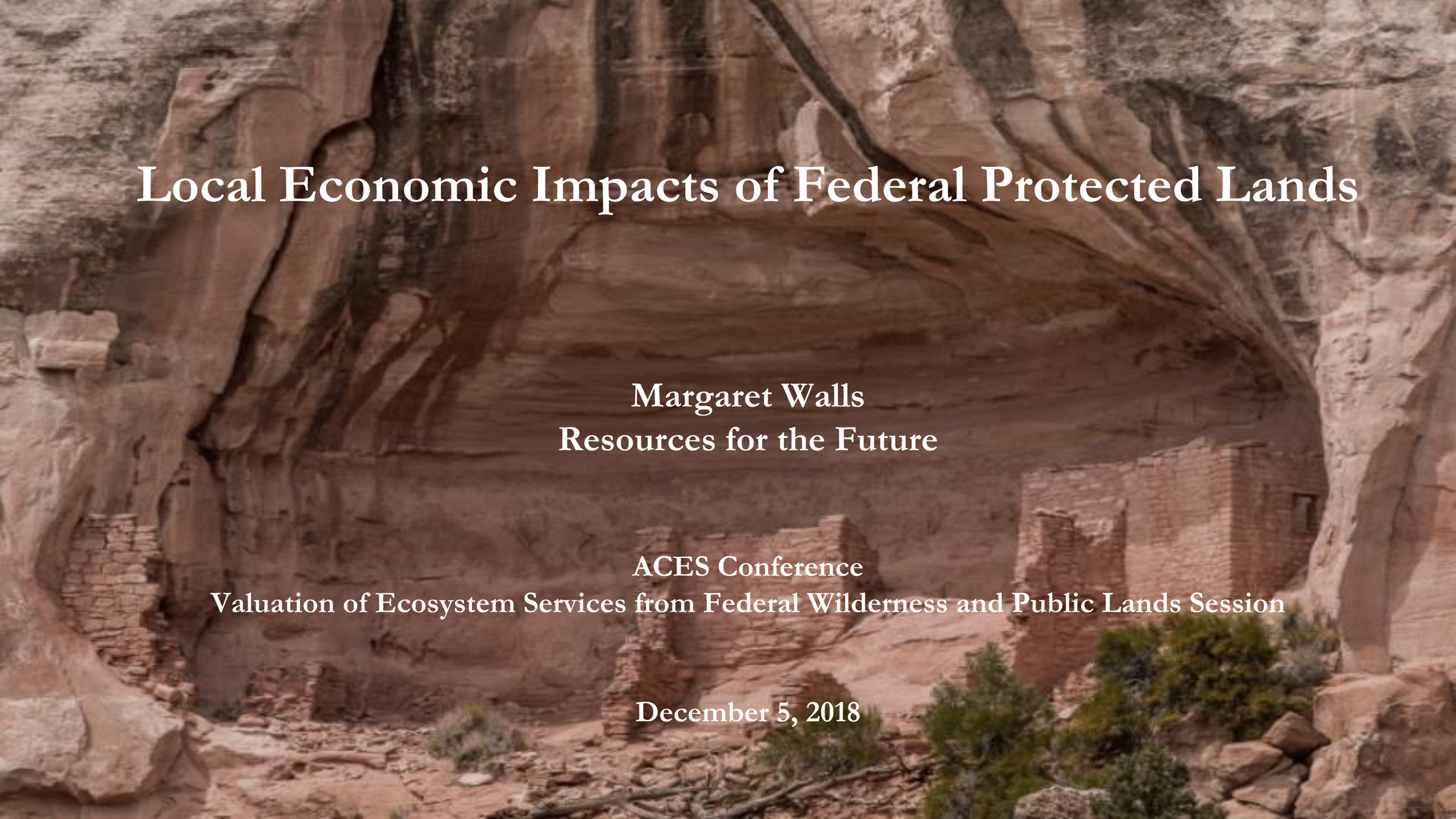

Local Economic Impacts of Federal Protected Lands

Margaret Walls
Resources for the Future

ACES Conference
Valuation of Ecosystem Services from Federal Wilderness and Public Lands Session

December 5, 2018

Ecosystem Services and Public Lands

- Natural lands provide a range of ecosystem services…
  - drinking water filtration, floodwater storage, storm surge attenuation, carbon sequestration, fish nurseries/wildlife habitat, and more
- Public lands in US hugely important contributor
  - 640 million acres of federal lands—28% of US land area
  - In 13 western states, 51% of land area
  - Lower drinking water filtration costs (Barton and Ernst 2004; Abildrup et al. 2013)
  - High percent of outdoor recreation activities on public lands (Outdoor Alliance)
  - 14% of US carbon emissions are sequestered in forests; 44% of forested lands are in national forests (USFS)

