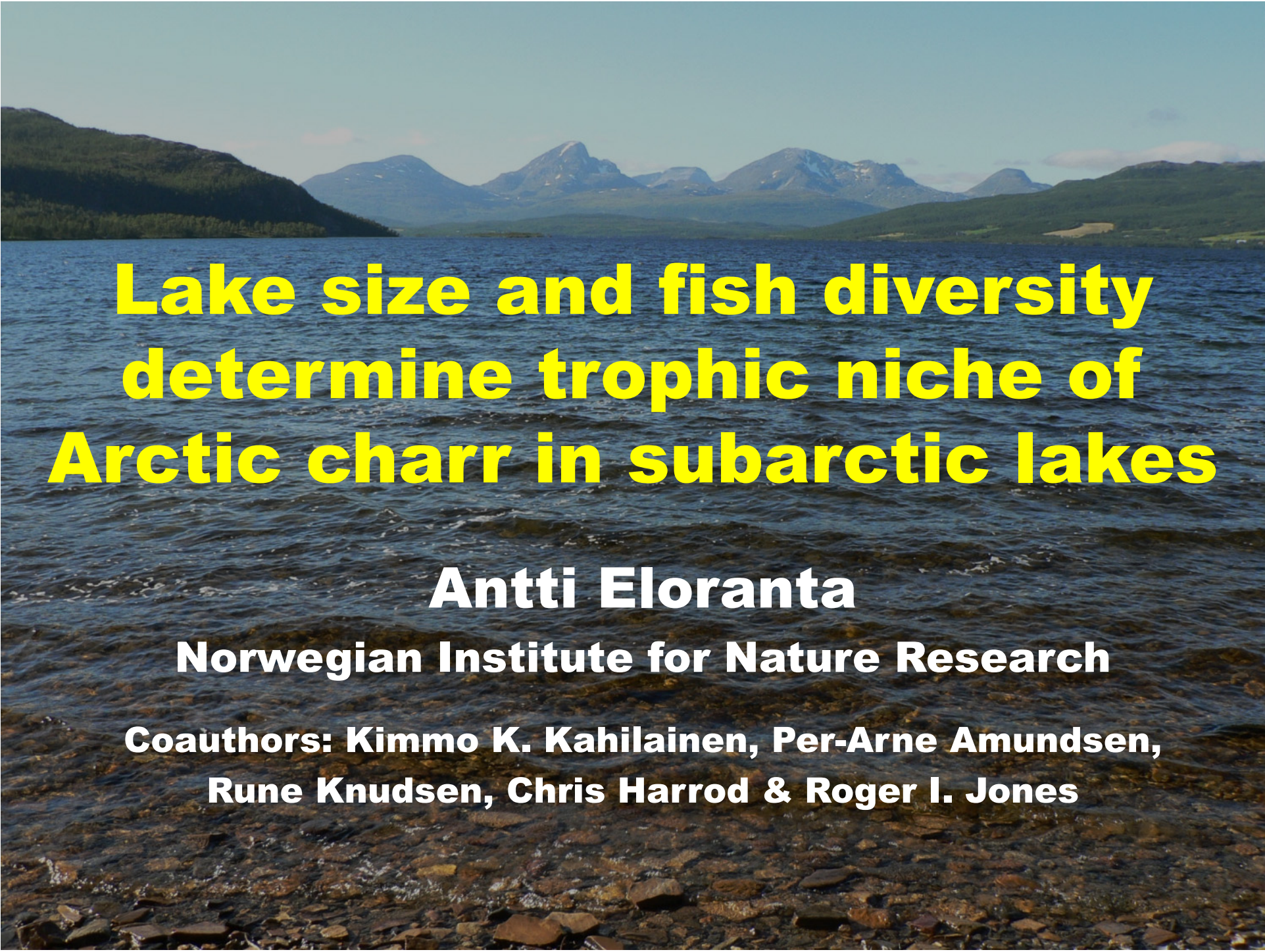




Lake size and fish diversity determine trophic niche of Arctic charr in subarctic lakes

