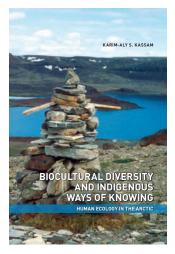


## **University of Calgary Press**

www.uofcpress.com



# BIOCULTURAL DIVERSITY AND INDIGENOUS WAYS OF KNOWING: HUMAN ECOLOGY IN THE ARCTIC

by Karim-Aly S. Kassam ISBN 978-1-55238-566-1

THIS BOOK IS AN OPEN ACCESS E-BOOK. It is an electronic version of a book that can be purchased in physical form through any bookseller or on-line retailer, or from our distributors. Please support this open access publication by requesting that your university purchase a print copy of this book, or by purchasing a copy yourself. If you have any questions, please contact us at <a href="https://www.uccpress@ucalgary.ca">uccpress@ucalgary.ca</a>

**Cover Art:** The artwork on the cover of this book is not open access and falls under traditional copyright provisions; it cannot be reproduced in any way without written permission of the artists and their agents. The cover can be displayed as a complete cover image for the purposes of publicizing this work, but the artwork cannot be extracted from the context of the cover of this specific work without breaching the artist's copyright.

**COPYRIGHT NOTICE:** This open-access work is published under a Creative Commons licence. This means that you are free to copy, distribute, display or perform the work as long as you clearly attribute the work to its authors and publisher, that you do not use this work for any commercial gain in any form, and that you in no way alter, transform, or build on the work outside of its use in normal academic scholarship without our express permission. If you want to reuse or distribute the work, you must inform its new audience of the licence terms of this work. For more information, see details of the Creative Commons licence at: <a href="http://creativecommons.org/licenses/by-nc-nd/3.0/">http://creativecommons.org/licenses/by-nc-nd/3.0/</a>

## UNDER THE CREATIVE COMMONS LICENCE YOU MAY:

- read and store this document free of charge;
- distribute it for personal use free of charge;
- print sections of the work for personal use;
- read or perform parts of the work in a context where no financial transactions take place.

### UNDER THE CREATIVE COMMONS LICENCE YOU MAY NOT:

- gain financially from the work in any way;
- sell the work or seek monies in relation to the distribution of the work;
- use the work in any commercial activity of any kind;
- profit a third party indirectly via use or distribution of the work;
- distribute in or through a commercial body (with the exception of academic usage within educational institutions such as schools and universities);
- reproduce, distribute, or store the cover image outside of its function as a cover of this work:
- alter or build on the work outside of normal academic scholarship.



Acknowledgement: We acknowledge the wording around open access used by Australian publisher, re.press, and thank them for giving us permission to adapt their wording to our policy http://www.re-press.org/content/view/17/33/

#### Α academic freedom, 3 Akilgivik (rock ptarmigan), 146-47 Alaska, 99-100, 161, 215, 219. See also academic self-interest, 31, 63, 221 Wainwright case study action research methodology, 13 Alberta, 204 community participation and, 4, Alopex lagopus, 138-39 93-94, 163-65, 186 Amaulik (common eider), 142 validity criteria in, 166 Amitukyok Lake, 136 adaptation, 29, 33-35, 39, 48, 61, 184. See also variance Amogoh (wolf), 139 cultural, 21 Amundsen Gulf, 126 cultural materialist view of, 24 analytical lens of human ecology. See human ecological lens into homo sapiens, 46-47 Angmagiak (Arctic cisco), 154 human ecology, 23-27 Anialik Lake, 144 irreversibility of, 24 animal rights groups, 105 adaptive responses, 22, 59 animal spirits, 101 Against Method (Feyerabend), 90 Aniuktuk, 153 agency. See human agency anthropology, 30-31 Agnasagga, George, 174 agro-industrial culture, 66. See also anti-trapping lobby, 105 industrial capitalism April Island, 120 Arctic blueberries, 156 Aguvluk, Gene, 173, 176, 183 Aguvluk, Raymond, 184 Arctic char, 116, 150-53 Ahangik (long-tailed duck), 147 Arctic cisco, 151, 154 Air Force Lake, 139 Arctic fox, 101, 104, 116, 131, 138-39 Aiviq (walrus), 130–31 Arctic hare, 116, 131, 137-38 Akasofu, Syun-Ichi, 81 Arctic Institute of North America, 201 Akhiatak, Winnie, 210 "traditional land use and occupancy studies," 204

Arctogadus glacialis, 154	biological and cultural diversity, 64, 222,
Aristotelian physics, 55, 74, 224	226
Galileo's challenge to, 73	biological and cultural diversity
Aristotle, 83, 193, 216	relationship, 2, 5, 13, 19, 31–45,
distinction between chrematistics and	52, 56, 59–62, 64, 90, 192, 204,
oikonomia, 28	222, 226–27
The Nichomachean Ethics, 80	contextual nature of, 77
Aristotle's notion of phronesis. See	natural resource exploitation and, 44
phronesis	niches, 42
Armstrong, Neil, 20	relations between, 18
Atlantic College in Bar Harbor, Maine, 25	third space between, 209, 216, 220 threats to both, 3, 17
Attar, Farid ud-Din, Manteq at-Tair,	biological and cultural evolution
227–30	human agency, 52
Aunnagruk (high tide with southwest wind), 176	biological diversity, 3, 33, 35–36. See also biological and cultural diversity
Aurora Borealis, 81	relationship
averages, 46, 52–54, 61	adaptation and variance, 61
	Darwin's appreciation of, 34
_	defining, 36–37
В	"hotspots," 37
Baconian empiricism, 74	loss of, 27, 36
balance of nature, 47, 61	species as indicator of, 12
Banks Island, 103, 127, 140, 145	willful blindness to, 5
Barrow, 163, 169, 176	wonder at the variety of life, 61
Bateson, Gregory, 52	biological sciences, 32
Mind and Nature, 68	biotechnology, 27
Bathurst Inlet, 99	birds, 140–48
bearded seal, 124-26, 168-69, 171	hunting methods, 140–41
beluga whale, 129–30, 168, 208	preparation and storage, 140-41
Berger, Thomas, 106–7, 204. See also	sharing of the catch, 141
Mackenzie Valley Pipeline	waterfowl behaviour, 165
Inquiry	blackberries, 156
indigenous land claims and, 201	Blake, William, 63-64, 74
Northern Frontier, Northern	blood-feud, 102
Homeland, 203	Blossom Shoal, 176
reliance on testimony from Inuit	blubber, 97–98, 120–23, 125
hunters, 208	Boas, Franz, 200–201, 205
Berkley Point, 125, 132	on Inuit map making, 195
berries, 116, 156	Bodfish, Barry, 171, 180, 183
biodiversity. See biological diversity	Bodfish, Homer, 163
biolinguistic diversity, 43. See also	bola, 140
linguistic diversity	Boot Inlet, 136
	Boulding, Kenneth, 20

