

# Landscape Conservation Cooperatives in Alaska

Advancing Science ~ Understanding Change

Fourth Edition ~ Fall 2012



## Arctic LCC Adapts

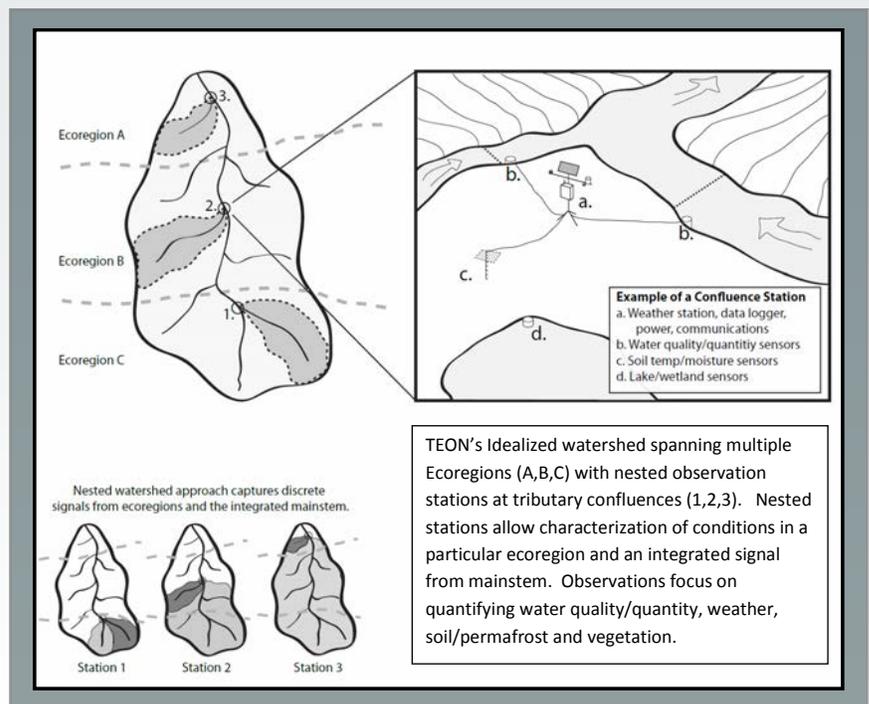
When the Arctic LCC first began supporting climate change research, we wanted to build a diverse portfolio of projects addressing both near and long-term climate information needs. After getting about three dozen such projects underway, we sought a more strategic approach that systematically builds our understanding of the linkages among physical processes and the response of biological systems

Our strategic approach is two-pronged. For prong one, we seek to develop a Terrestrial Environmental Observation Network (TEON) that gathers a broad suite of environmental and ecological data from selected locations within focal arctic watersheds representing diverse landscape settings. Such an effort will require standardized field and data management protocols. It will also require long-term buy-in from multiple sources, as full implementation is beyond the project funding capacity of this LCC. However, in implementing this network, we will be unifying a number of existing field efforts being undertaken by different agencies operating in Alaska's arctic, so costs will be offset to some degree by efficiencies. The resulting baseline monitoring will provide a foundation for a wide variety of studies aimed at addressing questions at management-

relevant scales. In particular, biophysical measurements will provide biologists with the data needed to relate species response to both short- and long-term variation in environmental conditions and incorporate the relationships into predictive models.

We are also fostering interdisciplinary studies, both within and outside of our focal watersheds that address broader questions regarding climate effects on arctic ecosystems. The Arctic LCC Steering Committee recently funded four

interdisciplinary study planning efforts that address environmental change to resources of concern to managers. These study planning efforts share a common theme: *How do the arctic's rapidly changing physical processes affect species and their habitats?* The planning efforts address high priority information needs identified by our Species and Habitat Technical Working Group. As with TEON, implementation of these interdisciplinary study plans will require buy-in from multiple partners.





*Used with permission of Frederick Otilius Olsen, Jr. Organized Village of Kasaan.*

## Science and Traditional Ecological Knowledge Planning in the North Pacific LCC

In support of identifying how and where Traditional Ecological Knowledge (TEK) can be incorporated into the work of the North Pacific LCC (NPLCC), seven TEK pilot projects were funded in the summer of 2012 throughout the geographic range of the NPLCC. One example is the Organized Village of Kasaan on Prince of Wales Island in southeast Alaska who are conducting a project to determine how climate change may affect their traditional gathering practices -- and to better understand

what changes might occur on resources important to the Tribe. Lessons learned that have been approved for sharing with the NPLCC will be provided as a case study next fall. This Alaska-based TEK project, among others, will help inform the development of the LCC's science strategy.

