Research in United States has indicated that there are large disparities in the production of, and exposure to, industrial air pollution: A small fraction of industrial emitters called “super-emitters” contributes to the majority of industrial emissions of hazardous chemicals while disproportionately impacting vulnerable communities. In Canada, there is a lack of research on whether vulnerable communities are affected by the air pollution environmental toxins, and if so, what the underlying causes are. This research hopes to clarify these questions using geospatial and statistical analyses on the National Pollutant Release Inventory, focusing on specific emissions from Canada’s 13 petroleum refineries and identifying their potential super-emitters. Graphs for the absolute emissions and the ratio emissions (absolute pollutant emission for year/ total crude oil production) were created to determine the outliers. One of the main research question was “Do the ratio outliers emit the majority of emissions for that pollutant, therefore making this refinery a super-emitter?”

2014 preliminary findings show that Co-op Refinery Complex in Saskatchewan is an outlier in the emissions ratio distribution for VOCs and Hydrogen Sulphide, releasing a total of 34.7% and 36.6% respectively for that pollutant from Canada’s petroleum industry. This makes Co-op a candidate for being a potential super emitter. The next steps are to compare the refineries regulations and hypothesize a reason for the existence of these super-emitters. This research may offer actionable insight for re-designs of regulations in petroleum refineries and strategies to mitigate these emissions, and continue on the research for environmental injustice.

Themes:
Check (highlight) the most applicable theme according to the abstract.

- Innovation and Technology
- Health and Wellness
- Culture and Society
- Sustainability and Conservation

Comments:
Very current and interesting topic chosen. Abstract contains a lot of great content. However, some reordering suggested. The conclusion needs to explain why the issue was set up as an exploration into environmental injustice – did you (or will you) later look at demographics of who receives greater and lesser exposure to the super-emissions from the Co-Op Refinery Complex?

Commented [SN1]: Who are the vulnerable communities? Socio-economic status or some other demographic?

Commented [SN2]: Who are the vulnerable communities? But perhaps rewording: In Canada, there is a lack of research investigating whether similar disparities exist for our vulnerable groups (who?) – whether these groups experience disproportionate exposure to air pollutants, and why these disparities exist.

Commented [SN3]: Need more specificity, for example: This research aimed to identify which of Canada’s 13 petroleum refineries offer disproportionate emissions of air pollutants and super-emissions. Using geospatial and statistical analyses on the National Pollutant Release Inventory (which allows us to measure pollutant emission for year/ total crude oil production) we identified refineries which showed a disproportionate level of pollutant emissions, especially ‘super-emissions’.

Commented [SN4]: Reorder and avoid acronym: Preliminary findings from analyzing the latest data available (Year of 2014), showed the Co-op Refinery Complex in Saskatchewan is an outlier in the emissions ratio distribution for VOCs and Hydrogen Sulphide. They released 34.7% VOC and 36.6% Hydrogen Sulphide of Canada’s total petroleum industry (between 13 sites).

Commented [SN5]: Need to loop back to the ‘hook’ you set up in the beginning: The next step is to gather data on the area where this super-emitter exists, including understanding the differences between groups who receive greater or lesser exposure to these pollutants. Choose one or you must separate the applications of these findings. This research may offer actionable insight for re-design of regulations in petroleum refineries and strategies to mitigate these emissions. How? And continue on the research for environmental injustice. How? Did you explore human impact (and human demographics) in your research?