ONR’s new effort will focus on building the next-generation integrated global prediction system to support the needs of the US Navy in 2020:

- **Fully-integrated** ocean-wave-ice-atmosphere model
- Appropriately coupled across a **wide range of space and time scales**
- Provide **improved short-term** ( < 7 days ) **predictions** of the physical environment in support of safe, efficient, and effective naval operations
- Provide **extended-range predictions** for Navy strategic resource decisions
- **Understand relevant physics** to inform and enable longer (decadal+) predictions
- Define the **limits of predictability** for different physical variables and processes
Establishment of an Arctic Research Program

In response to priorities identified in coordination with Task Force Climate Change, a new research program focused on the Arctic has been created at ONR through a realignment of funding priorities.

**Program Goals:**

- Improved **basic understanding of the physical environment and processes** in the Arctic region
- Development of a new **dynamic, fully-integrated (ocean – ice – wave – atmosphere) Arctic system model** for improved prediction of the operational environment in high-latitudes at longer lead times
- Utilization of **satellite SAR data** for assimilation into integrated models
- Exploration of **new technologies** (platforms, sensors, communications) required for **persistent observation** and operation in the harsh Arctic environment

Advances in technology will be required to develop an Arctic Observing Network that will support scientific exploration and be able to initialize predictive models of the environment.
The Arctic is becoming more ice-dynamic, with a larger area of sea ice melting and refreezing on an annual basis.

- Increased surface exposure in the Chukchi and Beaufort Seas
- More opportunity for waves, swell, and wind-induced mixing
- Feedback from air-sea interactions

Goal: Better understanding of the coupled physical processes operating in the Marginal Ice Zone

Better understanding of the MIZ physics will enable improved ice-dynamic models of the Arctic
Main driver for model improvement is the need to **understand and address key uncertainties**

Understanding will be increased through a combination of **modeling, theory and observations**

Quantitatively **assess the skill of the models** at simulating and predicting seasonal oscillations

Provide insight into where to **focus and prioritize future process studies**