

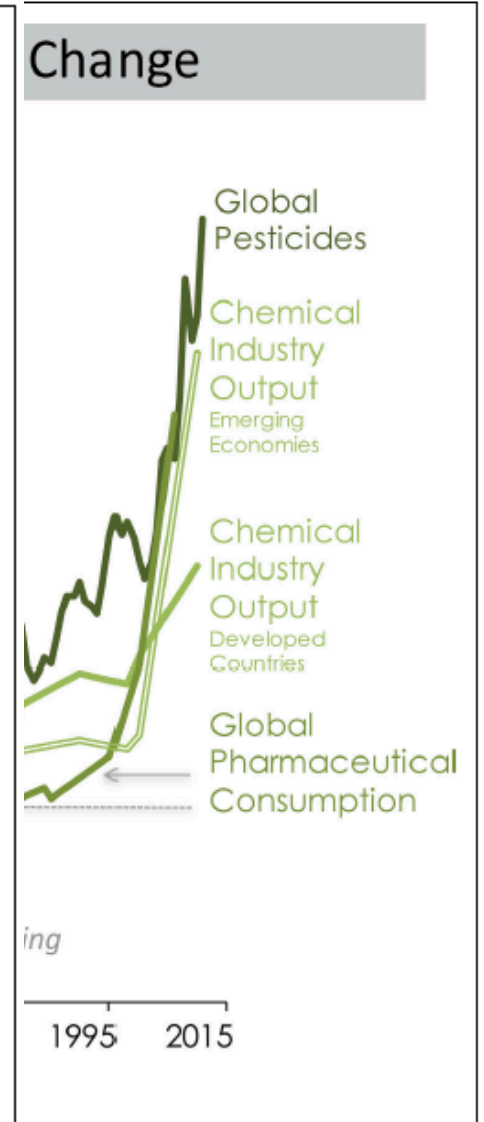
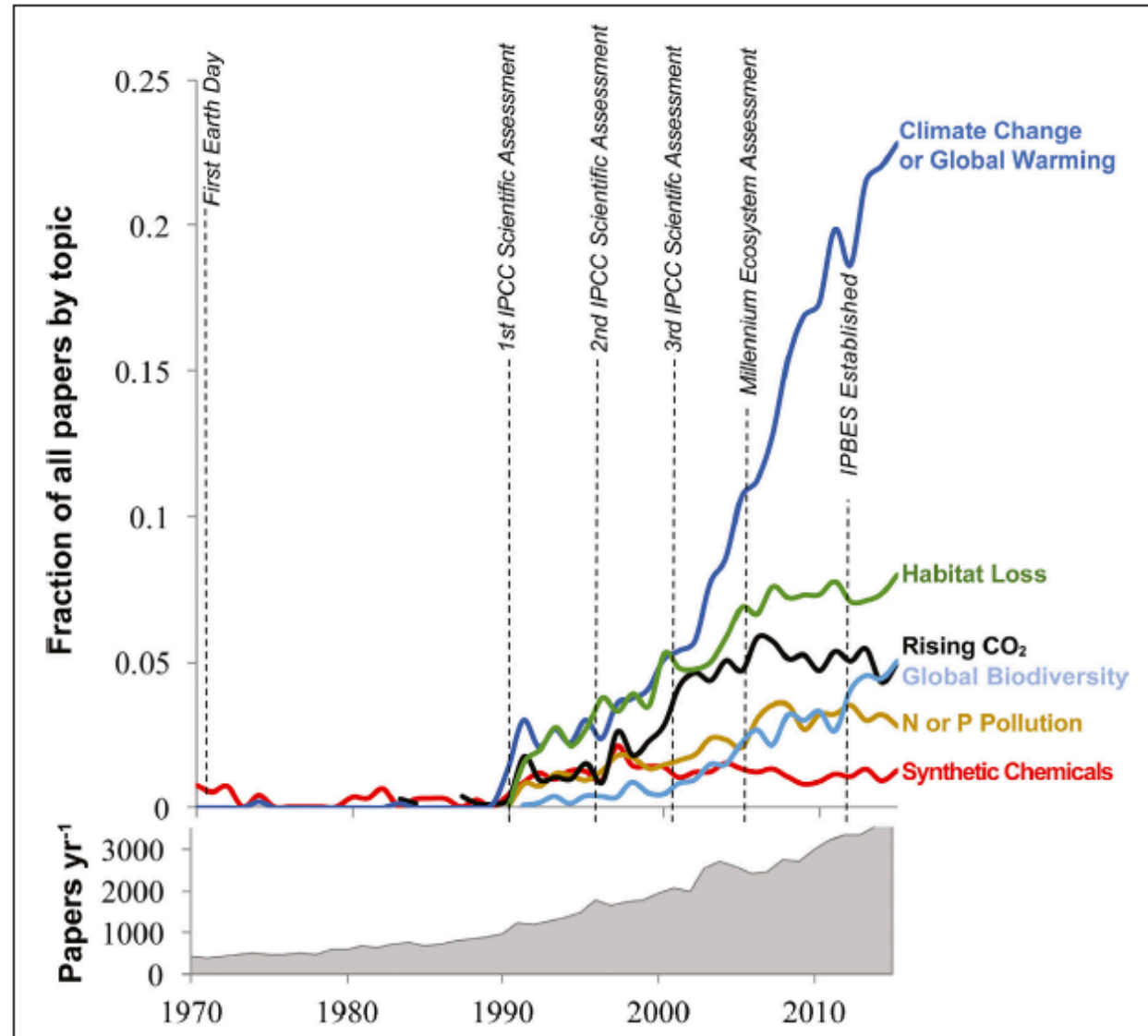
One Health Approaches in Arctic Indigenous Communities