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**Coauthors: Kimmo K. Kahilainen, Per-Arne Amundsen,
Rune Knudsen, Chris Harrod & Roger I. Jones**

Antti Eloranta

The Variable Position of Arctic
Charr (*Salvelinus alpinus* (L.)) in
Subarctic Lake Food Webs

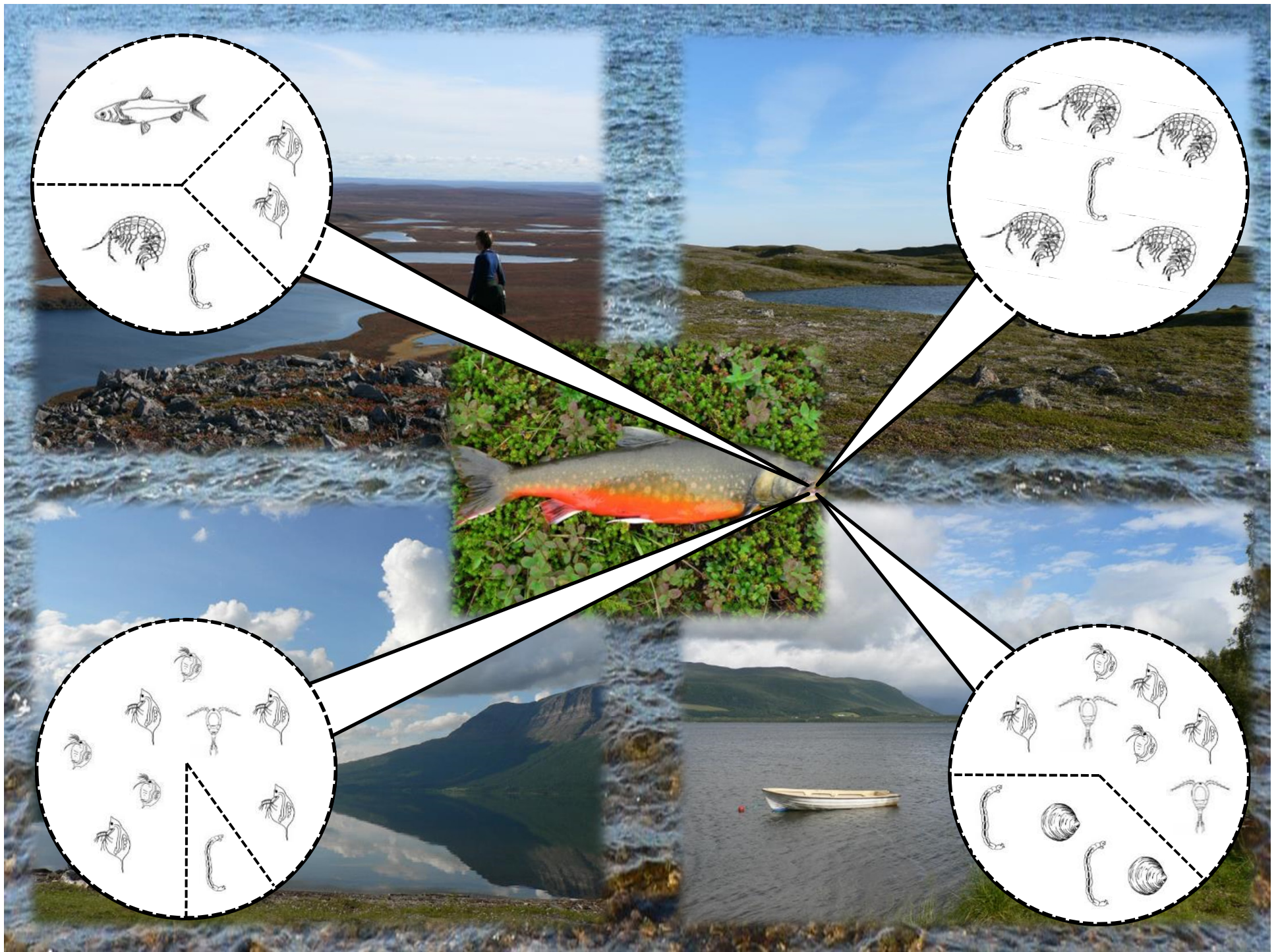


**What affects
energy flow to
top consumers
in subarctic
lakes?**

**Importance of
littoral benthic
production?**



Eloranta = Littoral zone



How lake abiotic and biotic characteristics affect charr trophic niche?



