

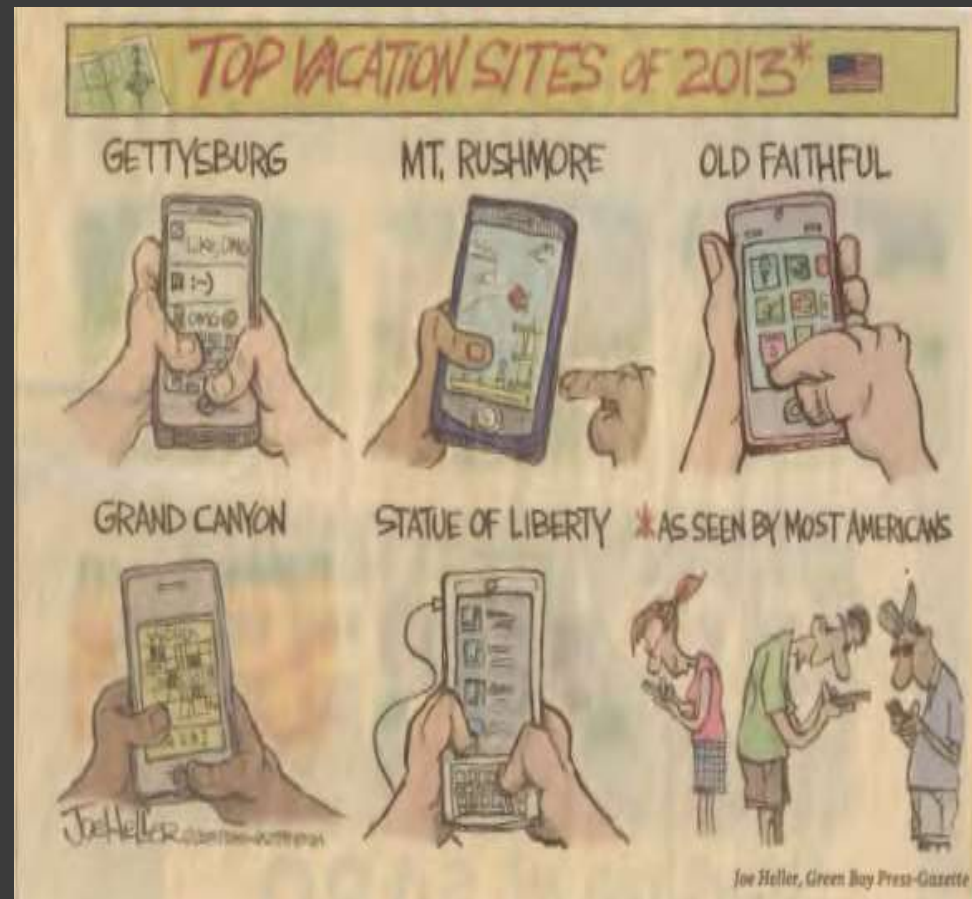
# VALUING ON-SITE AND VIRTUAL BEAR VIEWING IN KATMAI NP&PRES



Leslie Richardson, NPS Social Science Program  
John Loomis, CSU Department of Agricultural & Resource Economics  
Chris Huber, USGS Fort Collins Science Center

# Background

- More and more people are using National Park Service websites for:
  - Trip planning
  - Education
  - Viewing landscapes and features through one of the 76 webcams
- These off-site, virtual experiences may either complement or substitute trips to national parks
- NPS is interested in knowing more about these 'virtual visitors'

