

## STEVEN CARL AMSTRUP

**Workplace:** USGS ALASKA SCIENCE CENTER,  
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**Life Mission:** Engage science to reconcile the ever enlarging human footprint on our environment with the needs of other species for that same environment-thereby assuring that prosperous people can live sustainably on healthy productive landscapes that provide their food, fiber, aesthetic, and recreational needs.

### University Education

<u>Institution</u>	<u>Degree Conferred</u>	<u>Date</u>
University of Washington, Seattle, Washington	B. Sc. Forest Resources (Magna Cum Laude)	10 June 72
University of Idaho, Moscow, Idaho	M. Sc. Wildlife Mgmt. <u>Thesis Title:</u> Activities of Radio-collared Black Bears in Idaho	18 May 75
University of Alaska Fairbanks, Fairbanks, Alaska	PhD. Wildlife Mgmt. <u>Dissertation Title:</u> Movements, distribution, and population dynamics of polar bears in the Beaufort Sea.	7 May 95

### Work Experience

**December 2007 to Present**

**Senior Polar Bear Scientist,** Alaska Science Center, USGS.

I am the senior polar bear specialist in the US Federal Government. I am responsible for independently formulating and guiding a broad program of integrated research on the rapidly changing arctic marine ecosystem. This program addresses management issues at national and international scales and assures that research results reach the broadest possible audience of decision makers. I use the polar bear as the Arctic keystone species to formulate new and innovative scientific hypotheses

regarding ecosystem response to the changes projected to occur in the sea ice habitat of the far north due to climate warming.

**December 1980 to December 2007:**

**Leader, Ursid and Arctic Marine Research Team**, Alaska Science Center, USGS, *(Formerly: Research Division U. S. Fish and Wildlife Service, Alaska Fish and Wildlife Research Center).*

In this post, I was the leading Arctic research scientist for the Department of Interior, and the United States' authority on technical matters relating to the biology and management of polar bears and other components of their ecosystem. I was responsible for planning conducting and reporting independent research on the general biology, life history, ecology, distribution, and population dynamics of polar bears and their prey. I recommended unilateral and international management policies and practices based on research findings. I supervised a research program consisting of several major projects with 5 full time employees. Conducting this research required extensive coordination and collaboration with all of these organizations.

**January 1976--November 1980:**

**Leader, Sharp-tailed grouse and pronghorn antelope project**, Sheridan Field Station, Denver Wildlife Research Center, US Fish and Wildlife Service.

As Project leader for grouse and antelope studies, I was responsible for conception, design, and conducting research projects intended to understand how surface coal mining in eastern Wyoming and southeastern Montana might impact populations of pronghorns and grouse. I also was responsible for coordinating activities with representatives of Montana department of Fish and Game and Wyoming department of Game and Fish to assure that research findings were directly available for management decision making processes. All research was conducted on private lands. Hence, position required extensive coordination with and permission from landowners.

**July 1975 to January 1976:**

Regional Wildlife Biologist, Utah Division of Wildlife Resources, Price, Utah.

Responsible for biological investigations and management recommendations concerning 30,000 square miles of southeastern Utah. Conducted wildlife censuses, classification counts, as well as trapping, tagging, and transplanting operations. Responsible for directing public meetings related to actions and regulations changes proposed by the Department. Also participated in law enforcement activities including issuing of citations for game law violations. Duties required public meetings, and group and individual coordination with private landowners and representatives of energy companies.

<b>RECENT ACCOMPLISHMENTS</b>
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As leader of the Ursid and Arctic Marine Research Team at the Alaska Science Center, I developed a research program that had immediate application to management issues in Alaska, and impacted polar bear research and management

around the world. This program provided numerous publications regarding the movements, distribution, denning ecology and enumeration of polar bears. These papers, many of which were firsts in the realm of polar bear science, are a fundamental part of the current knowledge base regarding polar bears and their role in the Arctic.

In 2007, I led an international team of researchers composed of scientists in multiple federal agencies, universities, and the private sector to the development of 9 reports describing the present status and projecting the future status of polar bears worldwide. These science products became the foundation for the recent decision by the Secretary of Interior to list polar bears as a threatened species under the U. S. Endangered Species Act.

<b>Skills</b>	
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<b>Research</b>	By planning organizing and completing state of the art research, by stimulating ideas for research among others in my field, and by communicating results to both technical and non-technical audiences, I have developed a 30+ year record of effective research leadership. Specific areas of expertise include: animal capture and restraint; large mammal evolution and ecology, life history and population dynamics; impact analysis; and management of interactions between human activities and wildlife.
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<b>Management</b>	Despite a career devoted to research, I have a long track record of effective management recommendations, and of working closely to help managers use the latest research findings to make appropriate management decisions. Throughout my career, I also have worked closely with private landowners energy company representatives, and representatives of Native American organizations to accomplish study objectives.
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<b>Communication</b>	I have a long history of effective written and oral communication to scientific and non-scientific groups and individuals. I have given dozens of talks and lectures to groups, ranging in technical awareness, from elementary school classes to members of the general public, to university faculties, to Capitol Hill Staff. Several of my papers were aimed at general public and semi-scientific audiences. My outreach efforts also include numerous professional television projects, and hundreds of interviews with news media from all over the world.
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<b>Leadership</b>	I have a demonstrated record of leading other professional researchers and managers as well as those making a living off
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the land, toward decisions which benefit the landscape.