The NPLCC is close to completing a 4-year Science and Traditional Ecological Knowledge Strategy. The Strategy seeks to "maximize the availability of partners,

constituents, and stakeholders to make informed conservation and sustainable resource management decisions in the face of climate change and related stressors".

In developing the Strategy, the Science/Traditional Ecological Knowledge (TEK) subcommittee used an "Impact Matrix" with pairings of climate-related drivers and valued cultural and natural resources to screen a long list of potential topics to include in the Strategy. A draft list of five priority topics is being identified. In addition to science priorities, a draft set of four guiding principles were identified to ensure the final Strategy is balanced and meets the needs of all the NPLCC partners. They are:

- Focus on helping managers understand the availability and effectiveness of climate change adaptation and mitigation response actions.
- Focus on facilitating coordination, collaboration, and capacity building, and on developing or assisting with climate-related tools to assist decision-makers.
- Identify and promote opportunities to use TEK to inform partner and stakeholder decisions (like the Kasaan Village example from above).
- While exploring the effects of climate change within aquatic, marine, and terrestrial ecosystems, also consider the connections and interactions between these ecosystems.

The Science and TEK Strategy will drive the NPLCC's annual implementation plans and will be used as an outreach tool with the Climate Science Centers and other partners to help identify opportunities for collaboration. The final Strategy will be available on our website (<http://www.fws.gov/NPLCC>) later this fall.

## Northwestern Interior Forest LCC Continues International Planning Effort

Yukon College in Whitehorse hosted the first Canada-based LCC meeting. A subset of the Steering Committee (back row: left to right): Gary Larsen (US Army), Jamie Kenyon (Ducks Unlimited Canada), John DeLapp (NWIF LCC Coordinator), Bryan Maracle (Council of Athabaskan Tribal Governments), Phil Burton (Canadian Forest Service), Mark Bertram (US Fish & Wildlife Service), Trish Wurtz (USDA Forest Service), Jim Fincher (Bureau of Land Management), Steve Hartmann (Bureau of Land Management), Lenore Heppler (Bureau of Land Management); (front row: left to right): Hilary Cooke (Wildlife Conservation Society Canada), Orville Huntington (Tanana Chiefs Conference), Brian Pelchat (Canadian Wildlife Service), Maggie MacCluskie (National Park Service), Mike Spindler (US Fish & Wildlife Service), Amanda Robertson (NWIF LCC Science Coordinator).



*John Yarie of the University of Alaska Fairbanks led the NWIF LCC Steering Committee on a tour of the Bonanza Creek Long-Term Ecological Research Site near Fairbanks in August 2012. The group visited both experimental and control inventory plots in mature spruce forests and learned how climate variability results in changes in forest growth and productivity. This photo overlooks the Tanana River floodplain.*

The Northwestern Interior Forest (NWIF) LCC is currently assessing its priority resource information needs, in which the LCC is working with partners to determine commonalities in what science information is needed, at what scale, and in what format to inform local and landscape management and planning across the region. The NWIF LCC Steering Committee is holding a series of workshops to incorporate shared science and management information

needs into the LCC strategic science planning process.

NWIF LCC is convening a “Management Framing Workshop” in Whitehorse, Yukon Territory the week of October 29, 2012. The workshop will identify high priority science questions that are directly related to issues important to regional land and resource managers in their decision making and to the stakeholders who are impacted by those decisions. The prioritized information gaps identified

by this workshop will provide a basis for LCC’s subsequent Science Workshop, scheduled spring of 2013.

The Science Workshop will bring together members of the scientific and management communities to discuss the best approaches for addressing the identified science and management information needs by exploring what types of research, products and tools, and over what time period, will be most useful to NWIF LCC partners.

## The Aleutian and Bering Sea Islands LCC: Integrated Science on Alaska's Most Remote Islands

This summer's St. Matthew Expedition is an example of how collaborative, integrated science is achieved in the vast and remote region of the Bering Sea using the U.S. Fish and Wildlife research vessel, *M/V Tiġlaġ*. The St. Matthew Islands, (St. Matthew, Hall, and Pinnacle) are located in the northern Bering Sea and are part of the Alaska Maritime National Wildlife Refuge. Located over 200 miles from the nearest human settlement they are Alaska's most remote islands. In late July of 2012, the ABSI LCC participated in an integrated science expedition to St. Matthew and Hall Islands. This expedition was organized by the Maritime Refuge who visits this island group roughly every five years, primarily to conduct counts of ledge-nesting seabirds that have been monitored there since 1983.