bowhead whale, 175	Childress, June, Passing On The
requirement for calm weather and	Knowledge, 215
strong ice, 168	Chipewyan language, 12
social change and, 50	Chipewyan map makers, 194
spiritual interchange with, 85	chrematistics, 28, 216
traditional techniques combined with	Christianization, 101
aluminum boats, 88	Chuckchi Sea, 161
bows and arrows, 102, 132, 135-36, 140	Chukota Peninsula, 1, 212
brant, 148	emergency relief efforts, 2
Branta bernicla, 148	'civilization,' 8, 66, 102
Branta canadensis, 144	"clash of civilizations" hypothesis,
Bravo, Michael, 207	4–5
breathing-hole sealing, 100	Clangula hyemalis, 147
British Ecological Society, 20	classification, 53-54
Brody, Hugh, 68, 76, 205	indigenous vs. scientific, 39
The Other Side of Eden, 41	Clements, Frederick, 20
Burch, Tiger, 99-100	click languages of Africa, 55
Burgess, Ernest W., 30	climate change, 4, 7, 159–89, 199, 225
	challenge to sharing, 186
	effect on quality of fur, 168
C	effect on subsistence harvesting
Canada goose, 116, 144	activities, 168, 183
Canadian national anthem, 7	erratic weather patterns, 174, 184
cannibalism, 9	human ecological implications, 14,
Canus lupus, 139	160, 162, 183, 186
Cape Bering, 144	impact on safety and cultural
capelin, 150	survival, 183–84, 186–88
caribou, 101–2, 104, 116, 131–35	local observation, 170
decline, 102–3, 133	and marine mammal calving and
interbreeding with reindeer, 66	migration patterns, 184
sharing, 132	and pressure on harvesting of
speared from kayaks, 133	terrestrial mammals, 184
staple food, 132	source of stress, 184
"causal-functional integration," 49	Wainwright, Alaska, 159–89
Centre for Indigenous Peoples' Nutrition	warming trends, 168, 173
and Environment (CINE), 114,	Clupea harengus, 155
116, 125, 132, 136, 138, 152, 154	co-management
changing weather. See climate change	of Arctic char, 51–52
char, 116, 150–52. See also Arctic char	Fisheries Joint Management Committee, 107
char fishing	
important subsistence activity, 150	of natural resource use, 106
chemical pollutants, 64, 95–96, 199, 210,	Co-operative store, 137
214	Coast Point, 143–45, 147–48
Chen caerulescens, 145	cod, 151, 154

"coldspots," 37, 55	context-dependent knowledge, 13, 80,
commensurability, 201, 217-18	162–63
with indigenous knowledge, 207	context of the Arctic and sub-Arctic
in map making, 195	significance of, 64-65
common eider, 116, 142	context-specific knowledge, 164
common loon, 142-43	Convention on Biodiversity. See
communication technologies, 66, 207-8,	Convention on Biological
217	Diversity
communities of inquirers, 166, 209, 223–24	Convention on Biological Diversity, 21, 36, 66
communities of social practice, 166, 208–	conservation ethic, 22
9, 217, 224	Copernican point of view, 81
community, 23	Copper Inuit, 67, 98, 119, 133
full partner in human ecological	diversity, 99
research, 224	seasonal migration, 100
community freezers, 135, 140-41	sharing and co-operation, 101
community of experts, 206. See also	Coregonus autumnalis, 154
communities of inquirers; expert	Coregonus clupeaformis, 154
includes subsistence hunters, 188	Coregonus nasus, 154
community of practitioners. See also	cranberries, 156
communities of social practice	cranes, 140
subsistence hunters, 188	creative activities
community participation and action	as indicatory of cultural diversity, 38
research, 93-94, 163-66	Cree language, 12
community ownership of research	"The Cremation of Sam McGee"
results, 95	(Service), 6
role of community researchers, 95	cross-cultural communication
complex connectivity, 48, 56–57, 67–68,	mediating symbols for, 209-12, 218
100, 216	cultural adaptation, 21
in indigenous knowledge, 86	cultural and biological diversity. See
complex interconnectivity	biological and cultural diversity
between biological and cultural, 63	cultural and ethnic consciousness, 4
of culture and nature, 187, 222	cultural anthropology, 200
The Concept of Mind (Ryle), 75	cultural behaviour
Conference of the Birds. See Manteq at-	effects on environmental phenomena
Tair (Attar)	30
connectedness, 59	cultural diversity, 5, 10, 38-39, 61. See
conservation, 200, 226	also biological and cultural
conservation biology, 33	diversity
conservation ethic, 22	in Arctic and sub-Arctic, 43
Consilience (Wilson), 32	extinction (prospect of), 32
context, 68, 71, 79, 89–90	language as indicator, 12
context as basis for relations, 72–74	cultural ecology, 31
context-dependence, 82	cultural identity, 39

