



Welcome to the new NSF.gov experience. [Take a brief survey <https://touchpoints.app.cloud.gov/touchpoints/f0b5f6ee/submit>](https://touchpoints.app.cloud.gov/touchpoints/f0b5f6ee/submit) to share your feedback.



<https://www.nsf.gov>

Environmental Update for USAP Personnel in Response to the Highly Pathogenic Avian Influenza (HPAI H5N1)

October 19, 2022

Summary

There is a **high risk** that Highly Pathogenic Avian Influenza (HPAI H5N1) will arrive in the Southern Ocean during the 2022/23 and 2024/24 austral summers. Current outbreaks of this disease have resulted in the deaths of hundreds of thousands of seabirds around the world. Introduction of this virus into the Southern Ocean may result in high mortality among affected seabird populations in Antarctica. There is a heightened risk of HPAI introduction or spread by infected migrating seabirds, as well as by contaminated boots, clothing, and equipment from humans. In response, the USAP is requiring enhanced biosecurity protocols in the Antarctic this season, including pre-landing surveillance, decontamination of boots and gear between seabird colonies, and reporting of suspected HPAI outbreaks to the National Science Foundation's Office of Polar Programs (OPP) Environmental team.

Background on HPAI

HPAI, more commonly called "avian flu," is a highly contagious, viral disease that causes high rates of mortality in poultry and wild birds. New strains of HPAI are generally spread rapidly along wild bird migratory pathways. As of June 2022, an outbreak of Eurasian H5 HPAI has been detected in the northern hemisphere. The outbreak has been reported domestically in 44 states and in a wide variety of species including northern gannets, geese, terns, gulls, great skuas, ducks, sea eagles, puffins and pelicans resulting in high levels of mortality.

The transmissibility of avian flu varies. In wild birds, it is transmitted via the fecal-oral route and through environmental contamination (mostly water). Direct contact and as well as respiratory droplets are both likely additional routes of transmission. The close proximity of colonial nesting seabirds leads to a greater risk of disease spread. Additionally, migratory bird species arriving to the Southern Ocean (mostly between September and November) could transmit HPAI to the region, coinciding with the arrival of penguins and other breeding seabirds.

This virus also has the ability to be transmitted to mammals. Since June 2022, high levels of mortality in harbor and grey seals, as well as other mammals, in the U.S. and Canada has been linked to the seals contracting HPAI. The National Oceanic and Atmospheric Administration (NOAA) has declared an ongoing [unusual mortality event \(UME\) <https://www.fisheries.noaa.gov/2022-pinniped-unusual-mortality-event-along-maine-coast>](https://www.fisheries.noaa.gov/2022-pinniped-unusual-mortality-event-along-maine-coast).

The Scientific Committee for Antarctic Researchers (SCAR) Antarctic Wildlife Health Working Group (AWHWG) has released a practical guide for operators who will interact with Antarctic Wildlife this year. In the guide, the AWHWG provides guidance on keeping people and animals safe. This guide is based on input from Avian Influenza experts, as well as experts in Antarctic wildlife health. To view the complete document, please consult the [SCAR AWHWG guide \(\(cgi-bin/good-bye?https://ecoevorxiv.org/8jrby/\)\)](https://ecoevorxiv.org/8jrby/) (August 2022).

Risks to Public Health

There have been 863 human cases of HPAI H5N1, with 456 deaths, between 2003 and 2021. The current circulating lineage of this virus (lineage 2.3.4.4) has been reported in humans in China, Laos, Russia, Nigeria, the UK and the U.S., with no examples of human-to-human transmission detected thus far. To date, all human infections with HPAI have been in people closely interacting directly with birds.