Although extremely difficult to reach, the St. Matthew Islands have long been recognized as an area of ecological significance by indigenous people and scientists. Similar to the earliest scientific expeditions to St. Matthew,

including the Harriman Expedition of 1899, the 2012 group included thirteen scientists from a variety of disciplines ranging from Archaeology to Zoology. In addition to seabird colony counts, basic inventories of plant, insect and freshwater fish assemblages were completed alongside scientists evaluating coastal erosion and landscape change, as well as the remnants of short-lived early human settlements on the islands.

The ABSI LCC plans to showcase the abilities of the *M/V Tiġlaġ* and her crew to support integrated science throughout the area with a new interactive web portal. This portal publishes the annual vessel operations plan using an online map-based system hosted by the Alaska Ocean Observation System. It is our hope that scientists working in the region will see the possibilities in combining resources to accomplish research projects and in so doing create the type of collaborative science environment demonstrated by the St. Matthew Expedition.



Aaron Poe is now serving as permanent science coordinator for the Aleutian and Bering Sea Islands LCC after working on the Chugach National Forest for the past fourteen years as a wildlife biologist, landscape planner and in partnership development and community engagement. Over his years with the Chugach, Aaron focused on evaluating the impacts of outdoor recreation activities on wildlife habitat and populations. Aaron has B.S. degrees in Fisheries and Wildlife Management, and Geography, specializing in GIS and Remote Sensing, from Utah State University as well as a Masters in Natural Resource Management from the University of Arizona.



*St. Matthew Expedition science team and focus areas, from left to right:*

Marianne Aplin, seabirds (Alaska Maritime National Wildlife Refuge); Aaron Poe, seabirds (U.S. Fish and Wildlife Service); Heather Renner, supervisory biologist (Alaska Maritime NWR); Marc Romano, Bering Sea seabirds (Alaska Maritime NWR); Tony DeGange, fish, freshwater invertebrates and birds (U.S. Geological Survey); Monte Garroute, botany (University of Alaska Museum); Rich Kleinleder, climate and hydrology (URS, Inc.); Steve Delehanty, fish, freshwater invertebrates, and mammals (Alaska Maritime NWR); Dave Klein, geology, climate and paleo-environment (University of Alaska Fairbanks); Dennis Griffin, archeology (State of Oregon). Not pictured: Derek Sikes, arthropods (University of Alaska Museum); Casey Bickford, arthropods (University of Alaska Museum); Ned Rozell, science writer (University of Alaska Geophysical Institute)

## Detecting Thaw/Re-freeze Patterns: A New Tool for Biologists in the Western Alaska LCC

In 2011, Ryan Wilson at The Wilderness Society received funding from the Western Alaska LCC to apply recent remote sensing methods to detect thaw/re-freeze events across the state, by week, from 2001-2008 (when the satellite was decommissioned). This project is indicative of the Western Alaska LCC's commitment to integrative science that crosses disciplines, promotes collaboration and has direct link to management questions.

Thaw/Re-freeze events create a layer of ice on top of the snow which sometimes persists in layers throughout the winter. Wildlife can be impacted adversely by icing events. For example, caribou's access to forage resources and their mobility across the landscape may be reduced. Adverse impacts to caribou from thaw/re-freeze events are most likely to occur when the events are large in spatial extent, create a thick ice layer, and when winter conditions keep the temperatures below freezing for a long period of time following the development of the ice layer.

