

Ecosystem, Fishery and Social Changes in West and Southwest Alaska



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Social indicators: measuring change in fisheries-dependent communities

- Social indicators in general
 - Why use social indicators?
 - Example health and population indicators
 - Demographics of fishing communities
 - Impacts of fisheries decline
- Bristol Bay salmon fishing communities
- Kodiak Island groundfish and halibut impacts



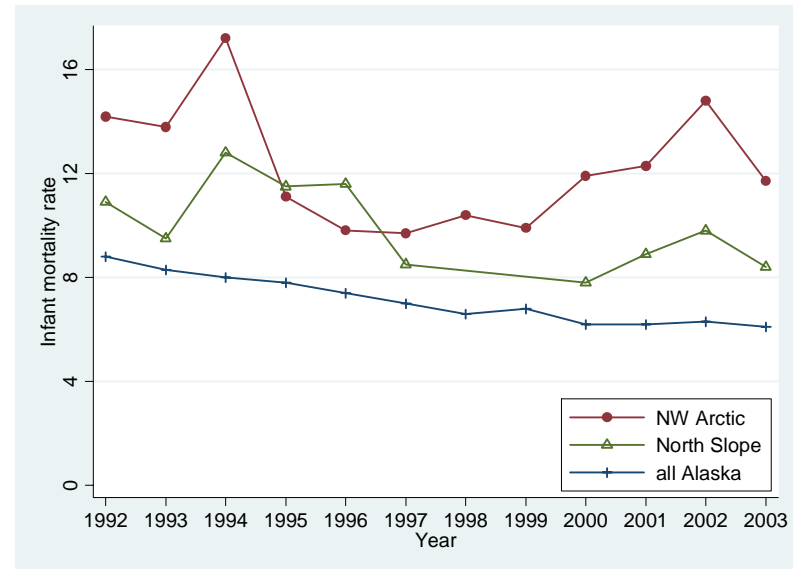
Why use social indicators?

- To quantitatively compare different places, or different kinds of places (such as fishing and non-fishing communities)
- Time series track change over time
 - Evaluate effects of programs or policies
 - See impacts of social, economic, environmental change — such as fisheries resources
- Community-level indicators may be available through routinely collected official statistics
- To study subpopulations (e.g., fishermen only) targeted surveys or interviews are needed

Examples: health indicators

(Hamilton et al. forthcoming)

- Public health
 - Infant mortality
 - Child mortality
 - Access to health care
- Mental health
 - Suicide rate
 - Self-assessed health
- Chronic disease
 - Obesity
 - Smoking

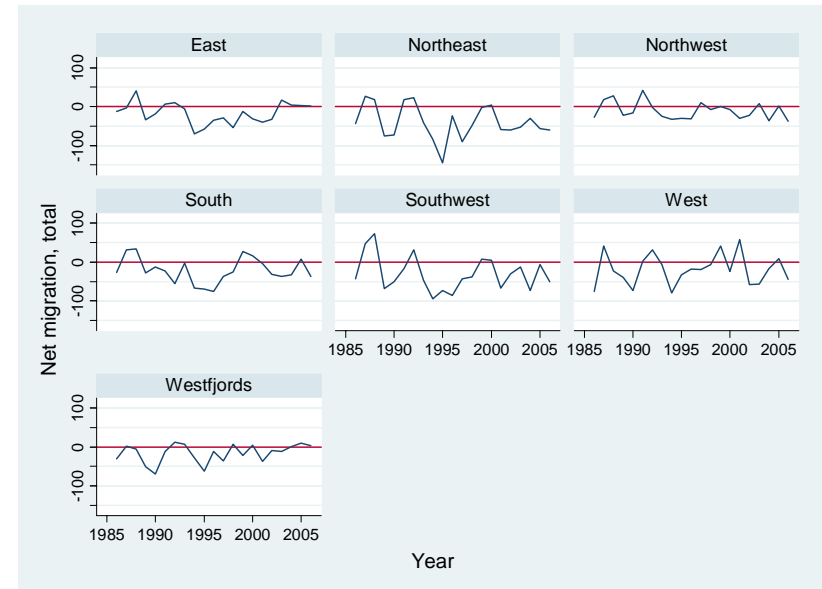


Infant mortality trends for 2 rural Alaska regions, and for all Alaska, 1993–2003

Examples: population indicators

(Hamilton et al. forthcoming)

- Total population
- Births
 - Crude birth rate
 - Fertility rate
 - Teenage birth rate
- Deaths
 - Crude death rate
 - Infant mortality rate
- Net migration
- Age–sex structure
 - Sex ratio
 - % over 65
 - % under 15



Net migration rates for 7 rural Iceland regions, 1986–2007

Demographics of commercial fishing communities in Alaska (Package & Sepez 2005)

- Commercial fishing activities most substantial in a small number of hub communities with shoreside processing capacity
- But many more large & small communities have commercial fishing involvement
- Two common population pyramids
 - Labor shape, with bulge of males age 20–60, characteristic of communities w/processors
 - Family shape, relatively more women, children and elders, characteristic of Bering Sea Native communities

A social-indicators view of 1990s codfish collapse on Newfoundland's Northern Peninsula

- Percentage of labor force in fishing fell from 20.5% to 14.4% in just five years, 1991–96.
- Reversing previous growth trends, population dropped by 3.6% over 1986–91, then plunged a further 8.7% over 1991–96.
- Reflecting its high birth rate, the Northern Peninsula's under-15 population was proportionately greater than Canada's in 1986 (30.4% v. 25.9%). A decade later, however, it had fallen slightly below national levels (20.2% v. 20.5%).
- Meanwhile the proportion 65 and over grew twice as fast on the Northern Peninsula (from 7.2% to 10.2%) as it did in Canada as a whole (10.7% to 12.2%).
- Mean family size remained unchanged (3.1) for Canada during this period, while on the Northern Peninsula it dropped from a high level (3.7 in 1986) to one near the Canadian average (3.2 in 1996).

<http://www.docurights.com/drmaker.cgi?vid=3899&objid=271121>

A social-indicators view of 1990s codfish collapse on Newfoundland's Northern Peninsula

- Starting out far behind the rest of Canada, the Northern Peninsula saw progress in education and income.
 - But in 1996 the Northern Peninsula still had more than twice Canada's proportion not completing 9th grade, and less than half the proportion with college degrees.
 - The gap in median household income, \$5,200 in 1986, had widened to \$9,300 by 1996.
- Perhaps the most telling indicator is the proportion of income from government transfer payments.
 - Even in 1986, at the height of the glory years, this amounted to 32.2% on the Northern Peninsula, and 21.2% in Newfoundland — compared with 11.1% in Canada.
 - Transfer support increased slightly by 1991, but jumped up to 40% of all income after the codfish collapse.