Multiple Use Public Lands

BLM and Forest Service lands follow multiple use mandate

- Timber harvesting, livestock grazing, mining, recreation (motorized and "quiet")

Long-standing conflicts over uses

Lands granted protective status…

- Wilderness areas – most restrictive
- National monuments, national conservation areas – management plans vary but drilling is off limits; some grazing may be allowed
- National parks, National wildlife refuges

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Debate Typically Revolves around Jobs

- *Opponents*: protective status hurts the local economy
- *Advocates*: protective status creates new and better economic opportunities

National monuments particularly contentious…

- Presidential "overreach"
- Federal "land grab"
- Locals have no say

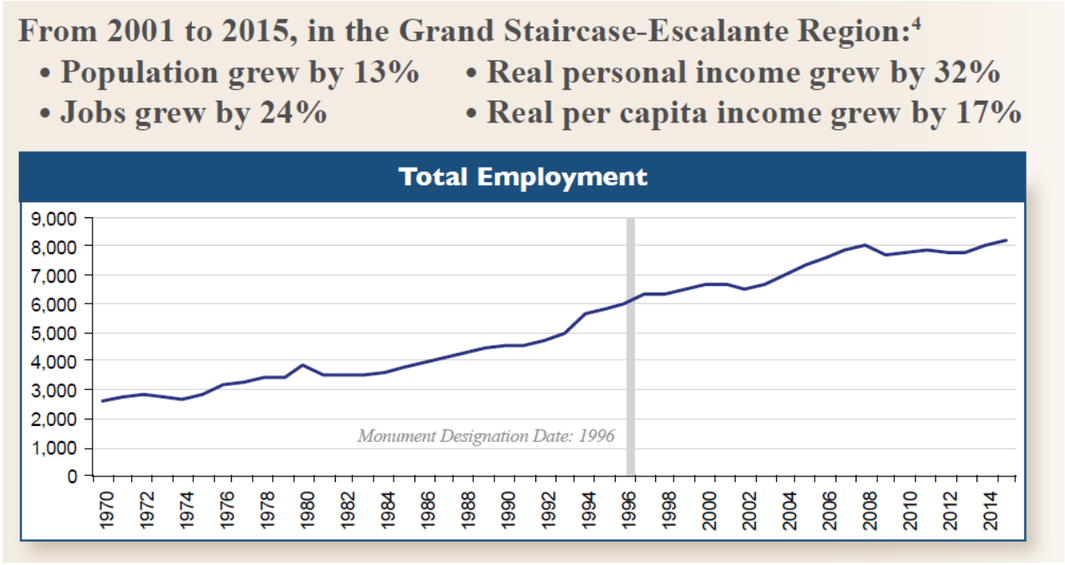
April 2017, President ordered review of 22 monuments

- Results: Bears Ears reduced 85% and Grand Staircase Escalante 50% -- 2 million acres in total

Congress: several Republican bills to limit Antiquities Act

The Literature on Economic Impacts

- *Headwaters Economics* series of reports on national monuments; Rasker *et al.* (2013)
- Some older studies…
  - Duffy-Deno (1998); Homes & Hecox (2004); Lorah & Southwick (2003); Southwick Associates (2012)
- Studies finding negative correlations…
  - Steed *et al.* (2011); Simmons & Yonk (2012)



Source: Headwaters Economics 2017

Useful for baseline information but some limitations:

