Potential Research Projects broken down in the 7 priority areas in the CSB Sustainability Master Plan:

Grounds

- GIS map of a CSB/SJU Sustainability Tour
- Tour the Full Circle greenhouse and create a mini "how to" on greenhouse building procedures and primary considerations that need to be made before building a greenhouse.
- Research how sustainable our lawn mowers, snow blowers, sweepers, etcetera on campus are, how many hours a week they are approximately used, etcetera.
- Research the impact of salt (for ice in the winter) and grass fertilizer has on watershed and runoff.
- Develop signage for sustainable landscaping projects.
- Investigate permeable pavements for CSB, how they would impact watershed, how they would look aesthetically, etc.
- Examine the Fibonacci sequence at CSB.
- Learn more about the bee population at CSB and its role in the flora and fauna.
- Collect data about the mosquitoes at CSB in comparison to nearby water, open area, square foot of pavement, and wooded areas.
- Follow Monarch butterflies through their life cycle at CSB and compare to surround area Monarch populations.
- Compare CSB soil quality by various buildings, near Lake Sarah, in wooded areas, and near paved areas.
- Compare weather patterns at CSB for the past decade. Consider tree cover, location, and elevation.
- Measure the trees at CSB to calculate the carbon sequestration of each.
- Research natural medicine and research native medicinal plants and if they can be found on the CSB campus.
- Evaluate the flooding and erosion of various locations on the CSB campus. Investigate which are most commonly flooded or most eroded and why.
- Learn about the invasive species on campus, how to stop them and how it pertains to the integrity of the eco-system.
- Collect data from Lake Sarah and Lake Sag about various pollutants found. Evaluate the rivers that flow into these lakes and potential non- point sources of population (agriculture, industry, etc).
- Examine examples of biomimicry on campus and how these can be applied to technology and lifestyles.
- Collect data about the different bacteria present at CSB/SJU. Consider how this bacterium relates to plant growth, nutrient levels, and erosion.
- Analyze the CSB compost project, how to improve it and what areas of campus would benefit most from using the composted material the most.
- Address the issue of dead grass around the sidewalks each spring- how can this be avoided and is there better solutions than replanting each year.

- Work with Common Grounds Garden to research the effectiveness of community supported gardens.

Food Dining

- Research on Gorecki's Apex System (dishwasher) and changes in open hours in order to estimate energy savings, soap savings and other resource savings, if any.
- Survey students about the perceived importance of eating at a place that is incorporating sustainable practices. Produce an article on this and inform dining services on campus.
- Research food scarcity and food deserts in Stearns County or the St. Cloud area.
- Investigate persistent pests of corn and how that would impact our food at CSB.
- Evaluate the local foods at the Farmer's Market, the Co-op, and Gorecki for nutritional quality. Also look at the energy expended in transportation of the foods.
- Calculate the size of a compost bin to fit all of CSB's food waste, MN's food waste, and the U.S. food waste. How much methane would this omit? Where would the compost go?
- Investigate the newest farm bill. How does this change the food CSB purchase? How does it impact Stearns County Farmers?
- Devise a plan to start a fish farm on campus. How would this change the CO_2 emissions of CSB? How would this restructure our food system?
- Create a plan to start a student run grass-fed cow or organic pig farm on campus. How many people would this employ? Would it be a profitable investment? How would the St. Joseph community respond?
- Evaluate the legumes grown in the Stearns County area. How does this change the make-up of the soil? How long is it sustainable to grow legumes? How much nitrogen is needed to grow successful legumes?
- Analyze the feasibility of using human manure as a fertilizer in MN or in the CSB surrounding area. What steps would it take to certify it as safe? What impact would it have on food quality and quantity?
- Devise a hydroponic farm system for CSB. Where would it be located? How much would it cost? What is the technology involved? How much could it produce?
- Survey Stearns County to see the age distribution of the farmers. Evaluate how this could impact the sustainability of food in the future.
- Investigate antibiotic use in the various foods served by Dining Services. Evaluate their impact on students and the animals involved.
- Research GMO's served by Dining Services. How do these impact farmers? How do they impact students? What makes them different from organic foods?
- Compare the food deserts in St. Cloud to obesity rates in the same areas. Is there correlation? Has a causation been proved in the other areas?
- Research the demand for local or organic food options in all dining options on campus and find viable options to meet students' needs.
- Create a guide for eating sustainably at CSB including where/what to eat on campus, where to buy local food and what options are best. Incorporate options for the co-op or farmer's market.

- Identify how sustainable eating and nutrition work together. What relationships do the two have and what issues arise in trying to eat nutritionally while also being sustainable in Minnesota?
- Compare the coffee available on both campuses to develop a guide of the best options regarding sustainably produced and fair trade. Make suggestions for all campus coffee providers to encourage the best options campus-wide.
- Define "local" as it applies to food in the St. Joseph area. How can students or CSB identify what options are truly local and what goes into making these decisions.
- Research the problem of food scarcity as it applies to MN, the US and globally.