### Academic Positions Held

Adjunct Full Professor, University of Wyoming, Laramie Wyoming

Associate Professor, University of Alaska, Fairbanks, Fairbanks, Alaska.

### Honors Awards and Certificates

The Wildlife Society, Wildlife Publications Award, Outstanding Article, 2005: Using satellite radio-telemetry data to delineate and manage wildlife populations (S. C. Amstrup, T. L. McDonald, and G. M. Durner, Wildlife Society Bulletin).

The Wildlife Society, Wildlife Publications Award – Outstanding Edited Book Category, 2006: Handbook of Capture-Recapture Analysis (S. C. Amstrup, T. L. McDonald, and B. F. J. Manly).

USGS Star Award, 1999

USGS Star Award, 2001

USGS Star Award, 2002

USGS Star Award, 2003

USGS Alaska Science Center Safety Champion Award 2004

USGS Star Award, 2005

USGS Star Award, June, 2006

USGS Star Award, Nov., 2006

USGS Star Award, 2007

Special recognition of my extraordinary efforts leading the work to produce the reports informing the Secretary of Interior regarding whether polar bears should be listed as a threatened species under the Endangered Species Act.

USGS Quality Step Increase 2007

Special recognition of my extraordinary efforts leading the work to produce the reports informing the Secretary of Interior regarding whether polar bears should be listed as a threatened species under the Endangered Species Act.

Secretary of Interior's Unit Award for Excellence 2007

In December 2007, the Secretary of Interior presented me (and the other

members of the team I assembled to inform the decision of whether polar bears should be listed as a threatened species under the Endangered Species Act) with this award. In his presentation, Secretary Kempthorne stated, "...The USGS was tasked with working with the FWS, the public, and the scientific community to broaden the understanding of the species before the listing decision could be made. USGS staff from the Alaska Science Center met the challenge and working tirelessly for six straight months, gathered information, undertook additional analyses, and assessed the reliability of relevant scientific models. They developed a variety of new models that merge available information on climate, arctic sea ice conditions, and polar bear habitat requirements to forecast changes in that habitat over the next 100 years. These tools significantly reduced the uncertainty associated with future polar bear population trends and will provide invaluable support to the FWS and the Department of the Interior. "

#### USGS Star Award, 2008

This award, presented by the USGS Communications Office at Headquarters, recognized my "outstanding service on behalf of the USGS, to high-level Administration Officials and Congress". Specifically, this award recognized my performance at briefings I gave on Capitol Hill, for the Council of Environmental Quality, the President's Science Advisor, the Secretary of Interior, and Director USFWS.

#### Meritorious Service Award, 2009

This award honouring my research accomplishments is to be presented February 24, 2009.

#### Interests and Activities

My main interests are outdoor activities including hunting, fishing, camping, Nordic and alpine skiing, biking, hiking, and photography.

#### Recent Published Work\*

Amstrup, S.C., B.G. Marcot, and D.C. Douglas. (*In Press*). A Bayesian network modeling approach to forecasting the 21st century world-wide status of polar bears. In, *Arctic sea ice decline: Observations, Projections, Mechanisms, and Implications*. American Geophysical Union Book Series.

Durner, G.M, D.C. Douglas, R.M. Nielson, S.C. Amstrup, T.L. McDonald, I. Stirling, M. Mauritzen, E.W. Born, Ø. Wiig, E. DeWeaver, M.C. Serreze, S.E. Belikov, M.M. Holland, J. Maslanik, J. Aars, D.A. Baily, and A.E. Derocher. (*In Press*). Predicting the future distribution of polar bear habitat in the polar basin from resource selection functions applied to 21st century general circulation model projections of sea ice. *Ecological Monographs*.

Amstrup, S. C., B. G. Marcot, and D. C. Douglas. 2007. Forecasting the Range-wide Status of Polar Bears at Selected Times in the 21<sup>st</sup> Century. U. S. Geological Survey Administrative Report, 131 pp.

