environmental Injustice in Northwestern Indiana
Lauren Bryan, Rachel Shaw, Madison Smith	Dr. Michael Philben, Chemistry and Geology and Environmental Sciences	Selective Preservation of Structural Carbohydrates During Peat Formation
Rachel Shaw, Lauren Bryan, Madison Smith	Dr. Michael Philben, Chemistry and Geology & Environmental Sciences	Organic matter quality influences aerobic and anaerobic respiration rates in peatland soils
Madison Smith	Dr. Michael Philben, Chemistry and Geology & Environmental Sciences	Temperature sensitivity of nitrogen mineralization in peat from a southwestern Michigan Bog
Dylan Clem, Clara Voskuil	Dr. Courtney Peckens, Engineering	Experimental Experimental Validation of Real-Time, Weighted Control Algorithm on High Rise Structures
Parker Perry	Dr. Courtney Peckens, Engineering	The Design and Fabrication of a 2 Story, Small-Scale Shear Structure
Heleyna Tucker, Micah Sterk	Dr. Darin Stephenson, Mathematics	Classification of Land Cover on Sand Dunes
Anna Whittle	Dr. Sarah Kornfield, Women's and Gender Studies	The Storytellers of Climate Change: Women in the Global South as Changemakers

**TRANSPORTATION** | The movement of people, goods, and services within the area is an evolving system. We interact with other regional, national and international elements to create a total network.

Nicholas Migaldi	Dr. Meagan Elinski, Chemistry	Multifaceted Surface Coatings from Composite Dry Lubrication Schemes
Lindsay Martin	Dr. Meagan Elinski, Chemistry	Influence of Molecular Structure on Interactions with Nanodiamonds Under Shear Stress

*We believe the Christian faith calls us to care for all of God's creation and ensure preservation for generations to come. It is through our daily actions that we can make a big impact and create a better world for every individual, as one created and loved by God.*

*Called to be global citizens, we will engage the world constructively through our teaching, research, and community service in order to shape Hope College into a model of sustainability and be a force for good in the world.*

*Congratulations and thank you to all of the students and faculty for their hard work this year!*

[hope.edu/sustainability](https://hope.edu/sustainability)