Risks to Antarctic Wildlife

HPAI results in rapid and high mortality in infected wildlife groups. It is possible that the virus could survive in the environment beyond the austral summer. Symptoms of HPAI in birds include loss of balance, trembling, lethargy, swelling of the head, hemorrhaging, and respiratory distress (i.e., open mouth breathing, coughing, gurgling). Field Guidance for all USAP Participants:

Before entering a wildlife colony, conduct a pre-landing/pre-entry surveillance with binoculars from 150 meters to identify unusual behavior. Common behavioral signs of HPAI include:

- Unusual mortality
- Neurological issues (loss of coordination and balance)
- Trembling head and body
- Lethargy and depression (lying down, unresponsiveness, drooping wings)
- Swollen head
- Twisting of the head and neck
- Haemorrhages on legs and under the skin of the neck
- Respiratory distress (open mouth/gaping, coughing, sneezing, gurgling)
- Closed and excessively watery eyes

For a visual example of HPAI in seabirds, please refer to this [video compilation \(\(cgi-bin/good-bye?https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNazJV9RSu5JPF8m6NL8Lyz776vJTLee2Q/photo/AF1QipMJyXwREvvecOEZlj8RjhOUkey=RI9qb01BLUdvdv1FpWVRUM09FcDhWX3JiZnZONFVR\)\)](https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNazJV9RSu5JPF8m6NL8Lyz776vJTLee2Q/photo/AF1QipMJyXwREvvecOEZlj8RjhOUkey=RI9qb01BLUdvdv1FpWVRUM09FcDhWX3JiZnZONFVR) by SANCCOB.

If signs of HPAI are detected, do not enter the colony. Note information such as the date/time/location, HPAI signs detected, approximate number and species of birds affected, and photographs and videos as possible. Report this information as soon as possible to the Station Manager and to the NSF OPP Environmental team ([OPP-ENV@nsf.gov \(mailto:OPP-ENV@nsf.gov\)](mailto:OPP-ENV@nsf.gov)).

Additional actions to prevent disease contraction and spread include:

- No USAP personnel should enter seabird colonies unless covered under an ACA permit
- Maintain at least a 5-meter distance from seabirds unless permitted to approach closer
- Do not handle dead or sick birds unless you are specifically permitted to do so and have received clearance from the NSF OPP Environmental team

- Boots and equipment should be decontaminated before and after any colony visit. This includes decontamination between colony visits if personnel visit multiple colonies within the same day
- All boots, exterior clothing, and equipment should be decontaminated with a broad-spectrum disinfectant such as 70% ethanol, Virkon S, F10, or soap + 10% bleach solution
- Refrain from sitting or lying on the ground around wildlife
- USAP personnel specifically authorized to handle sick or dead birds should assume that HPAI will arrive in Antarctica and wear appropriate personal protective equipment (PPE) during handling including gloves, mask, and eye protection
- Samples from dead or potentially infected animals should only be taken by persons who 1) have been trained to do so, (2) are wearing appropriate PPE and taking appropriate biosecurity precautions, (3) have a clear need to do so in light of an outbreak, and (4) have permits to collect diseased samples. Samples should be kept and stored away from other samples.

Additional Resources

Dewar, M. L., Dr. Wille, M., Gamble, A., Vanstreels, R., Boulinier, T., Smith, A., ... Hart, T. (2022, August 22). The Risk of Avian Influenza in the Southern Ocean: A practical guide. <https://doi.org/10.32942/osf.io/8jrbu> <<https://www.fisheries.noaa.gov/2022-pinniped-unusual-mortality-event-along-maine-coast>>

NOAA Fisheries. 2022 Pinniped Unusual Mortality Event along the Maine Coast. <https://www.fisheries.noaa.gov/2022-pinniped-unusual-mortality-event-along-maine-coast> <<https://www.fisheries.noaa.gov/2022-pinniped-unusual-mortality-event-along-maine-coast>>

SANCCOB. Highly Pathogenic Avian Influenza video of some of the symptoms.

[https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNAzJV9RSu5JPF8m6NL \(/cgi-bin/good-bye?](https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNAzJV9RSu5JPF8m6NL (/cgi-bin/good-bye?)

<https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNAzJV9RSu5JPF8m6NL%208Lyz776vJTLEe2Q/photo/AF1QipMjyXwREvvecOEZlJ8Rjtkey=Rl9qb01BLUdVb1FpWVRUM09FcDhWX3JiZnZONFVR>

[https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNAzJV9RSu5JPF8m6NL%208Lyz776vJTLEe2Q/photo/AF1QipMjyXwREvvecOEZlJ8Rjtkey=Rl9qb01BLUdVb1FpWVRUM09FcDhWX3JiZnZONFVR \(/cgi-bin/good-bye?](https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNAzJV9RSu5JPF8m6NL%208Lyz776vJTLEe2Q/photo/AF1QipMjyXwREvvecOEZlJ8Rjtkey=Rl9qb01BLUdVb1FpWVRUM09FcDhWX3JiZnZONFVR (/cgi-bin/good-bye?)

