

## Ensuring safety of navigation and reducing transportation costs in the Arctic with digital technologies

**This Policy Brief elaborates recommendations for developing digital technologies that improve the safety of navigation and reduce shipping costs in the Arctic. This issue is of utmost importance for Russia and European countries, since the growing freight traffic requires prompt and secure provision of modern and innovative logistics solutions. The Northern Dimension Partnership for Transportation and Logistics provides a platform for cooperation in this area. The following actions are suggested:**

- Organization of a joint digital technology forum for all states interested in the development of the Arctic transport highway to present new solutions that would ensure efficient logistic management of the Arctic seas.
- Establishment of a joint scientific and educational consortium for active collaboration of information technology companies and scientists in the Northern Dimension area. The consortium could form common proposals in the field of safety and rescue at sea for relevant national ministries and international institutions such as the Arctic Council.
- Foundation of a unified “road map” for all emergency services (primarily EMERCOM) explaining the legal and managerial nuances of interaction and response in the event of an emergency.
- Formation of a list of topical issues from suppliers planning or already engaged in the transportation of goods through the Arctic sea, their wishes and suggestions.

## Digital technologies for managing risks in the Arctic seas

The Arctic is a zone of special attention due to its vulnerable ecological environment and specific climate conditions (Fig. 1) [1]. Growing traffic flows in the Arctic seas, including the Northern Sea Route, increase risks of accidents and associated environmental risks.

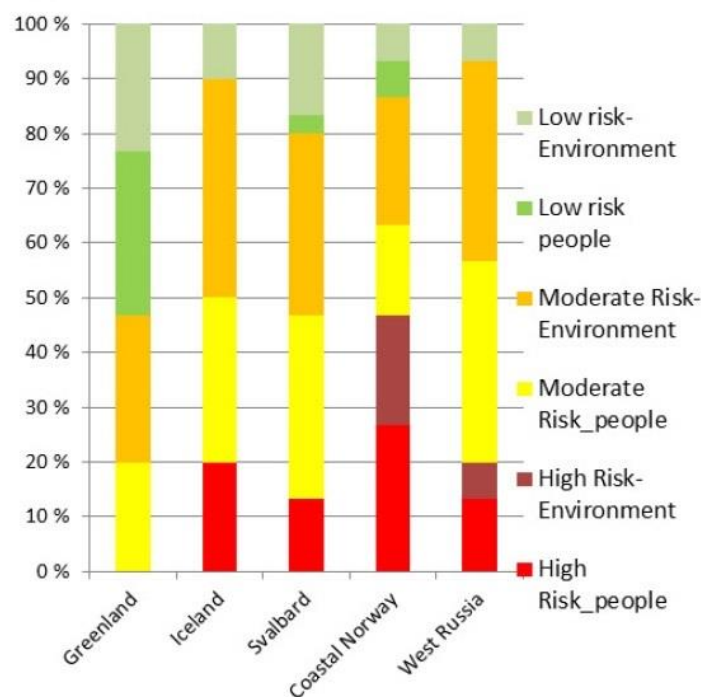


Fig. 1 Share of events with different risk level in the Arctic regions

The management of risks can be improved with digital technologies that enable the monitoring of traffic in the Arctic seas, and the efficient detection of accidents. Such technologies can be used for estimating the presence of vessels of various categories in the Arctic waters (Fig. 2) [2], and for monitoring of risks associated with navigation (Fig. 3) [2].

