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2 Serologic survey for exposure to potential pathogens in ribbon seals (*Histiophoca fasciata*), spotted
3 seals (*Phoca largha*), and bearded seals (*Erignathus barbatus*) in the Bering Sea

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5 Authors: Heather L. Ziel¹, Tracey Goldstein², Paul B. Conn¹, Peter L. Boveng¹

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7 Author affiliations:

8 1 NOAA, Alaska Fisheries Science Center, Marine Mammal Laboratory, Seattle, Washington

9 2 One Health Institute, School of Veterinary Medicine, University of California, Davis, California

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11 **Correspondence**

12 Heather L. Ziel, NOAA, NMFS, AFSC, MML, 7600 Sand Point Way NE, Seattle, WA 98115

13 Email: heather.ziel@noaa.gov

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14 Abstract

15 Little is known about exposure to diseases or the health of ice-associated seals of the Bering Sea, which
16 include ribbon (*Histiophoca fasciata*), spotted (*Phoca largha*), and bearded seals (*Erignathus barbatus*).
17 To assess exposure to several pathogens, ribbon and spotted seals were sampled from the pack ice of
18 the Bering Sea, and bearded seals were sampled in Kotzebue Sound, Alaska. Serum was tested for
19 antibodies against phocine herpesvirus-1 (PhHV-1), phocine distemper virus (PDV), influenza A, *Brucella*
20 spp., *Coxiella burnetii*, *Leptospira interrogans*, *Toxoplasma gondii*, and *Sarcocystis neurona*. Spotted
21 seals were positive for antibodies to PhHV-1 (76.6%), PDV (41.5%), influenza A (10.6%), *Brucella* spp.
22 (9.5%), and *Coxiella burnetii* (8.3%); ribbon seals tested positive for PhHV-1 (9.5%), PDV (41.2%),
23 influenza A (4.8%), and *Coxiella burnetii* (8.0%); and bearded seals tested positive for PhHV-1 (33.3%)
24 and PDV (100%). All species were negative for antibodies to *Leptospira interrogans*, *Toxoplasma gondii*,
25 and *Sarcocystis neurona*. Our study confirms that ice-associated seals in Alaska have been exposed to at
26 least five pathogens, some of which could pose health concerns for indigenous Arctic communities. We
27 recommend continued monitoring to identify human health concerns and to monitor changes in seal
28 health that might be exacerbated by effects of climate warming.

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30 KEYWORDS baseline health, Bering Sea, changing environment, ice-associated seals, pathogen, serology

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