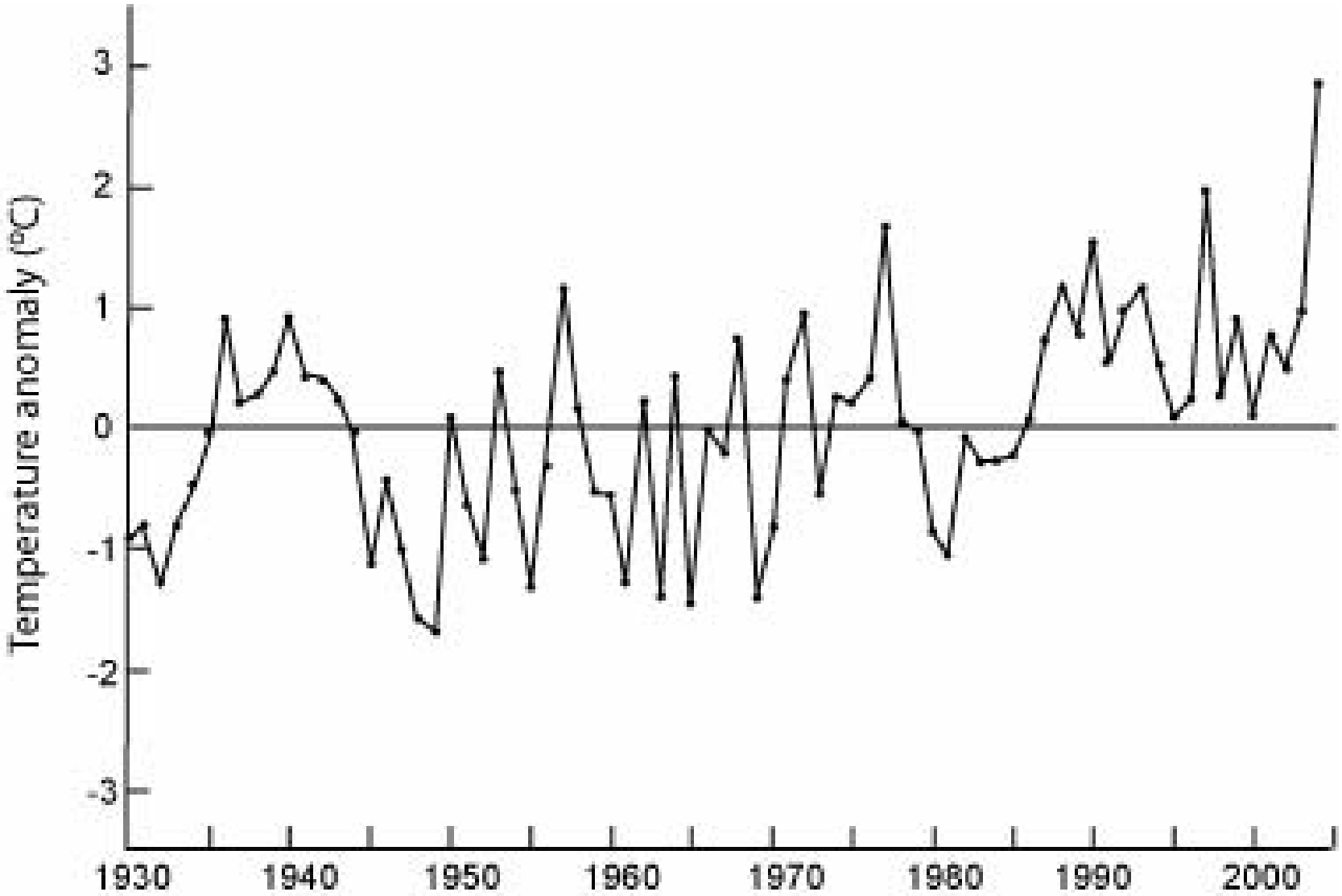
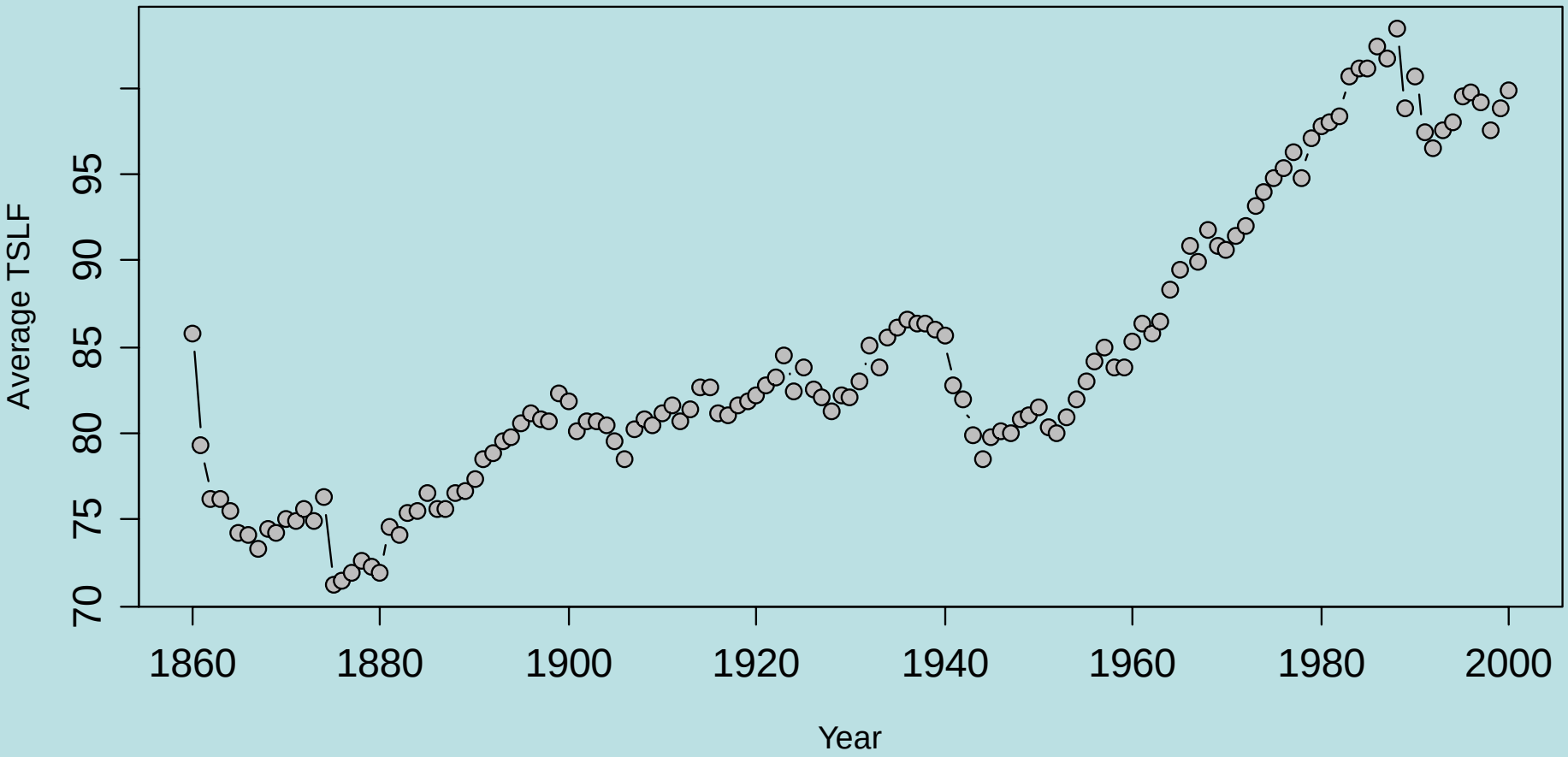
Human-Fire Interactions: Prospects for the Future