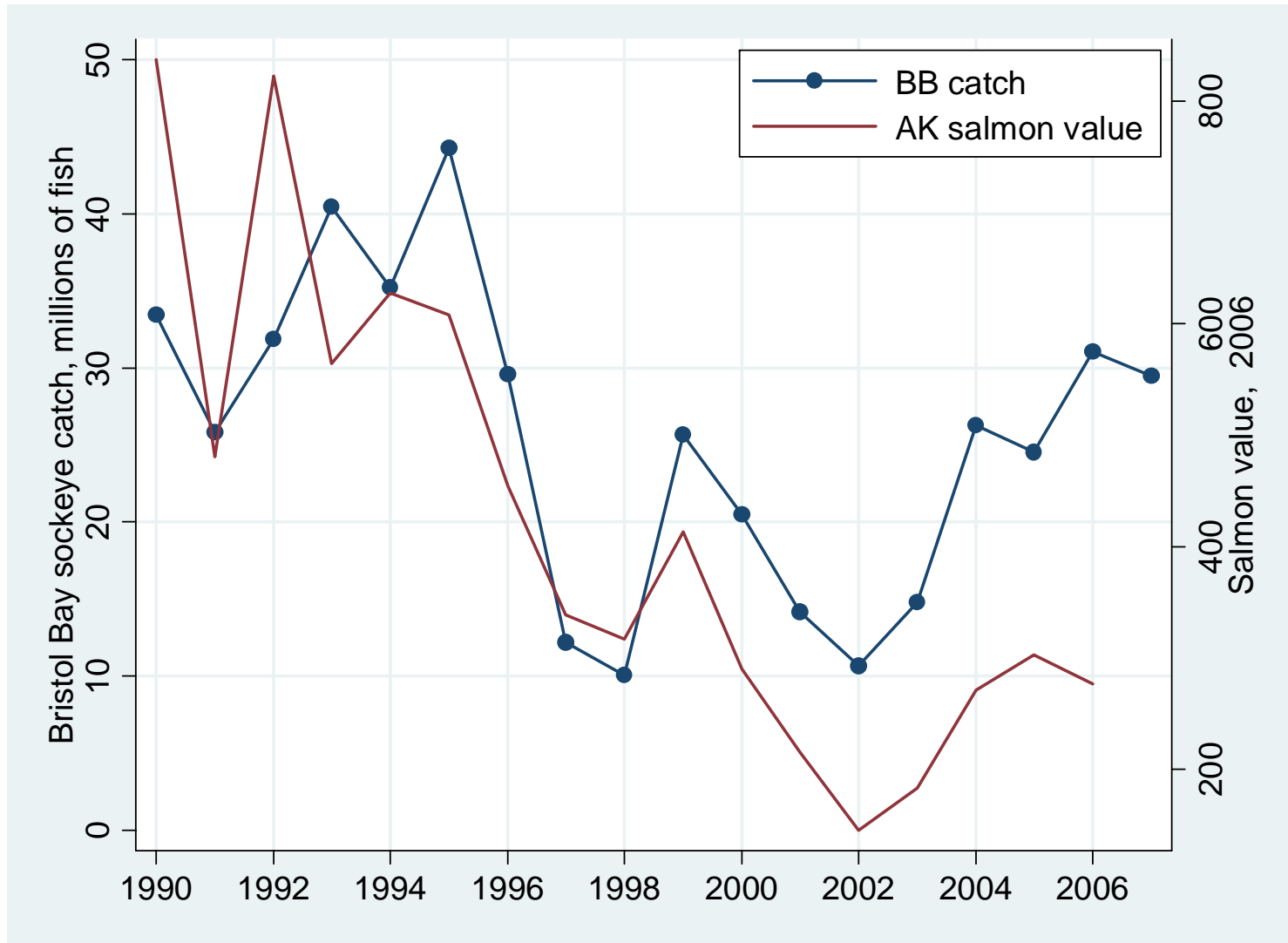
Bristol Bay, Alaska
salmon fishing
communities



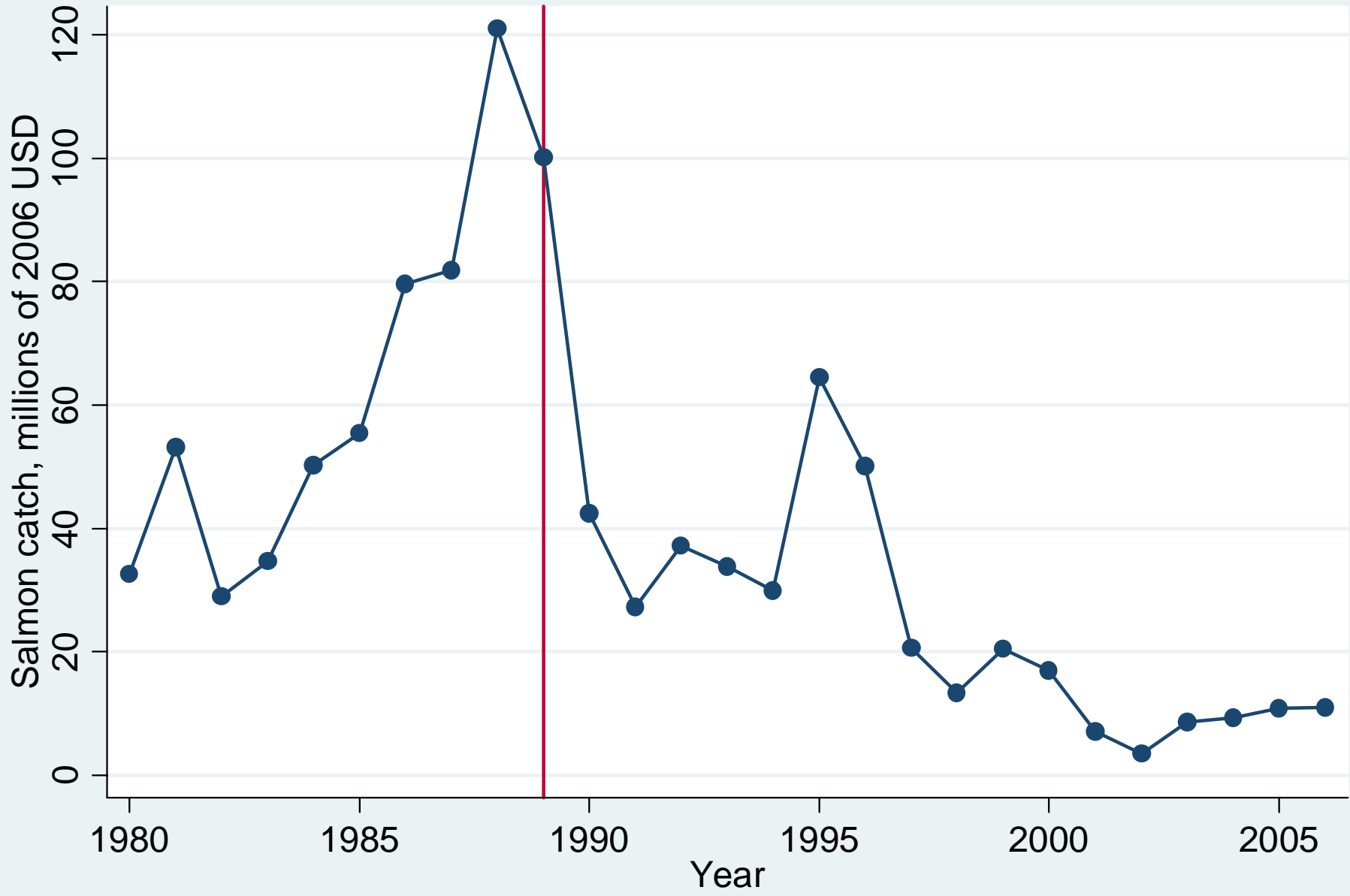
Collapse of Kvichak sockeye salmon
production brood years 1991–1999
(Ruggerone and Link 2006)

