**Waterloo ExL Community of Practice**
Games and Simulations in the Classroom
Monday, October 29, 2018
DC Fishbowl

**Session host:** Dr. Michael Drescher, Associate Professor, School of Planning

Have you ever wondered why people jump queues, why automobilists stand together in a traffic jam, or why we are losing biodiversity at a rapid pace? Many societal and environmental problems can be understood using a common-pool resource lens. Playing a common-pool resource use game, we will experience phenomena like over-exploitation and free-riding, and explore whether cooperation or enforcement can help.

Common-Pool Resources

- Group of users that all have access to the resource
- It is difficult to control what people are doing with the resource (costly to exclude people form using or benefitting from its use)
- Unlike pure public goods (i.e. radio airwaves), common pool resources face problems of congestion or overuse, because they are subtractable.

How do resources get over-exploited? What is the psychology of over-exploitation?

**Common-Pool Resource Simulation**

- Play multiple rounds of the game – each player privately decides how many months they will spend in the forest – the more months in total all players are in the forest ("months in the commons"), the individual profit decreases (as per the Payoff Table).
- What should we consider in subsequent rounds? What are the external factors?
- Outcomes: earnings jumped from over 400 to less than 100
- **Government control variation:** everyone is only allowed one month in the forest. However, since common-pool resources are hard to police, there is only a chance of being monitored. After every player has submitted their months in the forest, there is a coin lip and if it lands on heads then one player is randomly selected to be "policed" and if they are in the forest for more than one month, they are penalized 100 points for every month <1 they were in the forest.
- **Outcomes:** less variation in earnings: 230-260 earnings in each round. Players stuck to optimizing their outcome regardless of the consequences
- **Lessons learned:** government control did not work. people will communicate, make agreements to optimize the outcomes. People are deterred by getting caught, and not the punishment. There was a low probability of getting caught in this instance
- **Using the simulation in the classroom:** the main challenge would be the time required. Another challenge would be that many students probably do not do the reading in preparation for the game but this is true for normal course work as well. Otherwise, I found this is a great exercise to illustrate to students some of the basic issues around management of open access resource systems.