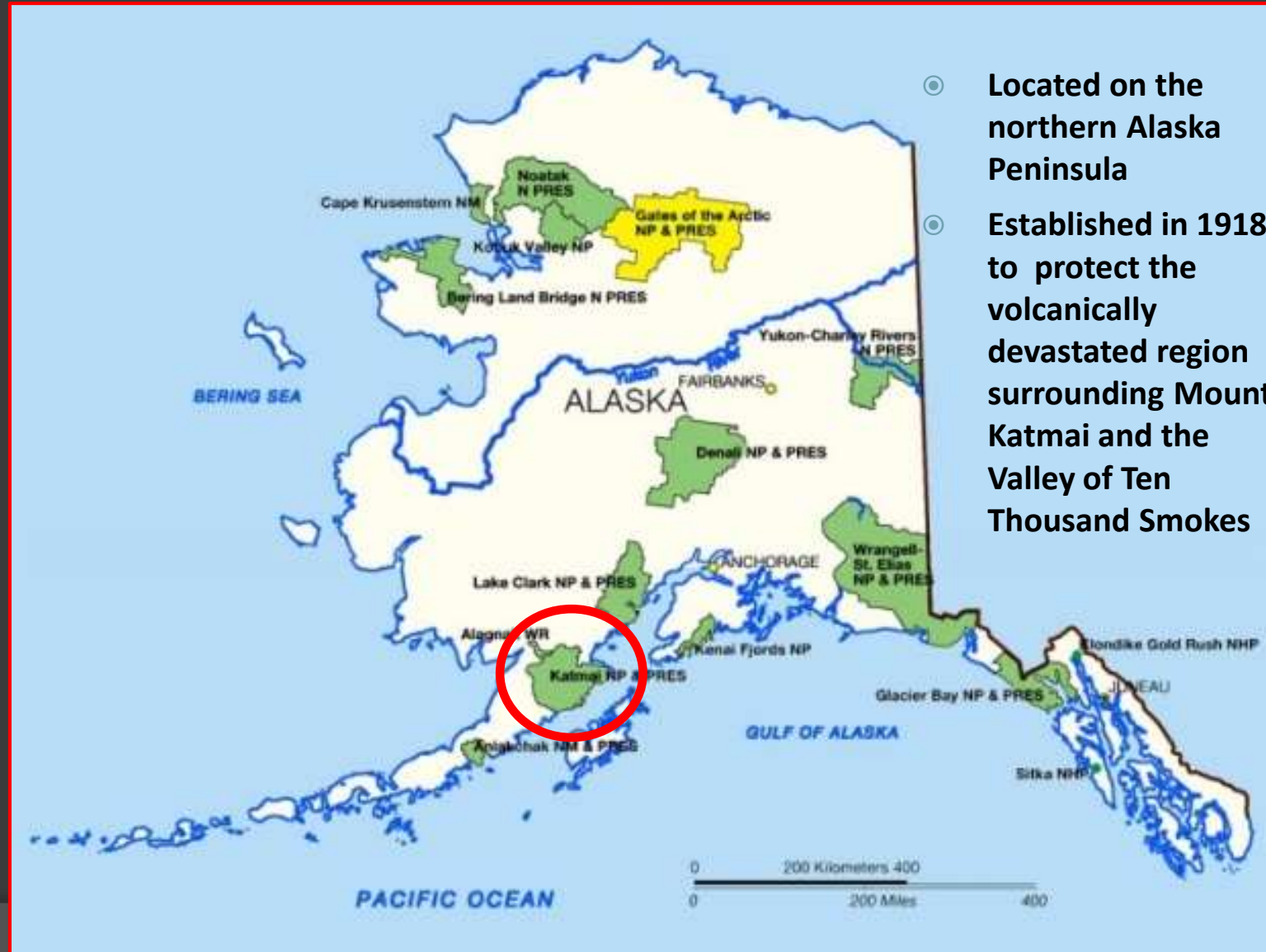


# Background

- ◎ Primary goals
  - Explore methods that can be used to value people's use of NPS websites and webcams
  - Case study of Katmai NP&PRES bear webcams
- ◎ Secondary goal
  - Value on-site bear viewing at Katmai NP&PRES