Bergen, S., G. M. Durner, D. C. Douglas, and S. C. Amstrup. 2007. Predicting Movements of Female Polar Bears Between Summer Sea Ice Foraging

- Habitats and Terrestrial Denning Habitats of Alaska in the 21<sup>st</sup> Century: Proposed Methodology and Pilot Assessment. U. S. Geological Survey Administrative Report, 24 pp.
- Durner, G. M., D. C. Douglas, R. M. Nielson, S. C. Amstrup, and T. L. McDonald. 2007. Predicting the Future Distribution of Polar Bear Habitat in the Polar Basin from Resource Selection Functions Applied to 21<sup>st</sup> Century General Circulation Model Projections of Sea Ice. U. S. Geological Survey Administrative Report, 61 pp.
- Hunter, C. M., H. Caswell, M. C. Runge, E. V. Regehr, S. C. Amstrup, and I. Stirling. 2007. Polar Bears in the Southern Beaufort Sea II: Demography and Population Growth in Relation to Sea Ice Conditions. U. S. Geological Survey Administrative Report, 51 pp.
- Regehr, E. V., C. M. Hunter, H. Caswell, S. C. Amstrup, and I. Stirling. 2007. Polar Bears in the Southern Beaufort Sea I: Survival and Breeding in Relation to Sea Ice Conditions, 2001-2006. U. S. Geological Survey Administrative Report, 50 pp.
- Rode, K. D., S. C. Amstrup, and E. V. Regehr. 2007. Polar Bears in the Southern Beaufort Sea III: Stature, Mass, and Cub Recruitment in Relationship to Time and Sea Ice Extent Between 1982 and 2006. U. S. Geological Survey Administrative Report, 31 pp.
- Regehr, E. V., N. J. Lunn, S. C. Amstrup, and I. Stirling. 2007. Effects of earlier sea ice breakup on survival and population size of polar bears in western Hudson Bay. *Journal of Wildlife Management* 71(8):2673-2683.
- Fischbach, A. S., S. C. Amstrup, and D. C. Douglas. 2007. Landward and eastward shift of Alaskan polar bear denning associated with recent sea ice changes. *Polar Biology* 30(11):1395-1405.
- Amstrup, S. C., I. Stirling, T. S. Smith, C. Perham, and G. W. Thiemann. 2006. Recent observations of intraspecific predation and cannibalism among polar bears in the southern Beaufort Sea. *Polar Biology* 29(11):997-1002.
- Durner, G. M., S. C. Amstrup, and K. J. Ambrosius. 2006. Polar bear maternal den habitat in the Arctic National Wildlife Refuge, Alaska. *Arctic* 59(1):31-36.
- Amstrup, S. C., T. L. McDonald, and B. F. J. Manly (eds.). 2005. *Handbook of Capture-Recapture Analysis*. Princeton University Press: Princeton, New Jersey, 296 pp.
- Amstrup, S. C., G. M. Durner, I. Stirling, and T. L. McDonald. 2005. Allocating harvests among polar bear stocks in the Beaufort Sea. *Arctic* 58(3):247-259.
- Amstrup, S. C., T. L. McDonald, and G. M. Durner. 2004. Using satellite radiotelemetry data to delineate and manage wildlife populations. *Wildlife Society Bulletin* 32(3):661-679.
- Kern, J. W., T. L. McDonald, S. C. Amstrup, G. M. Durner, and W. P. Erickson. 2003. Using the bootstrap and fast Fourier transform to estimate confidence intervals of 2-D kernel densities. *Environmental Ecology and Statistics* 10(4):405-418.
- Amstrup, S. C. 2003. Polar bear, *Ursus maritimus*. Pages 587-610 in G. A. Feldhamer, B. C. Thompson, and J. A. Chapman (eds.), *Wild Mammals of North America: Biology, Management, and Conservation*. Johns Hopkins University Press: Baltimore, Maryland.
- McDonald, T. L., and S. C. Amstrup. 2001. Estimation of population size using open capture-recapture models. *Journal of Agricultural Biological and Environmental Statistics* 6(2):206-220.

- Durner, G. M., S. C. Amstrup, and K. J. Ambrosius. 2001. Remote identification of polar bear maternal den habitat in northern Alaska. *Arctic* 54(2):115-121.
- Amstrup, S. C., G. M. Durner, T. L. McDonald, D. M. Mulcahy, and G. W. Garner. 2001. Comparing movement patterns of satellite-tagged male and female polar bears. *Canadian Journal of Zoology* 79(12):2147-2158.
- Amstrup, S. C., T. L. McDonald, and I. Stirling. 2001. Polar bears in the Beaufort Sea: A 30-year mark-recapture case history. *Journal of Agricultural Biological and Environmental Statistics* 6(2):221-234.
- Amstrup, S. C., G. M. Durner, I. Stirling, N. J. Lunn, and F. Messier. 2000. Movements and distribution of polar bears in the Beaufort Sea. *Canadian Journal of Zoology* 78(6):948-966.
- Amstrup, S. C., and G. M. Durner. 1995. Survival rates of radio-collared female polar bears and their dependent young. *Canadian Journal of Zoology* 73(7):1312-1322.
- Amstrup, S. C., and C. L. Gardner. 1994. Polar bear maternity denning in the Beaufort Sea. *Journal of Wildlife Management* 58(1):1-10.
- Amstrup, S. C. 1993. Human disturbances of denning polar bears in Alaska. *Arctic* 46(3):246-250.
- Amstrup, S. C., I. Stirling, and J. W. Lentfer. 1986. Past and present status of polar bears in Alaska. *Wildlife Society Bulletin* 14(3):241-254.

\*A full list of publications going back to 1973 is available on request.