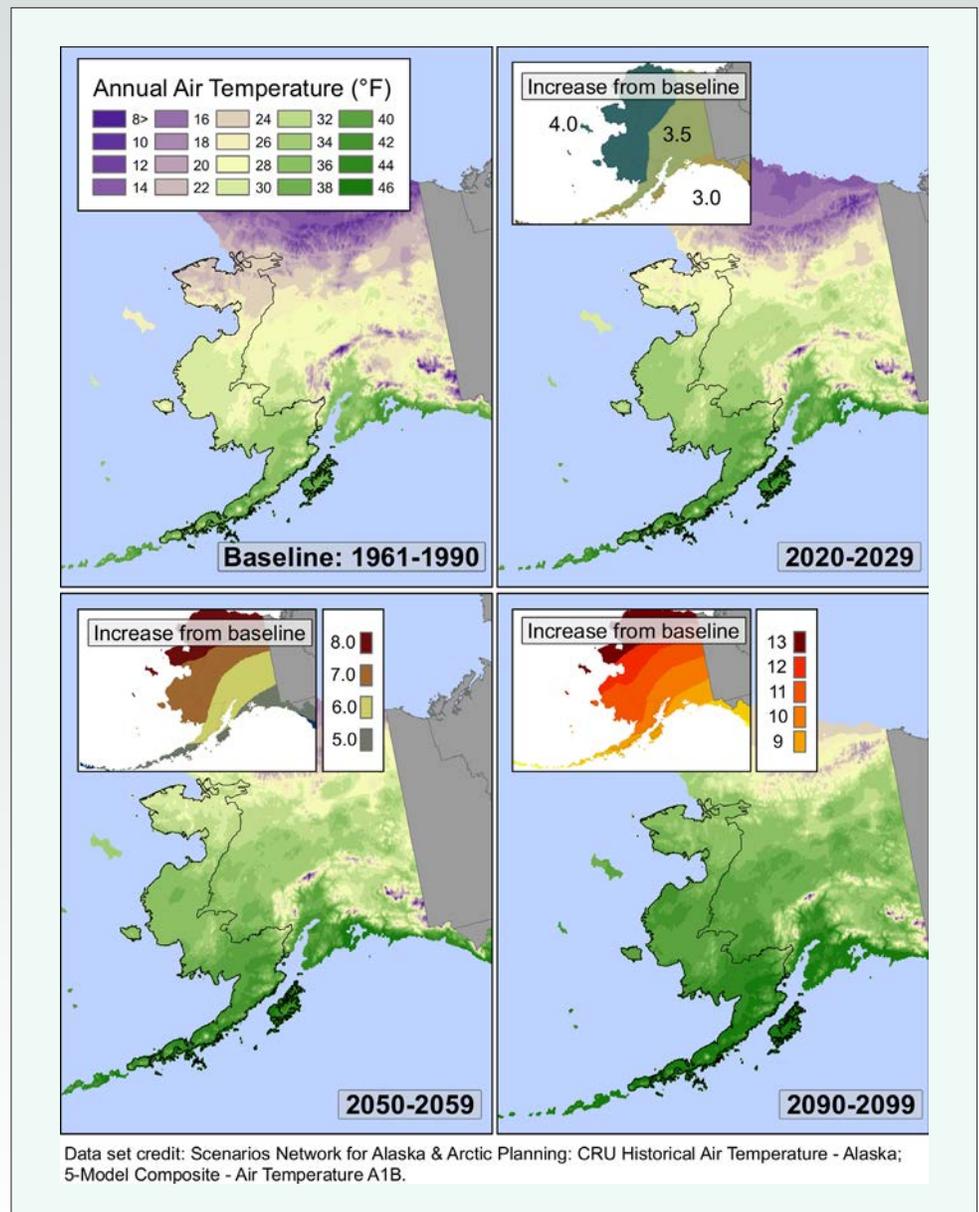
From 2001-2008, southwestern Alaska had the highest frequency of thaw/re-freeze events in the State. The events were especially common in low elevation areas adjacent to coastlines and river deltas and occurred most frequently in April. The Nulato Hills, an important wintering area for the Western Arctic caribou herd, experienced the most extensive icing events.

While this project was not focused specifically on caribou, it has relevance in making future management decisions about where snow monitoring sites may be most effective in understanding habitat changes for this important species.

Caribou are a key subsistence resource, a favored species for harvest by residents and non-residents, and an important part of the ecosystem. Caribou herd declines, like those occurring in southwestern Alaska, can create challenges in meeting subsistence and other harvest goals for both state and federal entities. Multiple factors are believed to contribute to population declines, including disease, predation, and habitat change. This project addresses an aspect of habitat quality for which little data exists and

which we expect to be affected by climate change. The resulting products, which will be made publicly available, will be valuable for researchers and managers in considering how changes in winter temperatures may affect habitat for caribou and other species.

