



2017 Sustainability Research Projects

The Holland-Hope College Sustainability Institute (HHCSI) would like to formally recognize the following 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. Our

City of Holland Sustainability Committee has created a seven-pillar framework with “lenses” to help us evaluate and make more sustainable choices. We have used this framework model as a way to identify the Hope College Sustainability Research Projects.

This year’s research projects will also be designated with a “green ribbon” on their research poster.

Framework Categories:

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

For more information about the Framework visit: www.hollandsustainabilityreport.org

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.

104 Katrin Kelley	Dr. Marty Jordan, Political Science	Does Oil Really Influence the Probability of Foreign Intervention?
150 Cindy Alexander, Christopher Kruger, Regan Jekkals, Chelsea Steinfeldt, and Marissa Marks	Dr. Stephen C. Scogin, Biology and Education	Welcoming a Greener Campus? It's Up to You!
179 Scott Joffre	Dr. Jennifer Hampton, Physics	Characterization of Cation Intercalation in Surface Bound Prussian Blue Analogues
180 Benjamin Peecher	Dr. Jennifer Hampton, Physics	Electrochemical vs. X-ray Spectroscopic Measurements of NiFe(CN) ₆ Crystals
181 Rylan Prafke	Dr. Jennifer Hampton, Physics	Response of Surface Bound Hexacyanoferrate Films to Binary and Ternary Metal Alloys
182 Anna Lunderberg	Dr. Jennifer Hampton, Physics	Exploring the Effects of Copper on Composition and Charge Storage of Prussian Blue Analogue Pseudocapacitors



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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. We want to be a location of choice for new businesses and industry.

2 William Harrison	Dr. Sarah Estelle, Economics	Does Debt Discourage Marriage Early in Adulthood?
3 Karl Heusinkveld	Dr. Sarah Estelle, Economics	Financial Habits among the Faithful
175 Natalie Fulk	Dr. Marty Jordan, Political Science	The Relationship between a Nation-State Being Land-Locked and Its Economic Development

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.

5 Paul Nelson	Dr. Sarah Estelle, Economics	Do Ridesharing Services Affect the Congestion of Urban Transportation?
6 Hadley Roy	Dr. Sarah Estelle, Economics	Up with Uncertainty, Down with Demand: How do Information Shocks Impact Automotive Purchasing Behavior?

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.

23 Joshua Groenhof	Dr. Sarah Estelle, Economics	Do More Lenient Gun Laws Reduce Criminal Activity? The Impact of State Concealed Weapon Laws on Crime
43 Olivia Skatrud	Dr. Marissa Doshi, Communication	Media Games: The Non-Athletic Framing of the 2016 Summer Olympic Games by the American Media
110 Arend Buitenhuis	Dr. Marty Jordan, Political Science	What Effect Does Community Size Have on Individual Voter Turnout?



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124 Katheryn Irwin, Leah Krudy, Julia Kirby, Darwin Guillen, Emily Branca, and Grace Hulderman	Professor Tori Pelz, Art and Art History Professor Sara Alsum-Wassenaar, Art and Art History Deb Coyle, CASA Program Coordinator	Honoring an Inmate through Socially Engaged Art
170 Matthew Gentry	Dr. Marty Jordan, Political Science	Factors That Lead States to Raise Their Minimum Wage
172 Madeline Shupe	Dr. Marty Jordan, Political Science	To What Degree Does Expanding Political Freedoms Affect an Individual's Satisfaction?

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.

1 Trevor Barker	Dr. Sarah Estelle, Economics	The Effect of Maternal Work Hours on Children's Mental Health
4 Nathan Morales	Dr. Sarah Estelle, Economics	Do Breadwinners Create Biased Households? The Effects of a Breadwinner's Gender on Investments in Sons and Daughters
34 Anna Jones	Dr. Jack Mulder, Philosophy	Same Sex Marriage in the United States
39 Nicolette DeSantis	Dr. Sarah Kornfield, Communication	The Language of Gender
56 Kirstin Anderson, Nina Kay, Andrew Monroe	Dr. Anne Heath, Art History Laura McGrath, Mellon Scholars Program	The Anti-Slavery Almanac
74 Laura Teal, Lucas Wiles, Haila Asefa, Sam Kuiper, Samantha Stevens, Jordan Brown, Tymi Staub	Dr. Andrew Gall, Psychology Dr. Alyssa Cheadle, Psychology	Sleep in College Students: How Sleep is Related to Daily Health and Spiritual Behaviors, and How does Sleep Education Affect Sleep Quality and Quantity?



