Aquatic Mesocosms for Invasive Species Research In Alberta

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Features of the Facility

- **30 mesocosms, each ~14,000 L operating volume**
  - In-ground installation confers realistic thermal gradients and allows ~0.5 m layer of liquid water to be maintained under ~1.0 m of ice in winter
- **1 shallow and 4 deep plant propagation ponds**
  - On-site plant propagation allows non-invasive macrophyte acclimation to local conditions before exposure to test materials/biota
- **2 potable water tanks with distribution system**
  - Potable water offsets evaporative losses
- **5 wastewater tanks in lined berm**
  - Containment of potentially noxious test materials or biota prior to disposal
- **Road network**
  - Can accommodate vehicles as large as 18-wheeler trucks – facilitating material delivery and removal
- **Semi-autonomous dewatering system**
  - Groundwater suppression minimizes risk of buoyant ejection and ground subsidence
- **Irrigation pipeline**
  - Facilitates delivery of biologically-active surface water


InnoTech Alberta aquatic mesocosm facility


Multiple layers of containment


Nested tanks

Capabilities

- **Balance of complexity, realism, replication, and control**
- **Multi-year studies possible**
  - Including winter operations
- **Local biologically-active surface water**
  - Facilitates community establishment
- **Containment protects environment**
  - Nested design and overflow protection prevent escape of waterborne biota or chemicals
  - Mesocosms can be enshrouded with netting to prevent animal access
  - Invasive aquatic biota can be destroyed within mesocosm prior to tank evacuation
- **On-site support**
  - Service laboratories, heavy equipment, fabrication, open lab space, greenhouses, and scientific/technical staff can support project design and execution
- **Food and accommodation**
  - Available in Vegreville (2 km southeast of facility)
- **Array of 16 smaller (5,000 L) tanks in a common berm**
  - Above-ground tanks adjacent to the aquatic mesocosm facility


Road access for large vehicles

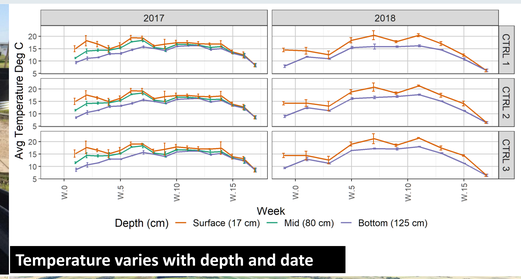

Above-ground suitable for shorter duration experiments


16 tanks in a common berm adjacent to aquatic facility


Animal biota overwinter


Winter operations


Heavy equipment facilitates exposure and cleaning



Temperature varies with depth and date


Emergent, submerged, and free-floating plants


Supporting laboratories and services within walking distance

Article

Video

Website

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