This project is nearly complete and a final report will be available for download from <http://www.arcus.org/western-alaska-lcc> by late fall. Much of the data is already publicly accessible via the web at <http://climate.iarc.uaf.edu/geonetwork/srv/en/main.home> then search for 'icing'.



## Recent LCC News and Events



A female polar bear emerges from a maternal den near the Spy Island Development operated by Eni Petroleum, North Slope, Alaska. Photo courtesy of Eni Petroleum.

## Snow Drifts and Polar Bear Dens: Melding Biology, Physics, and Education

Polar Bears need big snow drifts for dens. On flat tundra, big drifts are rare, and it turns out, predictable. The Arctic LCC hosted a webinar on October 1, 2012, highlighting an LCC-supported project that integrates snow modeling, polar bear biology, and environmental education. The results show how agencies and industry can improve the efficiency and effectiveness of conservation measures aimed at protecting maternal polar bear dens. A series of vibrant new polar bear education materials from the project also engage children in learning a number of new skills while increasing their knowledge of polar bear ecology.

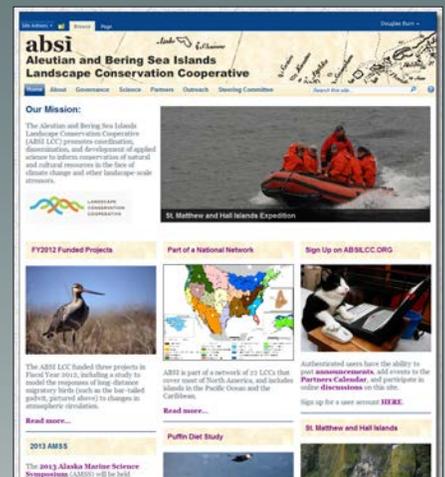
Snow modeler Dr. Glen Liston developed the denning habitat model, which mimics the physical interactions of snow, wind, terrain, and ground cover, to determine the

locations of “drift traps” capable of accommodating those pregnant polar bears that den on land. Dr. Liston worked with Craig Perham of the Service’s Marine Mammals Management program and Dick Shideler of the Alaska Department of Fish and Game to field test the model. April Cheuvront, a PolarTrec program teacher from North Carolina, worked in the field with the scientists to later develop an interactive computer-based curriculum, which teachers across Alaska and elsewhere can use for polar bear and arctic snow science education. The National Fish and Wildlife Foundation supported the field efforts.

For more information about this project or to learn more about the education materials created for it, please contact Arctic LCC Coordinator Greg Balogh at: [greg\\_balogh@fws.gov](mailto:greg_balogh@fws.gov) or (907) 786-3605 or visit [arcticlcc.org](http://arcticlcc.org).

## absilcc.org Now Live!

On October 8, 2012, the Aleutian and Bering Sea Islands LCC web site ([absilcc.org](http://absilcc.org)) went live and in color. The site, which is based on the SharePoint Foundation framework, allows for public access to information about the ABSI LCC including its governance, strategic science plan, and partners. Registered users will also have the ability to post announcements, add events to the partners calendar, and participate in online discussion forums. Visit [absilcc.org](http://absilcc.org) to sign up for a user account.



## Northwestern Interior Forest LCC Website Coming

This fall the Northwestern Interior Forest LCC is developing their first full website, also on the Sharepoint 2010 Foundation framework. Look for its unveiling this winter.

## LCC Partner Highlight: Climate Science Center

The DOI/USGS Alaska Climate Science Center (Alaska-CSC) continues to work very closely with the Alaska LCCs as we pursue our common mission of understanding the impacts of climate variability and climate change on resource management. In addition to science coordination with the LCCs, joint LCC and Alaska-CSC projects and joint workshops, the Center has also been involved in a variety of recent activities designed to meet LCC science goals. Examples include:

- In August Dr. Jeremy Littell joined the Alaska-CSC as an applied climate scientist and research lead for the Center. Dr. Littell is an expert in ecological climatology, analysis of historical climate data, and the use of climate projections in natural resource management. He comes to the Alaska-CSC from the University of Washington's Climate Impacts Group, where his research included studies of climate-fire interactions across western North America and the use of tree rings to reconstruct climates of the past 1,000+ years. Dr. Littell will serve as a primary science liaison between the Alaska-CSC and LCCs.