Terry Chapin, Scott Rupp, Monika Calef, Henry Huntington, Orville Huntington, Sarah Trainor, Sherri Wall, Joe Little, Nancy Fresco, Paul Baer, Amy Lovecraft

Alaska is getting warmer

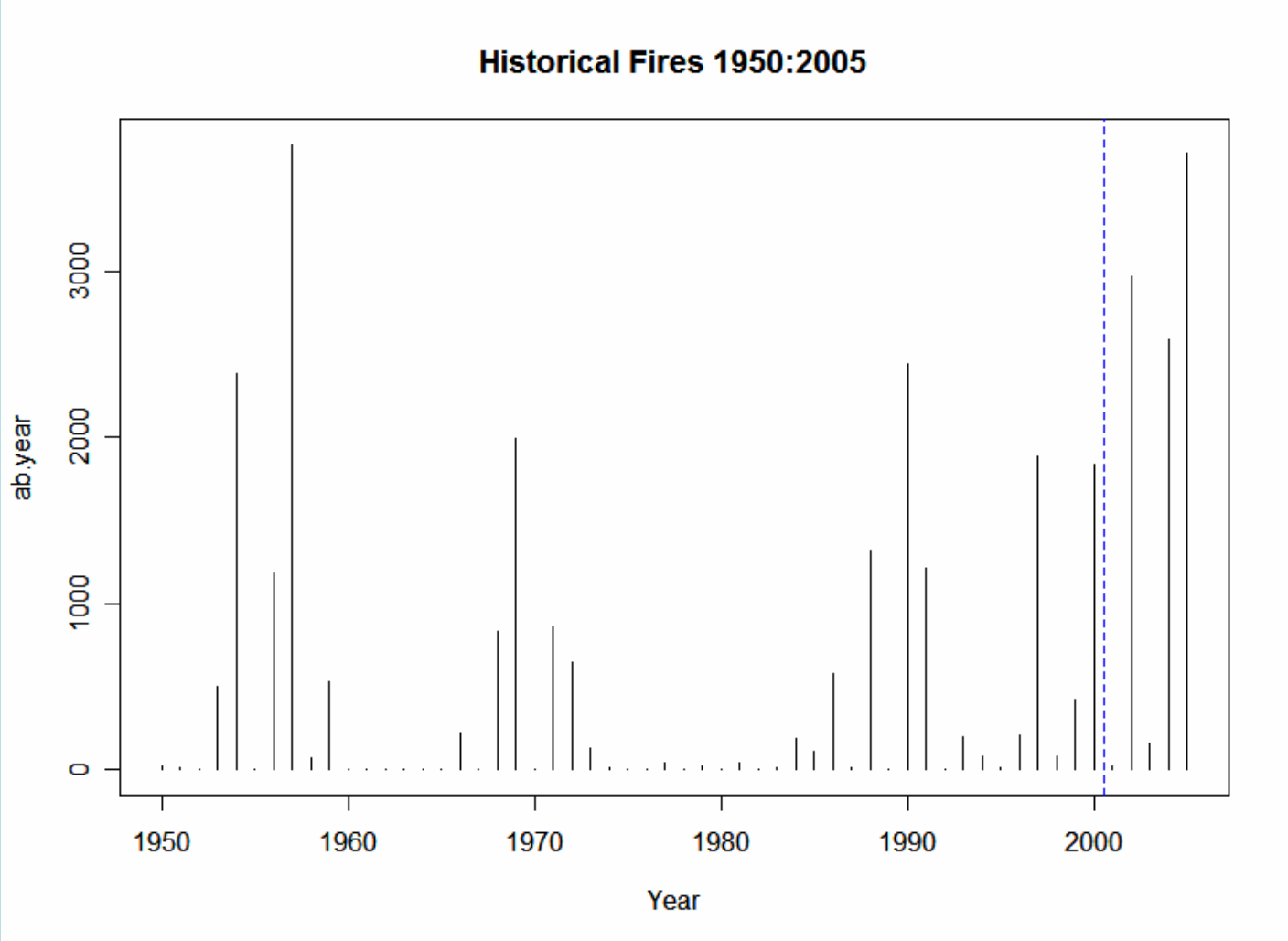


