

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?”*

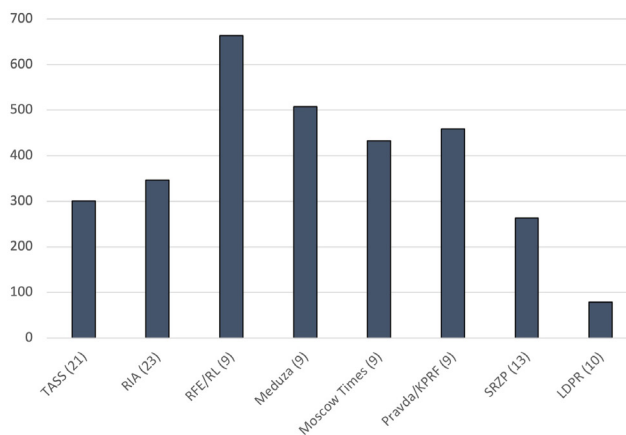
## Changes in Russian Media Language in Turbulent Times

**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 “Вагнеровец/Wagnerite” (members of the Wagner PMC), words used more prominently like “Дерусификация/De-russification” 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.”*

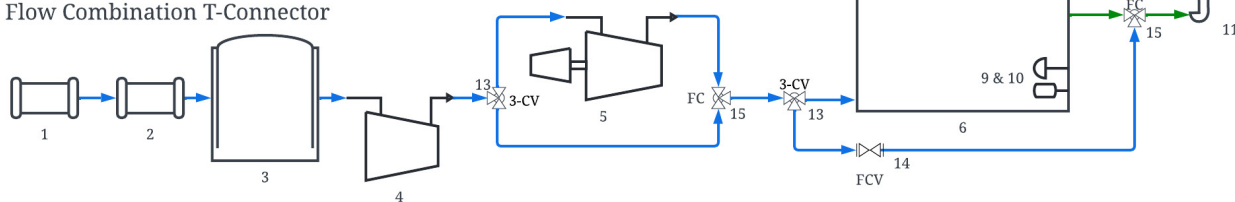
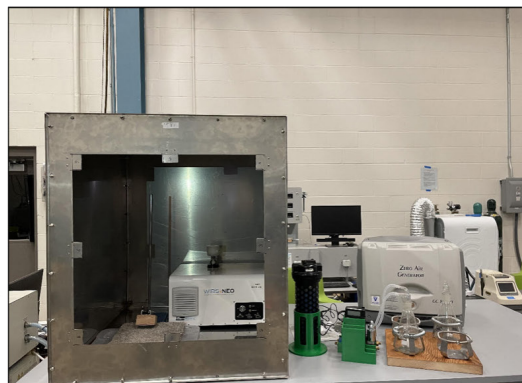
## Design and Development of an Inert Controlled Environmental Chamber for Evaluation of Contaminant Mass Transfer

**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

Teflon Connection  
Stainless Steel Connection

1. HEPA Capsule Filter
2. Carbon Capsule Filter
3. Zero Air Generator
4. Mass Flow Controller
5. Bubbler System
6. Environmental Chamber
7. Pump
8. Exhaust
9. Relative Humidity Probe
10. Dry Bulb Temperature Probe
11. Olfaction Port
12. PTR-MS
13. 3 Way Split Valve
14. 1 Way Flow Control Valve
15. Flow Combination T-Connector



The constructed stainless-steel chamber and the components of the ventilation system are shown in the center above the ventilation system schematic. The ventilation system schematic illustrates the filtration, humidification, and data collection segments and the flow path throughout the chamber. The Wideband Integrated Bioaerosol Sensor (WIBS), which measures concentrations and size distributions of airborne fluorescent aerosol particles, is shown within the physical chamber.

environment, inert materials were exclusively selected to construct the chamber, specifically 316 and 18-8 stainless steel and polytetrafluorethylene (PTFE). Additionally, to preserve the interior environment and minimize the effective leakage area of the chamber, the stainless-steel body was tungsten inert gas (TIG) welded to create continuous seals along the chamber's edges, and PTFE gaskets were used as a seal between the body and the removable panels. The ICEC influent air is provided by a zero-air generator that removes gas- and particle-phase pollutants. A bubbler system is utilized to humidify the air to appropriate indoor conditions for experimentation. A network of mass flow controllers ensures the ICEC remains at a constant air exchange rate. This controlled environment allows for isolation of emission and resuspension experiments, including identifying VOCs emitted from volatile chemical products and measuring resuspended particle concentrations by disturbing settled dust samples. These and other potential experiments require a controlled atmosphere to isolate the pollutants from the event of interest, which cannot be guaranteed in an open-air environment, and to purge the chamber of residual contaminants from previous experiments.

Research advisor Nusrat Jung writes: "This highly sophisticated chamber provides us with the possibility of controlling indoor atmospheric conditions very precisely, thereby enabling us to conduct high-quality research on contaminant mass transport in buildings. The chamber is an exciting addition to our laboratory that will provide new experiential learning opportunities for students in the years to come."

## Tree Localization in a Plantation Using Ultra Wideband Signals

**Student researcher:** Akshat Verma, Junior

Forest inventory is a task that requires many manual measurements. As a result, it is slow, labor-intensive, and prone to human errors. Our research team uses video images to collect data from standing timber for subsequent analysis. The purpose of our research is to expand upon our previously developed semi-automatic system for measuring trees. The goal of that research is to develop a fast and accurate method of estimating timber volume and calculating lumber value of logs. One