H1: Charr shift to a more pelagic diet with increasing lake size

H2: Charr shift to a higher trophic position with increasing fish diversity

$\delta^{13}\text{C}$ = Predominant energy flow pathway

$\delta^{15}\text{N}$ = Food chain length

Study area



Area: 0.5–1084 km²

Altitude: 12–679 m a.s.l.

Fish species: $n = 2–13$

Other explanatory variables:

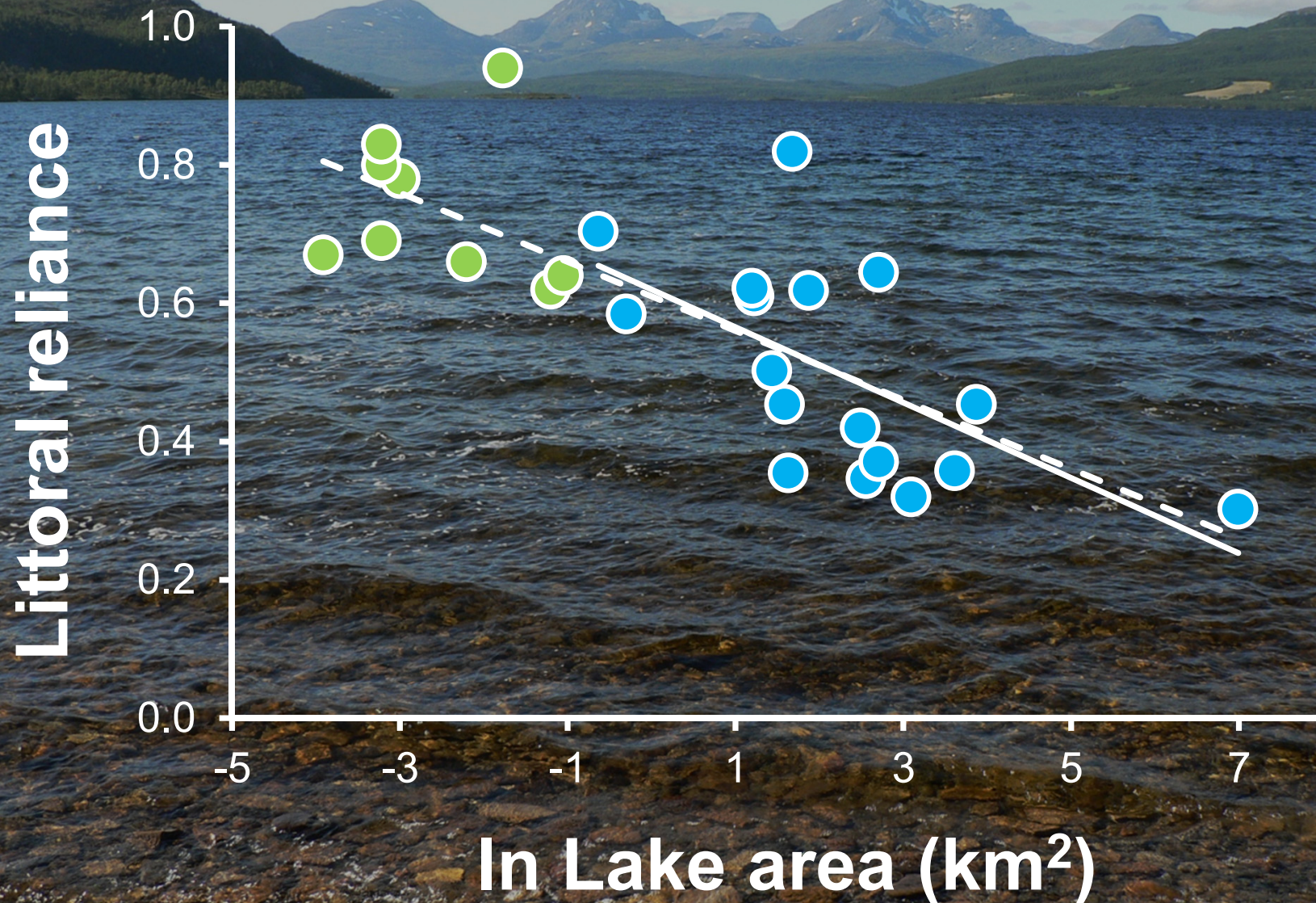
Shoreline development

Secchi and relative depth