cultural materialism, 24, 31, 45, 48, 61	diversity, 24, 60, 89-90, 220, 222
cultural system, 82	basic to mental perception, 72
culture, 49	basis of knowledge, 69
agricultural meaning, 38	biolinguistic, 43 (See also linguistic
artistic and intellectual practices, 38	diversity)
as aspect of nature, 17 (See also nature	conservation of, 69
and culture)	constant sense of becoming, 36
categorized as language, 57 (See also	contradictory meanings, 32
language)	culture and, 54 (See also biological
central to production of human	and cultural diversity;
animal, 46	cultural diversity)
changeability, 52	ecological (See ecological diversity)
definitions, 54	of Inuit human ecology and way of
honour and worship meaning, 38	life, 99–100
plurality and, 38	loss of, 27, 36
culture and nature as seamless reality, 18	preservation of, 56
Cumberland Sound Inuit, 67	standardization of, 52–53, 55
currents. See wind and currents	undesirable in Judeo-Christian
Cygnus columbianus, 145	creation narrative, 32–33
	diversity and perception, 68–69
	Dobzhansky, Theodosius, 53
D	Dogrib language, 12
Darwin, Charles, 14, 34-35, 39, 55, 73, 90	dogs and dog teams, 101, 129, 135
case study approach, 225	sniffing out seal holes, 121
death as synonymous with idea of the	used to distract polar bears, 127
north, 8	"dominion" over nature, 37
Delphinapterus leucas, 129–30	Doodlik (yellow billed loon), 142–43
democratic decision making, 22	double entendre, 193
demography, 65, 104	double hermeneutic, 197, 212, 218, 226
Dene, 203–4	double-loop learning, 82, 205
dependency based on exploitation, 103–5	Dreyfus, Hubert L., 79–80
determinism, 48. See also cultural	Mind over Machine, 77
materialism; human agency	Dreyfus, Stuart E., 77, 79-80
Diamond Jenness Peninsula, 132, 136,	ducks, 140. See also common eider; king
139, 144–45, 153	eider
diamonds, 64	
diet, 65, 104, 114–15. See also Centre for	E
Indigenous Peoples' Nutrition	ecological diversity, 11-12, 36
and Environment (CINE)	prospect of extinction, 32
store-bought food, 116	ecological economics, 28
tobacco, sugar, and flour, 103	ecological management
dietary benefit and risk questionnaires	adaptive 'learning-by-doing'
and surveys, 114	approach to, 22
disease, 65-66, 99-100, 102-4	ecological niches, 21

ecological restoration, 27	European explorer-geographer maps,
Ecological Society of America (ESA),	205-6
20, 27	European superiority myth, 205-6
ecology	Evitakik/qaqhuaq (red throated loon),
definitions, 19-20	142–43
recognition as a science, 20	evolutionary thinking, 34–35, 46, 55, 73.
economic development, 4, 65. See also	See also theory of evolution
resource development	exception as basis of diversity, 55
diversity as threat to, 33	experience, 79
economics, 28	experiential knowledge, 68, 75
ecosystem management, 27	expert, 39, 47, 54, 78–79, 102, 107, 166,
ecosystems, 20–22, 201–22	203, 208–9
egalitarianism (cultural norm of), 68	community of experts, 182, 188,
eggs, 141, 148	205–7
eggs (Arctic char), 153	hegemony of, 74
eider. See common eider; king eider	subsistence hunters as, 166, 224
Einstein's theory of general relativity, 81	
Eleginus gracilis, 154	
emergency relief efforts, 1–2	F
empirical tendency, 86–87	family allowances, 103
'empty lands,' 9, 206, 217	Feyerabend, Paul, Against Method, 81, 90
environment, 4	Finland, 2
as field of competing stakeholder	fish and fishing, 101, 149-55
interests, 29	preparation and storage, 149-51
environmental economics, 28	Fish Lake, 139, 150
environmental psychology, 30	fish weirs, 149
environmental stress, 36	Fisheries Joint Management Committee,
episteme, 80–82	107
Erignathus barbatus, 124–26	fishnets, 103, 154
Eskimo-Aleut languages, 43	Flyvbjerg, Bent, 77, 79, 82
Eskimo potato, 156	folk-ecology, 84
essentialist categorization of culture as	food consumption and preferences
language, 57	(traditional/country and marke
ethical values, 83	food), 114–15
ethics, 39	food sharing and co-operative hunting,
ethnobiology, 84	101. See also sharing
ethnobotany, 84	foods from subsistence activities
ethnoecology, 31, 84	continued importance, 114
ethnographic research, culture of, 217	Fort McKay First Nations, 204
ethnohistory, 84	Foucault, Michel, 192-93
ethnoscience, 84	fourhorn sculpin, 155
Euro-American culture as pinnacle of	fox, 168. See also Arctic fox
civilization, 8	Franklin expedition, 8, 206
European Enlightenment, 32	

6 0 0 0 1 5 5	
frontier prospective of the north, 5–7,	Н
200, 202, 204	habitat alteration and destruction, 27
expectation of riches, 6, 194	Haeckel, Ernst, 19
fur trading, 96. See also Hudson's Bay Company	Halahikvik, 139, 144
Company	Harley, J.B., The New Nature of Maps, 191
•	Harmon, David, 45, 53
G	In Light of Our Differences, 38
Gadus ogac, 154	harmony with nature, 47
Galilean physics, 55, 74	harpoons, 127, 132
Galileo, 13, 90	Harris, Marvin, 24
Galileo's experiments	Hawley, Amos, 23-25, 27, 52
case study approach, 225	Human Ecology, 29
validation by communities of social	Hearne, Samuel, 194
practice, 224	Hedysarum alpinum americanum, 156
gasoline engines, 102	Helen Kalvak School, 114
Gavia adamsii, 142–43	heredity, 45
Gavia immer, 142–43	herring, 151, 155
Gavia pacifica, 142–43	Hingelik Lake, 144
Gavia stellata, 142–43	Hinigouk, 144
Geertz, Clifford, 49, 54, 73, 82	holism, 20, 46, 60, 219
geese, 140, 145	Holling, C.S., 59
geography, 29	Holman Eskimo Cooperative, 105
as a language, 193	Holman Island, 136, 147
George's Island, 132	homo sapiens. See also humans
gillnets, 154	cultural adaptation, 21
global climate change, 27, 64, 187–88	cultural and biological evolution, 46
global market system, 37	"professions" within ecosystems, 21
globalization, 44, 64, 66	Horizon Islets, 127
gnosis, 72	"hotbeds" of languages, 43
gold, 64, 214	"hotspots," 37, 43
Goose, Bill, 202	houses, 103
Goose, Roy, 104	Hudson's Bay Company, 194, 205
Goose, Wallace, 107	Hudson's Bay Company trading posts,
government employment, 103	98, 101–2, 104
Grand Roy, 106	Hudson's Bay store in Ulukhatok, 103
grayling, 150	human agency, 24, 52, 58, 185, 212
Great Bear herd (caribou), 132	denial of, 46, 48
group identification, 38	determinism vs., 58
Grus Canadensis, 146	through reflexivity, 81
Gunderson, Lance, <i>Panarchy</i> , 59	and transformation, 225-26
	human ecological lens, 86, 90, 182, 221, 223
	human ecological map vs. topographical maps, 200