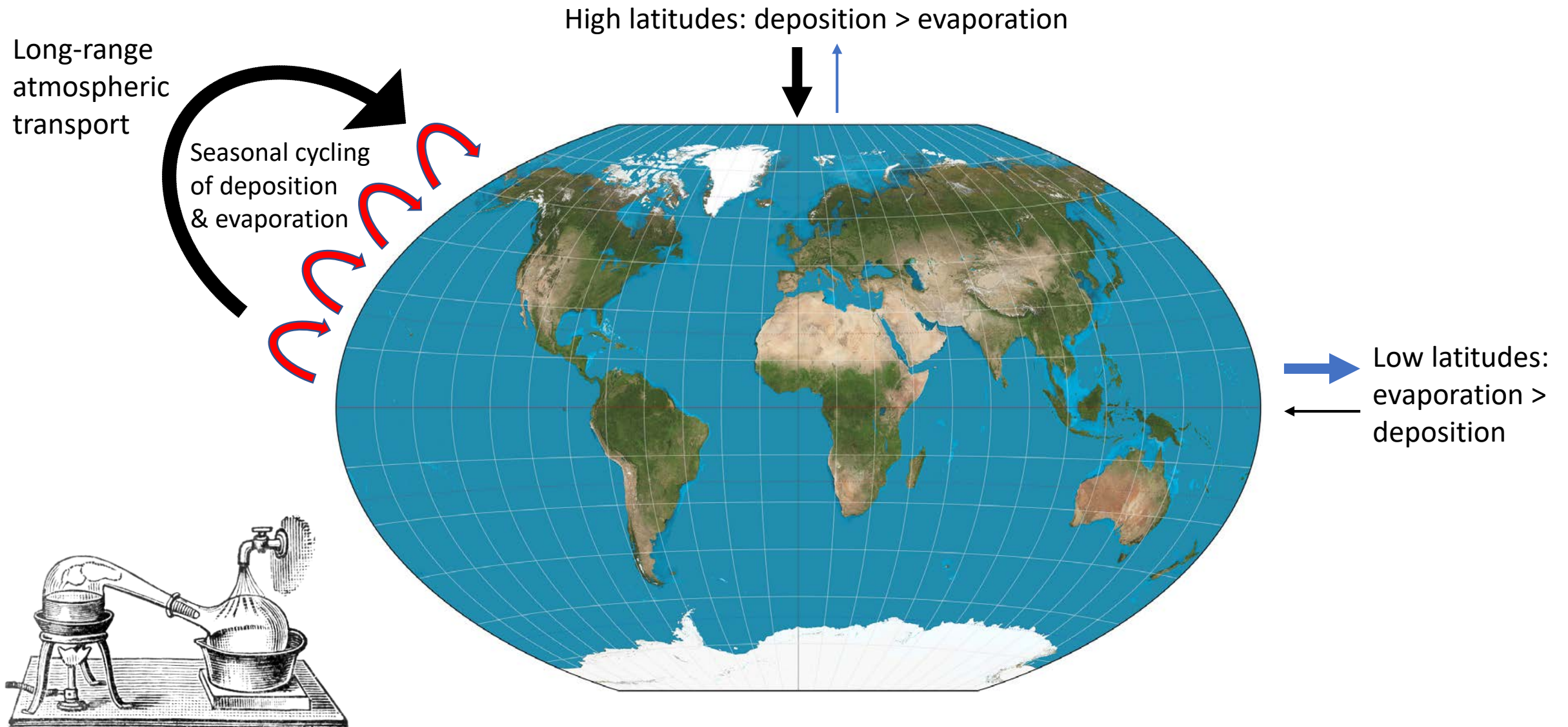
Frank von Hippel, Department of Community, Environment & Policy
Mel & Enid Zuckerman College of Public Health, University of Arizona

Agents of Global Change

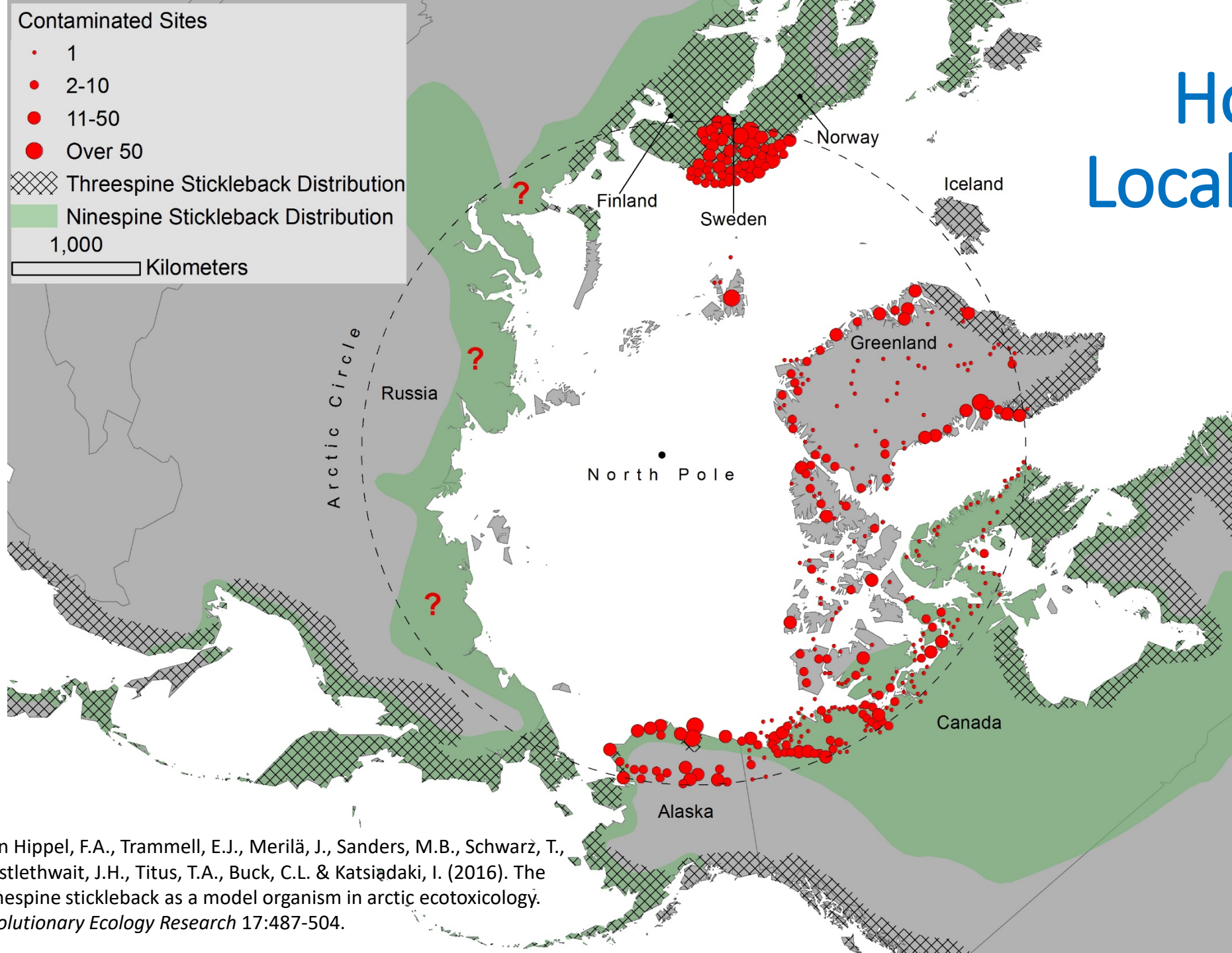
Bernhardt, E.S., Rosi, E.J. & Gessner, M.O. (2017).
Synthetic chemicals as agents of global change.
Frontiers in Ecology and the Environment 15(2):84-90.