- correlations only, not causation
- aggregate data

Regional multiplier models…

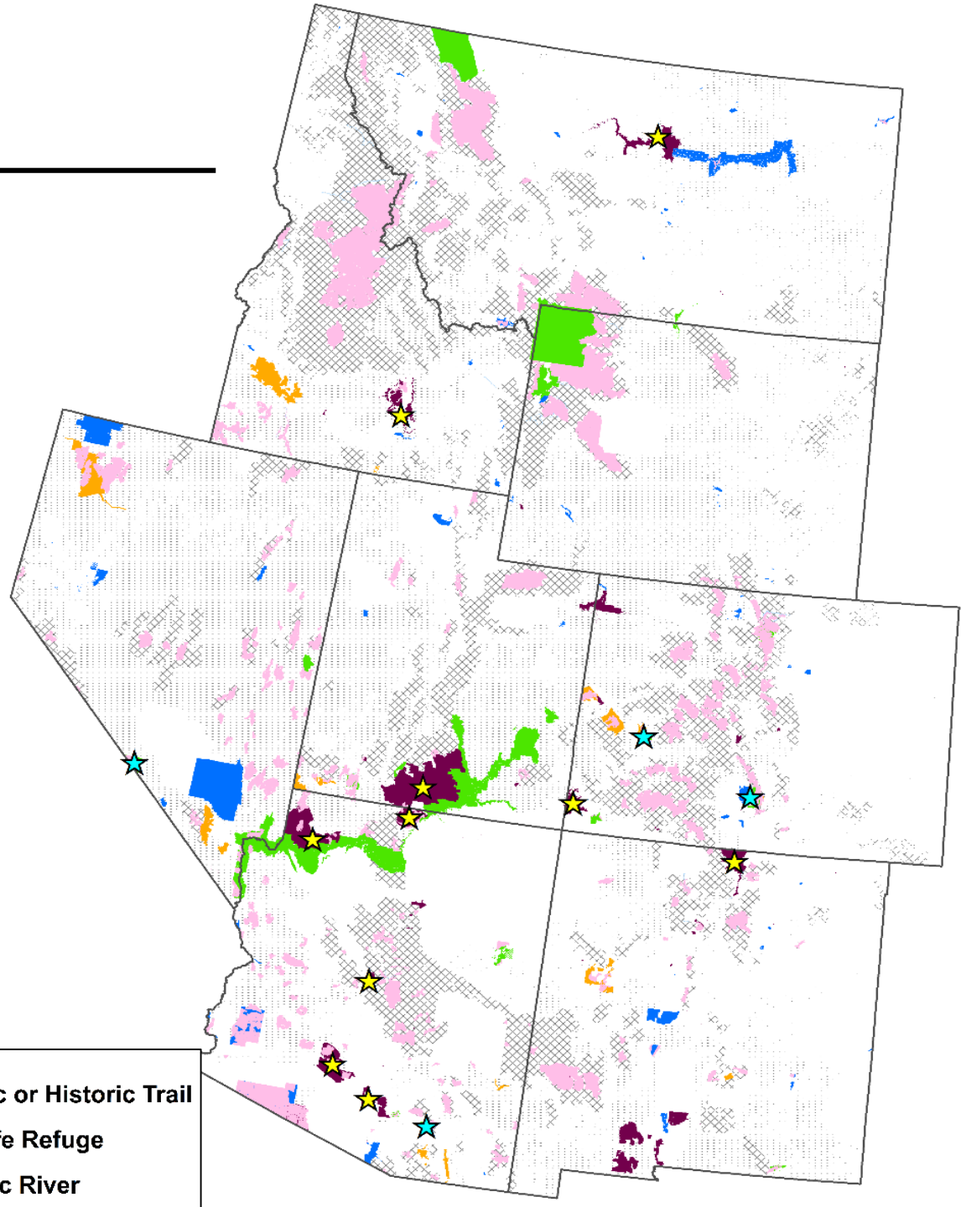
- Wheeler & Siedl (2004)
- Hjerpe (2017)
- Several govt studies, e.g. *Banking on Nature* 2013 study of NWRs

The Literature on Economic Impacts (cont.)

- Estimating causal impacts:
  - *Chen et al. (2016)* study of 1994 Pacific Northwest Forest Plan
    - DID methods, matching techniques
    - Impacts on income, population, & property values
    - *Findings:* positive effects on small communities close to NWFP plan; no effect for medium-sized communities
  - *Jakus and Akhundjanov (2018a)* study of Grand Staircase-Escalante National Monument
    - DID and synthetic control methods
    - Impacts on county-level per capita income
    - *Findings:* no statistically significant effects
  - *Jakus and Akhundjanov (2018b)* study of 9 monuments
    - Synthetic control methods
    - Impacts on county-level per capita income
    - *Findings:* no statistically significant effects

This Study

- Assessing local economic impacts of national monuments (NCAs too, later)
- **Using micro-data**… all individual establishments in 8-state region, 1990-2015
  - Address, employment, sales, 8-digit SIC code (National Establishment Time Series (NETS) Database)
    - 4.6 million establishments
    - We geocoded, calculated distances to each protected area
    - Not restricted to county-level analysis
- Econometric methods that establish **causal relationships** between monument designations and economic activity



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Empirical Methods

Detailed (i.e., SIC code, location) assessment of trends

- Number of establishments & jobs, 1990-2015
  - Total region, rural areas only, within 100-km of monument
  - By SIC code (2-digit, 6-digit)

Differences-in-differences (DID) regressions

- $\ln y_{isct} = \beta_0 + \beta_1 1[monument = 1]_{ict} + \alpha_i + \gamma_{ct} + \delta_{st} + \varepsilon_{isct}$
  - y_{isct} is number of jobs in establishment i in industry s and county c in year t.
  - $1[monument = 1]_{ict}$ is an indicator equal to 1 once a monument is designated within 100-km (50-km) of establishment i
    - **β_1 is the coefficient of interest**
  - a_i is an individual establishment fixed effect; γ_{ct} is a county by year fixed effect; δ_{st} is an industry by year fixed effect (using 2-digit SIC code)
  - 2-way clustering of SEs (by county & year)