USGS researchers using a ground penetrating radar (GPR) to measure snow and ice volumes at Wolverine Glacier, Alaska. (Photo Credit: Shad O'Neel, USGS)

- July 16-27, 2012 the Alaska-CSC hosted its first ever "Climate Summer School" at the University Alaska Fairbanks and the International Arctic Research Center. Graduate students and post-doctoral researchers from across the eight regional Climate Science Centers examined the development and application of climate projections, with an emphasis on their use in resource management. The students were joined by a host of nationally and internationally-recognized

experts in climate science that served as classroom mentors and field instructors during the two-week course.

- Documenting the present state of snow, ice, and permafrost in Alaska is crucial for predicting and adapting to the significant climatic changes expected for this region. In turn, multiple LCCs have identified research on cryosphere variability and change as a pressing research need. As one response to this need, the Alaska-CSC is acquiring a Ground Penetrating Radar (GPR) system to support the gathering of spatially distributed observations of terrestrial snow, freshwater ice, permafrost, and glaciers in Alaska. This system will be cooperatively managed by the Alaska-CSC and University of Alaska Fairbanks, and will be used collaboratively by multiple state, federal and academic institutions.

Please contact Alaska-CSC Director Steve Gray ([sgray@usgs.gov](mailto:sgray@usgs.gov)) for additional information on any of these activities.

### LCC Partner Input Encouraged

The U.S. Fish and Wildlife Service recently released the *Draft Technical Guidance on Selecting Species for Design of Landscape-scale Conservation*, which provides information on the use of surrogate species as a landscape conservation planning tool within the strategic habitat conservation framework. The U.S. Fish and Wildlife Service will be hosting two fall workshops in Anchorage and Fairbanks on this topic. These workshops will provide Service employees and partners with an opportunity to learn more about the concepts outlined within the Draft Technical Guidance and to provide constructive feedback on the document. Input about the Draft Technical Guidance is due to the Service no later than December 7, 2012. If you are interested in more information about the Draft Technical Guidance, please contact Heather Abbey at: (907) 786-3872 or [heather\\_abbey@fws.gov](mailto:heather_abbey@fws.gov).

Lisa Matlock is the new permanent Outreach Specialist for Science Applications, with responsibilities including LCC outreach. Lisa was most recently Education Specialist for the Alaska Maritime National Wildlife Refuge. Lisa came to U.S. Fish and Wildlife Service after twelve years in various positions with the National Park Service in Alaska. She is dusting off her writing skills and jumping into web and publications design for her new assignment. Lisa holds a B.A. in English Language and Literature, with a minor in Biology, from the University of Chicago. She did her graduate work in the English Department at the University of Alaska Anchorage, specializing in Nature Writing and Science Communications.



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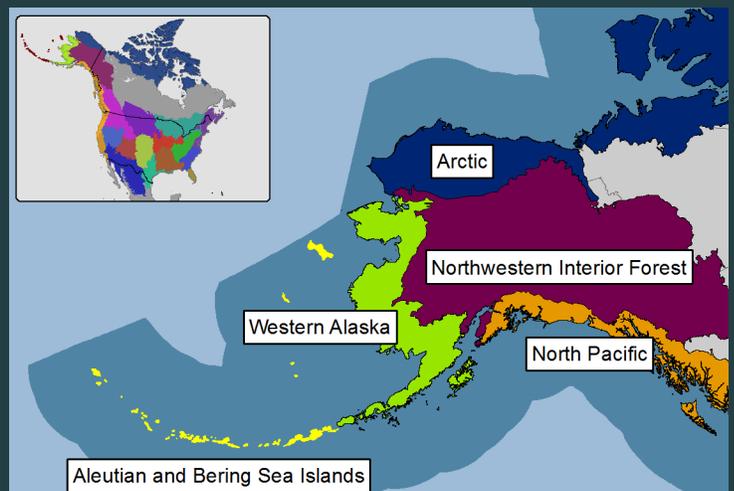
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## Landscape Conservation Cooperatives

Landscape Conservation Cooperatives (LCCs) are self-directed partnerships that link science with conservation actions to address climate change and other stressors within and across landscapes. They complement and build upon existing science and conservation efforts – such as fish habitat partnerships and migratory bird joint ventures – as well as water resources, land, and cultural partnerships. While LCCs will not assume other partner responsibilities or supersede agency decision-making, they will provide the scientific information needed to help inform the development of strategic conservation actions.



Terrestrial areas of the five LCCs within Alaska; marine area of Alaska LCCs shown in teal blue. Inset shows distribution of LCCs across the North American continent.