Global Distillation with Fractionation According to Global Mobility



Hotspots of Local Pollution



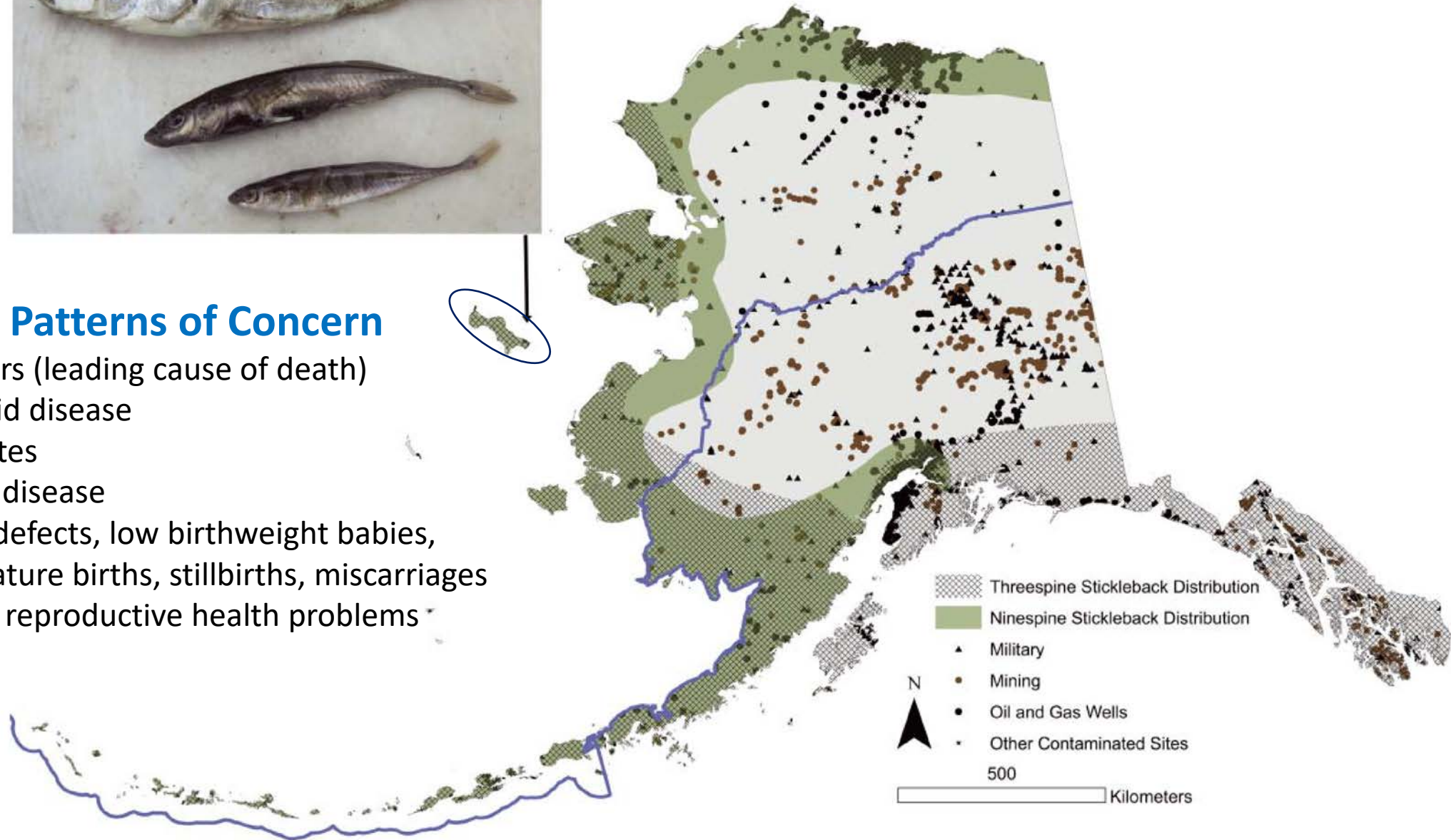
von Hippel, F.A., Trammell, E.J., Merilä, J., Sanders, M.B., Schwarz, T., Postlethwait, J.H., Titus, T.A., Buck, C.L. & Katsiadaki, I. (2016). The ninespine stickleback as a model organism in arctic ecotoxicology. *Evolutionary Ecology Research* 17:487-504.