- Kvichak River watershed in Bristol Bay is largest producer of sockeye salmon in world
- During 1996–2005 run size declined by 84%
 - Created economic hardship in region
 - Other Bristol Bay salmon stocks declined too, especially Egegik and Ugashik
- Harvests recovered substantially in 2006 and 2007, but not to mid-1990s levels

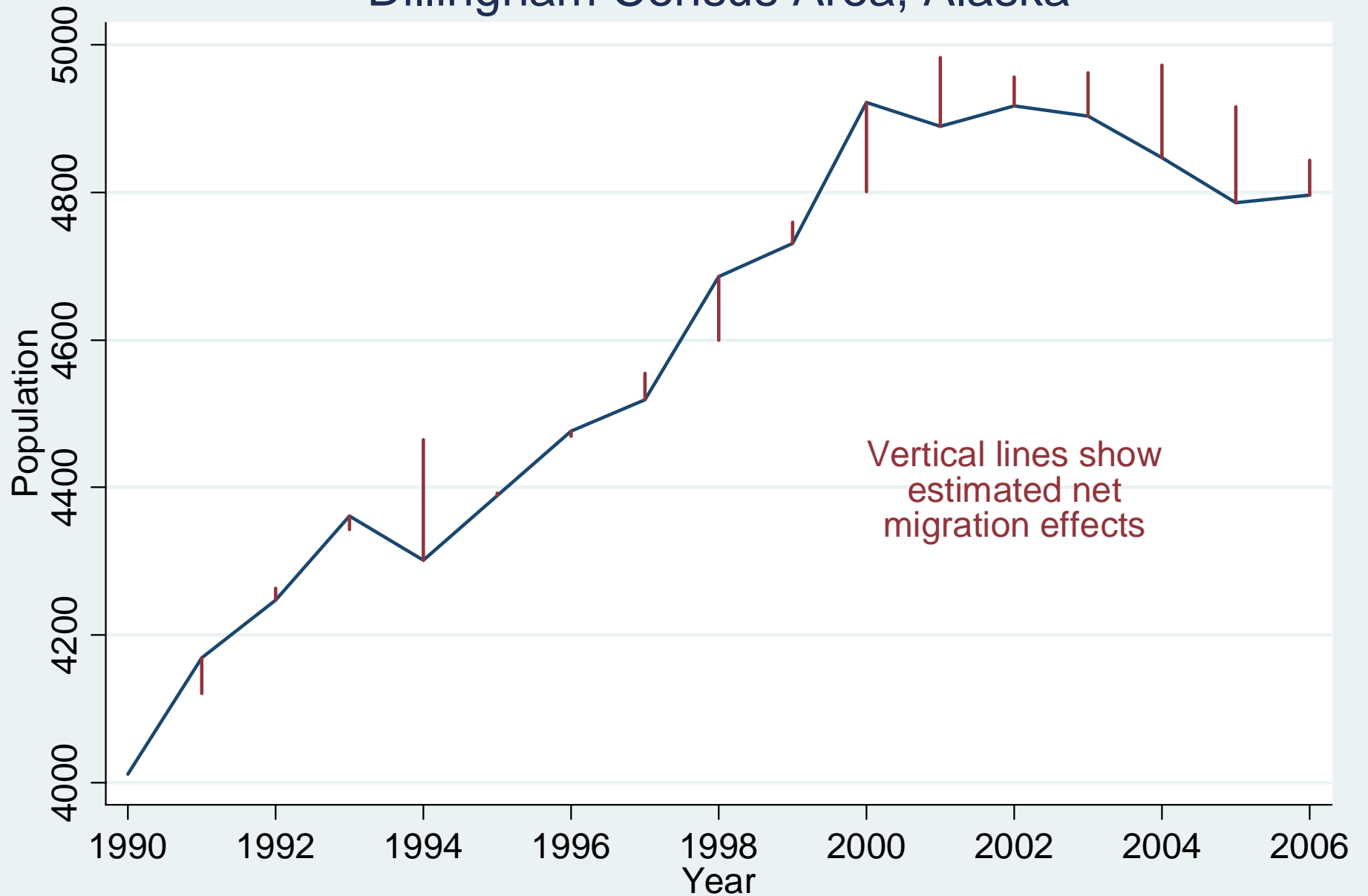
Bristol Bay sockeye salmon catch, and all-Alaska salmon value, 1990–2007



