

goals for this project include designing filters to minimize error in these images and formatting them into a cling-sticker to be placed over a smartphone camera.

Success here means accurate, quick, and dependable measurements of color, allowing for smartphones to be used in colorimetry.

Research advisor Thomas Beechem writes: “Combining optics and compressed sensing, our undergraduate team is working to place a spectrometer in the hands of a majority of the world’s population. With ubiquitous spectroscopy, tracking dangers like pathogens and pollution takes the lab to the sample instead of the sample to the lab.”

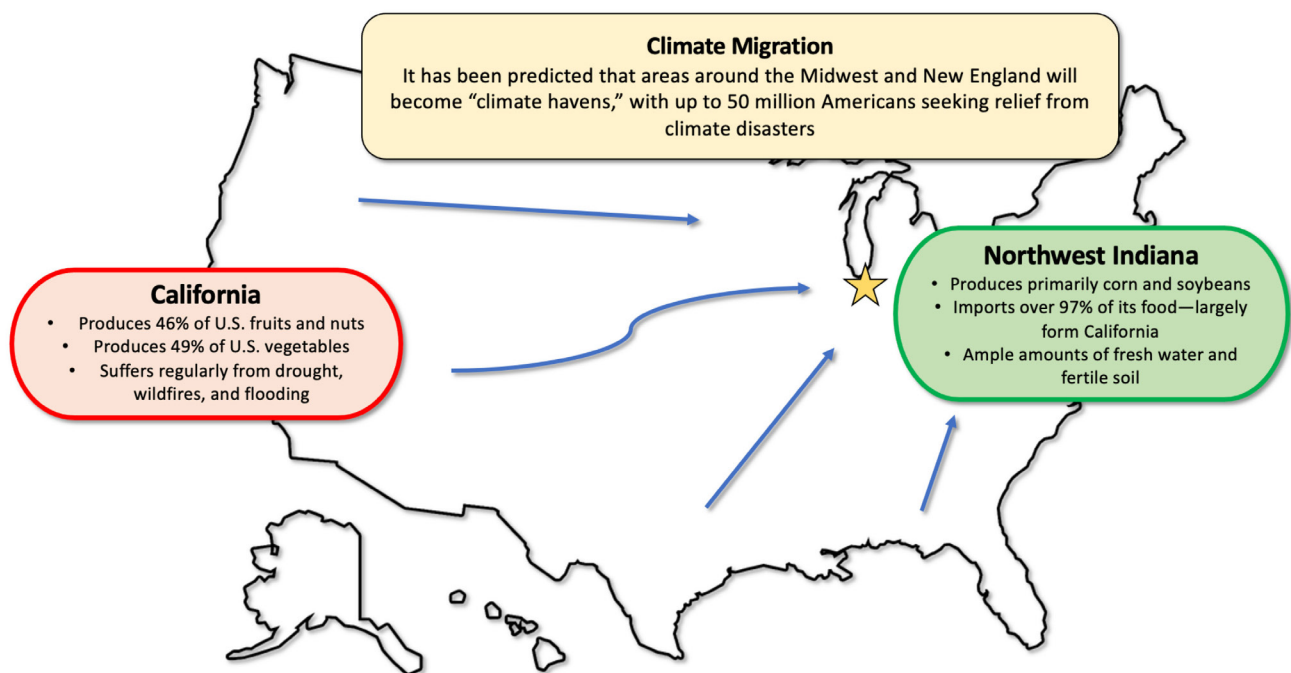
Is Northwest Indiana Prepared to Be a “Climate Haven”?

Student researcher: Luke Carl Jorgensen, Senior

Climate change is forcing Northwest Indiana (NWI), along with the rest of the world, to urgently adapt. Sociological issues of environmental justice, food insecurity, and human migration are accelerating alongside rising temperatures. This research project

brings together global, national, and local resources to show the need for interdisciplinary action. If up to 50 million people will eventually seek new homes in the Upper Midwest and New England (a figure that ignores the mass migration expected from the global South)—we must begin preparing. Luckily, there is plenty of available housing in NWI; 2021 housing vacancy rates in Gary, Indiana, were over 50% in some areas, and with economic investment these neighborhoods can be inviting to the new migrants. The region’s economy has been ravaged by political corruption and questionable policy making for nearly a century, however, leaving one to ask: Where can we find the money for this type of honest investment?