Total phosphorus and nitrogen

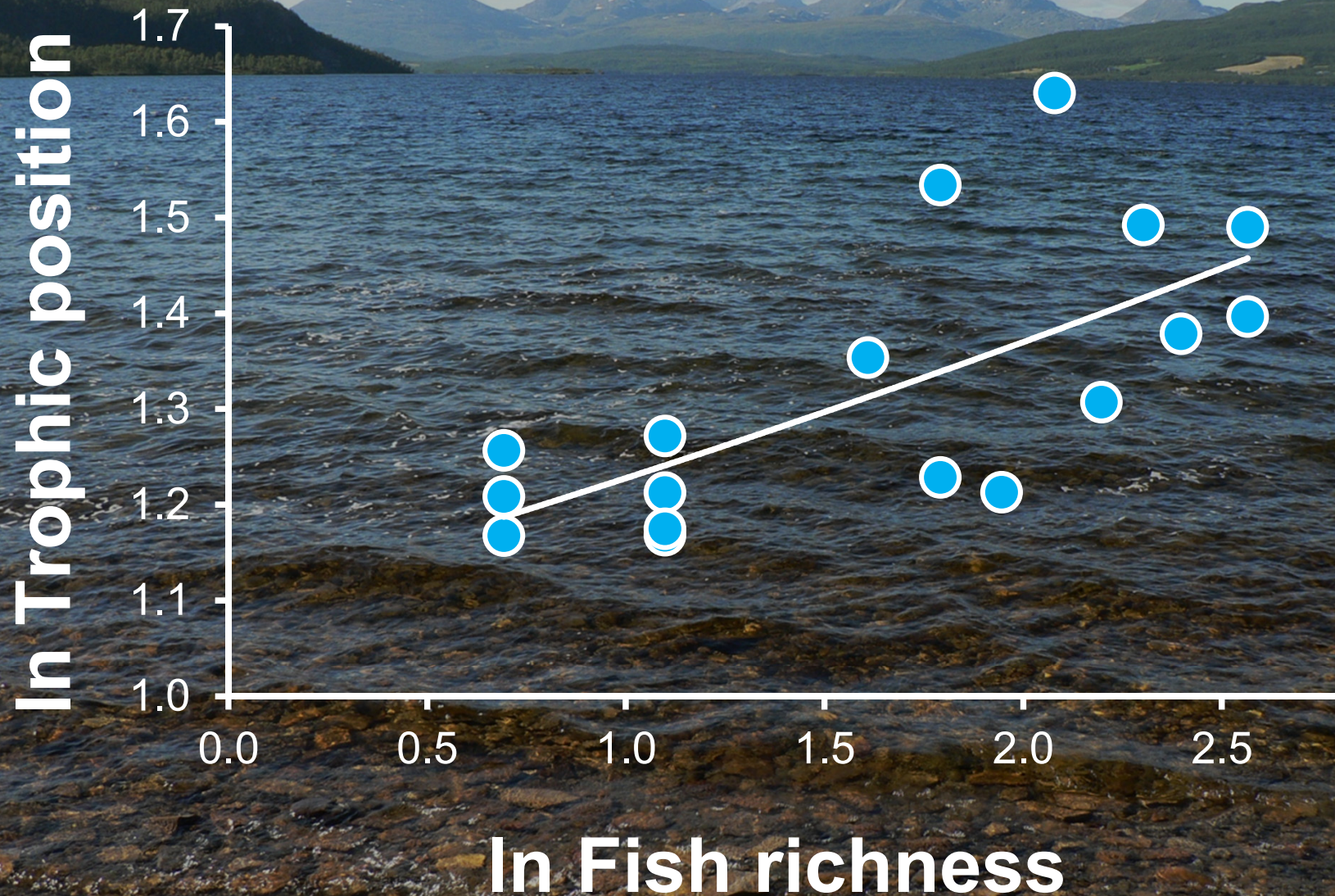


Littoral reliance decreases with lake area

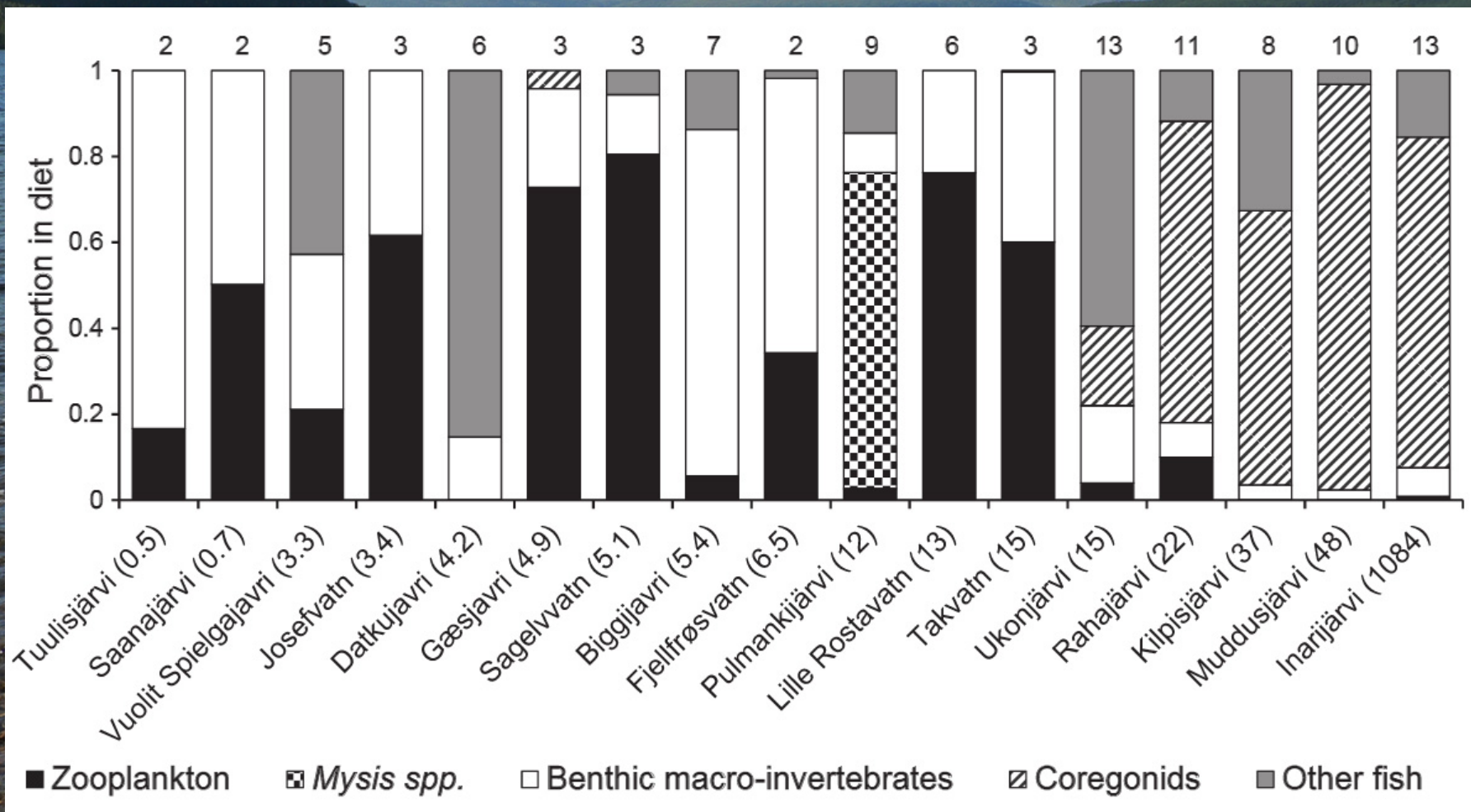


Karlsson & Byström (2005) *Limnol. Oceanogr.* 50: 538-543.