human ecological mapping, 15, 191, 195 transformation of knowing how to knowing that, 191 action research and community participation in, 209-16 women and vulnerable groups, 220 biological and cultural connectivity, human ecological perspectives in 199 anthropology, 30-31 co-option possibilities, 220 human ecological research, 94-96 human ecology, 4, 12-14, 18, 22-28, 45, communication across cultures, 195, 60, 67, 77, 158 adaptation, 23-27 communicative for both producers and users, 196 analytical lens of (See human context-dependent, 196 ecological lens) deep connectivity of a specific group for the Arctic and sub-Arctic, 65-68, within a specific bio-region, associated with the social sciences. double hermeneutic, 197, 209, 212, 27, 31, 60 218, 226 bridge between biological and empowerment, 212, 214 cultural, 163, 221 historical significance in Canadian complex connectivity, 85-86 north, 192 context-dependent, 13, 51 human agency, 212, 218, 226 context specificity, 85 intergenerational transfer of development and, 65-66 knowledge, 192, 199, 209, diet, 65-66 215 - 16disease, 65-66 Iñupiat of Wainwright human as a field of sociology, 23, 29 ecological map, 213 first appearance of term, 30 mediating symbols in, 209-12 geographical conception of, 29 outside the domain of geographergoals in, 51 conqueror, 191 interdisciplinary study, 25–26, 31 political and legal support as interpretive, 89 requirement, 219 living through relations, 79 power to transform perception, 198, political decision-making and, 66, 201 202, 213, 218 potential to be 'third culture,' 60, 221 realignment of power and knowledge prominence in Chile and India, 30 relationships, 192, 200, 215, reconceptualizing, 63, 65 218, 226 significance to issues of indigenous reclaims the 'other,' 196, 217 rights and land claims, 202 reflexivity, 197, 218 territorially based, 23 represents practical knowing or thread linking culture with nature, 96 phronesis, 196, 198, 215-16 Ulukhaktok, 104, 113, 117-93 source of authority in exerting understanding through Indigenous indigenous rights, 214 knowledge, 68, 83-88 third space, 200, 209, 216, 220 Human Ecology (journal), 25 traditional land use and, 198-200, Human Ecology (Hawley), 29 203-4, 208, 213-14, 218 Human Ecology: Steps to the Future (Conference, 1988), 27

human ecology and climate change, 170	cumulative nature of, 84, 87-88
human footprint, 18	diversity of terms for, 84
human geography, 29	empirical tendency, 84, 86-87
human rights, 4, 39	Iñupiat knowledge of sea-ice, 166
humanitarian approach to knowing,	kindred spirit with other living
222–23	creatures, 85
humanities and sciences	loss of, 40
poor communication, 27	plurality, 84
humans. See also homo sapiens	practical and effective use of, 189
biological evolution not independent	recognition by scientists, 74
of cultural evolution, 46	relevance, 159, 188
integral components of many	remains intact, 158
ecosystems, 22	sharing with university researchers,
hunter-gatherers, 76	84
home is already Eden, 41	specificity, 84
Hunters and Trappers Association of	technological, 84
Holman Island, 150	understanding human ecology
Hunters and Trappers Committee	through, 83-88
(HTC), 108, 113, 117, 135	value of, 159, 170, 182, 186
Hunters of the Northern Ice (Nelson), 75	working in tandem with, 22
hunting and gathering. See subsistence	indigenous knowledge / scientific
hunting and gathering	knowledge dichotomy, 58
hybridity, 58	indigenous lifestyle. See also subsistence
	hunting and gathering
I	resilience and sustainability, 7, 157
ice fishing, 153	indigenous rights, 4, 64. See also land
ice formation. See sea-ice	claims
icons, 210-11. See also mediating symbols	industrial capitalism, 7
Icy Cape (Qayiaasqsigivik), 163, 176, 181	industrial social complex, 22
identity, 53–54	infanticide, 102
Ihuuhuk (lake trout), 153	influenza epidemics, 66, 103
Ikmallik (Inuit mapmaker), 194, 205	Ingold, Tim, 69–70
Iligliuk (Inuit mapmaker), 194, 205	innovative eclecticism, 58
Imigaahook Lake, 136	institutional economics, 28
In Light of Our Differences (Harmon), 38	instrumental connectivity, 5, 57, 202, 216
indigenous common property rights,	interdisciplinarity, 25–26, 31, 58–59
204. See also land claims	intermarriage (Sami and Inuvialuit), 66
indigenous knowledge, 13, 84	international relations
adoption of new ideas and	end of Cold War, 4
approaches, 88	restructuring of, 65
combining with scientific ways of	International Whaling Commission, 2,
knowing, 14, 160, 181	50
complex connectivity, 86	interviews. See research methodology
context specificity, 85	An Introduction to Science of Sociology (Park), 30

