# Article information:

Satellite Microwave remote sensing of contrasting surface water inundation changes within the Arctic–Boreal Region - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0034425712003562>

# Article summary:

1. Surface water inundation in the Arctic-Boreal region strongly influences land-atmosphere water, energy and carbon fluxes, and potential feedbacks to climate change.

2. Satellite microwave remote sensing is well-suited to monitor surface inundation owing to its strong sensitivity to surface water presence, reduced sensitivity to solar illumination and atmosphere contamination, and the deployment of microwave sensors on polar orbiting satellites that enable daily observations in northern land areas.

3. A regional trend analysis of the 8-year AMSR-E record shows no significant Arctic-Boreal region wide Fw trend for the period, and instead reveals contrasting inundation changes within different PF zones.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article discusses the use of satellite microwave remote sensing to monitor surface water inundation in the Arctic-Boreal region and its potential impact on land-atmosphere water, energy, and carbon fluxes. The study reports on recent (2003-2010) surface inundation patterns across the region and within major permafrost zones using daily fractional open water cover (Fw) retrievals from the Advanced Microwave Scanning Radiometer for EOS (AMSR-E). The AMSR-E Fw maps reflect strong microwave sensitivity to sub-grid scale open water variability and compare favorably with alternative, static Fw maps derived from finer scale Landsat, MODIS, and SRTM radar data.

The article highlights the dynamic seasonal and annual variability in surface inundation that is unresolved in static Fw maps. The AMSR-E Fw record also corresponds strongly with regional wet/dry cycles inferred from basin discharge records. A regional trend analysis of the 8-year AMSR-E record shows no significant Arctic-Boreal region-wide Fw trend for the period but reveals contrasting inundation changes within different PF zones. Widespread Fw wetting is detected within continuous and discontinuous PF zones, while sporadic/isolated PF areas show widespread Fw drying trends.

The article provides critical insight into the influence of permafrost thaw on surface hydrology but has some limitations. One limitation is that it does not provide a comprehensive analysis of all factors affecting surface water extent in the Arctic-Boreal region. Another limitation is that it does not explore counterarguments or alternative explanations for observed trends in surface inundation.

Overall, the article presents a well-supported argument for using satellite microwave remote sensing to monitor surface water inundation in the Arctic-Boreal region. However, readers should be aware of potential biases or limitations in the study's methodology or interpretation of results.

# Topics for further research:

* Factors affecting surface water extent in the Arctic-Boreal region
* Permafrost thaw and its impact on hydrology
* Alternative explanations for observed trends in surface inundation
* Land-atmosphere water
* energy
* and carbon fluxes in the Arctic-Boreal region
* Comparison of different remote sensing techniques for monitoring surface water inundation
* Implications of changing surface inundation patterns for Arctic ecosystems and communities

# Report location:

<https://www.fullpicture.app/item/db8e495eb4404b20930d85c01bb0bd87>