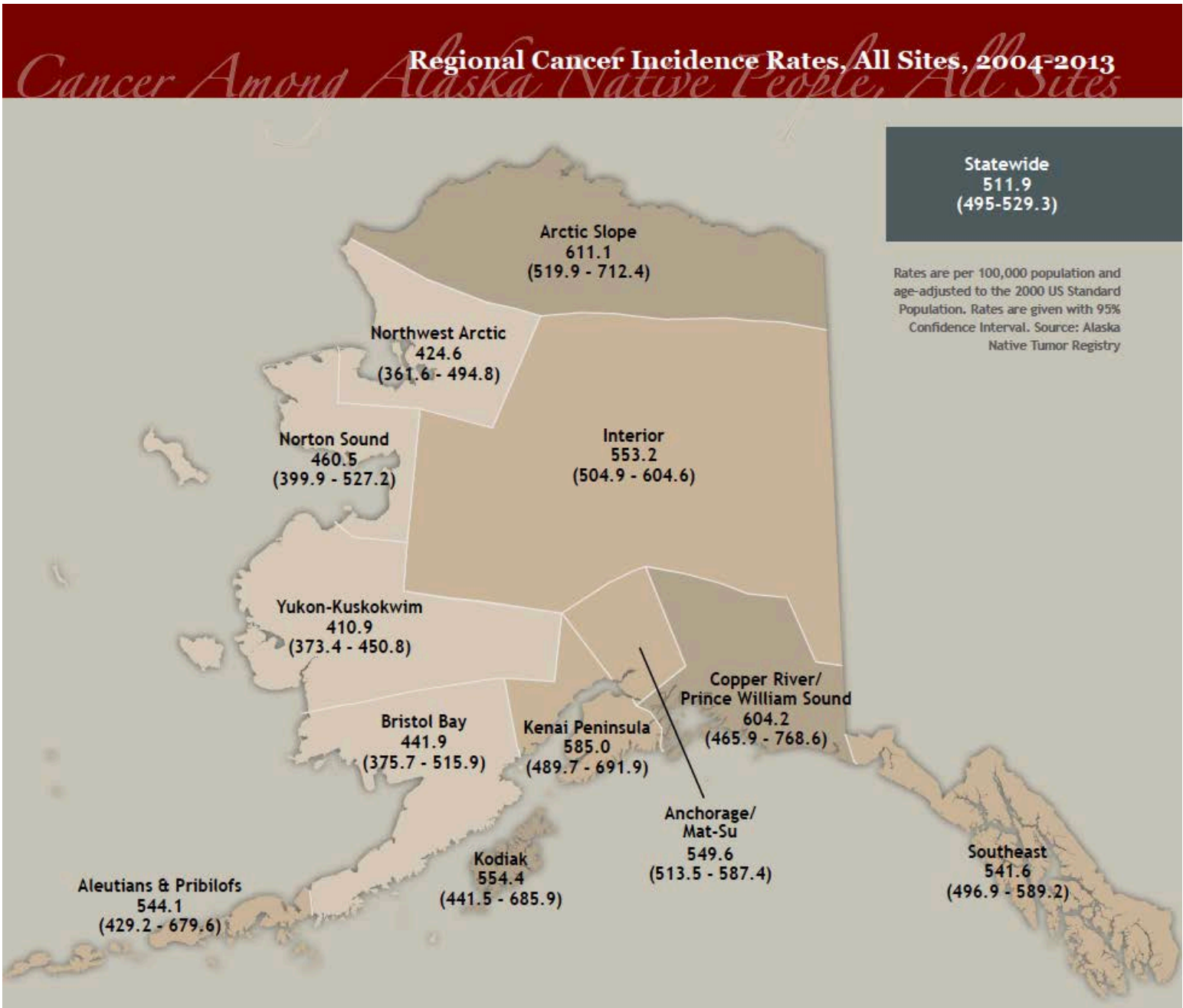


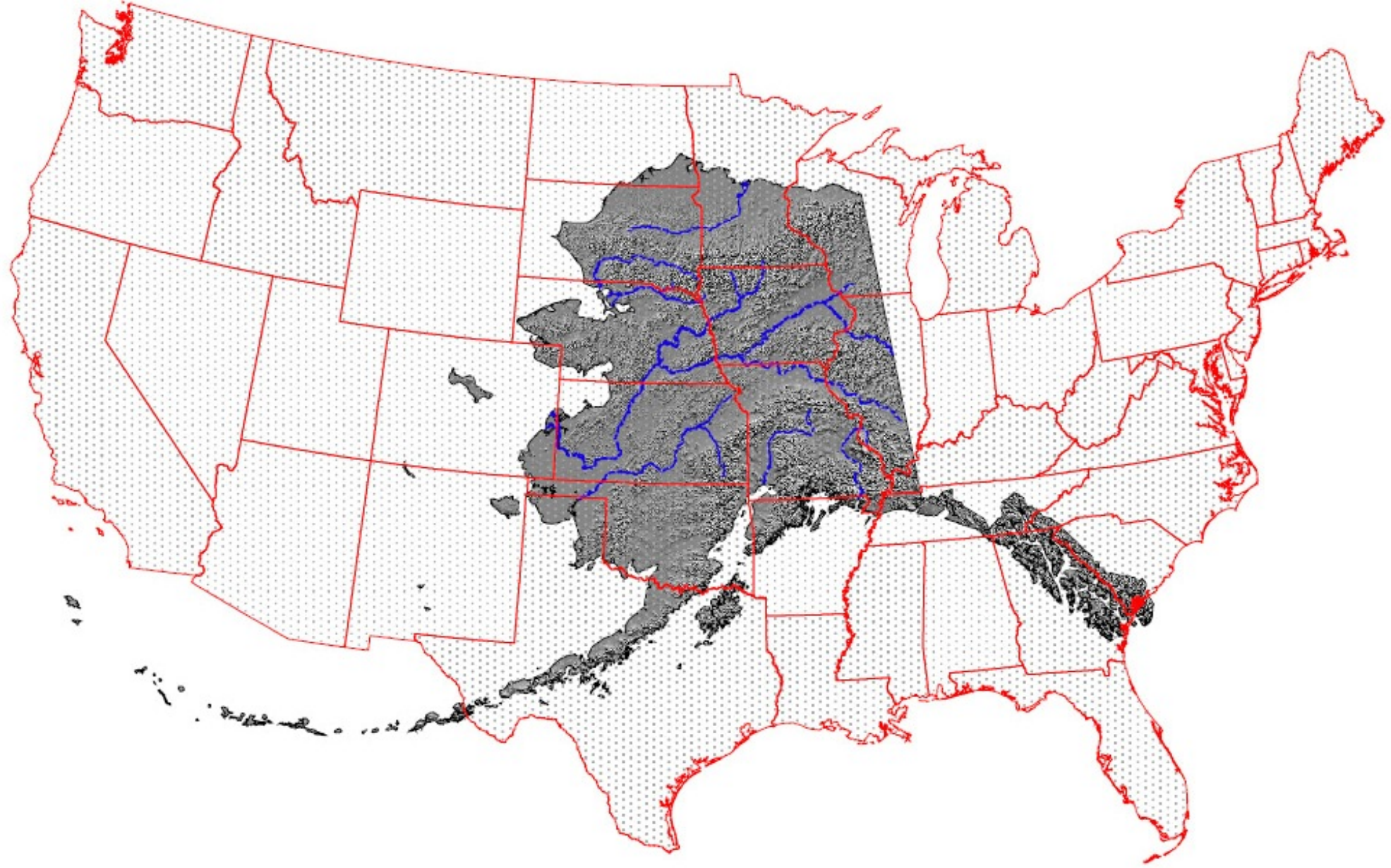
von Hippel, F.A., Trammell, E.J., Merilä, J., Sanders, M.B., Schwarz, T., Postlethwait, J.H., Titus, T.A., Buck, C.L. & Katsiadaki, I. (2016). The ninespine stickleback as a model organism in arctic ecotoxicology. *Evolutionary Ecology Research* 17:487-504.