IIIIIIIIII, 79	J
Inuit, 2, 12, 97–98, 203. See also Copper Inuit; Ulukhaktok case study slow to intensively engage in trapping, 103 superb technology for the	Jacob, Francois, 36–37, 39, 55  The Possible and the Actual, 34  Jenness, Diamond, 99, 102  jigging, 149–53
environment, 206	Judeo-Christian creation narrative, 32,
Inuit human ecology. See human ecology	41, 61
Inuit Land Use and Occupancy Project, 200–203, 205, 218	linguistic diversity presented as a curse, 33
mediates the 'frontier' perception of	
the north, 200	K
shift in power relations, 208	Kaglokyoak River, 144
Inuit of Baffin Island, 200	kagolik/kakhaok (Pacific loon), 142–43
Inuit of Pelly Bay, 67	Kaleb Riber, 145
Inuit Tapirisat of Canada (ITC), 201, 208	Kalvak, Helen, 96, 117
Inuit words for ice and snow, 76	Kanayugaq (fourhorn sculpin), 155
inukshuks, 133	Kanghiryuachiakmuit (from Minto inlet
Inuktitut language, 12, 76	region), 98
Iñupiat knowledge of sea-ice, 161, 166,	Kanghiryuakmuit (Prince Albert Sound region), 98–99
cumulative and continuous, 181	Kanguq (Snow Goose), 145
experiential knowing, 75	Kapihilik (lake whitefish, broad
intimate and context-specific in	whitefish), 154
contrast to SAR data, 181	katak, 176
knowing how, 184	Kataoyak, Simon, 105–6
Iñupiat of Wainwright human ecological	kayaks, 119
map, 213–14	Khoisan language, 55
Inuvialuit, 2	Kikiktolak Island, 139
real person, 98	king eider, 142
Inuvialuit behaviour	Kingalik Jamboree, 113
based on local knowledge and	Kitologitak, Charlie, 99
cultural values, 52	Kituskeenow (Bigstone Cree Nation and
Inuvialuit Final Agreement (1984), 96,	Metis People of Kituskeenow),
107-8, 202	205
Inuvialuit Regional Corporation	Klegenberg, Christian, 100, 102
proponent of MacKenzie Valley	Klondike Gold Rush, 7
Pipeline, 107	knowing, 74, 89-90
Investigator (ship), 100, 103	models of, 80
<i>Iqaluit</i> (fish), 149–55	knowing how, 2, 13, 41, 68, 79–80, 184,
<i>Iqalukpik</i> (landlocked char), 153	191, 198, 216, 223
Islam, 33	crucial to ecological problems
Ivitaaruq (Arctic char), 152–53	resulting from climate
	change, 164
	embedded in experience, 5, 72, 75, 90

L
Lagopus lagopus, 146–47
Lagopus mutus, 146–47
lake herring, 150
Lake Tahiryuak, 149
lake trout, 116, 150–51, 153
lake whitefish, broad whitefish, 154
land claims, 96, 106–8, 199, 201–2, 217.
See also Mackenzie Valley
Pipeline Inquiry
land-locked char, 151, 153
language, 12, 61, 74
click languages of Africa, 55
as culture, 41–42, 61
as ecology, 42–43
Eskimo-Aleut languages, 43
geography as a, 193
as indicator of cultural diversity, 13,
38
Inuktitut language, 12, 76
Khoisan language, 55
loss of, 38–40
monolingualism, 42
related to daily practice through
memory, 76
related to functionality, 40, 74
standardization, 32-33
subdialects, 57
language evolution, 55
language-species model. See species-
language model
late freeze-up. See sea-ice
Latour, Bruno, 205, 207
leads, 175–77, 179–81, 183
effect on hunting, 175–76
learning
double-loop, 82, 205
learning <i>how</i> , 75–76, 78, 90, 218, 223, 225
learning process, 72, 77–81
Lepus arcticus, 137–38
Lewin, Kurt, 30
linguistic diversity, 39, 42–43. See also
language
loss of, 39–40, 61

living through, 159 living through the environment, 5 long-tailed duck, 147 loons, 140, 143 Lovozero (on Kola Peninsula), 1, 213	market-oriented values, 68. See also neo- liberal economics dramatic social change and, 102, 225–26 market value of the harvest, 104 Masons, Tricksters and Cartographers
М	(Turnbull), 209 Matonabbee (Chipewyan leader), 194, 205
Mackenzie Delta, 103  Mackenzie Valley Pipeline Inquiry, 99, 102, 104–7, 139, 200, 202, 205, 218  historic significance, 203 shift in power relations, 208 ten-year moratorium on pipeline, 203–4 validity based on knowing how, 208  Maffi, Luisa, 38–40, 44–45  Mahu (Eskimo potato), 156  Manteq at-Tair (Attar), 227–30 maps and mapping, 29, 39 counter-mapping, 192 and cultural imperialism, 193 European explorer-geographer maps, 205–6 European maps, 206 furthered process of conquest, 205 indigenous vs. European, 205 (See	McClure, Robert, 100 mechanistic view, 19, 33 mediating symbols for human ecological maps, 209–12, 218 membership in a community (muit), 99 Method (Feyerabend), 81 Metis, 203 militarization, 64 Mind and Nature (Bateson), 68 Mind over Machine (Dreyfus), 77 Minto Bay, 144 Minto Inlet, 121, 145, 155–56 Minto Inlet region, 98, 132, 136 muit, 99–100 muktuk, 129–31 muskox, 104, 116, 131, 135–37 sharing, 136 Muskox Mines, 106 Myoxocephalus quadricornis, 155
also human ecological mapping) instruments of colonial power, 193 language of power, 191–92 'manifest destiny' and claims of 'empty land,' 206 support for claims to validity, 207 topographical maps, 200 marine mammal harvesting essential for human nutritional needs, 101 food for dogs, 101 ice condition requirements, 169 marine mammals, 116, 119–30, 168. See also names of specific marine mammals	N Nagyuktogmuit (people of Southwestern Victoria Island), 99 Nakushin, 144 Nalukataq festival, 50, 68, 86, 185. See also whaling Nanuq (polar bear), 126–29 narratives and oral histories. See oral histories Nashoalook, Billy, 173 National Petroleum Reserve (North Slope of Alaska), 215, 219 nations of northern Alaska, 99–100 Nattiq (ringed seal), 119–23