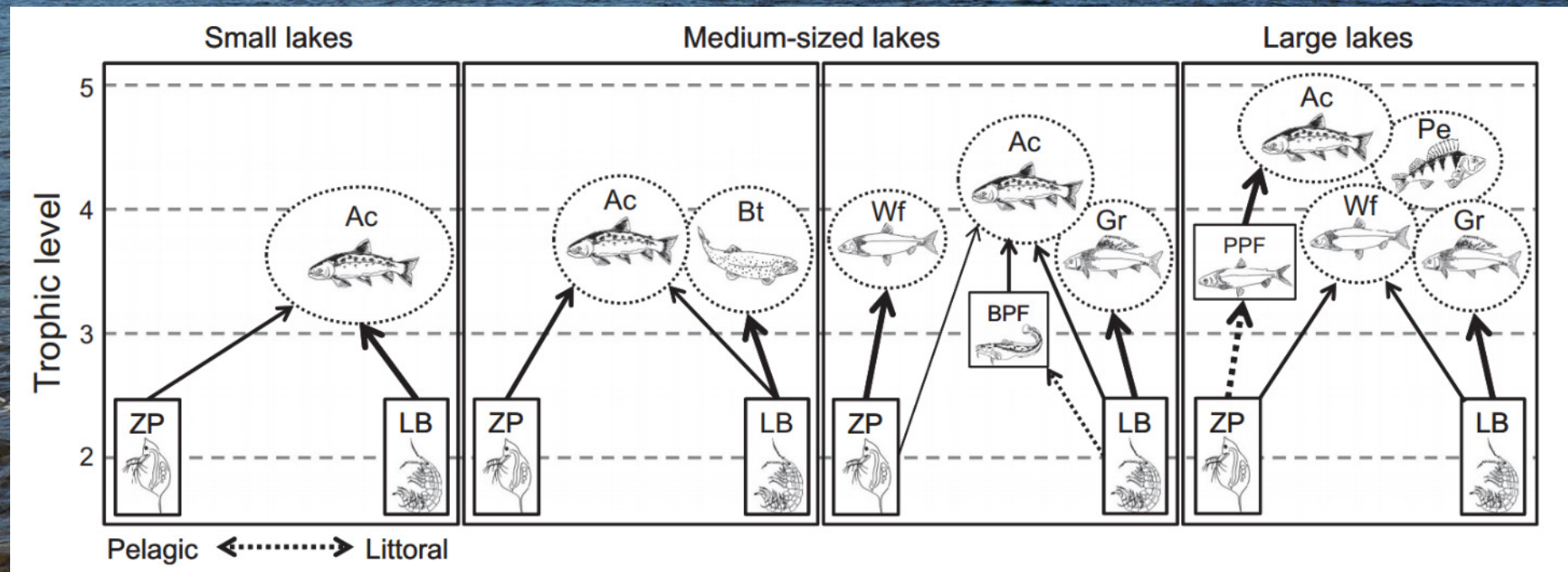
Trophic position increases with fish richness