Time Series of Simulated Average Stand-Ages

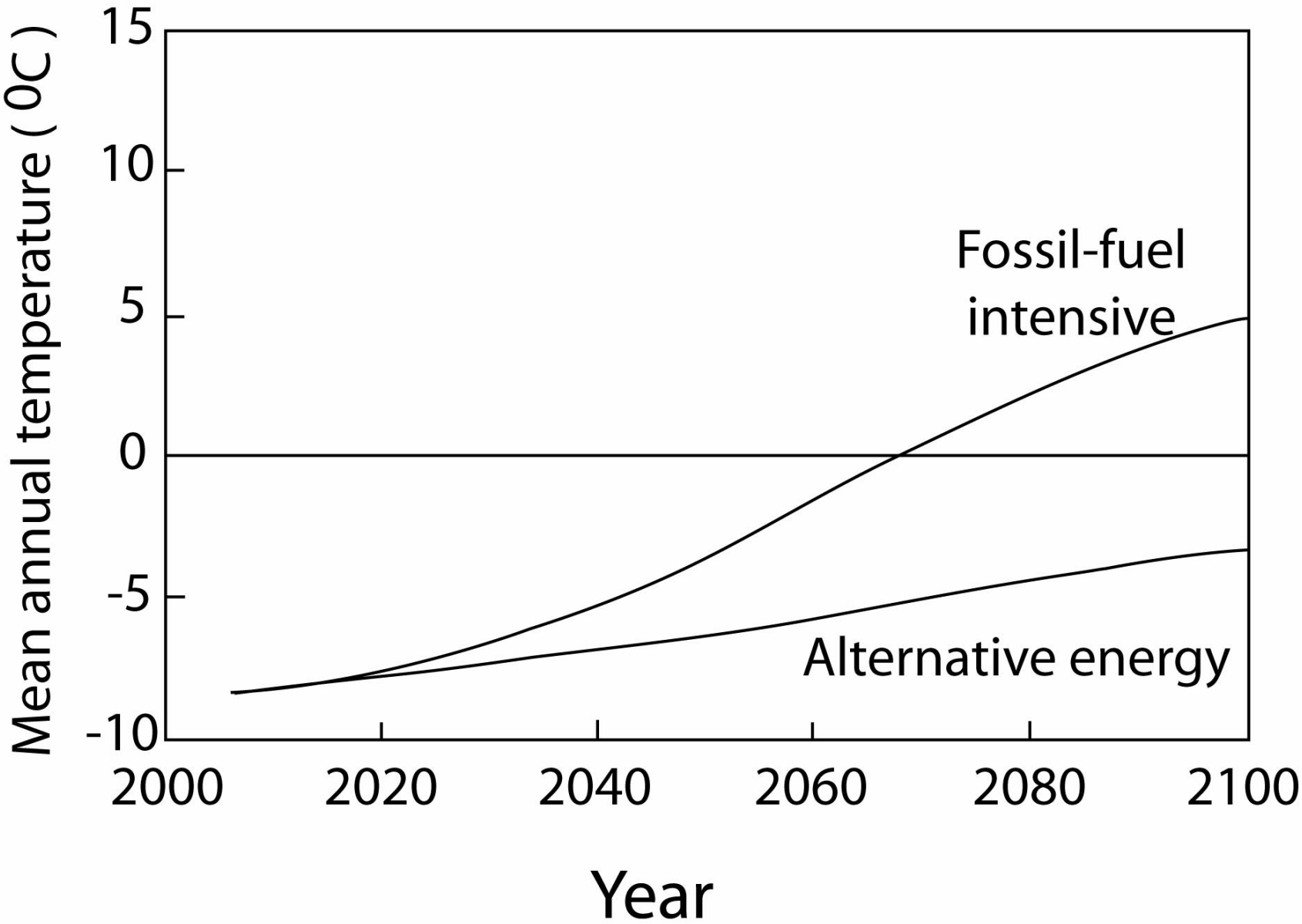


* Implies an increase in landscape flammability

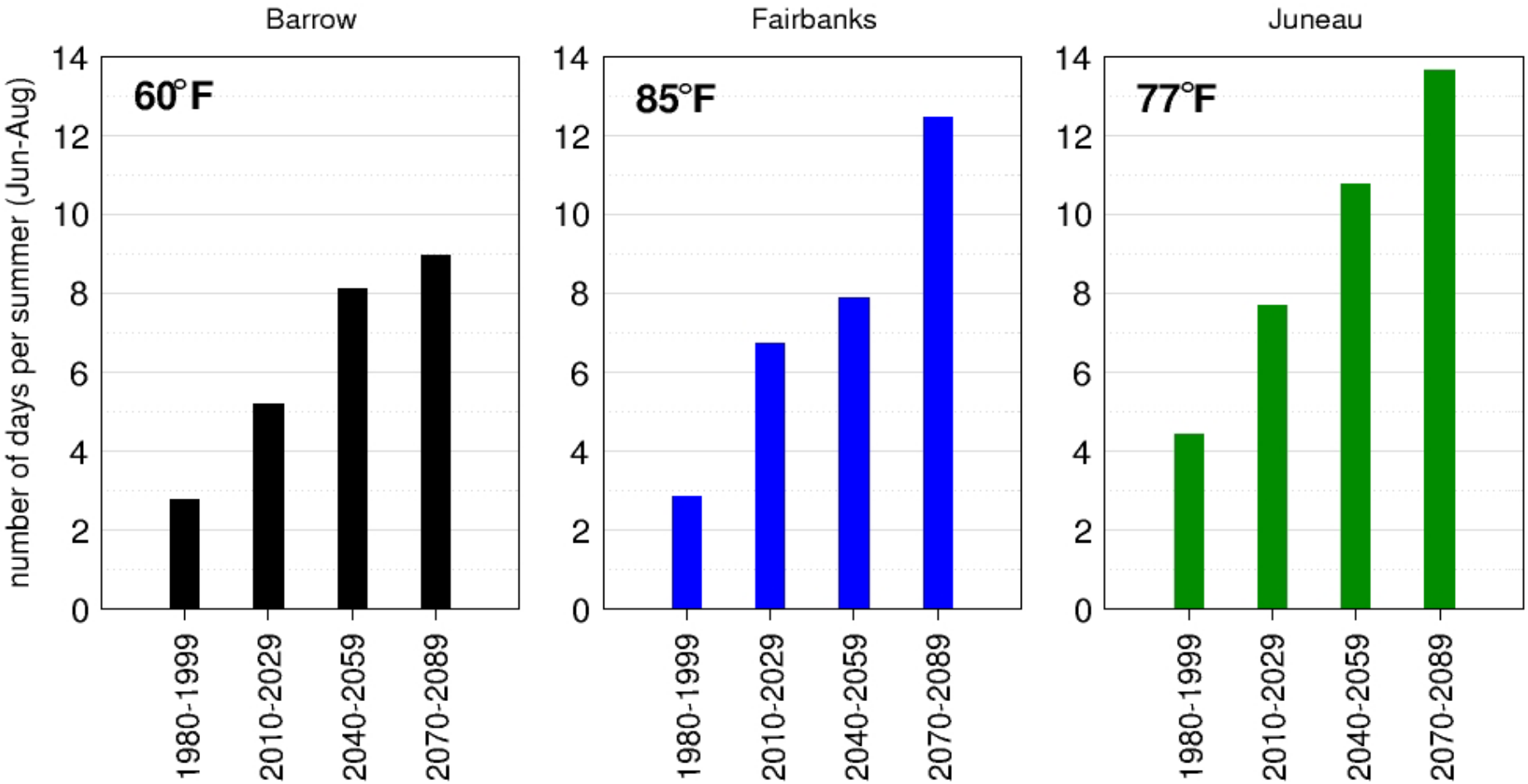
Large fire years have been more frequent since 1990



