



# RACER: Planning for Climate Resilience in the Arctic

## KEY FACTS

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**“We know the areas that have been important to Arctic life and peoples through history, but with climate change, we need to know about the future of those places,” said Martin Sommerkorn, head of conservation at WWF’s Global Arctic Program “RACER is helping us identify where the land and sea work together to create productive biological areas that will remain important to Arctic life despite climate change. It focuses on strength, rather than vulnerability”**

Defining what makes a place special in the Arctic is not a simple process, but one approach helping to address this challenge is RACER (Rapid Assessment of Circum-Arctic Ecosystem Resilience). It is a new way forward that is helping to safeguard the functioning ecosystems at the heart of Arctic life.

RACER is a scientific mapping process that identifies Arctic places of exceptional productivity and biological diversity. Pioneered by WWF’s Global Arctic Program, it is a tool for finding and mapping targets for future conservation and management efforts. These targets are the sources of ecological resilience with the likely ability to function in future Arctic climate change conditions.

The RACER technique helps us understand what makes certain places exceptional by assessing what is actually driving that productivity—factors such as the shape of the seafloor, seasonal ice cover, winds, water circulation and currents, sea surface temperature, and salinity.

This technique includes a regional analysis derived from global climate models to estimate whether those productivity-enhancing features will persist in the future despite the impacts of climate change on sea surface temperature, sea ice, salinity, rain and other factors. In short, it helps to predict whether the sites we protect today will remain diverse and productive in the future, and whether currently unprotected sites may increase in importance.

Recognizing that current approaches to managing often-vulnerable Arctic habitats and species are not keeping pace with accelerating climate change, RACER instead locates sources of ecological strength and durability in today’s arctic ecosystems. It looks ahead to whether these wellsprings of resilience will persist in a climate-altered future.

Focusing conservation attention on these enduring sources of resilience is important for the continued functioning of Arctic ecosystems, including the ecological services people receive from them. RACER empowers Arctic peoples to address challenges that rapid Arctic change poses for their environment and their way of life.

As we look forward to we need to adapt policies, planning and management to best support Arctic ecosystem resilience, reforming management approaches as well as improving our conservation targets.

### **Alaskan Results of RACER:**

In January 2014, the WWF team presented the RACER analysis to a group of scientists gathered for a one-day workshop. The end result was a robust map of the key features in the Bering, Beaufort, and Chukchi Seas that are now—and are likely to continue to be—the main drivers of productivity and diversity. This scientific mapping process is only the first step toward the development of actual conservation strategies. WWF is now using this map to inform our selection of priority conservation areas in the Bering, Beaufort and Chukchi Seas.



1. Barrow Canyon
2. Eastern Chukchi Corridor
3. Hanna Shoal
4. Northern Bering Strait
5. Pribilof Domain
6. Unimak Pass
7. Bristol Bay

In the eastern Chukchi Sea corridor, high productivity is driven by the convergence of water circulation patterns and wind and sea ice dynamics, which creates areas of persistent open water—called polynyas—that are critical for wildlife.

The Barrow Canyon, an undersea channel located at the boundary of the Beaufort and Chukchi seas off Point Barrow in Alaska, attracts a high diversity of wildlife. Here, the undersea currents and the shape of the canyon itself cause an upwelling of nutrient-rich water to the surface. That fertile mix benefits plankton and plankton predators, creating a nourishing stew on which a variety of species feed.

In the Chukchi Sea, Hanna Shoal's underwater contours drive ecological diversity. The shallow topography around the shoal diverts warm water masses flowing northward from the Bering Sea and holds on to colder water. As a result, sea ice persists there for an extended period of time each spring. Although it is beginning to show the effects of the warming climate, Hanna Shoal still acts as a refuge in the summer season for animals that feed on the bottom of the continental shelf.

### **For more information contact:**

Chris Conner, Media and External Affairs, [Chris.Conner@wwfus.org](mailto:Chris.Conner@wwfus.org), Mobile: 703-304-0857