Leveraging community partnerships and intelligent technologies to address septic system water quality risks in the Flathead Basin, Montana

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Project Overview: In partnership with the Flathead Basin Commission, we sought to galvanize new scientific understanding and emerging collaborations to address water quality impairment from failing septic systems.

Community-Identified Problem:
Magnitude of the septic issue in Flathead Basin needs to be better understood, quantified and shared in order to mobilize local leadership and the public to act with urgency.
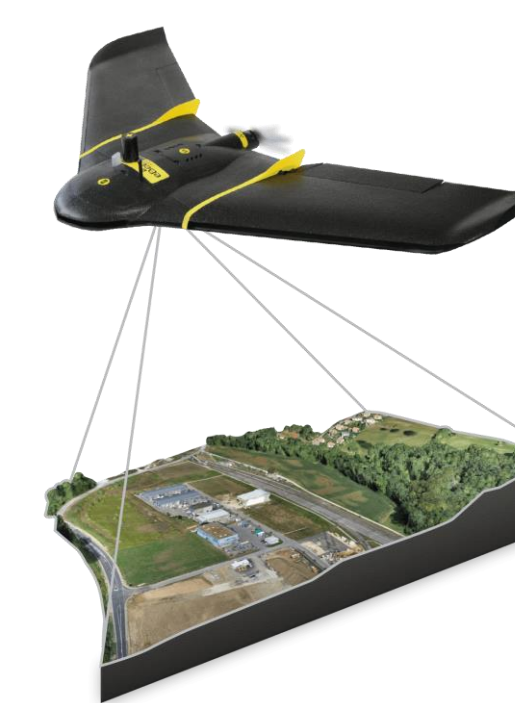

Flathead Watershed
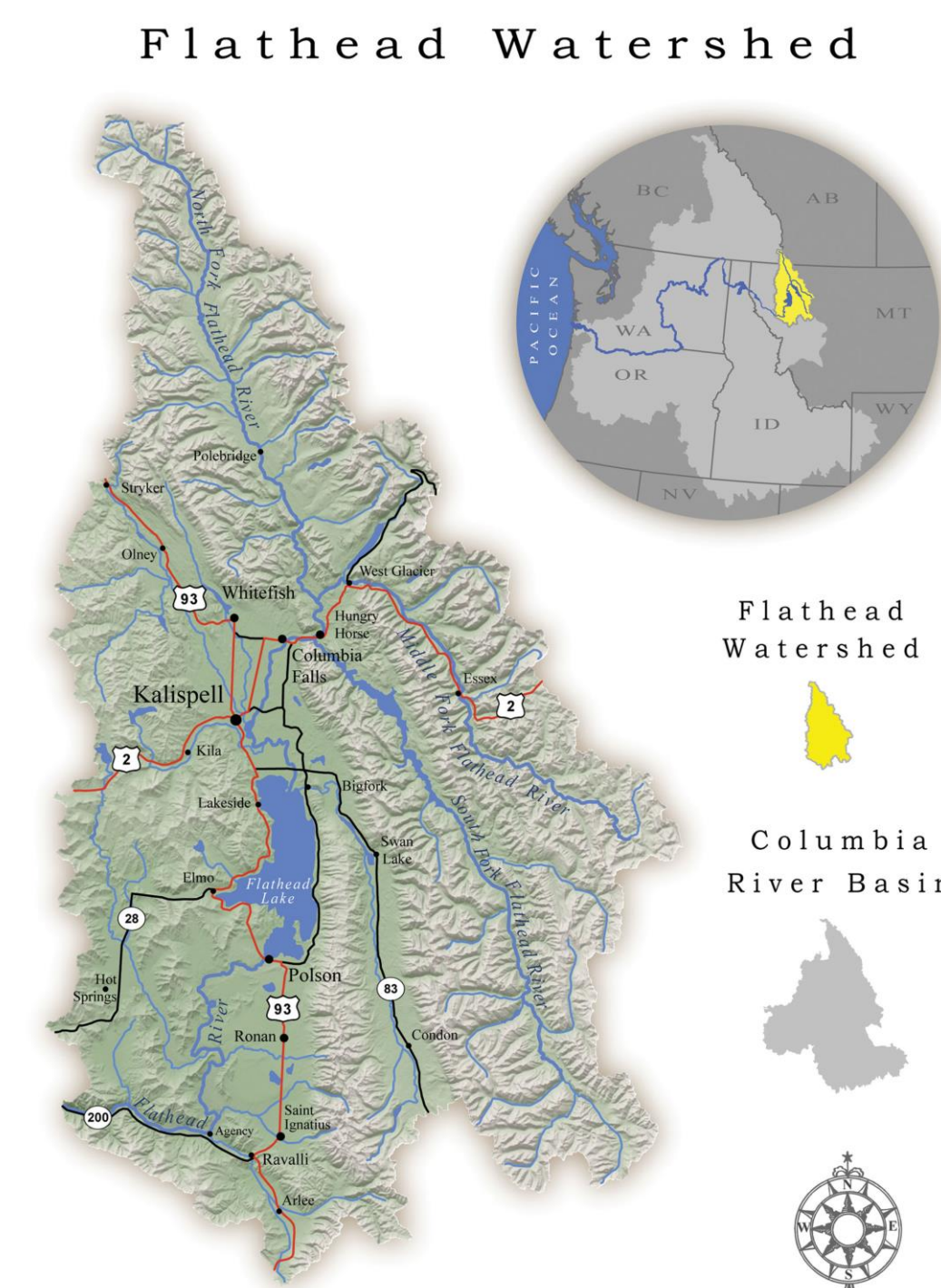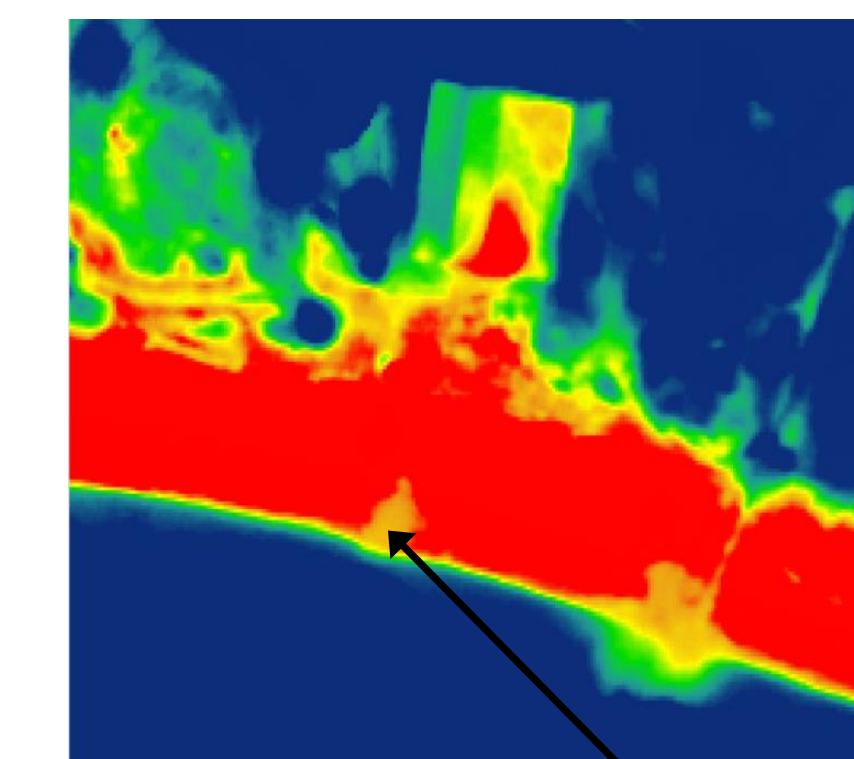
Intellectual Merit:
Socio-technical advancements include identifying needs for near-shore monitoring of water quality, groundwater flow mapping, and a publicly accessible database of septic permit data.