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100 Rachel Barszcz	Dr. Kendra Parker, English	Inclusivity or...?: A Multi-Lens Feminist Analysis of H&M's She's a Lady Commercial
101 Alissa Heynen	Dr. Kendra Parker, English	Coca-Cola: Bottling Happiness
102 Sophia Bouma-Prediger	Dr. Kendra Parker, English	When Will "Real Bodies" Mean All Bodies? A Critical Look at the #AerieREAL Ad Campaign
114 DeVante Cosby	Dr. Marty Jordan, Political Science	Attitudes towards LGBTQ Rights
159 Allison Utting, Alissa Frazee Briana, Bailey Mariah Bensley	Dr. Jeanne Petit, History	History behind the Hashtag: The Historical Roots of the Black Lives Matter Movement
174 Miche Andre	Dr. Marty Jordan, Political Science	Where Are the Women?
197 Jorge Benitez, Courtney Myers	Dr. Courtney Peckens, Engineering	Environmental Noise Monitoring Using a Wireless Sensor Network
222 Secret Permenter	Dr. Marty Jordan, Political Science	America's Support for LGBT+ Marriage
225 Dominic Ferrera	Dr. Marty Jordan, Political Science	Religion, Government, and Conflict

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.

10 Matt Sandgren	Dr. Sarah Estelle, Economics	The Impact of Diversity on Dropout Rates at the School District Level
68 Kara Lurvey, Amanda Gibson	Dr. Sonja Trent-Brown, Psychology	Childhood Physical Activity and Nature Experience as Predictors of Adult Perspectives on Nature
72 Emily Simmons, Dalila Salas, Nicole Marsh, Julia Licata, Brooke Ledsworth, Marissa Lozser	Dr. Sonja Trent-Brown, Psychology	Perceptual Differentiation of African American and European American Children Based on Gender and Ethnicity of Listeners



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86 Regan Jekkals, Katherine Supanich, Lara Iaderosa, Julie Isola, Carly Sommavilla	Dr. Stephen C. Scogin, Biology and Education	A Middle School English Language Arts Teacher's Transition to Integrated, Project Based Learning
87 Michael Wurster	Dr. Jane Finn Education	Improved Reading Scores: Does Gender Matter?
89 Kara Lurvey, Trechaun Gonzalez, Emily Forster, Amanda Gibson	Dr. Sonja Trent-Brown, Psychology	Implications of a Nature-Based Science Enrichment Program for Biosocial and Psychosocial Developmental Outcomes
90 Kara Lurvey, Trechaun Gonzalez, Emily Forster, Amanda Gibson	Dr. Sonja Trent-Brown, Psychology	Implications of a Nature-Based Science Enrichment Program for Early Literacy and Cognitive Development Outcomes
127 Miriam Roth	Dr. Deborah Van Duinen, Education	Document-Based Learning: Outside Advanced Placement and Inside Student Minds
130 Claire Kenyon	Dr. Jane Finn Education	Insight on Behavior Management Competencies from the Field of Special Education

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.

26 Trevor Hile, Mariah Dingman, Emily Zolman, Amanda Sanders, Charles Jordan, Clara Mitchinson	Dr. Paul Pearson, Mathematics Jill VanderStoep, Mathematics Day1 Research Program	Bacterial Counts in the Muskegon Area Watershed
27 Charles Jordan, Amanda Sanders, Clara Mitchinson, Emily Zolman, Trevor Hile, Mariah Dingman	Dr. Paul Pearson, Mathematics Jill VanderStoep, Mathematics Day1 Research Program	Growth of Pitcher's Thistle on the Flower Creek Dunes