<https://photos.google.com/share/AF1QipOy82Nx4VEQs7SQNgT6QII4BL26ZREkRNAzJV9RSu5JPF8m6NL%208Lyz776vJTLEe2Q/photo/AF1QipMjyXwREvvecOEZlJ8Rjtkey=Rl9qb01BLUdVb1FpWVRUM09FcDhWX3JiZnZONFVR>

Marion Vittecoq, Hermann Gauduin, Thibault Oudart, Olivier Bertrand, Benjamin Roche, Matthieu Guillemain, Olivier Boutron, Modeling the spread of avian influenza viruses in aquatic reservoirs: A novel hydrodynamic approach applied to the Rhône delta (southern France), Science of The Total Environment, Volume 595, 2017, Pages 787-800, ISSN 0048-9697, <https://doi.org/10.1016/j.scitotenv.2017.03.165> (/cgi-bin/good-bye?https://doi.org/10.1016/j.scitotenv.2017.03.165).

Wille, M., & Barr, I. G. (2022). Resurgence of avian influenza virus. Science, 376(6592), 459-460. DOI: 10.1126/science.abo1232 (/cgi-bin/good-bye? <https://doi.org/10.1126/science.abo1232>)

The U.S. National Science Foundation propels the nation forward by advancing fundamental research in all fields of science and engineering. NSF supports research and people by providing facilities, instruments and funding to support their ingenuity and sustain the U.S. as a global leader in research and innovation. With a fiscal year 2023 budget of \$9.5 billion, NSF funds reach all 50 states through grants to nearly 2,000 colleges, universities and institutions. Each year, NSF receives more than 40,000 competitive proposals and makes about 11,000 new awards. Those awards include support for cooperative research with industry, Arctic and Antarctic research and operations, and U.S. participation in international scientific efforts.

[Get News Updates by Email <http://service.govdelivery.com/service/subscribe.html?code=USNSF_51>](http://service.govdelivery.com/service/subscribe.html?code=USNSF_51)

Connect with us online

NSF website: [nsf.gov <https://www.nsf.gov>](https://www.nsf.gov)

NSF News: [nsf.gov/news \(/news/\)](https://www.nsf.gov/news/)

For News Media: [nsf.gov/news/newsroom \(/news/newsroom.jsp\)](https://www.nsf.gov/news/newsroom/)

Statistics: [nsf.gov/statistics/ <https://nces.nsf.gov/>](https://nces.nsf.gov/statistics/)

Awards database: [nsf.gov/awardsearch/ \(/awardsearch/\)](https://www.nsf.gov/awardsearch/)

Follow us on social

Twitter: [twitter.com/NSF <https://twitter.com/NSF>](https://twitter.com/NSF)

Facebook: [facebook.com/US.NSF <https://facebook.com/US.NSF>](https://www.facebook.com/US.NSF)

Instagram: [instagram.com/nsfgov <https://instagram.com/nsfgov>](https://www.instagram.com/nsfgov)

[Research Security <https://new.nsf.gov/research-security>](https://new.nsf.gov/research-security)

[Research.gov <https://www.research.gov/research-web/>](https://www.research.gov/research-web/)

[Website policies <https://www.nsf.gov/policies/>](https://www.nsf.gov/policies/) | [Inspector General <https://www.nsf.gov/oig/>](https://www.nsf.gov/oig/) | [Privacy <https://www.nsf.gov/policies/privacy.jsp>](https://www.nsf.gov/policies/privacy.jsp) | [FOIA <https://www.nsf.gov/policies/foia.jsp>](https://www.nsf.gov/policies/foia.jsp) | [No FEAR Act <https://www.nsf.gov/od/oecr/nofearact_notice.jsp>](https://www.nsf.gov/od/oecr/nofearact_notice.jsp) | [USA.gov <https://www.usa.gov/>](https://www.usa.gov/) | [Accessibility <https://www.nsf.gov/policies/access.jsp>](https://www.nsf.gov/policies/access.jsp) | [Plain language <https://www.nsf.gov/policies/nsf_plain_language.jsp>](https://www.nsf.gov/policies/nsf_plain_language.jsp)