Trends

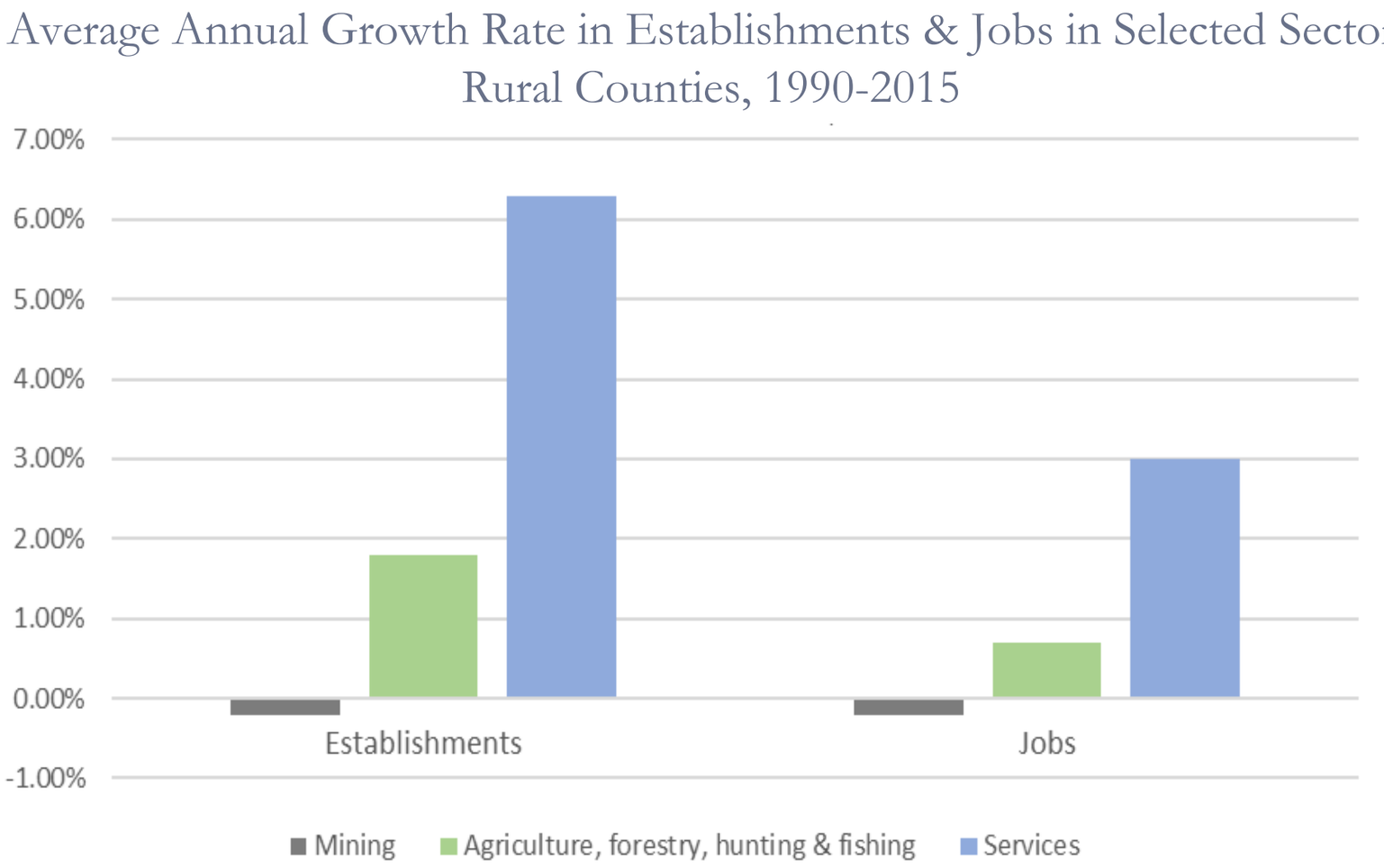
Regional Trends

- *important to understand because we're trying to see if there is anything separate from the trends*

  - Mountain West region's economy has done better than the US as a whole since 1990
    - but employment growth has been weak (as in the rest of the country)
    - and rural areas have fared worse than non-rural (as in the rest of the country)
  - Big growth in the service sector (36% of all jobs in 2015)
    - much of the growth is in "business services"
      - Many "cottage" establishments (private business in residence with <3 employees)

Trends (cont.)