Activity 2: Piloted shoreline monitoring of groundwater seeps

Method 1: Remote sensing
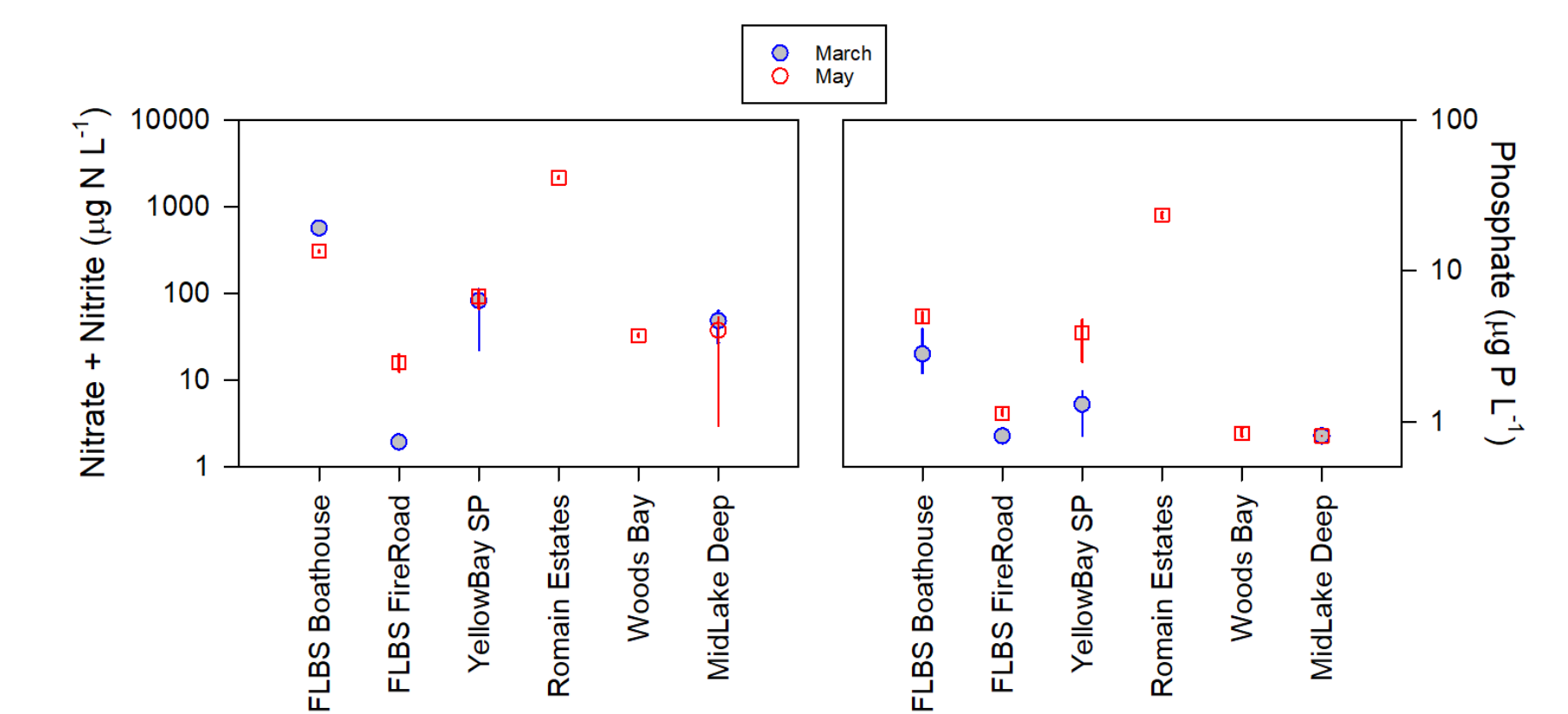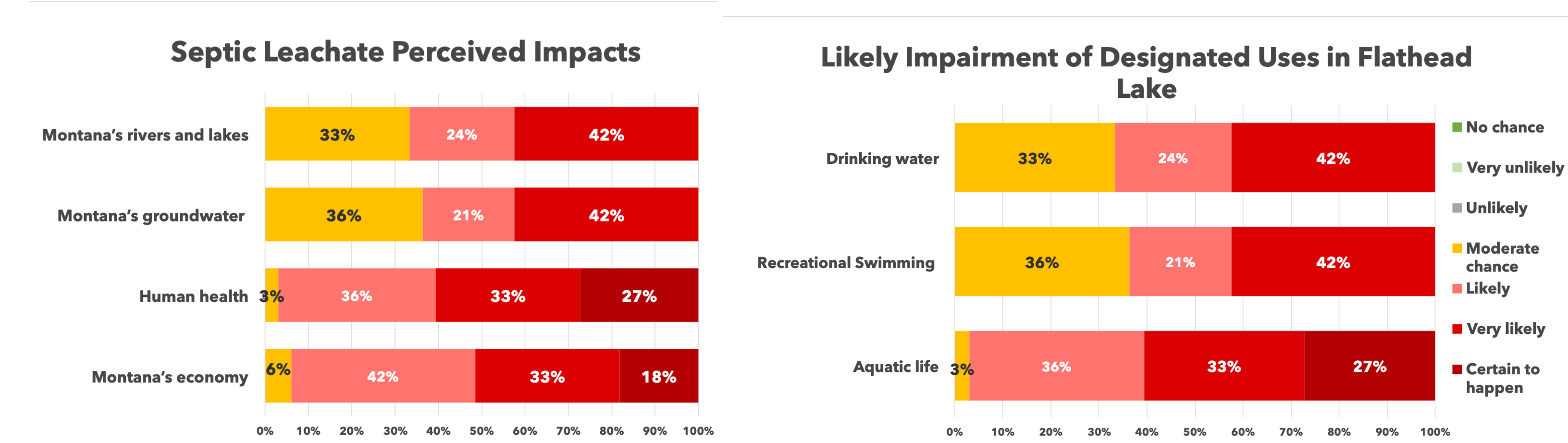

Thermal Image

Color Image

Boat house spring

Method 2: Boots-on-the ground field sampling

Activity 1: Held a workshop with 40+ practitioners and stakeholders; workshop participants identified the problem:

Septic Leachate Perceived Impacts

Likely Impairment of Designated Uses in Flathead Lake

Broader Impact (Society):

Immediate impact is evident in the identification of data to connect public health and environmental degradation directly to septic systems, which is critical for public engagement.

Broader Impact (Sustainability):

Flathead Basin Commission is applying insights gained from workshop and pilot monitoring study to inform local officials and public on range of solutions.

Next steps:

- Evaluate behavioral change strategies to encourage septic system best practices.
- Assess policies and governance frameworks that address the risks from failing septic systems to public health, surface water and groundwater quality.
- NSF IRG Track I/II proposal