Projection of Alaska's future climate



Number of hot summer days in the future



Expect more large fire years!

- Climate is likely to continue to warm
- Vegetation may be more fire-prone than at any time in last century
- Flammable fuels will accumulate most rapidly near communities, given current suppression policies
- Greater overlap in fire season between Alaska and the lower 48
  - Potential competition for suppression resources

What can we do about it?

- Increase local suppression effort
  - Effective locally in short term
  - Makes problem worse in long term

What can we do about it?

- Increase suppression effort
- Minimize future increases in human ignitions and expectations for suppression
  - Plan developments in less flammable vegetation (e.g., highly productive ecosystems; areas that burned previously)
  - Avoid highly dispersed development

What can we do about it?

- Increase suppression effort
- Minimize future increases in human ignitions
- Reduce continuity of flammable fuels
  - Wildland fire use in areas remote from communities (fight fire with fire)
    - Connect natural fuel breaks with low-flammability vegetation
  - Harvest flammable vegetation near communities as biofuels
  - Tremendous opportunities for collaborative planning between communities and agencies

What can we do about it?

- Increase suppression effort
- Minimize future increases in human ignitions
- Reduce continuity of flammable fuels
- Reduce rate of climate warming
  - Reduce rate of increase in fossil fuel use
    - Alaska needs to tell its story to the rest of the world
  - Foster alternative energy technologies
    - e.g., biomass fuels
  - Explore climate engineering

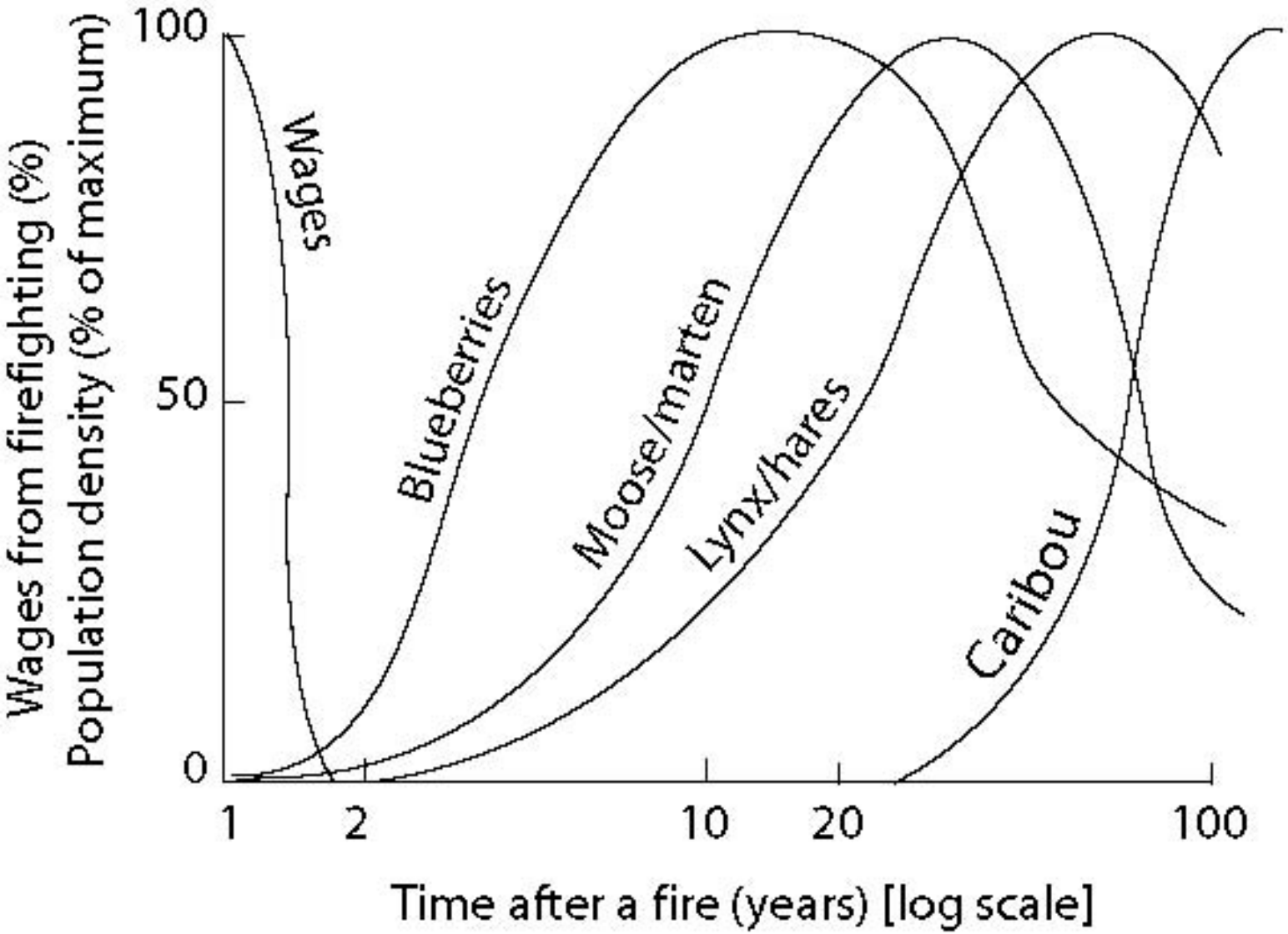
Why does it matter?