My research shows that NWI spends over \$2 billion annually on food imported to the region—money that could go into the region’s developing local food supply. Indiana is full of corn and soy fields, while nearly half our nation’s fruits and vegetables come from California; thus, NWI, and the nation, rely on an agricultural state that is suffering constant climate disasters. Investing in the local food system would be a step toward preparing NWI for a sustainable future, helping provide relief for the struggling West, creating economic stimulus for local



Northwest Indiana can be an inviting place for climate migrants, but we must begin investing in local food systems and stable housing now.

reinvestment, and helping alleviate food insecurity in the region.

Research advisor Kim Scipes writes: “When many political, economic, and social leaders refuse to confront climate change and its implications, Luke Carl Jorgensen asks some hard questions: If Northwest Indiana is considered to be a ‘climate haven’ for potential environmental refugees, are we prepared for this? What can we do to handle this without being overwhelmed?”

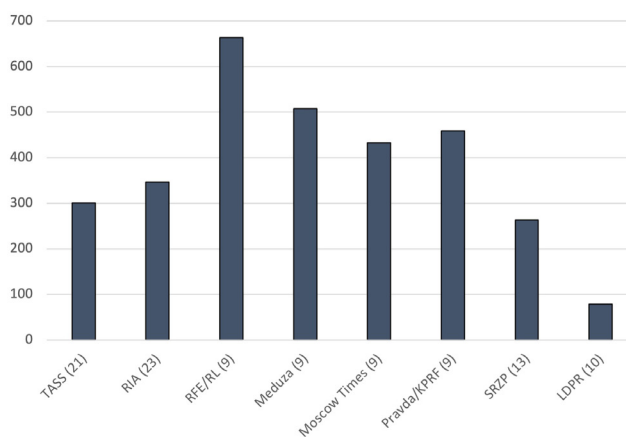
Changes in Russian Media Language in Turbulent Times

Student researcher: Evan Landau, Sophomore

Since the recent resumption of war between Russia and Ukraine, Russian propaganda has used a variety of tactics to shape the domestic and international narrative around the war. By comparing language used in Russian state, independent, and controlled-opposition media, the research team was able to identify patterns in word choice, style, and strategy between different types of media. Each news outlet has a distinct, consistent style in its news and word choice.

For this research, the team compared the language in news articles released by Russian and Russian-language media outlets on certain days. Research focused on the major state news outlets, party news outlets, and independent media. Data collected includes quotations from articles, annotations, and notes for qualitative comparison between the eight news outlets studied.

The team noted clear patterns of similarities and differences between different kinds of sources. State news sources had a consistent vocabulary set. This included entirely new words and symbols, such as “Z” (symbolizing the war) or “Вagnerовец/Wagnerite” (members of the Wagner PMC), words used more prominently like “Дерусификация/Derussification” or “Спецоперация/Special Operation” (used to refer to the war), or words with newly political connotations like “Полуколония/Half-Colony” (used to refer to Ukraine). The team believes that these words are intended to create a consistent narrative and means for the public to identify with the Russian government’s perspective.



Average length of articles from each source studied. The numbers in parentheses are the numbers of articles considered from each source.

The research team plans to expand on this research by comparing past and present propaganda techniques and by examining the factuality of news items to better understand disinformation techniques.

Research advisor Olga Lyanda-Geller writes: “During challenging times, language immediately reacts to and reflects social, political, and cultural changes. This project tracks transformations in the modern Russian lexicon occurring while Russia is waging an unjust war. Critically reading and analyzing modern media materials, Evan and the team identified and collected linguistic data characterizing language changes.”

Design and Development of an Inert Controlled Environmental Chamber for Evaluation of Contaminant Mass Transfer

Student researchers: Brian Magnuson, Senior, and Zachary Limaye, Senior

The Inert Controlled Environmental Chamber (ICEC) is a stainless-steel chamber that houses experimental equipment and state-of-the-art contaminant sensing technologies. It is outfitted with a ventilation system to maintain the interior atmosphere during experiments for controlled analysis of contaminant mass transfer, including the emissions and transformations of volatile organic compounds (VOCs) and particles. To avoid introduction of unwanted contaminants within the interior