Health Patterns of Concern

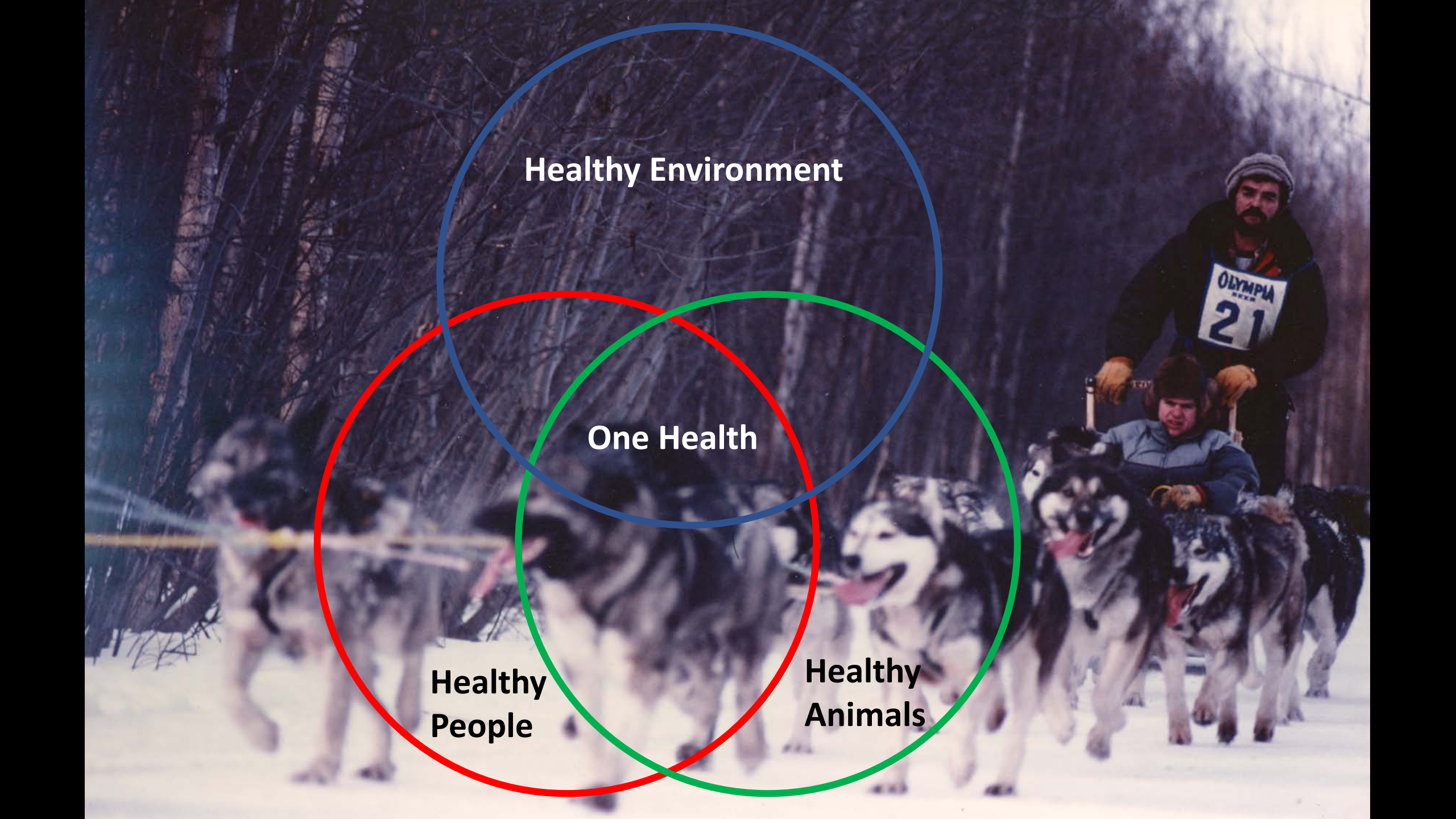
- Cancers (leading cause of death)
- Thyroid disease
- Diabetes
- Heart disease
- Birth defects, low birthweight babies, premature births, stillbirths, miscarriages
- Other reproductive health problems







500 0 500 1000 Miles

A photograph of a musher and a sled dog team in a snowy forest. The musher, wearing a dark jacket and a beanie, is pulling a sled with a smaller person on it. A team of sled dogs is running alongside them. Overlaid on the image is a Venn diagram with three overlapping circles. The top circle is blue and labeled 'Healthy Environment'. The bottom-left circle is red and labeled 'Healthy People'. The bottom-right circle is green and labeled 'Healthy Animals'. The central area where all three circles overlap is labeled 'One Health'.

Healthy Environment

One Health

**Healthy
People**

**Healthy
Animals**

What does One Health mean for people living a subsistence lifestyle?



What utility do companion animals have in subsistence communities as sentinels of human disease?

What are the roles of dogs?

People rely on dogs for (partial list):

- Transportation – reliability, expense, range & safety
 - Mail
 - Subsistence hunting & fishing, including strategy & silence
 - Safety on the ice & protection from predators
- Sport

4 Britons at North Pole After 407-Day Sled Trek

Special to The New York Times

LONDON, Sunday, April 6—
A four-man British expedition reached the North Pole yesterday after a 14-month, 1,300-mile trek by dog sledge, The Sunday Times reported today.

The newspaper, one of the sponsors of the trans-Arctic crossing, said the team arrived at the Pole at 7 A.M., Greenwich mean time (2 A.M., New York time).

The expedition set off from Point Barrow, the northernmost point in Alaska, 407 days ago and traveled by dead reckoning, using only dog sledges to haul the food and equipment.



The New York Times April 6, 1969
Expedition left from Point Barrow (1) for North Pole (2) and Spitsbergen (3).