- Increased risk to human communities
  - Risk to life and property
    - Short-term risk
    - Long-term protection (less flammable fuels)
  - Health risk
  - Reduced access to landscapes
    - Burns trapping cabins
    - Can’t drive snow machine through recent burns

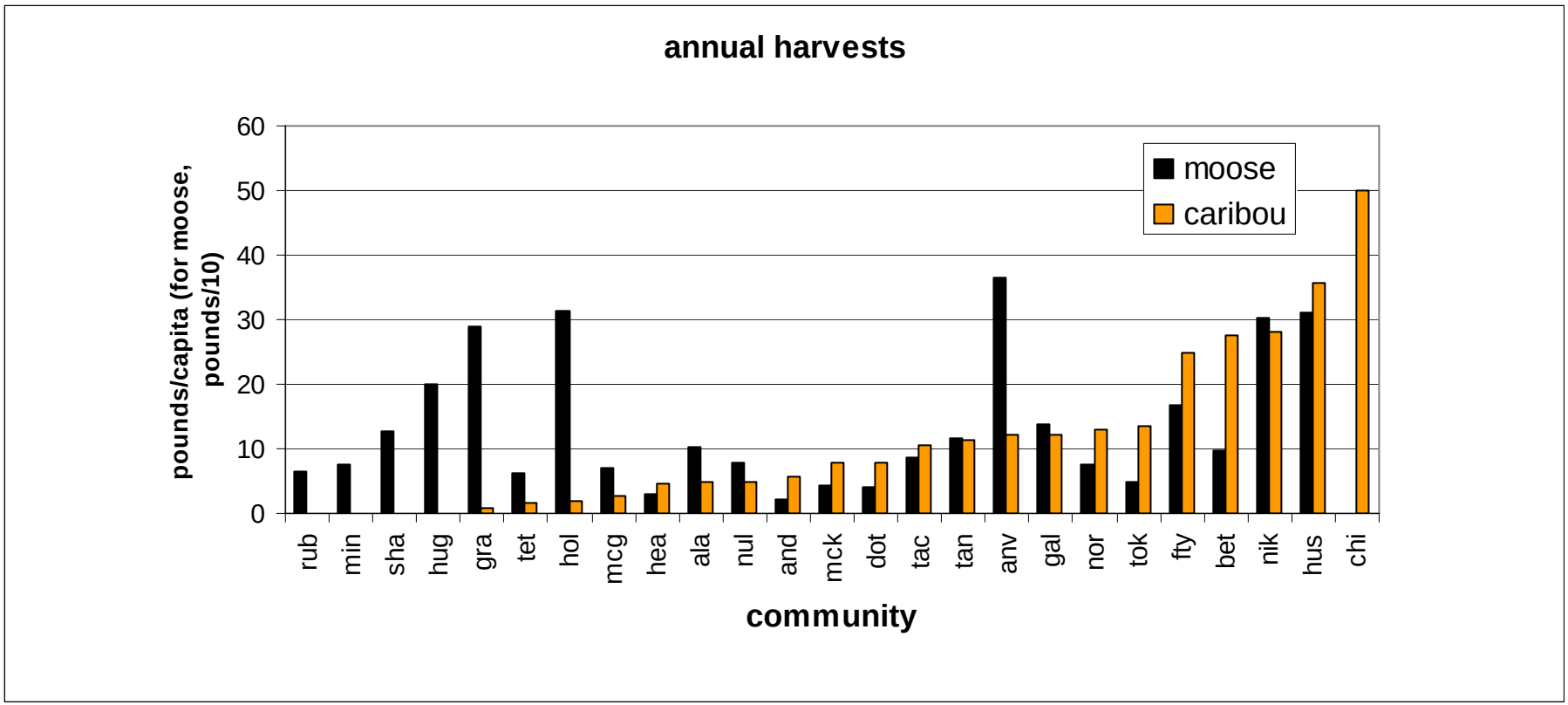
Why does it matter?