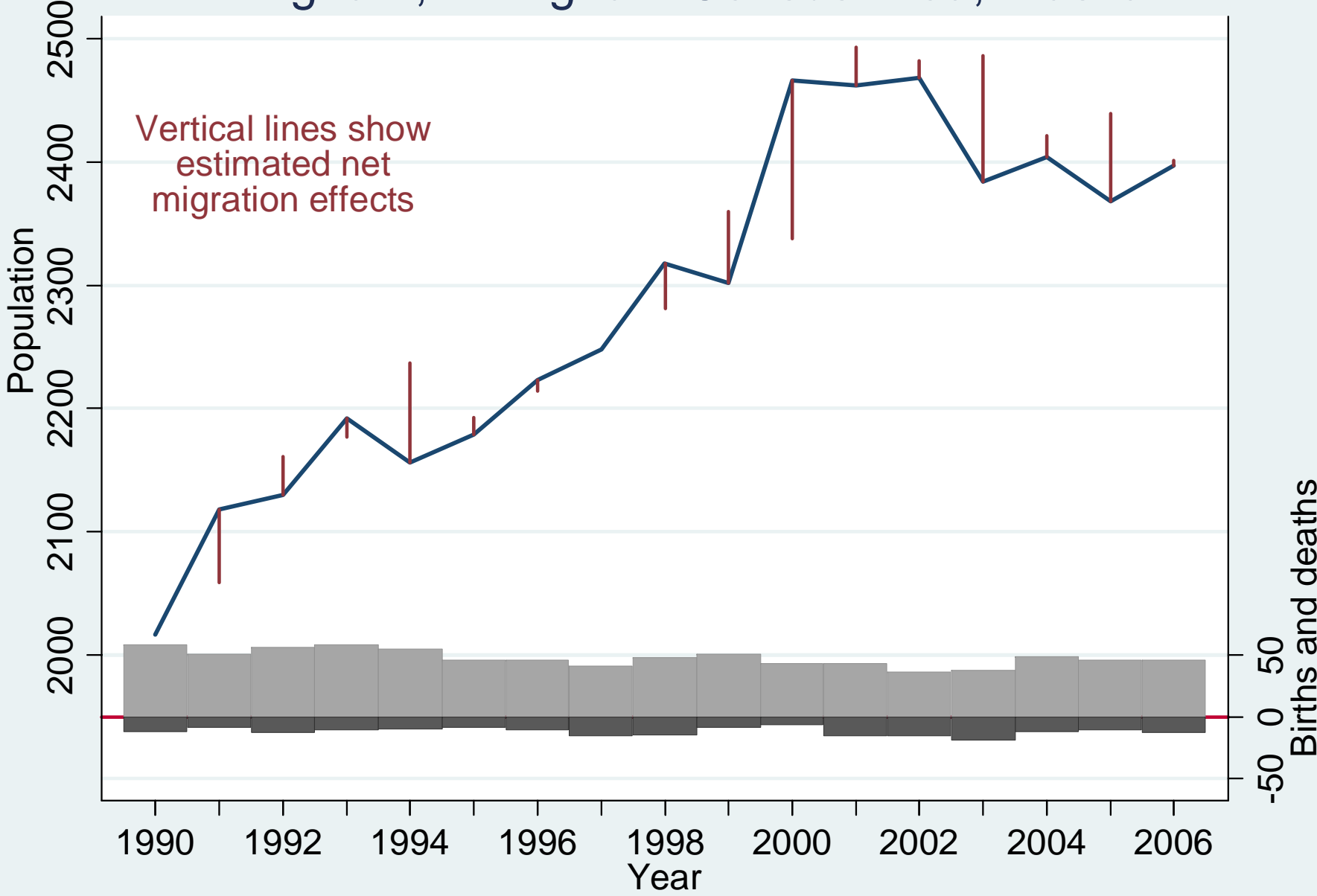
Dillingham Census Area



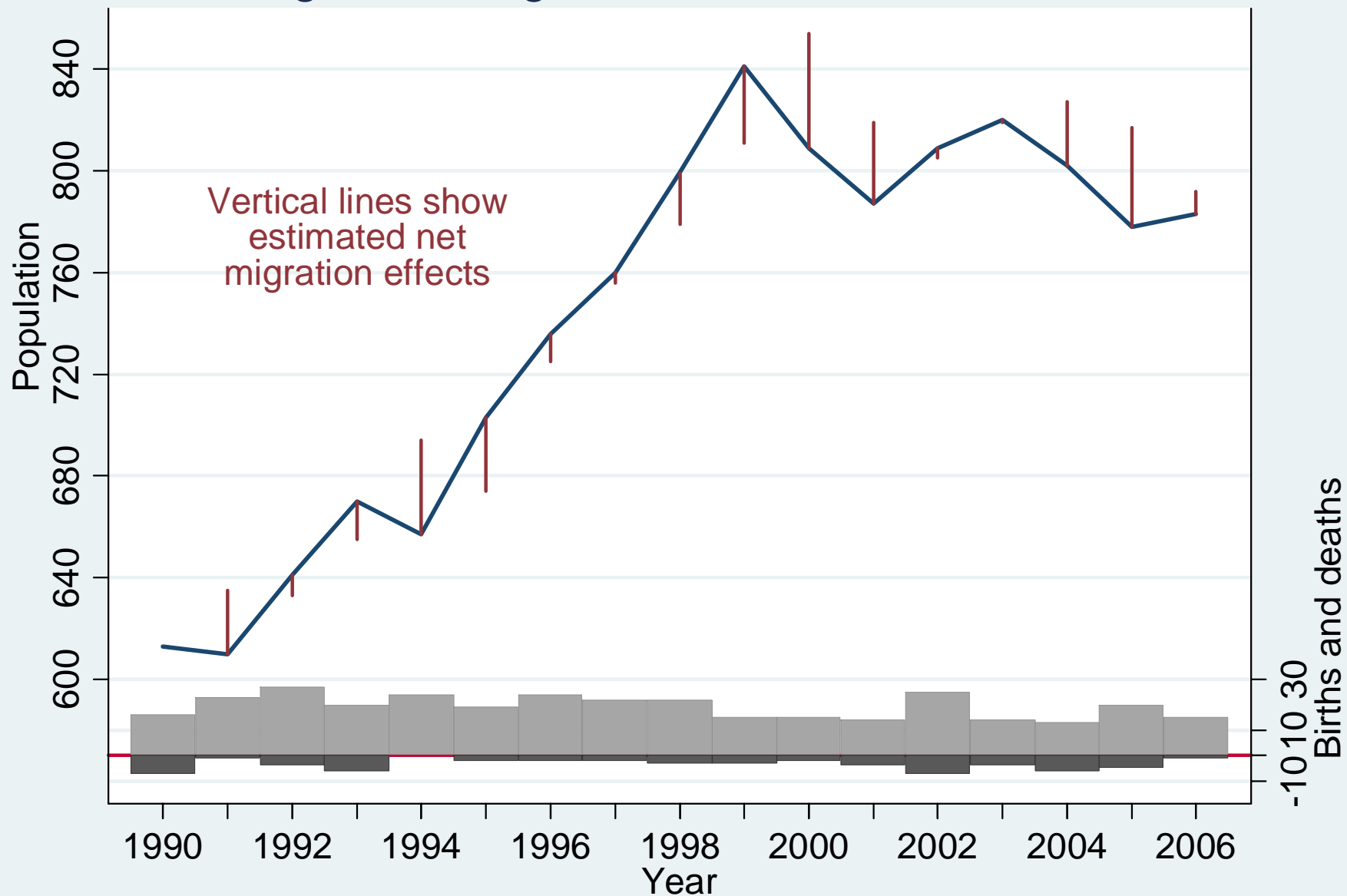
Dillingham Census Area, Alaska



Dillingham, Dillingham Census Area, Alaska



Togiak, Dillingham Census Area, Alaska



Kodiak Island, Alaska



Kodiak village fishing trends (Carothers 2006)

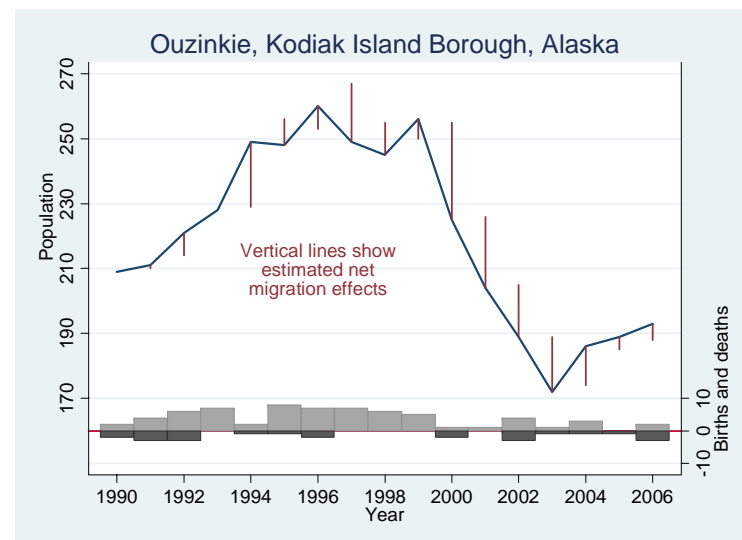
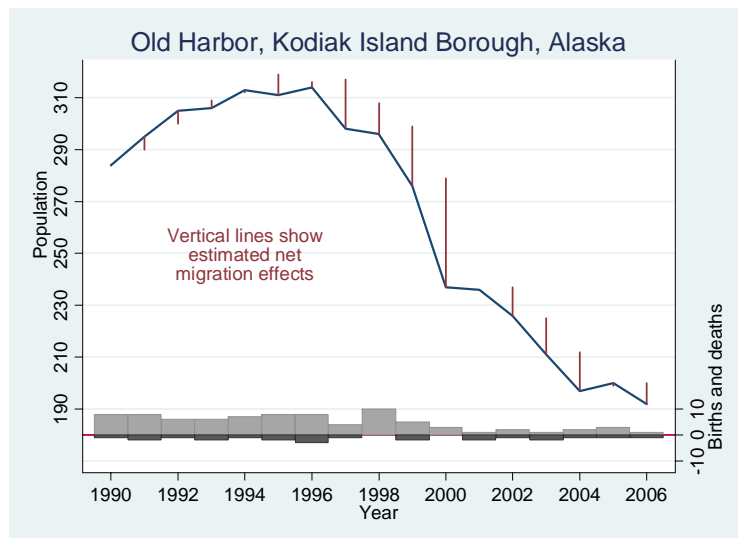
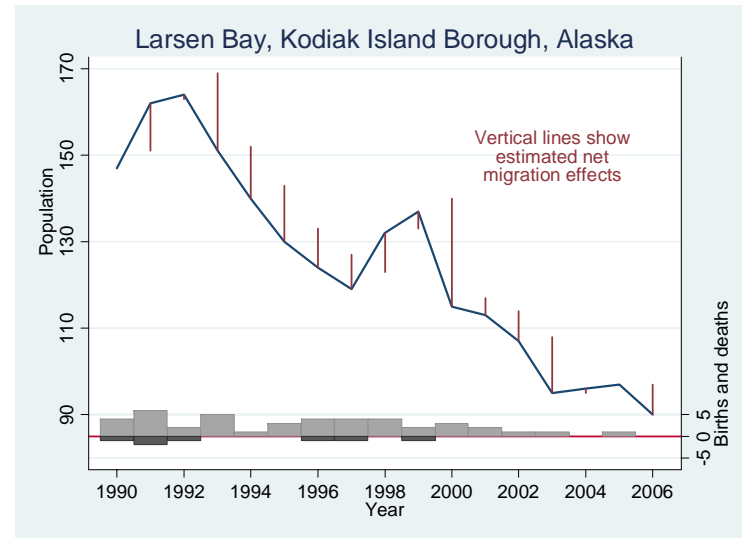
- **Community depopulation**
 - Lost access to fishing
 - Little economic diversification — no work
 - Education — no place for the young people
 - 18–30 year old gap
- **Significant decrease in fishing involvement**
 - Salmon price decrease
 - High entry costs — permits, IFQs, safety measures
 - Exxon Valdez oil spill
 - Crewmen's wages have decreased/Few good crew jobs available
- **Younger generation — “the lost generation”**
 - Loss of fishing identity, lifestyle, knowledge transfer

Kodiak village depopulation: Evidence from [survey \(Carothers 2006\)](#) and demographics ([Hamilton & Mitiguy 2008](#))