Rural Areas



Overall average annual growth rates, for all industries, in rural counties:

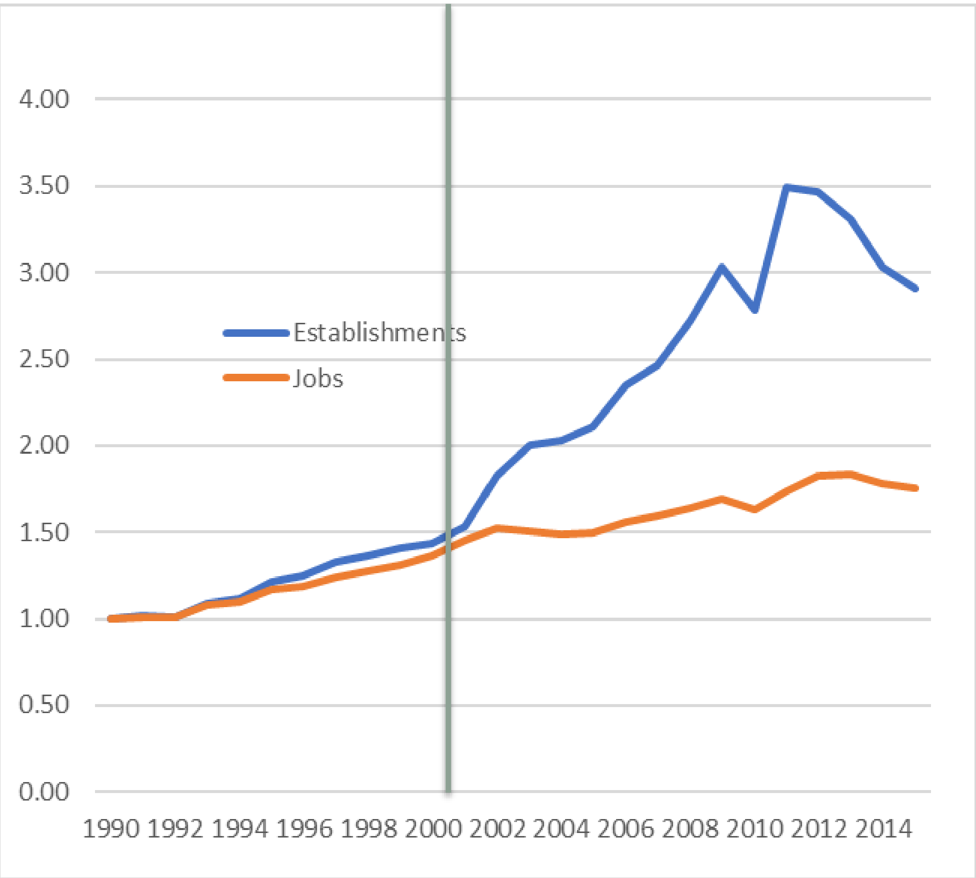
- Establishments: 3.2%
- Jobs: 1.8%

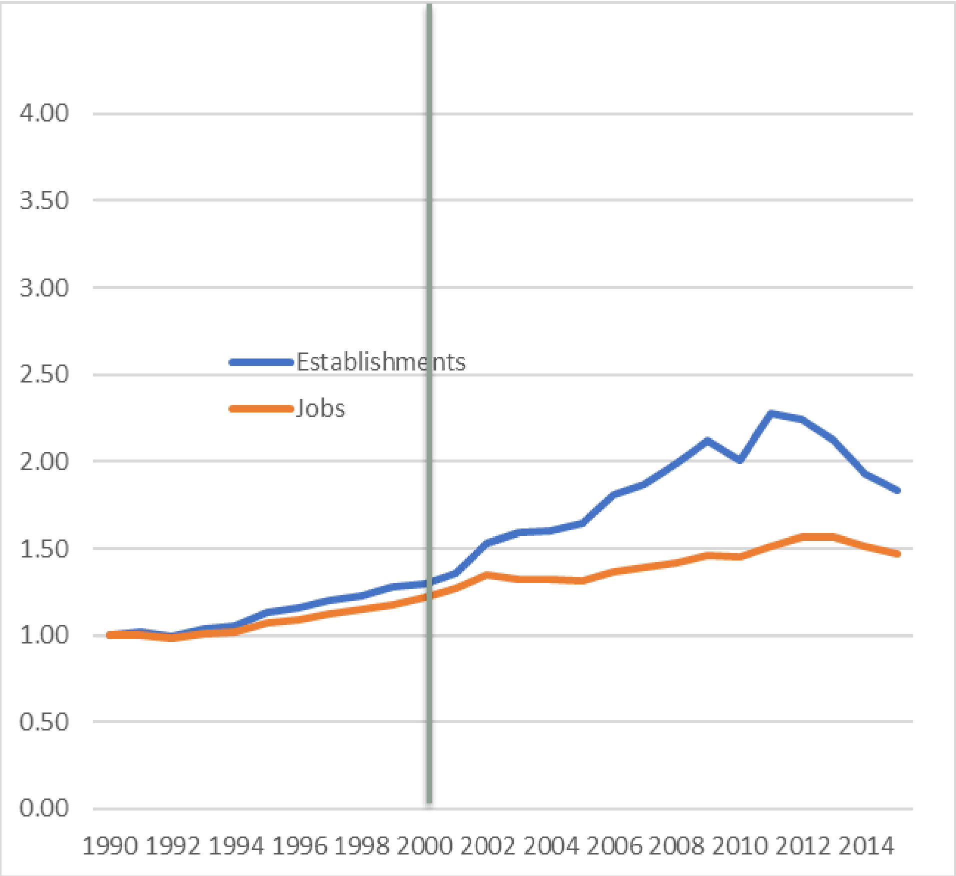
Trends and Monument Designations

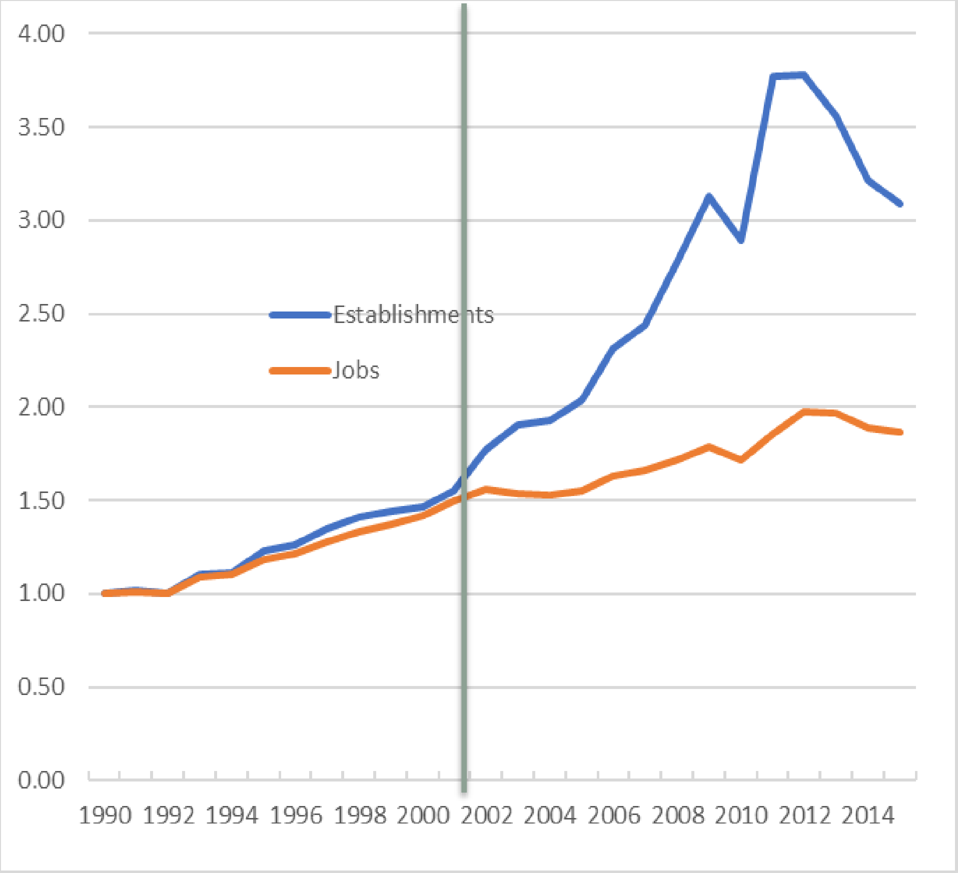
Comparing locations near and far from monuments

- **Areas around national monuments don't look a lot different from the rest of the region**
  - Similar trends over time
  - After designation compared to before…
    - growth in establishments slightly better than other areas
    - growth in jobs about the same (anemic)

Trends and Monument Designations (cont.)