- Increased risk to human communities
- Changes in ecological communities
  - Altered habitat for wildlife
  - Changes in flammability

Timing estimated from interviews with local hunters
Time estimates are consistent from village to village



Communities differ in moose/caribou dependence



Why does it matter?

- Increased risk to human communities
- Changes in ecological communities
- Reduced rate of climate warming
  - More carbon emissions (warms globally)
  - Reflects more of sun's rays (cools locally)
  - Net effect is modest cooling at global scale

Why does it matter?

- Increased risk to human communities
- Changes in ecological communities
- Reduce rate of climate warming
- Indirect effects
  - Permafrost thaws faster
  - Many unforeseen surprises

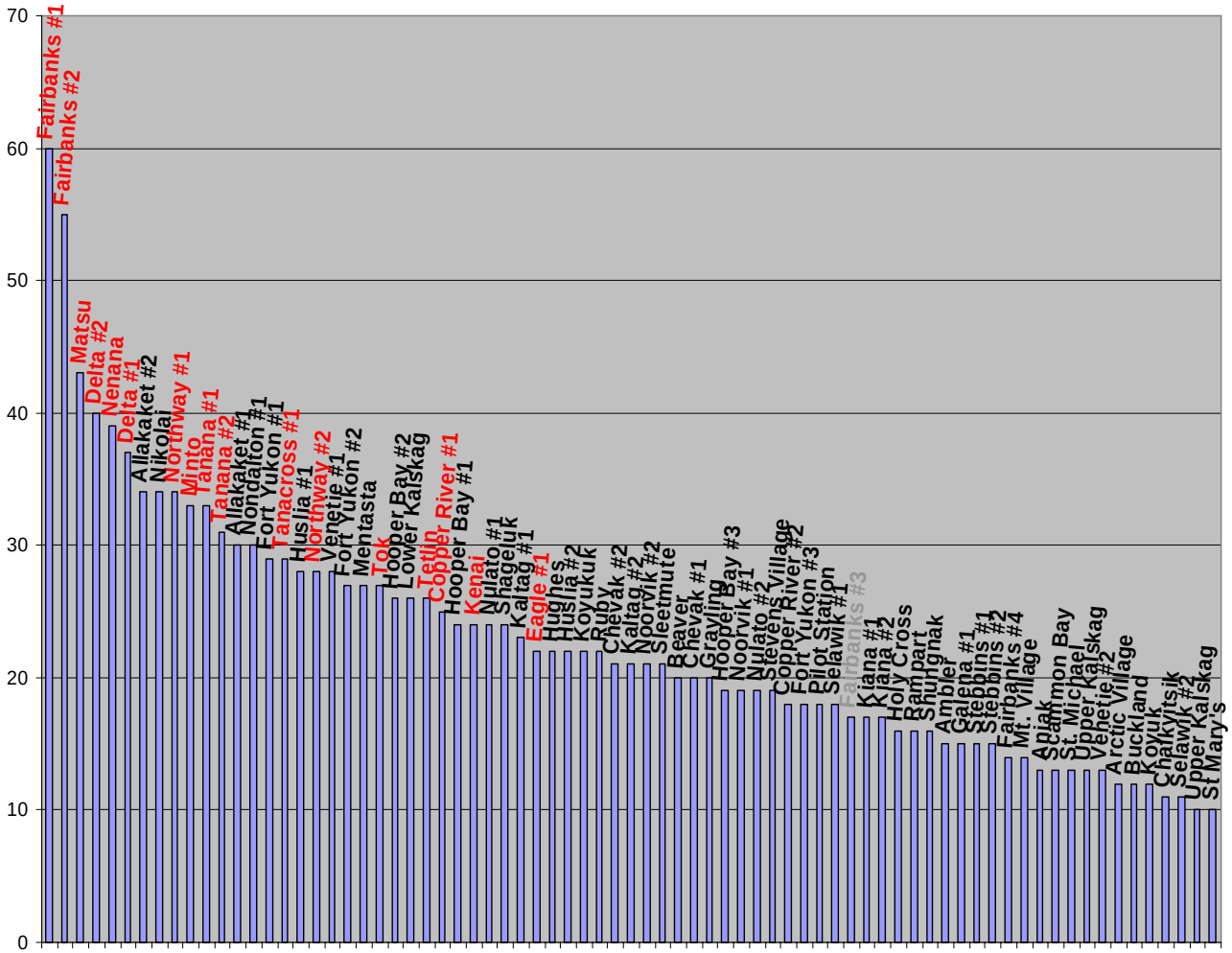
Human interaction with fire has changed over time