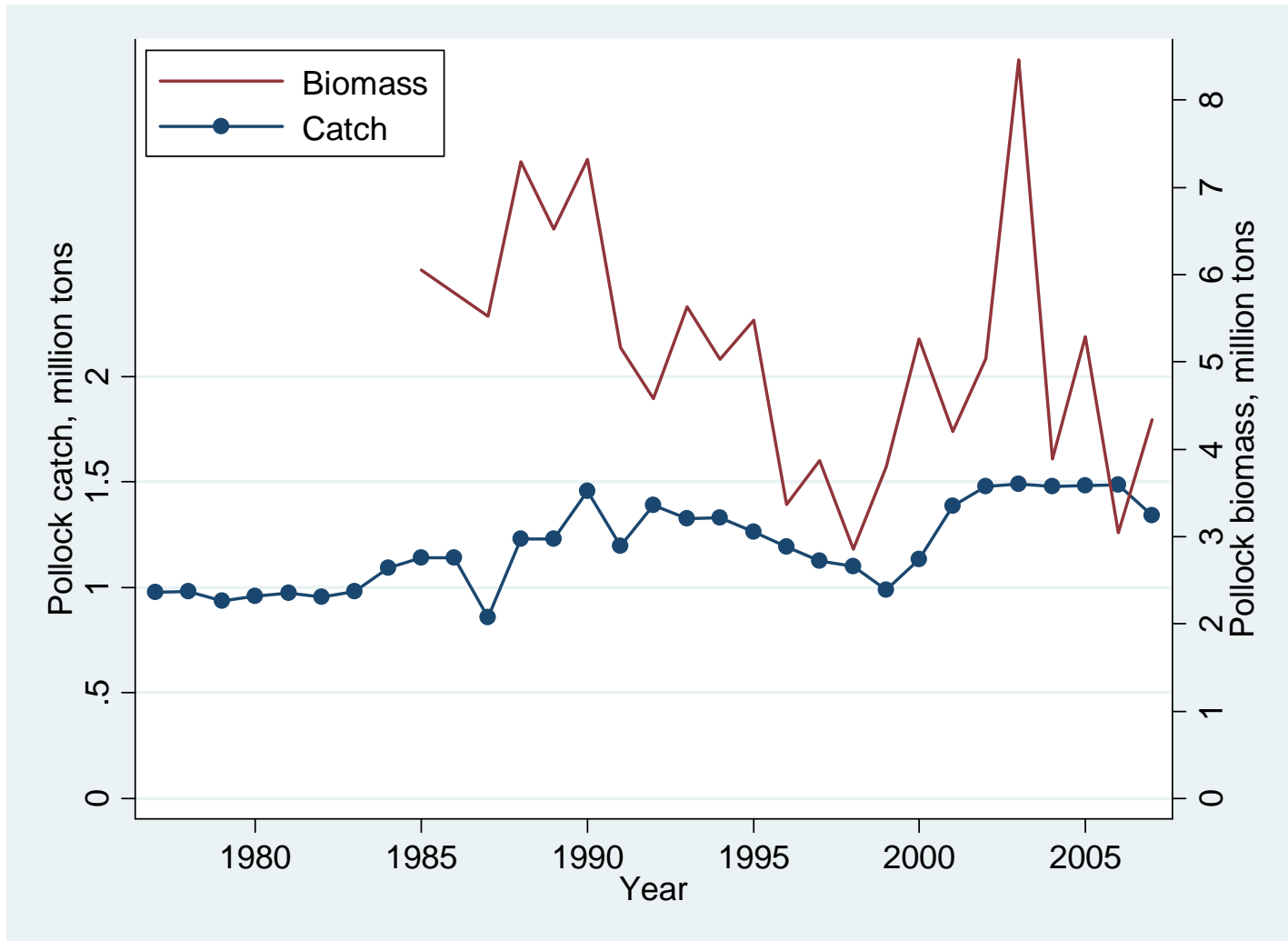
**Survey: brothers/sisters moved
due to decreased fishing (F)
or education (E)?**

- Larsen Bay (F 8%, E 50%)
- Old Harbor (F 44%, E 33%)
- Ouzinkie (F 21%, E 46%)

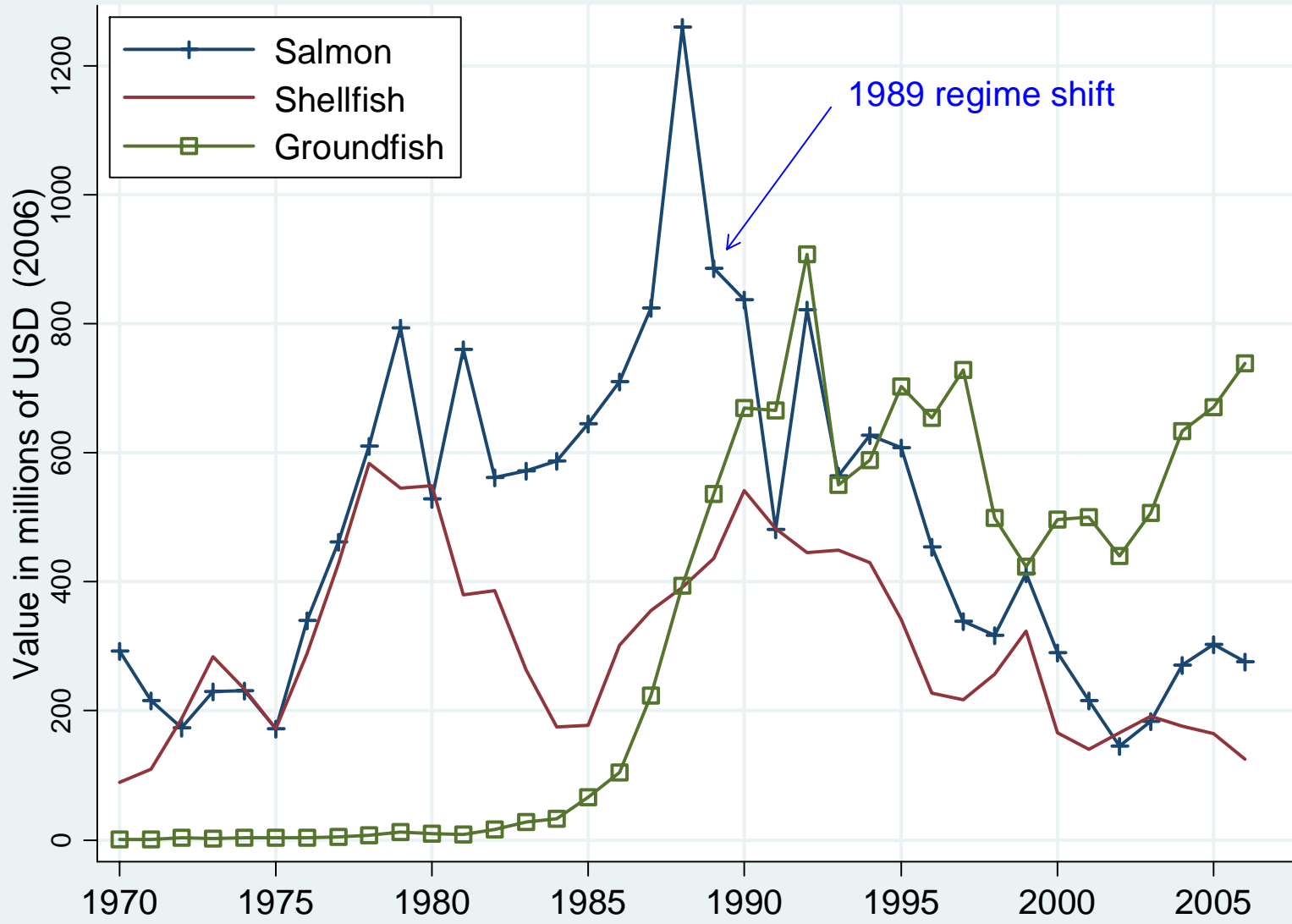
**Many people report that their
own fishing involvement
decreased**