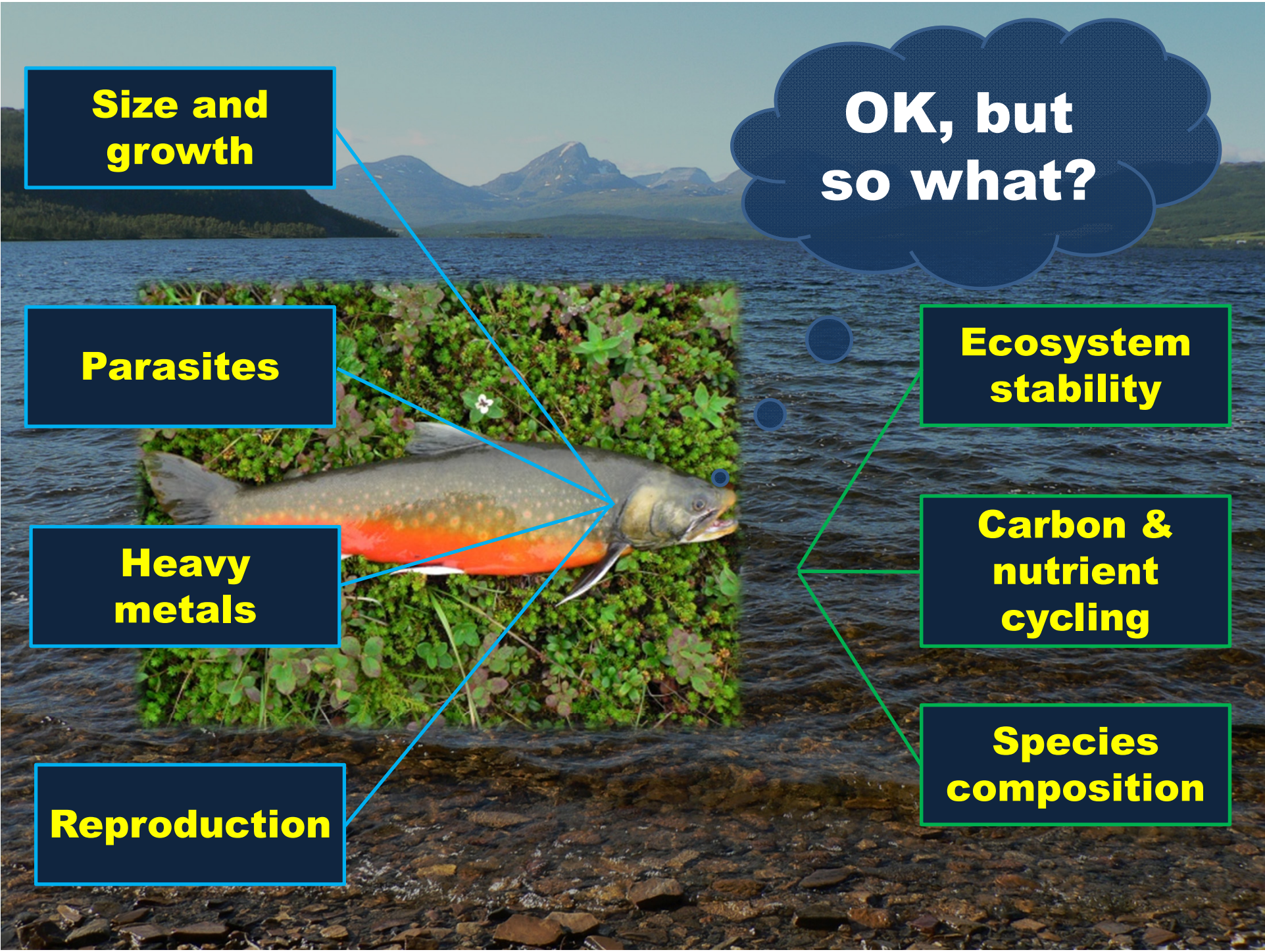


Stomachs support isotopes



Impacts on function and structure of subarctic lake food webs



A photograph of a fish, likely a trout or salmon, in a stream. The fish is positioned in the center-left of the frame, facing right. It has a silver-grey upper body and a bright orange-red lower body. The stream is surrounded by green vegetation and rocks. In the background, there are mountains under a clear sky. Several callout boxes are connected to the fish by lines. A thought bubble is in the upper right. Four boxes on the right are connected by a green line.