- Before contact Indigenous Peoples were mobile and could move in response to fire
  - Now constrained by infrastructure
- Gold miners cleared the country
  - We still enjoy fire protection from this near Fairbanks
- Suppression effort increased after WWII
  - Has become more efficient and targeted with time

Role of EFF wages in communities

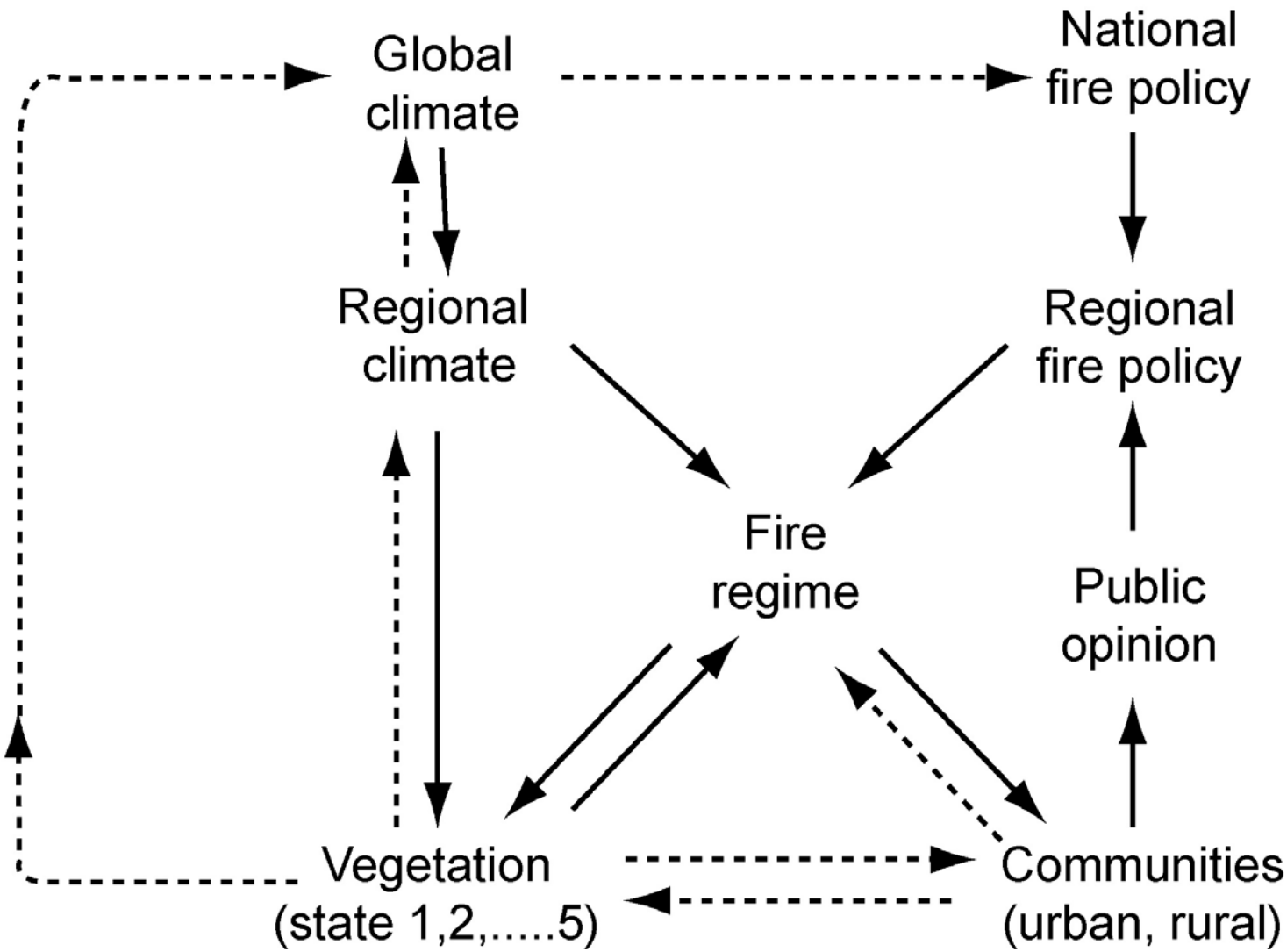
- Small proportion of village income
- Only source of income for half of crew members
- Important social, non-monetary benefits
- Makes subsistence more feasible
  - Contributes to cultural integrity

Total In-State Assignments >10
1986-2003



red = on road

Local policy disconnects
National policy constraints



Conclusions

- Wildfire will likely be increasingly important in Alaska
  - More frequent
  - Greater societal impacts
- Lots of opportunities to do something about it
  - Manage climate, fire, vegetation, and people
  - Public education about changing role of fire
  - Provide international leadership in finding solutions