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29 Alli VanderStoep, Taylor Rink	Dr. Paul Pearson, Mathematics Jill VanderStoep, Mathematics Day1 Research Program	One Bird, Two Bird? Red Bird, Blue Bird? Analyzing Bird Songs Using Wavelet Transforms, Image Processing, and Neural Networks
46 Dane Peterson	Dr. Edward Hansen, Geological and Environmental Sciences Dr. Brian Bodenbender, Geological and Environmental Sciences	Footprints in the Sand: Determining the Pattern of Human Traffic in a Coastal Dune Complex
125 John Harron, Leah Krudy, Ross Nickels, Jonas Peterson, Benjamin Turner, Ismael Byers, Collin Thomas	Dr. Aaron Best, Biology Dr. Jon Peterson, Geology Dr. Mike Pikaart, Chemistry Dr. Graham Peaslee, Chemistry Sarah Brokus, Day 1 Research Program Chelsea Payne, Day1 Research Program Randy Wade, Day 1 Research Program	Global Survey of Water Quality using Point-of-Use Water Filters
134 Megan Grimes, Jacob Peecher, Skylar Sundquist, Cassie Harders, Shannon Smith	Dr. Aaron Best, Biology, Dr. Joseph Stukey, Biology	Genomic Analyses of the Novel Mycobacteriophage Opia
137 Anne O'Donnell	Dr. Courtney Peckens, Engineering	Bio-Inspired Control of Civil Infrastructure
146 Katie Pniewski, Amber Bosch, Monica Elliott, Derek Richardson, Andy Teahan, Joshua Briggs	Dr. Kathy Winnett-Murray, Biology Dr. K. Greg Murray, Biology	Wildlife Use Patterns in A Constructed Wetland



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147 Ford Fishman, Abbygaye Parshall, Nestor Barrera, Prescott Binder, Max Huffman, Abigail Jeavons, Andrew Klein, William Kleinheksel, Mallory Luke, Elizabeth Morehead, Clay Sanders, Adam Slater, Cleveland Tarp, Benjamin Turner	Dr. Aaron Best, Biology Dr. Mike Pikaart, Chemistry Sarah Brokus Day1 Research Program Chelsea Payne Day1 Research Program Randy Wade; Day1 Research Program	Seasonal Variation in Microbial Populations in Lake Macatawa Watershed
148 Prescott Binder, Mallory Luke, Nestor Barrera, Ford Fishman, Max Huffman, Abigail Jeavons, Andrew Klein, William Kleinheksel, Elizabeth Morehead, Abbygaye Parshall, Clay Sanders, Adam Slater, Cleveland Tarp, Benjamin Turner	Dr. Aaron Best, Biology, Dr. Brent Krueger, Chemistry Dr. Mike Pikaart, Chemistry Sarah Brokus Day1 Research Program Chelsea Payne Day1 Research Program Randy Wade Day1 Research Program	Monitoring Nutrient Levels and Sediment in Lake Macatawa Watershed
176 Erin Brophy, Brooke Mattson, McKenzie Stock	Dr. Jonathan Peterson, Geological and Environmental Sciences	Groundwater under Hope College's Campus: Suspended Load Characterization
177 Kathleen Fast	Dr. Brian Bodenbender, Geological and Environmental Sciences	Does Biochar Improve Disturbed, Sandy Soils?



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178 Alexandria Watts,
Jennifer Fuller, Benjamin
Van Gorp, Dane Peterson

Suzanne
DeVries-Zimmerman,
Geological and
Environmental
Sciences
Dr. Edward Hansen,
Geological and
Environmental
Sciences

Examining the Relationship between Lake Michigan
Water Levels and the Ecohydrology of an
Interdunal Wetland/Slack in the Southeast Coast of
Lake Michigan

200 Eric Weeda

Susan Ipri Brown,
Engineering

Development of Inexpensive Air Quality Monitors
as a STEM Teaching Tool

227 Jake Birkhaug

Dr. Marty Jordan,
Political Science

Interest Groups Effects on CO2
Emissions/Environment

We believe the Christian faith calls us to care for all of God's creation and ensure preservation for generations to come. We realize 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.

Thank you to all of the students and faculty for their hard work this year!

Congratulations!

www.hope.edu/sustainability-institute