

# Teaching “Technological Stewardship”

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Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat / Copernicus  
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Google Earth



## **Learning Outcomes for ENGI 8152 “Engineering Professionalism II”:**

- Identify the range of skills, or attributes, required to become a competent professional engineer.
- Apply the concepts of professional ethics, accountability and equity.
- Analyze the social and environmental aspects of engineering activities. (Where possible, students will use their Senior Design Projects as case studies).
- Demonstrate an understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.
- Work effectively as a team member and leader.
- Reflect on the relationship between technology and society.





# Become a Tech Steward!



## ENGI 8152 deliverables

Assessment	% of final grade
<b>Experience Mapping Assignment (individual submission)</b>	35%
<b>Team Project</b>	35%
<b>Participation:</b>	
• <b>Complete Technological Stewardship modules (16 of 19)</b>	20%
• <b>Team Project audience feedback</b>	10%



**What are the challenges and opportunities  
for your capstone design project  
to demonstrate the principles, commitments and  
behaviours of tech stewardship?**

## Team project: What to include

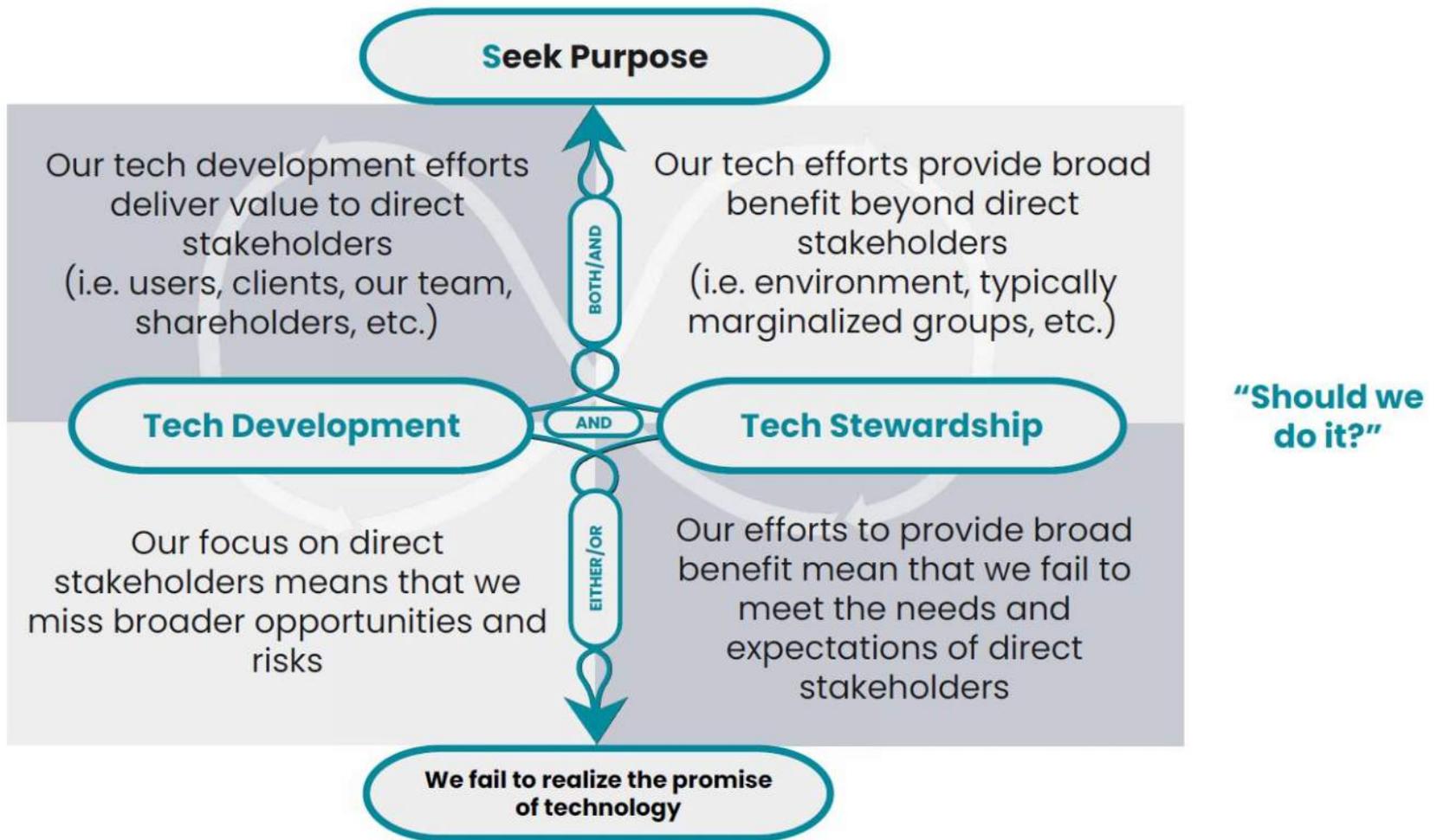
- Brief technical overview of your capstone project: what problem are you trying to solve?
  - What are your team's intentions with your design?
  - What are the intended effects of what you have designed?
  - What could be some unintended effects?
  - What values help your team to judge the effectiveness of your design?
- What tech “value tensions” or polarities exist in your design?

# Tech value tensions

Behaviors	Tech Development	+	Tech Stewardship
<b>Seek purpose</b>	direct tech dev. to maximize positive outcomes for direct stakeholders	<b>AND</b>	<b>direct technological development to maximize positive outcomes for all</b>
<b>Take responsibility</b>	anticipate and manage the direct and immediate impacts of tech	<b>AND</b>	<b>anticipate and manage the complex impacts across the full life cycle</b>
<b>Expand involvement</b>	leverage focused deep expertise in tech development	<b>AND</b>	<b>integrate a broad range of perspectives and expertise in tech development</b>
<b>Widen approaches</b>	take advantage of “tried and true” and tech heavy approaches	<b>AND</b>	<b>explore alternative ways to solve problems (including non tech based)</b>
<b>Advance understanding</b>	simplify people’s engagement with tech	<b>AND</b>	<b>foster dialogue about technology and tech stewardship</b>
<b>Realize diversity</b>	develop tech to work for a majority of use cases and to be easily scalable	<b>AND</b>	<b>ensure that technological development promotes equity</b>
<b>Deliberate values</b>	develop tech based on historical strengths and traditional values	<b>AND</b>	<b>consider differences in underlying values and leverage tensions</b>
<b>Seek regeneration</b>	proceed in a manner that enhances the capacity of direct stakeholders	<b>AND</b>	<b>enhance the health of the various systems with which you engage</b>

## Team project: What to include

- What 3 specific technological stewardship behaviours are most important to your capstone project?
- How could, should, or do they factor into your design?
- What questions do those TS behaviours raise about the effectiveness or implications of your design?



## Team project: What to include

- What challenges arise as you try to navigate those polarities in your design work (i.e. unintended effects, constraints set by the client, constraints of cost or access to resources, etc.)?
- What opportunities are there to demonstrate those TS behaviours?
- Did you change anything about your capstone design in light of TS? Should you have?



**HELLO, I'M**

A Tech Steward





TS ↔ Integrity





Engineering = a caring profession?







# The essence of Tech Stewardship practice...

Engaging critically with our values