Responsible Consumption

- Compare and contrast and develop a seminar on co-operative versus farmer's market versus grocery store (Ex: St. Joe Farmer's Market, St. Joe Co-Op, and Grocery Store)
- Examine the entire process of one product, such as a pencil, evaluating where it comes from, how much energy is used, and then the cost in comparison to the work in producing it.
- Follow a recycled product and a non-recycled product to see where they each end up and how each impacts transportation, land use, and employment.
- Compare compostable disposables, recycled disposables, and non-disposables and their impact financially and environmentally.
- Analyze the role body energy could have on energy used in college students.
- Learn about the role of "green" investments and how these can change supply and demand.
- Evaluate different sources for clothing and fashion goods. Compare cotton, hemp, and synthetics.
- Investigate eco-tourism and its impact on the surrounding community, economy, and sustainability.
- Analyze the lifecycle of CFL's in comparison to LED's and fluorescents.
- Learn about battery life and the potential of technological advancement. Consider materials, cost, and capacity.
- Identify the impact of the Pacific Garbage patch in the ocean and how consumption is related. Examine the culprits and solutions to this dilemma.
- Identify the effectiveness of second-hand clothing stores for college students based on price and available options. Are they meeting consumer demand or is there a better way to encourage reuse of clothing.
- Investigate consumption patterns of students in college compared to recent grads to identify whether college creates an environment of more or less consumption of non-essentials (clothing, electronics, and disposable items).
- Develop a guide for buying responsibly in the St. Cloud area by identifying what stores or brands have items for purchase that are considered responsible or sustainable.
- Research the use of plastic bags on campus and identify locations that use them. Create a plan to incentivize students to use reusable bags to ultimately eliminate plastic bags on campus. Apply the same idea to disposable containers for food (Good to Go, McGlynn's).

- Analyze the development of St. Joseph over the past few decades related to sustainable development and identify which areas were done well/poorly and offer suggestions for the future.
- Research various environmental issues as they relate to gender or racial inequalities (eco-feminism, environmental racism, etc)
- Paper versus plastic
- Quantifying the savings of unplugging appliances and chargers- does it really safe and if so, how much.

Sustainable Education

- Sustainable forestry in the Arboretum. How does this halt deforestation? How does this decrease erosion? How does this enhance soil quality and biodiversity?
- Climate change in MN and is impact on the natural system (i.e. maple syrup production, an earlier spring, more mosquitoes, movement of biomes, etc).
- Investigate the RED list of endangered animals. How does this apply to Stearns County, MN, and the U.S.
- Examine the role of recycling on pollution and landfills. Compare this to upcycling or reusing of products.
- Develop materials for local community members about the sustainable practices of CSB/SJU and identify the sustainable practices of St. Joseph. Make connections of how each can learn from one another.
- Identify what is lacking in education of most public schools regarding basic knowledge of sustainability. Develop materials that would be helpful for educating young students about what sustainability is and why it is important.
- Create a forum for community members to discuss sustainability issues relevant and important to their community in St. Joseph (examples: local food, adequate recycling system, etc).
- Conduct a STARS audit to update the data for CSB.
- Relate a sustainability focused topic to another area of study- theological perspectives of environmental protection, business approaches to dealing with climate change, biological analysis of habitat destruction, communication of environmental topics with the general public.

Sustainable Facilities (buildings and energy)

- Conduct an energy audit of a campus building and/or housing and recommend actions.
- Investigate alternatives to standard air conditioning in buildings with air conditioning.
- Compare and contrast two different types of greenhouses in the St. Joseph area.
- Investigate the energy that could be generated from wind, the costs, how much per year, how to implement it through Stearns County.
- Compare the costs and benefits of natural gas (our current main energy source) including the process of fracturing, to nuclear or solar power.
- Analyze the role of geothermal in central MN and how it could impact the reliance CSB has on nonrenewable energy.

- Calculate the total loss of energy as it is converted in each stage from various energy sources (coal, petroleum, nuclear, solar, etc).
- Create a blueprint for a passive house at CSB. Calculate the costs involved and the future benefits.
- Devise technology to harness the power of algae and other bacterium in Lake Sag or Lake Sarah.
- Analyze the potential for mining at CSB/SJU. What materials could be mined? How many jobs would be created? Would it be beneficial for the surrounding community?
- Research the effectiveness of lighting on campus and suggest changes to be more efficient.
- Identify other campuses' LEED projects and make suggestions for possible future additions to CSB that fit our needs.
- Identifying the benefits and barriers to biodiesel and how they are made.
- Research other sustainable building options and identify best options for CSB in future building projects.
- Conduct a greenhouse gas inventory for campus. Suggest ways to improve this inventory for the future.

Partnership and Outreach

- Shadow/tour local greenhouses and plant production strategies.
- Research sustainability in athletic departments across the state/Midwest.
- Research energy efficiency investments on campus and how they compare with endowment returns.
- Research solar energy opportunities on campus.
- Develop a waste reduction event on campus.
- Evaluate the unemployment in St. Joseph and determine how sustainable development and sustainable careers could impact the community.
- Develop a recycling promotional event on campus.
- Research local businesses (Co-Op, the Local Blend, ect) who exhibit sustainable practices and recommend ways to utilize those practices at CSB.
- Attend the Mill Stream Arts Festival and work with coordinators to make the event more sustainable (recycling, reusable materials).
- Research the Farmer's Market in St Joseph. Recommend ways to get more students aware/involved with the process.

Transportation

- Hybrid cars vs. electric cars- Compare hybrid vs. electric cars including the science behind it, the potential for success and any challenges/barriers. What obstacles face electric cars (source of electricity)?
- WeCar; how used is this new option at CSB/SJU?
- Predominance of Carpooling and/or how many cars per person are there at CSB/SJU? (How many students have cars, how often do they drive, how often do other students share rides, etcetera?)
- Compare the costs and benefits of petroleum to biofuel or electric energy for the Link.
- Investigate the role of bike sharing between campuses.

- Redesign the city of St. Joseph to be more walkable and bike friendly.
- Evaluate the costs and benefits of CSB/SJU students flying home for breaks and a potential alternative energy for airplanes.
- Devise a public transportation system for St. Joseph or St. Cloud. How would this impact the purchases we make? How much would it cost?
- Research ways to encourage students to use their personal vehicles less and suggest ways to make that happen at CSB.