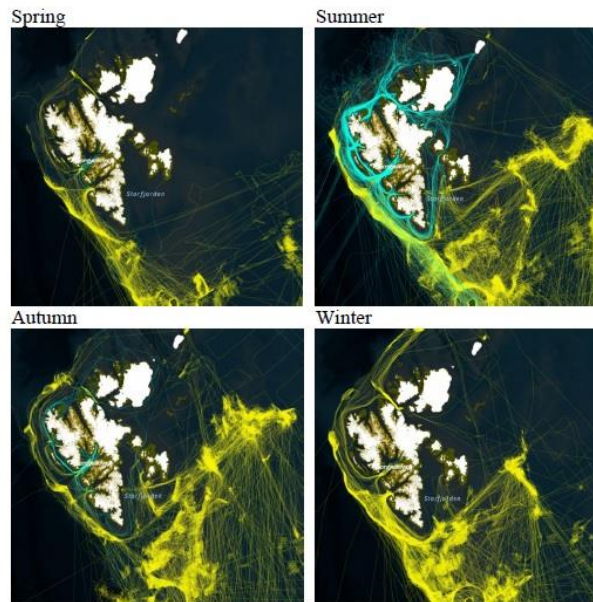
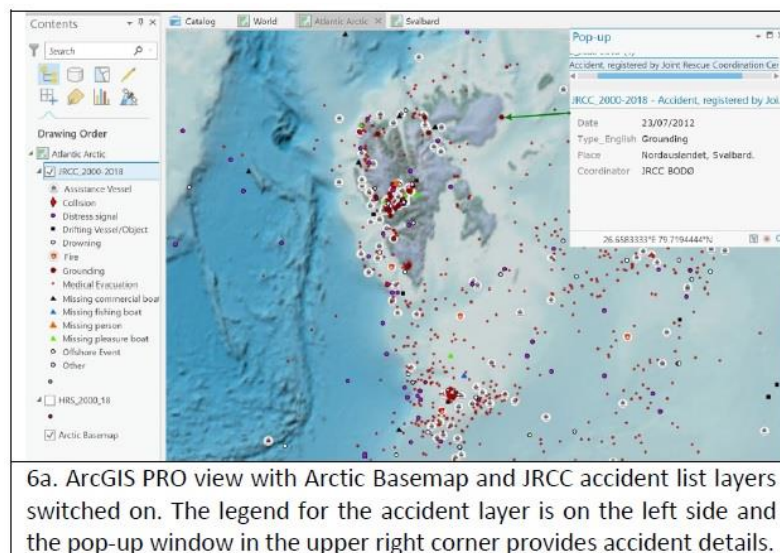


Fig.2 Fishing (yellow color) and passenger (blue color) vessels in Svalbard



6a. ArcGIS PRO view with Arctic Basemap and JRCR accident list layers switched on. The legend for the accident layer is on the left side and the pop-up window in the upper right corner provides accident details.

Fig. 3. System of accidents detection

The efficient use of digital solutions for risk management requires, however, not only advanced technologies but solid knowledge, skills and abilities from the individuals who use them. These include operators from shipboard personnel and institutions that control maritime traffic remotely. On the other hand, technology developers should understand the needs of these user groups. Therefore, it is important to engage the

users, including operators who work on the ships and on the shore, in the co-creation of digital solutions together with information technology specialists.

## Improving the use of digital solutions in the Arctic seas

One urgent task for improving the safety of navigation in the Arctic seas is the development of digitalization of the Northern Sea Route. This maritime transport artery has potential to develop into an important route for global trade of goods. At the same time, it is a route with high risks as the path lies through the Arctic ice. Therefore, digital solutions are needed to ensure the safety of navigation.

A current classification of Russian regions divides them into the following categories according to the level of digitization (fig. 4) [3]:

1. **Problem** (low level of digitalization under adverse conditions).
2. **Passive** (low digitalization level under favorable conditions).
3. **Active** (the average level of digitalization under adverse conditions).
4. **Balanced** (the level of digitalization meets the conditions, the balance is maintained).
5. **Progressive** (maximum level of digitalization in the absence of the most favorable conditions).
6. **Advanced** (high level of digitalization under favorable conditions).