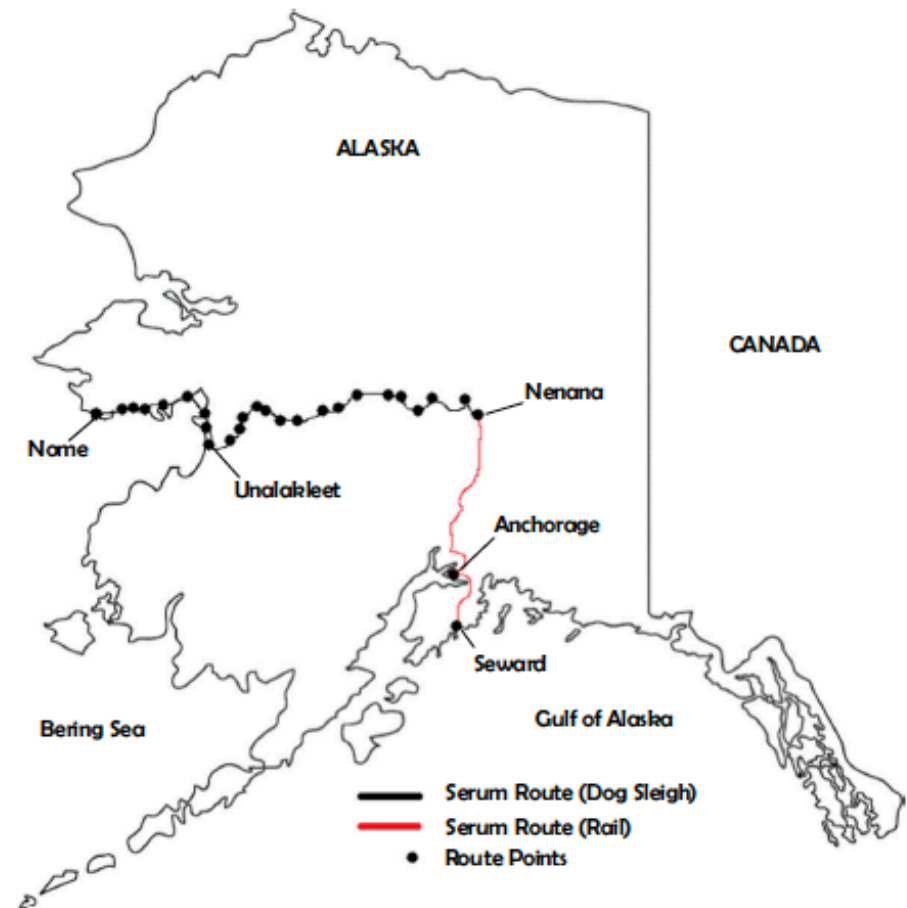
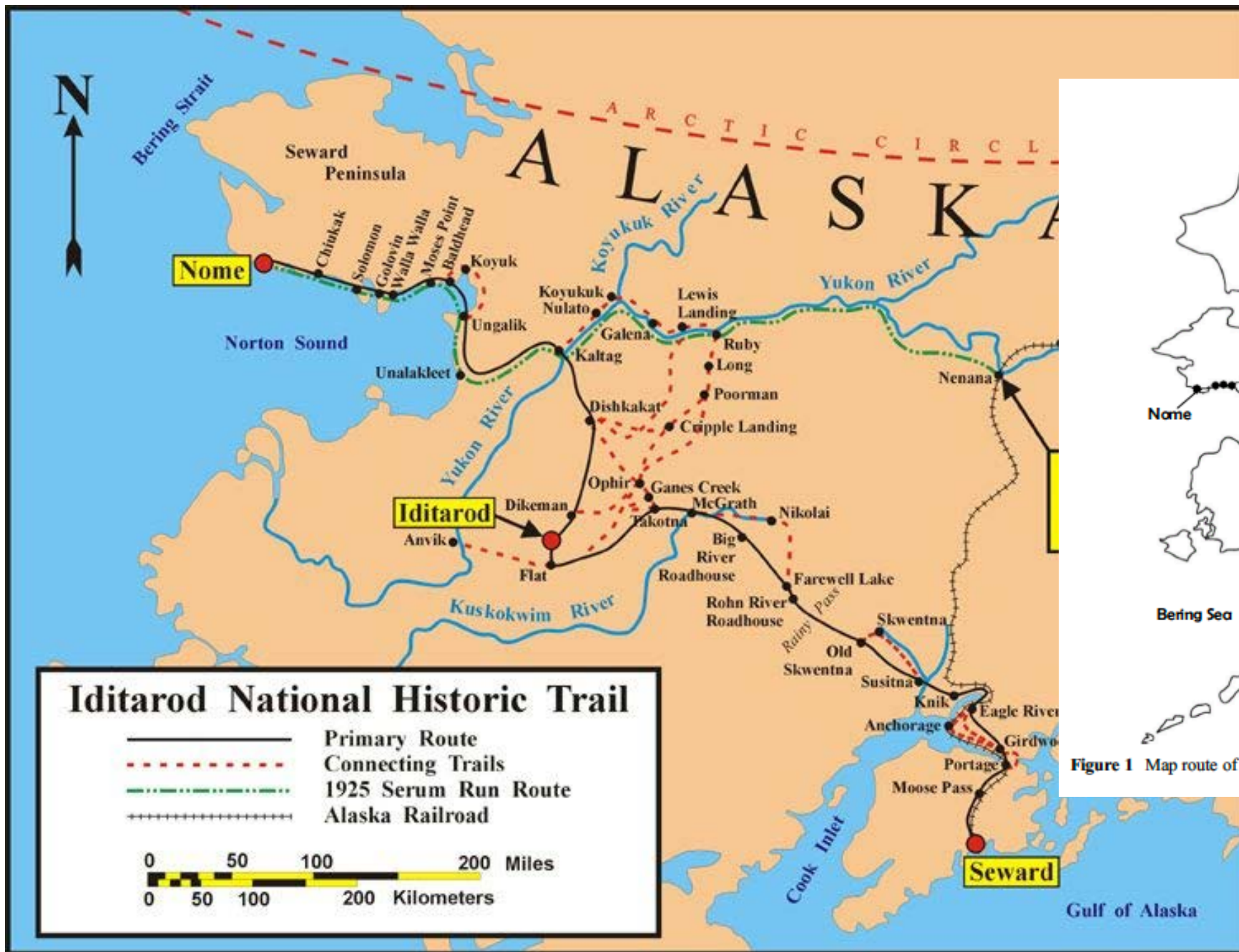