# Katmai National Park & Preserve

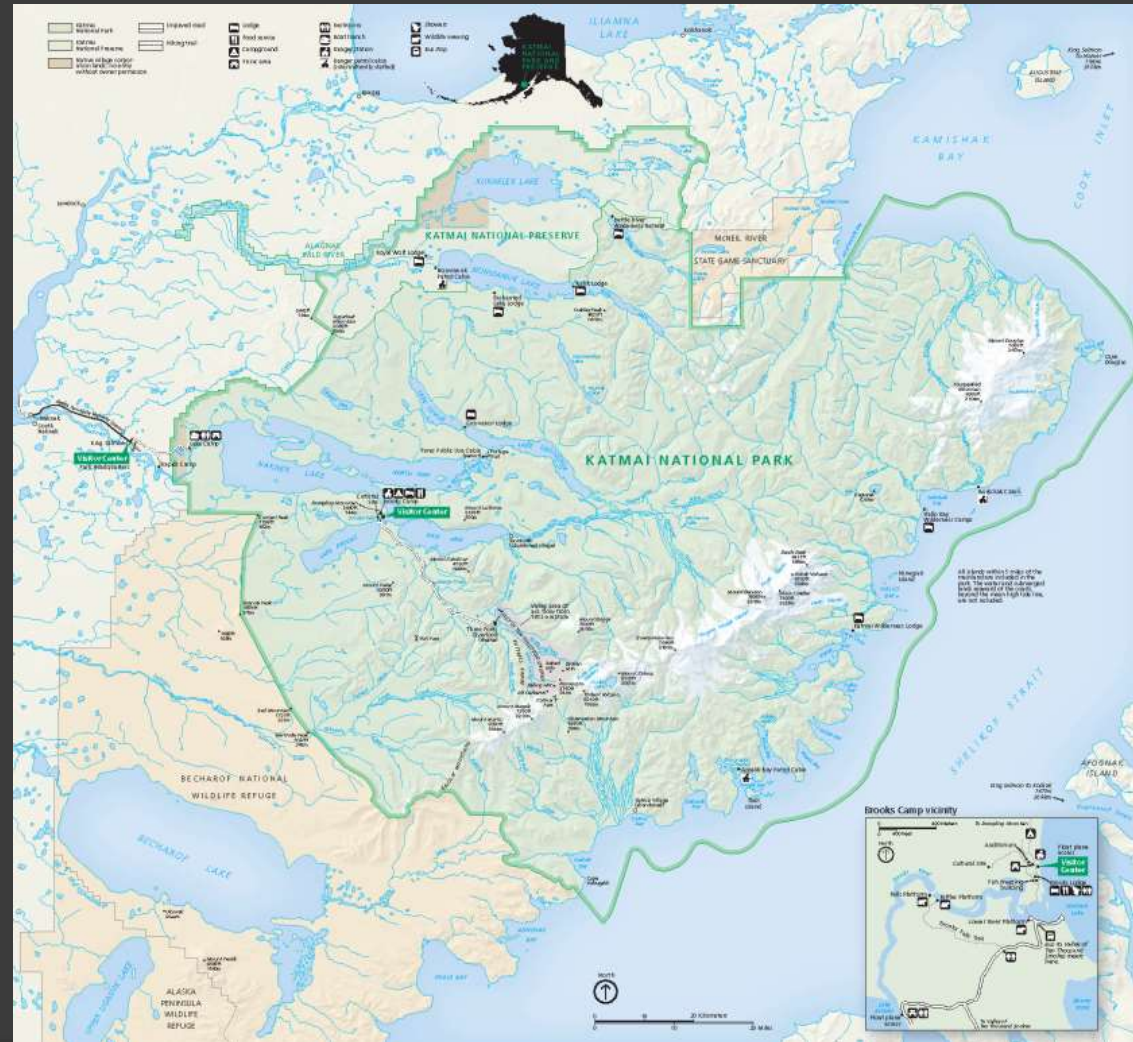


- Located on the northern Alaska Peninsula
- Established in 1918 to protect the volcanically devastated region surrounding Mount Katmai and the Valley of Ten Thousand Smokes



# Katmai National Park & Preserve

- Over 4 million acres
- Accessed only by plane or boat
- Some visitors come for the fishing or remote backcountry hiking...



# Katmai National Park & Preserve

- ⦿ ...but the majority of visitors come for the world-renowned brown bear viewing at Brooks Camp!
- ⦿ High concentrations of bears congregate to feed on sockeye salmon in the Brooks River late June –July and again in September