Natural laws, 46	as 'frontier,' 5-7, 200, 202, 204, 216
natural resource exploitation. See	as 'homeland,' 3, 5-7, 200, 202, 204,
resource exploitation	216
natural resource management. See	stereotypes, 7–9, 12
resource management	on verge of new era, 203
natural selection, 35	wish for wealth and, 6, 194, 205
nature and culture	North Slope Borough's Geographic
continuous thread between, 69	Information Systems Division
nature and culture viewed as co-created,	180
47	North Slope of Alaska, 161. See also
nature-culture dichotomy, 4, 13, 45-48,	Wainwright case study
58, 61, 186, 200, 202	Northern and Co-operative store, 139
nature reserves, 37, 47	Northern Frontier, Northern Homeland
Nayakik, Charles, 179	(Berger)
Nelson, Richard K., 50, 171, 174, 176-77,	historic significance, 203
186	Northwest Passage, search for
documentation of Iñupiat knowledge,	imagined riches, 6, 194
180	use of mapping based on indigenou
Hunters of the Northern Ice, 75	knowledge, 194
Nelson Head, 127	Norway, 2, 66
neo-liberal economics, 37, 65. See also	numbers vs. quantities, 52
market-oriented values	Nunavut, 202
resemblance to chrematistics, 28	Nunavut Comprehensive Land Claim
nets, 103, 150-52, 154	Agreements (1993), 202
whale nets, 129	Nyctea scandiaca, 148
Nettle, Daniel, 42	
"hotbeds" of languages, 43	0
Vanishing Voices, 40	0.1-1 120, 21
The New Nature of Maps (Harley), 191	Odobenus rosmarus, 130–31
'new worlds,' 194	Odum, Eugene, 20–21, 27, 32
The Nichomachean Ethics (Aristotle), 80	oikonomia, 28, 216
Nigipak (low tide with northwest wind),	oikonomia vs. chrematistics, 28
176	oikos, 80
Niglignaq (brant), 148	oil, 64, 215
Nigutit (terrestrial mammals), 131	Olokhaktokmiut Community
Nikhaktok (willow ptarmigan), 146–47	Conservation Plan, 107
nomadism, 41	long-term planning, 108
non-human persons, 71	oral histories, 198, 210
non-renewable resource extraction,	oral testimony, 202–3
105-6	organism-persons, 71
indigenous communities' interest in,	Orientalism, 193
203-4	The Other Side of Eden (Brody), 41
the north	outside 'expert.' See expert
as dangerous and menacing, 8	Ovibos moschatus, 135–37
as empty lands, 8–9	owls, 140
1 /	

Oxyria digyna, 155–56	pluralism, 5, 226–27
ozone depletion, 27	plurality, 38, 84. See also diversity
	of indigenous knowlege, 88
	Point Barrow, 175–76
P	Point Belcher (Nunaigiaq), 163, 176, 181
Pagatak Paul 106	Point Hope, 163, 175-77
Pagotak, Paul, 106 Pakkak's map, 205	polar bear, 116, 122, 125-29
1	paws, 127–29
visual metaphor of indigenous	quotas, 104, 128
knowledge, 201	sharing of, 127, 129
Palvik, Peter, 210	skins, 128–29
Panarchy (Gunderson), 59	starvation, 170
Park, Robert, 29	teeth, 150
An Introduction to Science of	political ecology, 29
Sociology, 30	political science, 28
Parry, Captain, 194, 205	pollution, 65
participatory approach to research and	pollution (roadside), 156
validity, 223–24	population geography, 29
Passing On The Knowledge (Childress),	population growth, 65
215	The Possible and the Actual (Jacob), 34
patience, 101	power, 191. See also knowledge
Patkotak, Billy Blair, 171, 173, 175, 177,	
183	realignment of power relations, 192, 200, 205, 215, 218, 225–26
Patkotak, Blair, 168	
Peetook, Rossman, 176	practical wisdom, 12, 15, 68, 80, 159, 163. See also phronesis
people's science, 84	1
perception, 68–69, 72	practice, 79
performance, 77–80	praxis, 164
Phillips, Noah, 174	pressure ridges, 173, 176, 183
Phoca hispida or Pusa hispida, 119–24	and safe passage for hunters, 174
phronesis, 12-13, 68, 80, 83, 88-89, 159,	Prince Albert Sound region, 98–99, 132, 139, 143, 147–48, 156
163, 170, 186, 193, 198, 216	psychology, 30
context-specific and anthropocentric,	ptarmigan, 116, 140, 146–47
224	Ptarmigan Point, 145
dynamic process of, 90, 222	Puiylingmuit (from Read Island), 98
ethical import, 82	1 mymigmum (110111 Read Island), 70
grounded in an ethical framework,	
186	0
process of learning viewed as, 81	Q
'physics envy,' 4	Qilalugaq (beluga whale), 129-30
Pikoaktitak (herring), 155	Qingalki (king eider), 142
Pingokyoak, 145	Qugruk (tundra swan), 145
pizza, 116	Qunguliq (wild rhubarb), 155-56
plants, 156, 210	quunnguq (crack in the ice), 149
foundation of Arctic food web, 155	

R	in partnership with private interests,
rabies, 138	204 rifles, 102–3, 129, 134–36, 138, 140, 147
racism, 8	ringed seal, 119–23, 168
Radium herd (caribou), 132	rock ptarmigan, 146–47
Rae, John, 8	rod-and-reel, 151–53
Rae herd (caribou), 132	Romaine, Suzanne, 42
Ramsey Island, 148	rope, 125–26, 135
Rangifer tarandus, 132–35	Rosen, Arthur G., 33
Rapoport's Rule, 42	Ross, John, 194, 205
Read Island, 98, 129	rural people's knowledge. See indigenous
realness of a human person, 98	knowledge
red throated loon, 142-43	Russia, 198
reflexivity, 90, 197, 218, 222, 226	Sami cultural groups, 2
capable of producing change, 82	Ryle, Gilbert, 77–80
at heart of human agency, 81, 198	The Concept of Mind, 75
reindeer	The Concept of Mina, 13
interbreeding with caribou, 102	S
introduction to western Arctic, 66	3
relatedness (or kinship), 67	sacred places
relations, 68–74	inclusion / exclusion from maps, 219
relationships (or kindred), 67	Safety Channel, 143–44
relationships as basis of knowledge, 90	saffron cod, 150
research methodology	Salvelinus alpinus, 152–53
case study approach, 13-14, 82, 90,	Salvelinus namaycush, 153
225	Sami cultural groups, 43, 198, 212, 216
Wainwright case study, 164–65	emergency relief efforts, 2
research overview (Ulukhatok), 112-17	Sami land and marine use maps (Kola
research partnership, 94	Peninsula), 198–99, 213, 218
reserves	prevention of environmental damage
antithetical to indigenous	Sami reindeer herders, 66
conceptions, 37	sandhill crane, 146
consequences for indigenous	satellite aperture radar (SAR) images,
populations, 47 resource development, 64, 104, 204	167, 180–82
resource exploitation, 4, 6, 64–65	'savages,' 9
implications for biological and	science (episteme), 84
cultural diversity, 44	applied science, 164
non-renewable resource extraction,	science of weather forecasting, 164
64-65, 105-6	scientific and indigenous knowledge
resource extraction (chrematistics), 96,	systems, 88, 160
216	combining, 14
resource management	not mutually exclusive, 182
co-management, 51–52, 106	scientific knowledge or episteme, 80-81,
-	87