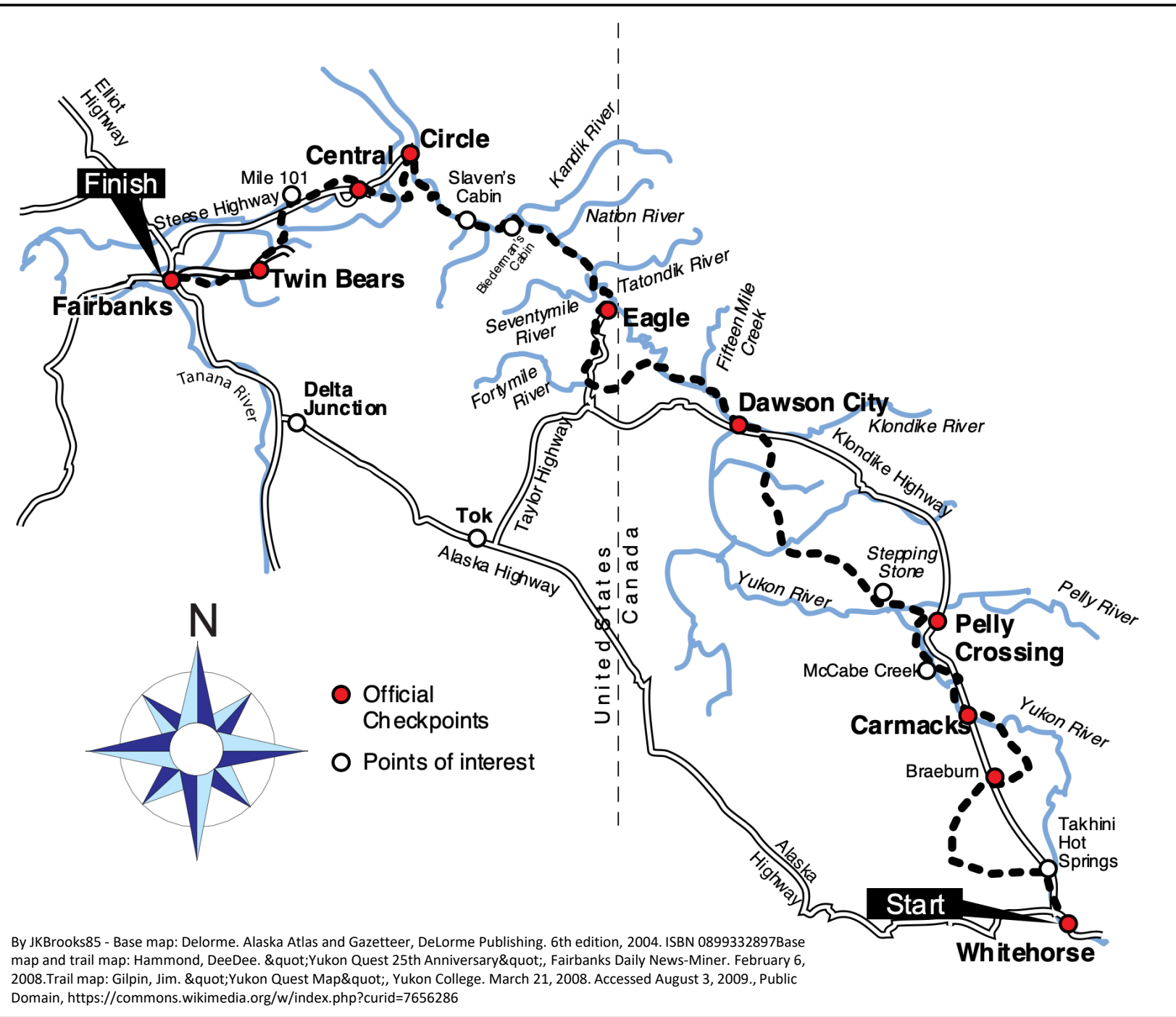
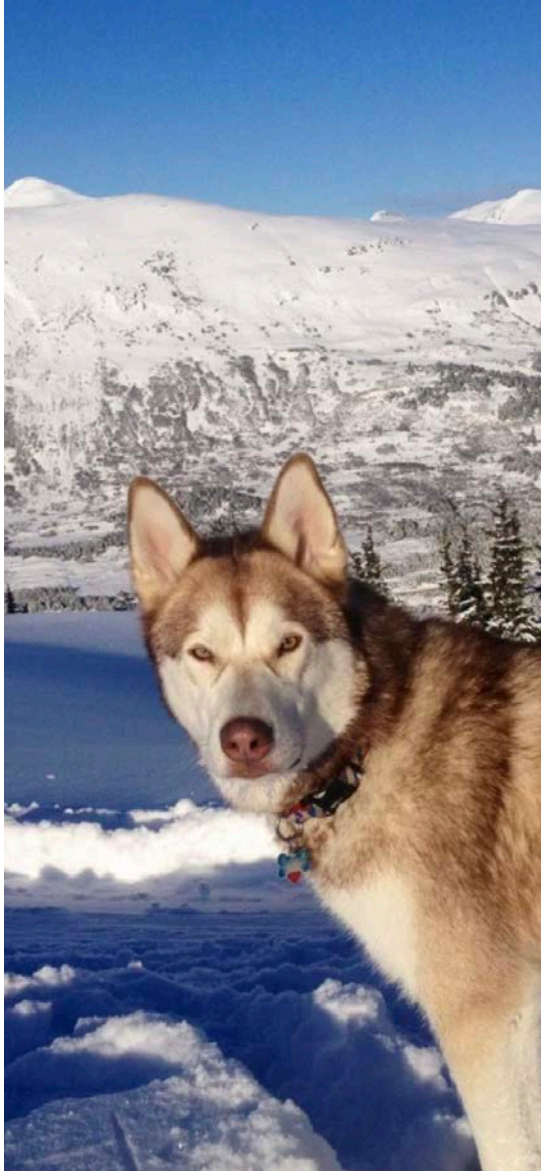
Figure 1 Map route of the 1925 Diphtheria antitoxin serum run to Nome, Alaska

J Med Humanit (2019) 40:287–296
DOI 10.1007/s10912-016-9428-y



The 1925 Diphtheria Antitoxin Run to Nome - Alaska: A Public Health Illustration of Human-Animal Collaboration