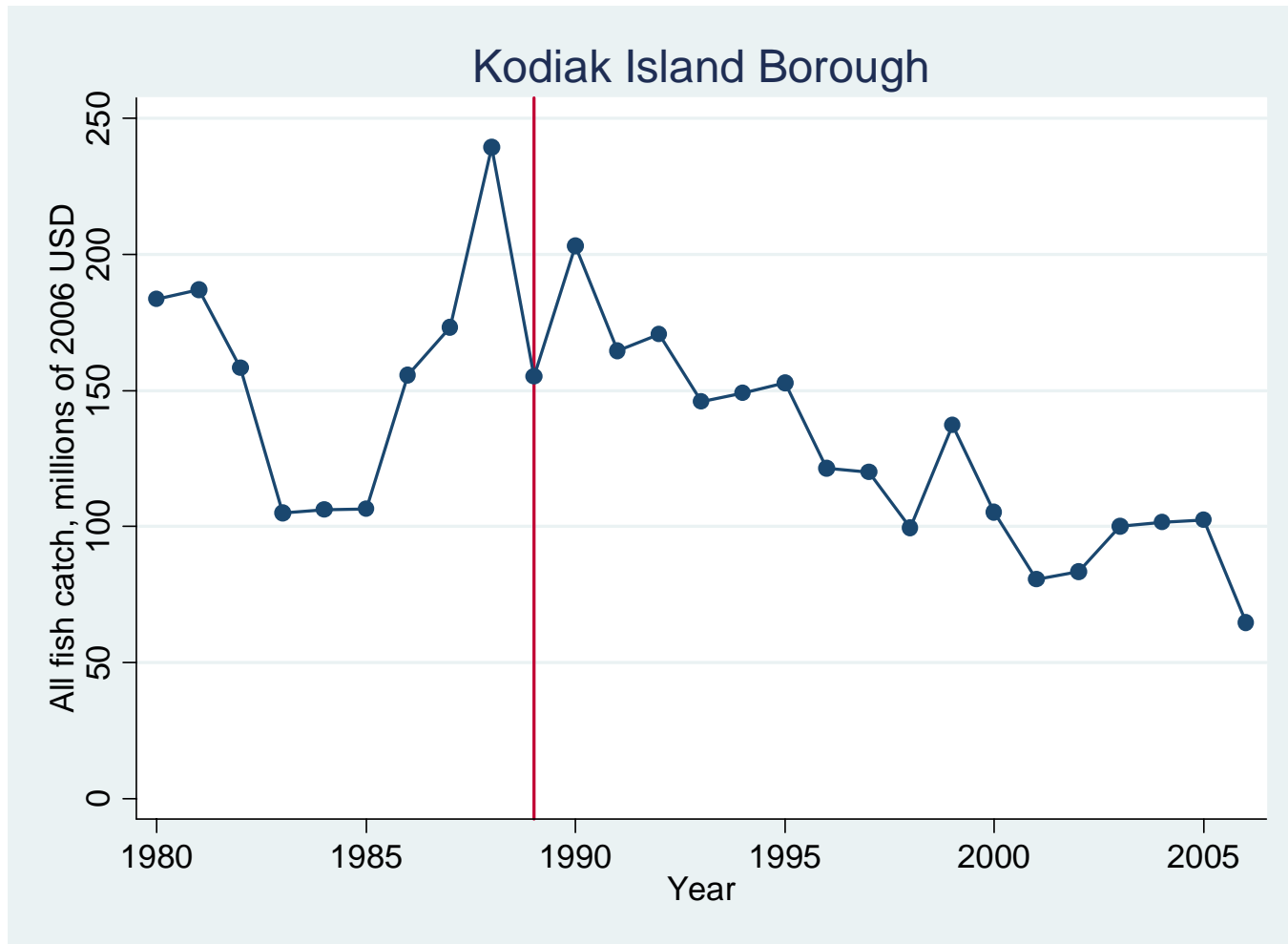


Eastern Bering Sea pollock catch and biomass

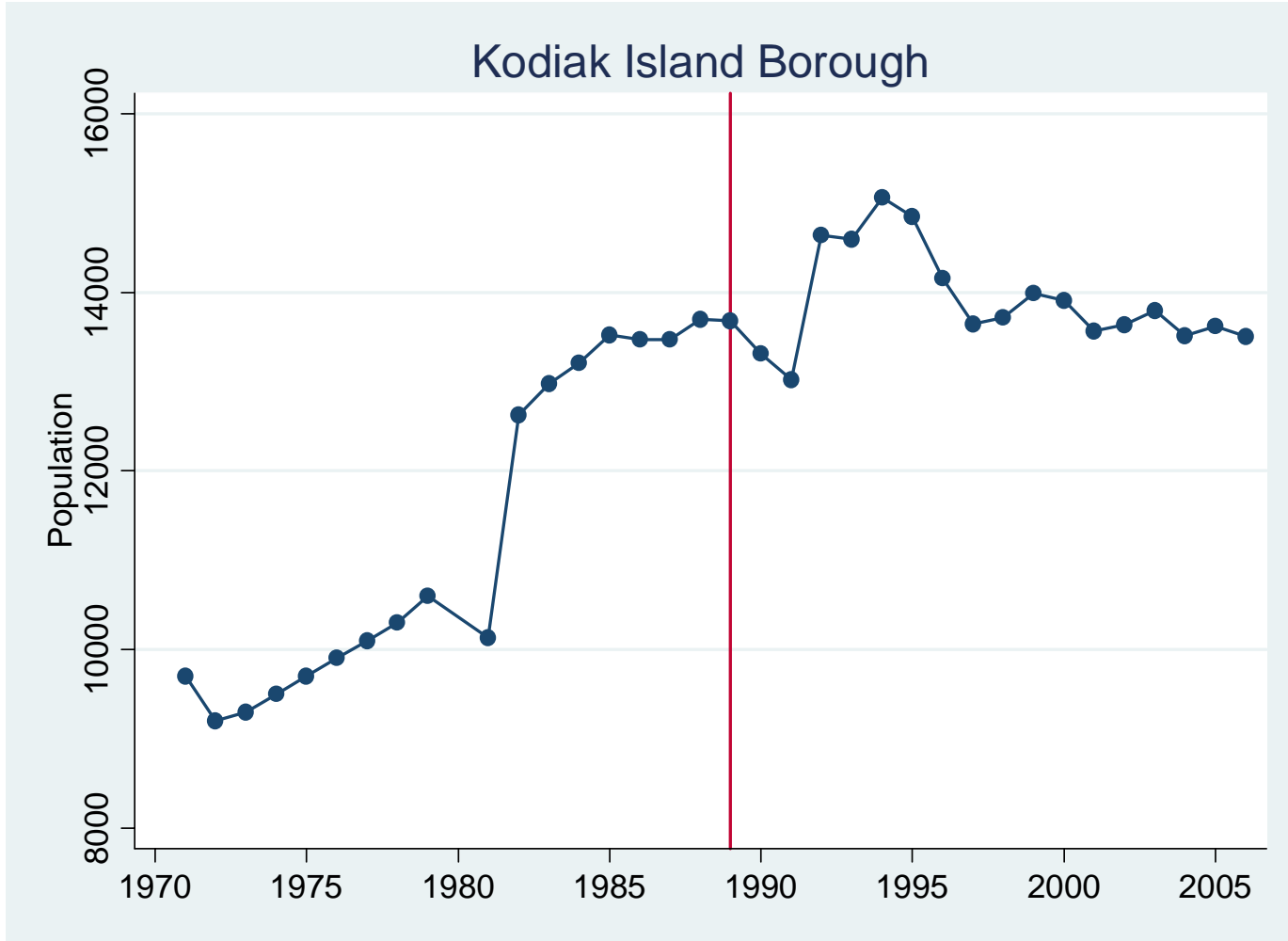


Alaska fisheries value (USD) by type, 1970–2006

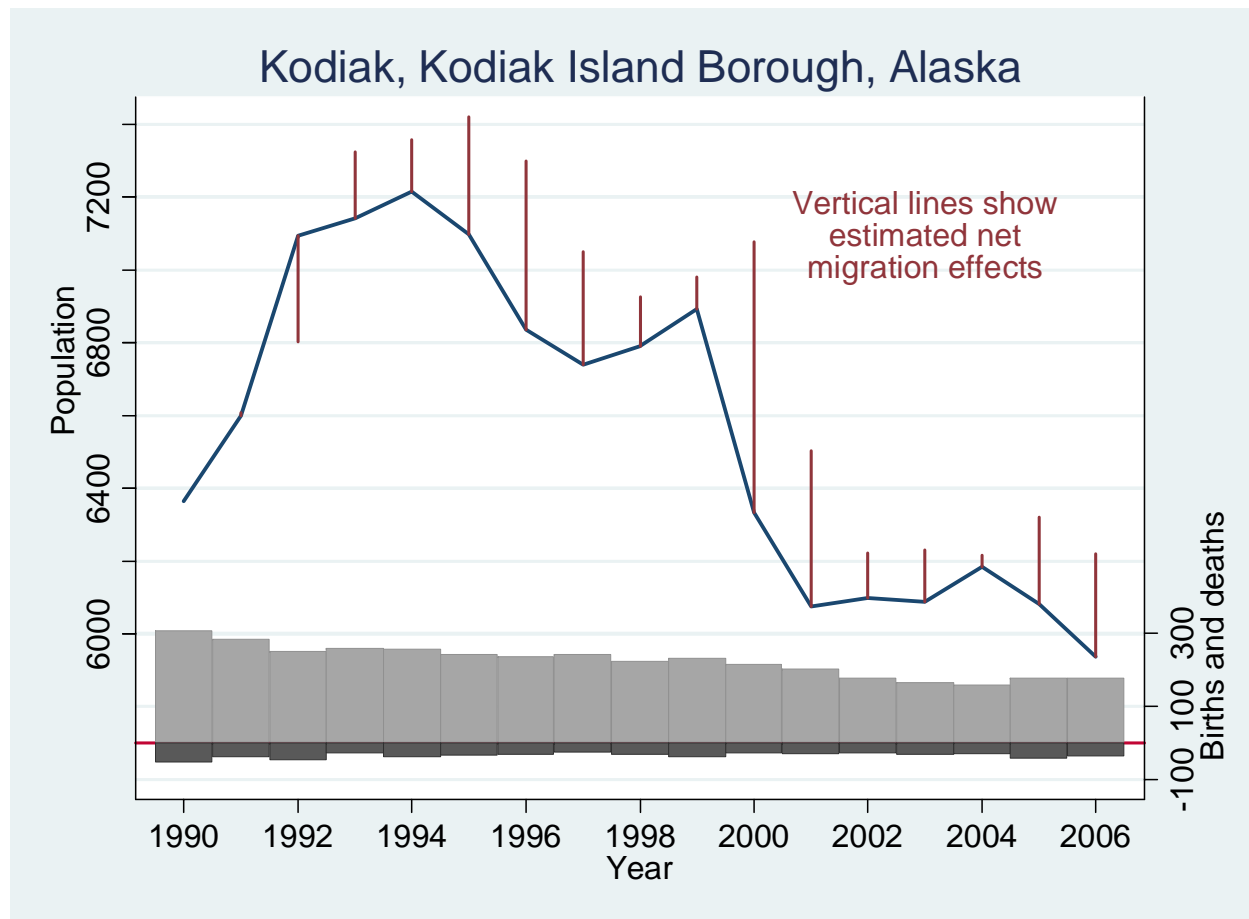




Kodiak Island-based fisheries, including groundfish, salmon, halibut and crab fisheries, have been losing value since 1989.



The population of Kodiak Island Borough has declined due to net outmigration after 1995.



Kodiak City, the main port of Kodiak Island, has lost population since 1994 despite a strong pressures for natural increase (an excess of births over deaths).

From “Population dynamics of Arctic Alaska” website:

<http://www.carseyinstitute.unh.edu/alaska-indicators.htm>

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Questions?