Size and growth

Parasites

Heavy metals

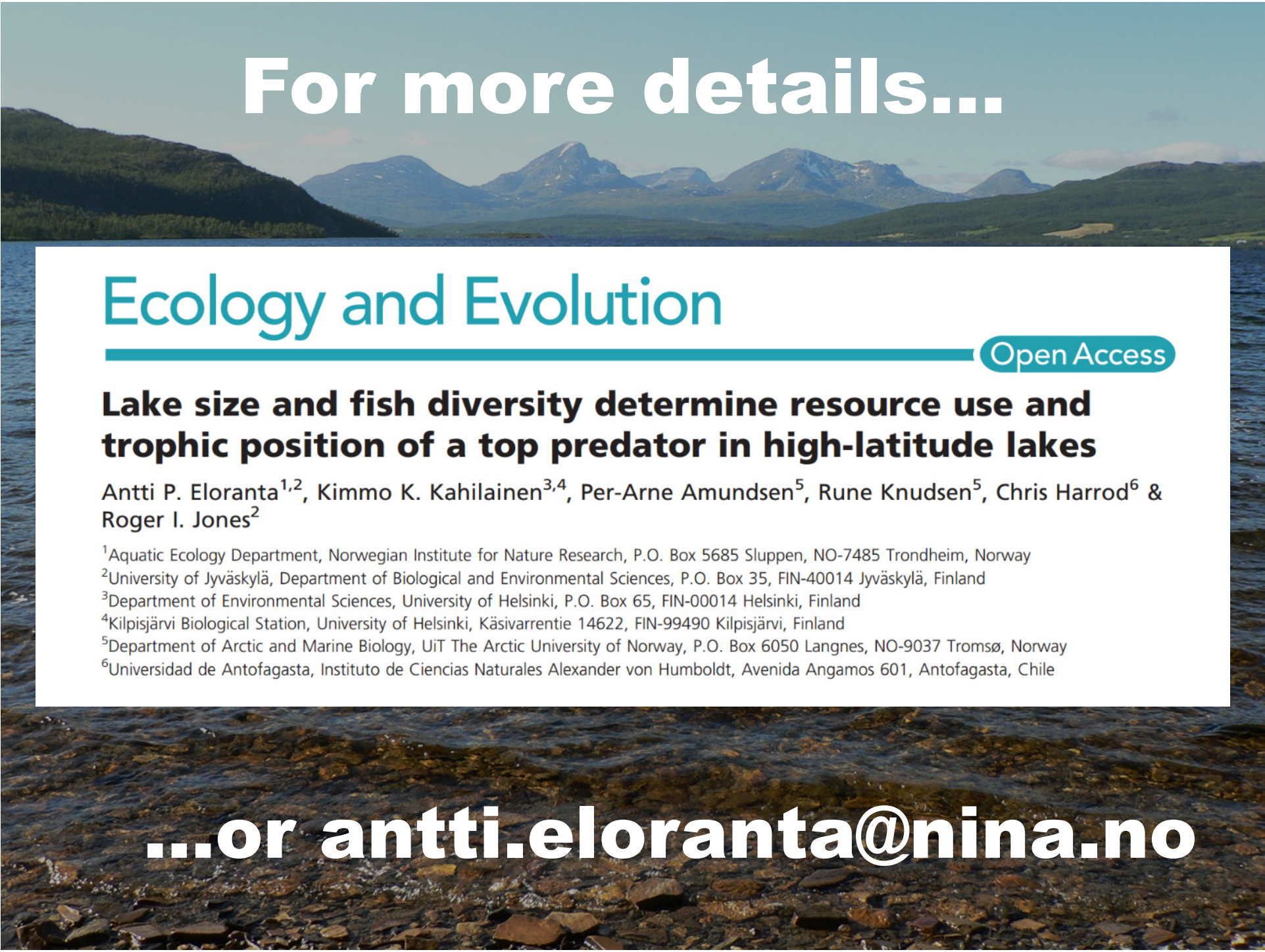
Reproduction

**OK, but
so what?**

**Ecosystem
stability**

**Carbon &
nutrient
cycling**

**Species
composition**

The background of the slide is a scenic photograph of a lake with mountains in the distance. The sky is blue with some light clouds. The mountains are rugged and have some snow or light-colored patches. The water in the lake is calm, reflecting the sky and mountains. The foreground shows some rocks and water.

For more details...

Ecology and Evolution

Open Access

Lake size and fish diversity determine resource use and trophic position of a top predator in high-latitude lakes

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**Tusen
tak!**



See: <http://www.cedren.no/Projects/HydroBalance>