

## List of potential natural-resource adaptation policy options Terry Chapin

This is intended to include *all* of the policy actions that were listed in the NS policy catalogue. It does not include options that will be considered by other working groups (e.g., research and monitoring; mitigation of climate-change effects). It lumps together closely related policy options that were listed separately in the previous catalogue (see NS policy option numbers listed with each policy).

### Natural-science policy options

1. (Agriculture: NS1.8-9) Subsidize the production of foods and the expansion of markets for those products that can be produced economically in Alaska under conditions of longer warmer growing seasons. This is crucial to provide food security for Alaskans and to explore markets for new Alaskan agricultural products. For example, this might include subsidies for garden tractors/rototillers or greenhouses in rural communities that were formerly too cold for gardening; fencing or improved processing facilities for red meat production or game ranching on grasslands, tundra, or recently burned forests; or production of weed-free seed sources for export to organic farmers in the lower 48.
2. (Forest insects and diseases: NS2.5) Subsidize the capacity to use of insect-damaged timber. For example, developing the capacity to produce wood pellets from standing dry timber near urban and rural communities would make wood fuels a more economical and less-polluting alternative to diesel fuel for private and public buildings.
3. (Forest fires: 2.6-2.8, 2.15-2.17, NS3.5, NS4.7) Establish a task force of agency and urban and rural community stakeholders to assess (1) how to fund and implement changes in wildland fire management that will be required in a warmer climate and (2) engage the public in more effective fire prevention and protection.
4. (Invasive plants and aquatic species: NS2.25-27, 5.21, 5.23, 8.14) Establish a task force to prioritize actions that will prevent or slow the spread of invasive plants and aquatic species in Alaska.
5. (Loss of habitats and species to climate warming: NS4.3-4, 4.11-15, 5.33-35, 5.38, 5.43, 5.45-5.48, 6.7-11, 6.14, 6.17,6.20-22, 6.43, 7.4, 8.14, 9.1, 10.1, 10.3, 12.4) Establish a task force of agency, NGO, and community representatives to identify habitats and species at risk to climate warming and develop strategies for protection of these habitats and/or migration of these species.
6. (Reduced river and wetland water flows: NS5.9, 5.11, 5.18, 5.31, 5.36, 5.44) Establish a task force to establish priorities and actions that will reserve river water to meet multiple needs, including transportation and spawning/rearing habitat.
7. (Fish and wildlife: NS5.41, 5.52, 6.13, 6.27, 7.8, 8.13, 9.111.16-17) Establish a task force that reports to the Boards of Fish and Game of agency representatives, subsistence hunters/fishermen and sport hunters/fishermen to develop criteria for adjusting hunting and fishing regulations to accommodate effects of climate warming on abundance and timing of fish and wildlife populations; the protection of endangered species; and the harvest of new species.
8. (Sea ice forecasts: NS6.1-.2, 6.16, 6.18,6.24, 8.4) Develop a funding mechanism by which existing agencies can develop more accurate forecasts of the safety of sea ice and river ice.

9. (Commercial fisheries: NS6.25-26, 6.34-35, 6.40-41, 8.1-2, 8.5, 8.10-11) Establish a task force to assess the changes and opportunities for commercial fisheries caused by climate warming. Consider subsidies for technological and infrastructure changes needed to protect endangered stocks or to accommodate new species and opportunities.
10. (Strategies for foreign competition: NS8.7-8) Establish a task force to develop strategies for assessing impacts of, and resolving boundary disputes with, foreign fishing fleets. For example, increased presence of U.S. Coast Guard might be requested.
11. (Educate the public: NS8.17, 9.5, 10.5, 11.19) Include information on climate change effects on wildlife, fisheries, and subsistence resources in materials provided to the public by state agencies, university extension, and K-12 curriculum.
12. (Forum to report observed changes: NS9.4, 10.4, 11.18) Provide a forum for subsistence users, commercial and sport hunters and fishermen, and recreational wildlife watchers to report changes in species numbers, composition, and condition.
13. (Disease testing: NS9.6) Establish a mechanism by which subsistence users and commercial and sport hunters and fishermen can test fish and wildlife for disease incidence.
14. (Modify tourism infrastructure and information: NS11.2-3, 11.5-9, 11.11-14, 11.16) Fund information outreach to potential tourists about longer summers and milder winter recreational opportunities and provide supplemental funding to communities to provide necessary services.
15. (Climate-change training: NS12.2) Provide training state, community, or volunteer "swat teams" that that can provide advice and assistance in climate change adaptive management.
16. Review Coastal Zone Management Act: NS12.5) Review Coastal Zone Management Act and other laws to determine the need for new tools and responses for climate-change impacts.
17. Apply revenues from emission allowances to climate-change conservation: 12.6) Apply revenues from auctioning emission allowances to conserving wildlife and natural resources threatened by climate change.