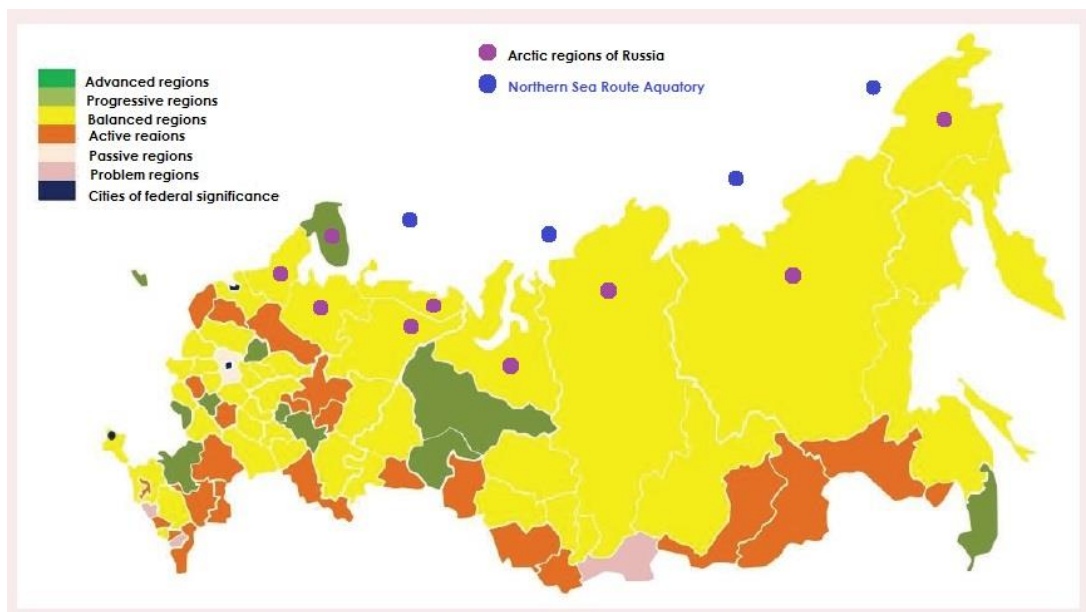


Fig. 4. Type of regions of the Russian Arctic zone by digitalization

The improvement of maritime safety along the Northern Sea Route is important not only for Russia, but also for other countries present in the Arctic. Therefore, investment in digital technologies that ensure effective and safe management of marine traffic flows in the Arctic seas should be a priority for Russia, the EU and other Northern Dimension countries.

The first step would be to develop a common understanding of the current state of the art, and the most urgent development needs. This requires sharing of information on the current level of digitization, and the evaluation of issues such as feasibility of current technological systems for data transfer between, for example, shipping companies and rescue services.

More efficient sharing of information is required also between marine traffic management structures and shipping companies. Improved understanding of the nodal supply chains, the necessary structure of ships, and the provision of port infrastructure would not only improve safety but also reduce supply costs.

Another important element in international cooperation in the improvement of maritime safety in the Arctic is to develop skills and capabilities of the personnel who uses the digital technologies. These skills include not only technical skills, but also soft skills such as the ability to communicate and work in international teams.

Finally, the improvement of the digital ecosystem in the Arctic seas as a joint effort requires the engagement of a wide array of stakeholders, including authorities, companies, as well as universities and research institutes from the participating countries. Existing legal frameworks and joint policies, such as the recently renewed EU-Russia Science and Technology Agreement and the Northern Dimension Partnership for Transport and Logistics, provide a solid basis for collaborative projects.

## **Recommendations**

To improve international collaboration in the development of digital technologies to ensure the safety and sustainability of transport flows in the Arctic, the following actions are recommended:

1. Organization of a joint digital technology forum for all states interested in the development of the Arctic transport highway (first of all, the EU, Russia and other Northern Dimension countries). The forum would present new innovations of proven technological solutions that would ensure efficient logistic management of the Arctic seas.
2. Establishment of a joint scientific and educational consortium for active collaboration of information technology companies and scientists in the Northern Dimension area. The consortium could form common proposals in

the field of safety and rescue at sea for relevant national ministries and international institutions such as the Arctic Council.

3. Foundation of a unified “road map” for all emergency services (primarily EMERCOM) explaining the legal and managerial nuances of interaction and response in the event of an emergency.
4. Formation of a list of topical issues from suppliers planning or already engaged in the transportation of goods through the Arctic sea, their wishes and suggestions.

## Sources

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