sea-ice, 1/2, 1/6	Seaozero, 214
decline in thickness, 173	self-control, 101
ice formation, 171-74, 176, 178	self-effacing humour, 101
importance of temperature, 173	September 11, 2001, 4
indicator of climate change, 87, 160	Service, Robert, "The Cremation of Sam
indigenous knowledge of, 75, 160-61,	McGee," 6
163, 166, 170–71, 177, 181,	Shaler Mountains, 132
184	shamans, 101, 135-36
late freeze-up, 170, 173	sharing, 93, 106, 113, 119-20, 122, 225
leads, 175–77, 179–81, 183	basis of the cultural system, 14, 141,
pressure ridges, 173-74, 176, 183	157
shore-fast ice, 171	bearded seal, 126
sea-ice conditions	climate change and, 186
fundamental role in subsistence	resilience in face of social change,
hunting, 160	157, 185
related to availability of marine birds	sea ice conditions and, 185
and mammals, 178	seal-sharing partnership, 101
sea-ice phenology and morphology, 162	sharing spouses, 101
context-specific, 169, 176	Shelley, Mary, 7
seal hides, 121, 124	shotguns, 102, 140–41, 145
market value, 104	Siberia, 66
seals, 104, 116, 169	slush ice. See sea-ice
bearded seal, 124-26, 168-69, 171	snares, 140
breathing-hole sealing, 100	Snow, C.P., The Two Cultures, 27
dog food, 121–22	snow goose, 145
flippers, 122–23, 125	snowmobiles, 105, 129, 133–35
hunting, 120–22	snowy owl, 148
ice-harvesting method, 119	Social and Cultural Dynamics (Sorokin)
income from, 102	48
open-water hunting by boat	social assistance, 103
(summers), 121	social change, 48-50, 61, 102, 225-26
preparation of seal meat, 122-24	persistence of subsistence lifestyle
ringed seal, 119-23, 168	despite, 64, 93, 156
seal-sharing partnership, 101	potential for, 81
sealskin, 104, 122, 124	resilience in face of, 157
seasonal migration, 97, 100, 103	social cohesion, 67
seal hunting, 120	social justice, 39
undermined by sedentization and	social science research
trapping, 103	relevance, 4
seasonal practices, 100-101	social sciences and humanities, 27
Wainwright, 172	negative perceptions of, 3
sedentization, 103	Society for Human Ecology (SHE), 25
decline of harvested food, 117	Sociobiology (Wilson), 32
impact on adolescence, 109	sociology, 29

Somateria mollissima, 142	cultural diversity and, 38		
Somateria spectabilis, 142	essential to cultural and human		
Sorokin, Pitrim, 49, 82	survival, 2		
Social and Cultural Dynamics, 48	knowing how, 41		
South Slave language, 12	nutritional, economic, cultural, and		
Soviet Union	social needs, 114		
collapse of, 1, 4, 65	persistence of, 22, 50, 102, 106		
spaghetti, 116	seasonal migration, 103, 133, 172		
spearing (fish), 150, 152	significant socio-cultural resource,		
special creation theory	116		
challenge to, 55, 73	social construct based on culturally		
specialization, 20	determined needs, 67		
species, 54	sustains the life of a culture, 67–68, 93		
ecological niches, 21	weakened by diet, disease,		
as indicator of biological diversity,	demography, and		
13, 27	development, 104		
preservation of, 56	subsistence hunting cultures		
species and language binary, 61	idea of person in, 69		
critical error, 62	subsistence whaling, 173		
species extinction	"superstition," 98		
and loss of biological diversity, 27	sustainable ecological systems, 27		
species-language model, 44-45, 48, 52,	sustainable livelihoods (oikonomia), 216		
54–56	sustainable use, 22, 199–200		
example of nature-culture dichotomy,	Sweden, 2		
47	Synthetic Aperture Radar (SAR) images,		
spring whaling, 179	180-82		
standardization of diversity, 52-53, 55	combined with indigenous		
standardization or monism, 32	knowledge, 87		
Stefansson, Vilhjalmur, 97-99, 127, 156	systemic ecology, 31		
stress study (proposed), 184, 186	-		
subsistence hunters	Т		
community of experts, 188	Tagarook Gregg, 176, 183		
community of practitioners, 188	Tahioyak region, 147		
knowledgeable experts, 166	Tahiryuak Lake, 136		
safety, 173	Tansley, Arthur J., 20–21		
subsistence hunting and gathering	Tardy, Father Henri, 105		
bodily substance of caribou or whale	Tariuqmiuttat (marine mammals),		
is received, 70	119–30		
climate change and, 160, 173, 183	Tatilgak (sandhill crane), 146		
collaboration in, 101, 113, 119	techne, 80		
context-specific character, 169	technological change, 65, 113		
continued despite dramatic social	effect on subsistence hunting		
change, 50, 64, 156–57	communities, 67		
continued importance of, 1, 51			