Entire Region

	Avg. Annual Percent Change	
	Establishments	Jobs
Pre-2000	**4.6**	**3.5**
Post-2001	**6.4**	**1.5**

Rural Counties

	Avg. Annual Percent Change	
	Establishments	Jobs
Pre-2000	**3.1**	**2.0**
Post-2001	**2.5**	**1.1**

Within 100km of Monument

	Avg. Annual Percent Change	
	Establishments	Jobs
Pre-2000	**4.6**	**4.2**
Post-2001	**5.7**	**1.5**

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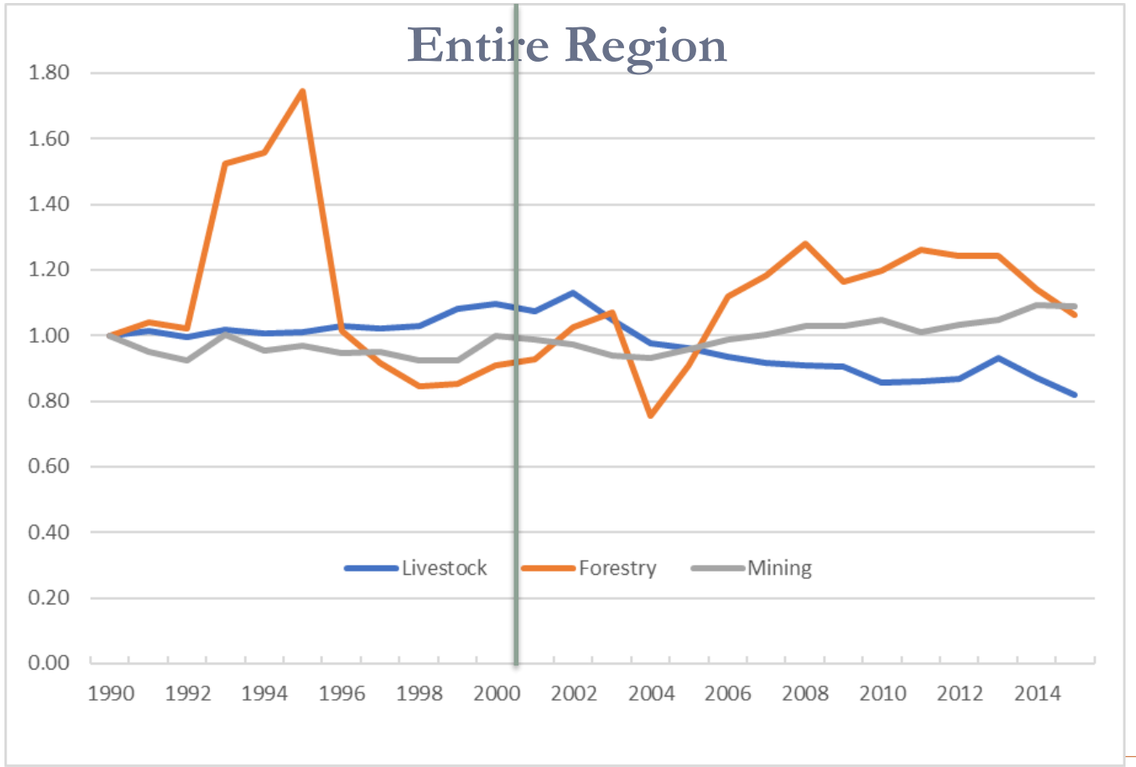
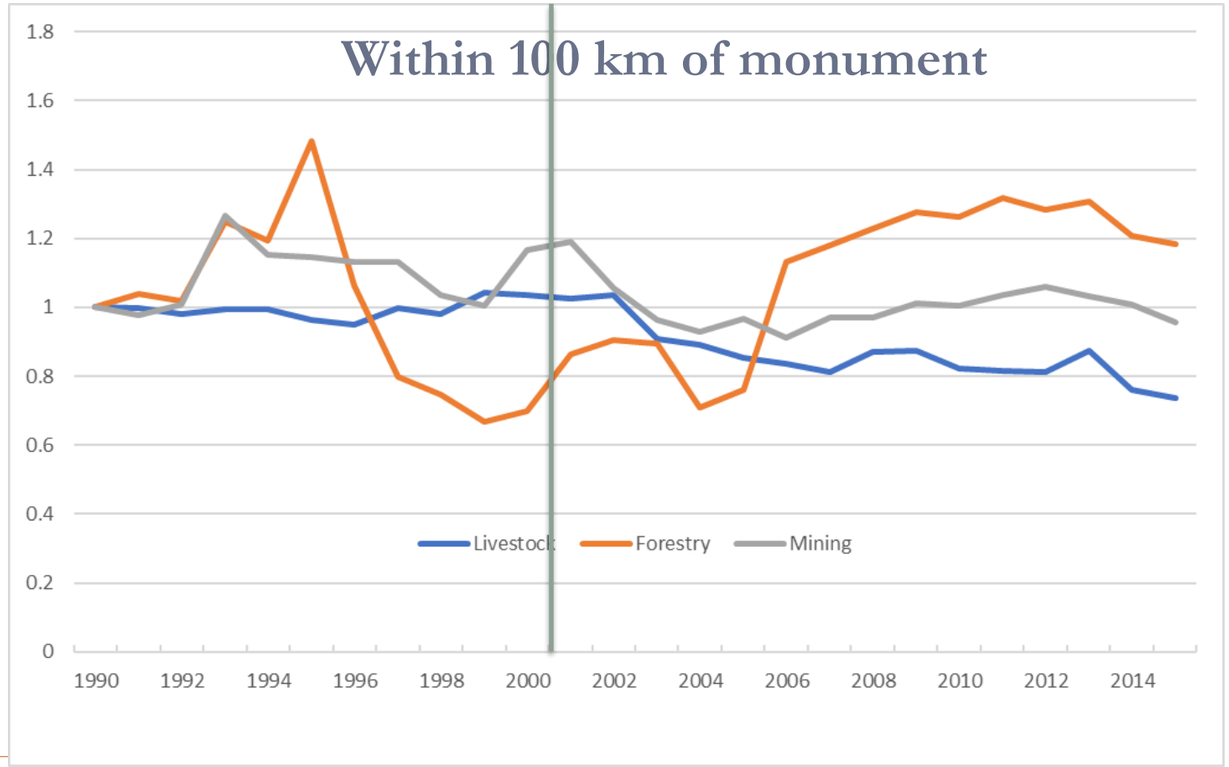
Note: Graphs show index of establishments and jobs, with 1990=1.

