Ice plays a crucial role in protecting shores and coastal infrastructure. Given the current context of climate change (CC), the gradual melting of shore fast ice is expected to leave coastal infrastructure and shores more exposed to large waves and storm surges, which, when combined, can pose significant risks to coastal infrastructure and the people using it. Therefore, the ice hazard should be a factor considered in risk assessments in the planning, design, construction, maintenance, operation, and use of maritime transportation infrastructure in Canada. Risk assessments should be able to determine the probability of the presence and duration as well as the spatial distribution of both land-fast and drift ice locally. Although the Canadian Ice Service publishes some local data on the statistical distribution of these parameters, their probability of occurrence and the spatial variability of sea ice this data is not presented through the lens of climate change.

**METHODOLOGY**
- Study the space-time variability of sea ice at the regional level to determine the characteristics of the statistical distribution of ice concentrations for each 12.5 km area for every day of the year.
- Develop procedures to map ice concentrations at the local level (250 m) using satellite imagery.
- Study the space-time variability of sea ice at the local level (250 m) in proximity to marine and coastal infrastructure.
- Implement a decision-making tool in the form of an interactive online atlas of sea ice conditions.
- Study the impact of climate change on sea ice in relation to risk management for marine and coastal infrastructure.

**EXPECTED RESULTS**
Development of a decision-making tool in the form of an interactive online atlas of sea ice conditions (IcePAC). Users (managers, decision makers, scientists, and the general public) will be able to perform interactive online searches of regional and local data to obtain information on historical ice conditions and to access probability forecast maps showing the current and future ice conditions and potential hazard via satellite imaging.

**BENEFITS FOR ADAPTATION**
These results will be integrated into the overall analysis performed by Ministère des Transports du Québec and used to develop adaptation measures to ensure the sustainability of marine infrastructure and user safety. Quantifying the intensity, scope and probability of occurrence of the ice hazard while also taking into account specific local conditions, will make it possible to better assess the risk posed by the presence or absence of ice to building or maintaining marine and coastal infrastructure from an operational perspective.