Basil H. Aboul-Encin¹ · William C. Puddy² · Jacquelyn E. Bowser³



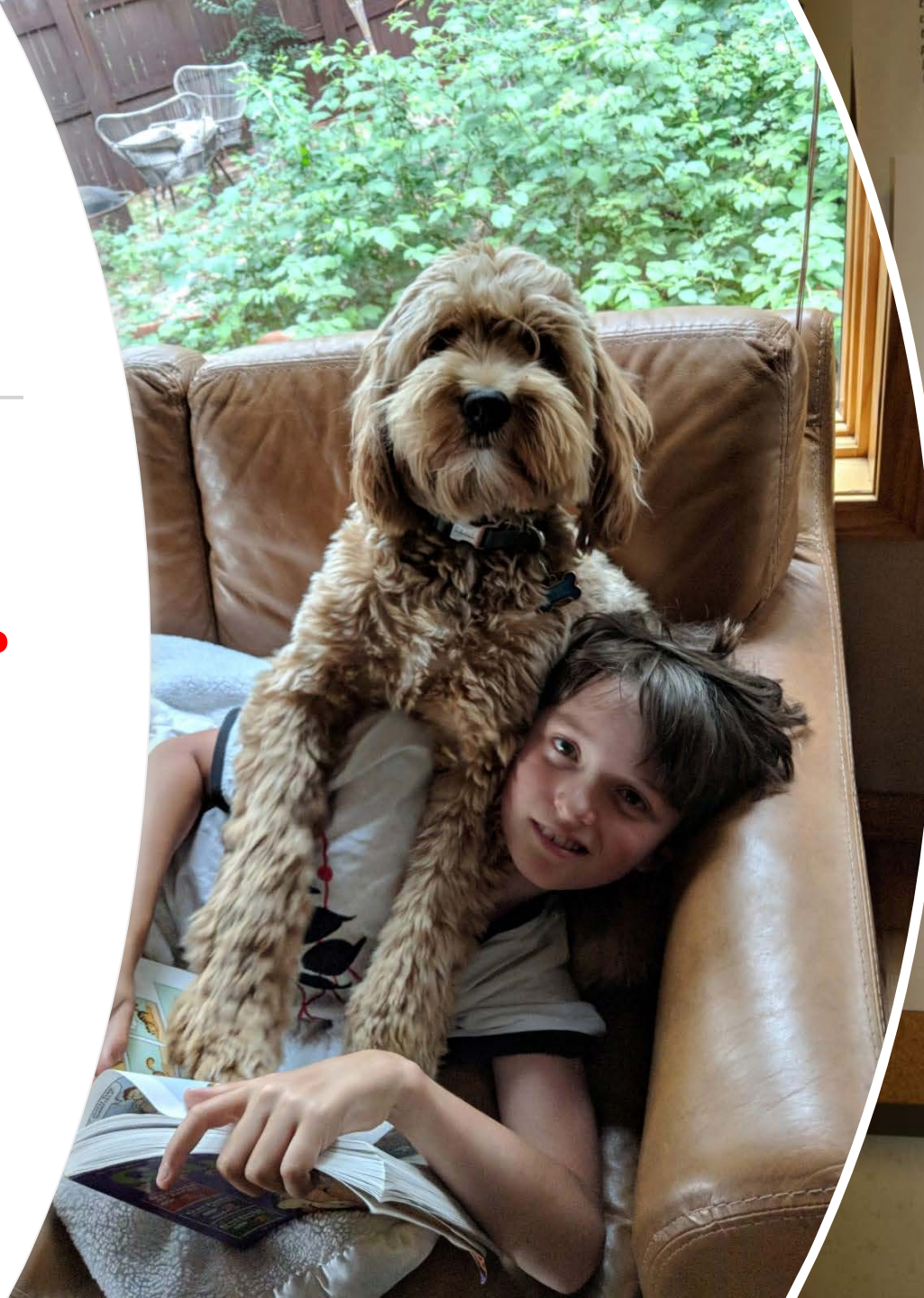


What are the roles of dogs?

People rely on dogs for:

-
- Transportation (mail, subsistence hunting & fishing)
 - Sport
 - Household economy (e.g., to buy stove oil)
 - Safety and security
 - Culture and community (gatherings of multiple villages from kids' races to televised races, festivals to funerals)
 - Emotional health (connection between musher and dogs, relying on dogs to deal with adversity)
 - Sobriety

What are the ethical issues and concerns for using companion animals as sentinels?



thousands of miles away, traveling northward in the cold climate and fat-based food web. At chemicals accumulate in the north because of the cold climate and fat-based food web. At the request of the Yupik people of St. Lawrence Island, ACAT conducted a community-based participatory research study to determine contaminant levels in traditional subsistence foods. Analyses of more than 300 samples indicated high levels of PCBs in important foods including bowhead whale, walrus, and seal.

Guest presenters:

- David Carpenter, M.D., director of the Institute of Health and the Environment at University at Albany, School of Public Health, State University of New York
- Executive Director, Alaska Community Action on Toxics
- Health and Justice Program Director, Alaska Community

****PUBLIC NOTICE****

This is a two (2) day notice to residents of Gambell. The City of Gambell will be disposing of all loose dogs that are not tied down on Friday, Oct. 28, 2011.

What are the obstacles to studying companion animals as biomonitors?

- Scientific: routes of exposure (e.g., household dust/air)
- Infrastructure: mostly nonexistent
- Ethical: lack of veterinary care (+ lack of data)
- Financial: poverty
- Practical: remoteness
- Cultural: fear of dogs
- Health: e.g., rabies, with broad host spectrum
- Conflicts in communities: traplines



What are the opportunities for studying companion animals as biomonitors?

- Scientific: routes of exposure (e.g., subsistence foods) – similar exposures in sled dogs, polar bears, and Arctic Indigenous Peoples with similar effects
- Infrastructure: improvements
- Ethical: improved access to veterinary care
- Financial: job opportunities
- Practical: remoteness can mean lack of confounding variables
- Cultural: dogs central to culture
- Health: e.g., fighting rabies (zoonoses = ~60% of human infectious diseases, >60 pathogens shared with dogs, some specialized)
- Conflicts in communities: enhancing community engagement



+ Excellent scientific literature...

How can we ensure that research does not perpetuate inequities or discriminate against disadvantaged populations?

- Community-engaged research is essential, ideally community-based participatory research (CBPR)
- Consent of the owner + community/Tribe
- Data ownership
- Benefits of the research for animal health, human health, local economy, education...
- Understanding a society that views animals in different ways
- Opportunities for collaboration, with appropriate timelines

We need a global science-policy body on chemicals and waste

Major gaps in current efforts limit policy responses

By Zhanyun Wang¹, Rolf Altenburger^{2,3}, Thomas Backhaus⁴, Adrian Covaci⁵, Miriam L. Diamond^{6,7}, Joan O. Grimalt⁸, Rainer Lohmann⁹, Andreas Schäffer³, Martin Scheringer^{10,11}, Henrik Selin¹², Anna Soehl¹³, Noriyuki Suzuki¹⁴

Many countries and regional political unions have regulatory and policy frameworks for managing chemicals and waste associated with human activities to minimize harms to human health and the environment. These frameworks are complemented and expanded by joint international action, particularly related to pollutants that undergo long-range transport via air, water, and

biota; move across national borders through international trade of resources, products, and waste; or are present in many countries (1). Some progress has been made, but the Global Chemicals Outlook (GCO-II) from the United Nations Environment Programme (UNEP) (1) has called for “strengthen[ing] the science-policy interface and the use of science in monitoring progress, priority-setting, and policy-making throughout the life cycle of chemicals and waste.” With the UN Environment Assembly (UNEA) soon meeting to discuss how to strengthen the science-policy interface on chemicals and waste (2), we analyze the landscape and outline recommendations for establishing an overarching body on chemicals and waste.

Published by AAAS



Parallels Between Climate Change & Synthetic Chemical Pollution

- Effects on the Arctic
- Declines in arctic wildlife
- Disease spread & virulence
- Intergovernmental Panel on Climate Change
- But...divergent levels of attention – political, societal, funding