Trends and Monument Designations (cont.)

Any impacts on **mining, forestry, livestock** sector jobs from monument designations?

- Doesn't look like it
- Growth in those sectors is weak over the 25-year period





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Note: Graphs show jobs index, with 1990=1.

Differences-in-Differences Regression Results

PRELIMINARY

Dependent variable: *ln*(no. of jobs)		
Treatment – w/in 50 km	**0.00604****	
	(0.0027)	
Treatment – w/in 100 km		**0.00842**
		(0.0096)
County*Year FE	Yes	Yes
SIC Code*Year FE	Yes	Yes
No. observations	9,935,725	9,935,725
No. establishments	1,380,575	1,380,575
R-squared	0.937	0.937

Robust standard errors, two-way clustered at county & year level, in parentheses.

Sample: all rural zip codes in counties with >10,000 acres of BLM & FS lands.

** p < .10; ** p < .05; *** p < .01.*

Monument designation has very small positive effect on the number of jobs in establishments w/in 50 km of monument

- 0.6% average increase per establishment
- ~10,200 additional jobs (in existing estabs.)

No statistically significant effect on number of jobs w/in 100 km of monument

- So monument designation impact seems to wash out farther away

Differences-in-Differences Regressions: Mining Sector

PRELIMINARY

Dependent variable: *ln*(no. of jobs)

Treatment – w/in 50 km	**-0.0520**	
	(0.0691)	
Treatment – w/in 100 km		**0.210**
		(0.125)
County*Year FE	Yes	Yes
SIC Code*Year FE	Yes	Yes
No. observations	29,164	29,164
No. establishments	3,331	3,389
R-squared	0.944	0.944

Robust standard errors, two-way clustered at county & year level, in parentheses.

Sample: all rural zip codes in counties with >10,000 acres of BLM & FS lands.

** p < .10; ** p < .05; *** p < .01.*

Monument designation has no statistically significant effect—positive or negative—on the number of mining jobs w/in 50 km or w/in 100 km of monument

Differences-in-Differences Regressions: Services Sector

PRELIMINARY

Dependent variable: *ln*(no. of jobs)

Treatment – w/in 50 km	**0.00362**	
	(0.0036)	
Treatment – w/in 100 km		**0.00233**
		(0.0167)
County*Year FE	Yes	Yes
SIC Code*Year FE	Yes	Yes
No. observations	6,113,169	6,113,169
No. establishments	890,014	890,014
R-squared	0.933	0.933

Robust standard errors, two-way clustered at county & year level, in parentheses.

Sample: all rural zip codes in counties with >10,000 acres of BLM & FS lands.

** $p < .10$; ** $p < .05$; *** $p < .01$.*

Monument designation has no statistically significant effect—positive or negative—on the number of service jobs w/in 50 km or w/in 100 km of monument

Next Steps

- Alternative control groups (matching)
- Heterogeneous effects (by monument, by industry, by establishment size)
- Beyond the number of jobs…
  - do numbers and types of establishments change?
  - wage trends
  - business survival rates
- Include NCAs – different effects than monuments? (Only real difference is in designation process so should be similar.)

Conclusions

- So far, it looks like monument designations have a **very small positive impact** on the number of jobs in businesses located close to the monument (w/in 50 kms)
- But the effect goes away at greater distances
- Mining jobs unaffected; services unaffected
  (What industries are driving the results? Not sure yet)

Results are preliminary!

Stay tuned for further analysis

Thank you!

Comments? Questions?

Contact: walls@rff.org