Godwin et al. (2020) Paper Summary

Lauren Gill, Hazel de Haas, Lyubava Erko and Carys Hughes

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Pre-discussion Preparation

Key terms

Self-reported data Recruitment Parasiticide Louse/delousing Audit Dip net and seine net Epizootics

General questions

1. What are some consequences of fish farming and why do we need audits?

2. What were the two studied species of lice? What is the difference in ecological implications between those two species?

3. Why does self-reporting exist in the first place among industries? What are some pros and cons to self-reporting?

4. What is problematic about the location of Atlantic salmon pens?

5. What are the implications of this paper when it comes to implementation of environmental policy?

6. Does this paper change the way you see environmental policy?

Figures

Figure 1 + Future applications

1. Notice how most salmon farms on the map are in clusters. What do you think the repercussions of this are? Is this positive or negative?

2. The authors suggest that the self-reported values of sea lice might need to be adjusted so that the number of reported sea lice would increase proportionately with the authors' findings .

    a) How does this affect the facilities which were following proper sea lice counting protocols and reported the right amount of sea lice?

    b) Do you think this would over-increase the overall amount of delousing treatments in the facilities that were not under-reporting sea lice?

    c) Do you think that those treatments (over-treating) could be harmful to the environment?

3. What incentives already exist to incite accurate self-reporting in animal farming in general? From what you have read in this paper, does it seem that these incentives exist in salmon farming? If not, what do you think is preventing those incentives from being put in place?

4. Do you believe it would be easier to implement stricter self-reporting protocols and enforce them or move the salmon farms away from the ocean, back on land?

Figure 2

1. Define the figure elements x-axes y-axes Dotted black lines Dash grey line

2. What is this figure trying to convey?

3. What were the specific results from the paper relating to this figure?

4. What are the environmental implications of underestimating lice counts?

5. Should the implementation of environmental policy rely on self-reporting? "requires salmon farms to either harvest or conduct a delousing treatment when louse abundance exceeds three motile lice per fish"? If self-reporting introduces biases, what are some solutions?

6. Are salmon farms doing more harm than good?

Figure 3

1. What relationship is this figure looking at? What conclusions can be drawn from it?
2. What do the dotted vertical lines represent in this figure? Why was this an important feature to include? Should there be more audits required during this time period?
3. What does the horizontal line represent in the graph to the right? Why is this only shown for L. salmonis? How accurate are the results for C. clemency if the current counting protocol doesn't account for mobile lice?
4. If data from individual sampling events or individual fish was available to the public, do you think there would be any difference in their findings?
5. Of the suggested ways to remove bias, which method do you think is most feasible and why?

Figure 4

1. What do the dotted vertical lines represent?
2. Why do you think the author of the paper chose to compare reduction in sea lice for 'unaudited' and 'prior treatment'? 3. Do you think this is an effective comparison?
3. Why do you think farmers would be motivated to underreport their sea lice counts, and what are some ways that we could incentivize/ensure accurate reporting
4. Knowing that these reduced values are being used in management decisions and as values in other population models - what effects do you think this could have?

Broad Questions

There were five main questions posed by the instructors: (1) What was your overall impression of the paper? (2) What role do the scientistswriting the paper play in tackling these environmental issues? What role should this paper inhabit? (3) Is science political? (4) How do the worlds of science and industry work right now (do they work at all?) (4) How could this relationship be more effective in the future? (5) Is this paper more objective because no authors were funded by the salmon industry?

Changing Viewpoints

The questions "What role do the scientists writing the paper play in tackling these environmental issues? What role should this paper inhabit? and"Is science political" generated the most discussion. While the class agreed that this paper is objective, we were unaware of the strong backlash that the findings of this paper lead to. It changed the way many people thought about conservation science as a whole - how it is inherently political as its goal is to inform policy making. And along that same train of thought, it is important to take into consideration the implications of the findings of this paper. People whose livelihoods depend on industry (i.e. salmon farmers) are suddenly at risk of losing their jobs because scientists are saying they are biased in the ways they implement environmental policy. Thus, while a paper might seem objective to us and even progressive in the way that it provides suggestions in improving industry self-reported - we have to take into consideration who this paper impacts and what those impacts might be.

Connections

Relating to the first question posed, the class' overall impressions of the paper were good and people thought that the figures and conclusions were well elaborated, easy to understand and accessible to a general audience. There was also an agreement that the methods were difficult to understand. This is important due to the backlash that the paper received considering that the salmon industry criticized the finding by claiming that the authors did a poor job at analyzing the DFO's data. Since most people would have trouble understanding the data analysis of the paper, this could have repercussions on the backlash to this paper and public opinion. The questions concerning the political side of the paper and of science relate to the article's discussion section where the authors could have pointed the finger to the salmon farming industry, but chose not to. They instead presented the results without making assumptions as to why sea lice numbers were underestimated and presented solutions in the discussion for remediating this problem.

Epistomology

This discussion was very eye-opening. At first, (and still now) the methods were difficult to understand, because of the unfamiliar vocabulary and complex model. Although in many papers the methods are important to understanding the premise of the paper, in this case we were still able to gauge what the author was trying to convey. This discussion also made us reflect on our bias in our DS projects, including our desire to get 'good' results, our choice of projects (ie choosing an animal based on how charismatic/uncharismatic it is) and other variables that may have introduced bias in our seemingly objective study designs.

Our approach to interpreting scientific literature has changed by learning to also consider not just what the paper says, but also the whole topic surrounding the paper. In this discussion we considered the position of the audience, the author, of possible stakeholders (like DFO) and rebuttal papers. This gave us a much more comprehensive understanding of the issue, than if we had just solely read the paper. ave us a much more comprehensive understanding of the issue, than if we had just solely read the paper.

How Science Happens

This paper does contribute to overall understanding on how science happens and how it is distributed widely. After the instructor-led discussion, we had a better comprehension that industry, government, and grant funding through universities are behind many studies. We discussed that because this paper wasn't funded by the salmon industry it was more objective. When asked if it had come out that the paper was in fact funded by the industry, some were unsure if the results would be reliable. Perceived quality of papers and how the papers are received by different parties depends on who published the paper. While the students had a positive reaction to the paper and how the issue was addressed, backlash was received from people within the salmon industry and a rebuttal article was made.