technologies of transportation and	Turnbull, David, 55
communication, 24, 66, 206–8	Masons, Tricksters and Cartographers,
support for subsistence livelihoods,	209
217	Tuullik (common loon), 142-43
technology	tuvaq (land-fast ice), 171
European, 8, 206	The Two Cultures (Snow), 27
indigenous peoples, 8, 206	typological approach, 55, 57
teenagers, 109, 129	
terra nullius. See 'empty lands'	
theory of evolution, 14, 73, 90	U
case study approach, 225	<i>Ugyuk</i> (bearded seal), 124–26, 169
'third culture,' 27, 32, 60, 221	<i>Ukaliq</i> (Arctic hare), 137–38
Third Lake, 136	Ukpiq (snowy owl), 148
third space, 200, 209, 216	ulimaun, 127
Tingmiat (birds), 140–48	
tinkering, 37, 61, 185	ulu (semil-lunar shaped knives), 98
Tiriganniaq (Arctic fox), 138-39	Uluagullik (Canada goose), 144
Tlingit language, 12	Ulukhaktok case study, 14, 93–118, 210
toggle head harpoons, 119	ancestry, 98, 101
topographical maps	co-management of Arctic Char, 51 demographic profile, 108–12
nature-culture dichotomy, 200	educational attainment, 110–11
traditional environmental knowledge.	· · · · · · · · · · · · · · · · · · ·
See indigenous knowledge	family makeup, 112
traditional land use. See also Mackenzie	first phase, 97–101
Valley Pipeline Inquiry	human ecology, 104, 113, 117–93 icon design, 209–11
Arctic Institute of North America	
studies, 201, 204	income, 112
and human ecological mapping, 198-	land claims, 105 ( <i>See also</i> traditional land use)
200, 203–4, 208, 213–14, 218	natural resource extraction, 105 (See
Inuit Land Use and Occupancy	also resource development)
Project, 200–203, 205, 208,	persistence of subsistence activities,
218	102, 113
trapping, 102–3, 105, 120, 131	phases of change, 96
Arctic fox, 138–39	religious affiliation, 112
combined with traditional practices,	second phase (1916 to 1980s), 101–5
promoted extensive inland use, 101	sedentization, 109
trout, 150	subsistence hunting practices, 97–102,
trust, 218	105, 110–11, 113
tuberculosis epidemics, 103	teenagers, 109–10
Tuktu (caribou), 132–35	third phase (1980s to present), 105
	trading, trapping, and formation of
tundra softening and melting, 170 tundra swan, 145	dependency, 101–5
tunura Swall, 143	Ulukhaktokmuit (people), 98
	unemployment rate, 112

wage economy and subsistence	and subsistence hunting
hunting interdependence,	interdependence, 113
113	Wainwright case study, 14, 50-51, 86-87
Ulukhaktok Hunters and Trappers	See also sea-ice
Association, 104, 128	climate change case study, 159-89
Ulukhaktok Hunters and Trappers	context-dependent knowledge, 163
Committee (HTC), 94-95, 210	context-specific character, 169
Umingmak (muskox), 135–37	human ecological map, 213-15, 219
Umingmaktomuit (Bathurst Inlet), 99	inhabitants, 161
UN Secretariat on the Convention on	objectives, 170, 186
Biological Diversity, 66	population, 161
universal, 73-74	research methodology, 164–65
approaching through the particular,	seasonal profile, 172
81, 223, 227	"The weather is going under," 167
University of Chicago, 29–30	Wainwright Traditional Council, 165,
ursus maritimus, 126–29	167, 215
Utuqqagmiut (people of the Utuqqaq	Walker Bay, 127
River), 161	Wallace, Alfred Russel, 34-35, 39, 55,
Uugak (cod), 154	73, 90
	case study approach, 225
	walrus, 130-31, 168-69, 171
V	warfare among Copper Inuit, 99
validation of research, 166, 174	waterfowl behaviour
based on communities of inquirers,	changing as result of shift in sea-ice
209, 223–24	conditions, 165
based on communities of social	weasel, 131
practice, 208–9, 217, 224	weather forecasting
community of experts, 205	emerged from indigenous or local
Vanishing Voices (Nettle), 40	knowledge, 164
variance, 39, 61	weather prediction for subsistence
variation, 33	hunting
Vayda, Andrew P., 51	increasingly difficult, 175
Victoria Island, 97, 99, 144, 151, 153, 156	weirs, 140, 149
viewing earth from the moon, 18, 20	welfare (social service), 105
vocabulary of symbols, 209-12, 218	whale nets, 129
Von Liné, Carl, 39	whales, 183. See also beluga whale;
Voronye Tundra, 214	bowhead whale
·	whaling, 70, 165, 173
	defines cultural life of community, 86
W	expected demise of, 50
******* ******** 112	white fox fur, 104
wage economy, 113	whitefish, 150-51, 154
decline of harvested food, 117	wild rhubarb, 155–56
effect on subsistence hunting	wildlife management, 65
communities, 67	

Wildlife Management Advisory Council, 107-8 willow ptarmigan, 146-47 Wilson, E.O., 36-37, 39 Consilience, 32 Sociobiology, 32 wind and currents, 176-80 impact on formation of sea-ice, 180 impact on subsistence hunting, 179-80 important variables in ice formation and movement, 178-79 wolf, 131, 168, 212 opportunistic hunting of, 139 Wollaston Peninsula, 132, 144 wolverine, 168

#### Υ

yellow billed loon, 142–43 Young, Gerald, 25–26 Yupik, 2, 212



At the dawn of the third millennium, dramatic challenges face human civilization everywhere. Relations between human beings and their environment are in peril, with mounting threats to both biological diversity of life on earth and cultural diversity of human communities. The peoples of the Circumpolar Arctic are at the forefront of these challenges and lead the way in seeking meaningful responses.

In Biocultural Diversity and Indigenous Ways of Knowing, author Karim-Aly Kassam positions the Arctic and sub-Arctic as a homeland rather than simply a frontier for resource exploitation. Kassam aims to empirically and theoretically illustrate the synthesis between the cultural and biological, using human ecology as a conceptual and analytical lens. Drawing on research carried out in partnership with indigenous northern communities, three case studies illustrate that subsistence hunting and gathering are not relics of an earlier era, but rather remain essential to both cultural diversity and to human survival.

This book deals with contemporary issues such as climate change, indigenous knowledge, and the impact of natural resource extraction. It is a narrative of community-based research, in the service of the communities for the benefit of the communities. It provides resource-based industry, policy makers, and students with an alternative way of engaging indigenous communities and transforming our perspective on conservation of ecological and cultural diversity.

**DR. KARIM-ALY KASSAM** has been working with the peoples of the Arctic for over fifteen years. His research focuses on the complex connectivity of human and environmental relations, addressing indigenous ways of knowing, sustainable development, and climate change. In partnership with indigenous communities, he has conducted research in the Alaskan, Canadian, and Russian Arctic and sub-Arctic; the Pamir Mountains in Afghanistan and Tajikistan; and the forests in the south of India. Dr. Kassam is International Associate Professor of Environmental and Indigenous Studies at Cornell University.