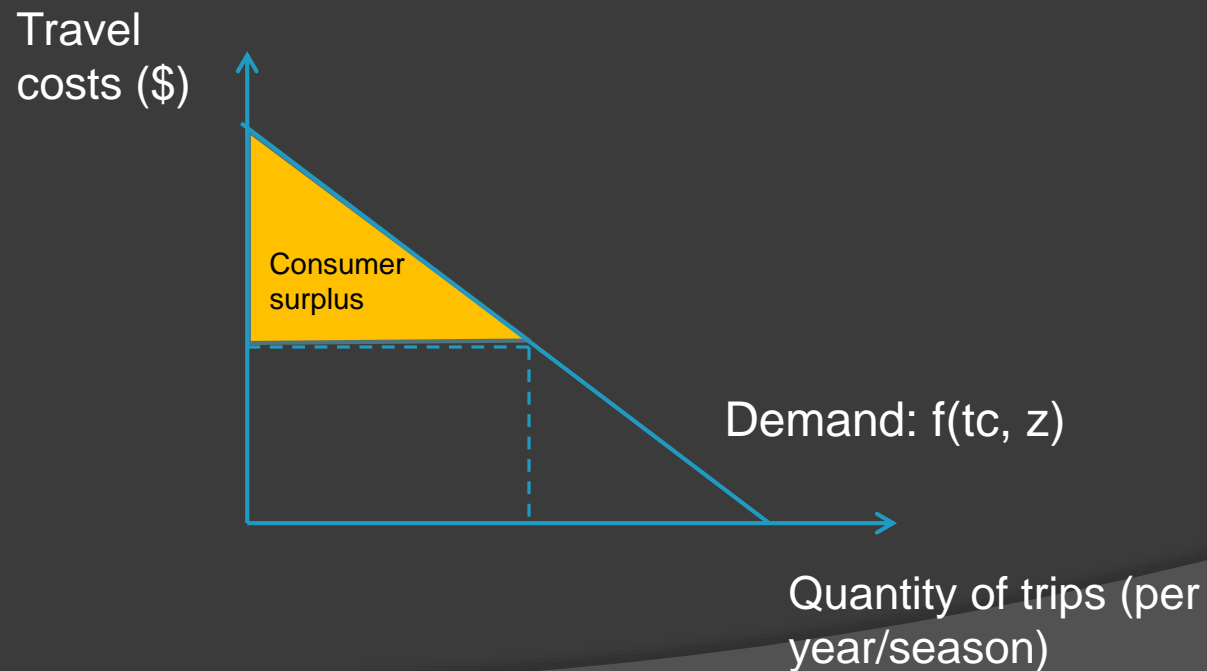
# Katmai National Park & Preserve

- Viewing platforms are set up along the River
- Most visitors come on day trips or stay in the designated campground or lodge



# Valuing On-site Bear Viewing

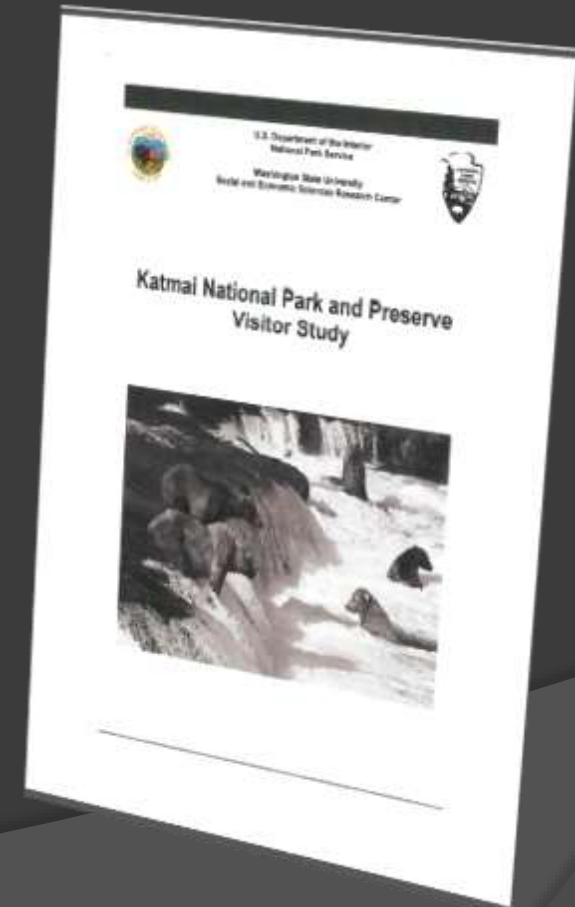
- Travel cost (TC) model – consumer surplus for access to a recreation site is estimated by relating the quantity of trips taken to the cost of reaching the site





# Valuing On-site Bear Viewing

- ⦿ Primary source of data was a 2014 Katmai NP&PRES visitor survey (Strawn and Le, 2015)
  - Administered June 14 – September 30, 2014
  - Mail-back
  - More than half were distributed at Brooks Camp
  - 55% response rate for all sampling sites and 61% for Brooks Camp
- ⦿ Questions relevant to TC model include number of trips taken to Katmai, home zip code, mode of travel, and demographics



# Valuing On-site Bear Viewing

- ⦿ TC models can be difficult for national parks because many visitors come only once a year
- ⦿ Other options:
  - ✗ Ask visitors to report # of trips taken over a multi-year timeframe and use this as the dependent variable
  - ✗ On-site TCM – dependent variable is number of days and costs of interest are on-site costs (Bell & Leeworthy, 1990)
  - ✓ Redefine dependent variable as *Persontrips*, which is the # of trips taken in the last year multiplied by group size (Bowker et al., 1996)

# Valuing On-site Bear Viewing

## ⦿ Travel cost calculated as:

- Roundtrip miles from respondent's home zip code to Anchorage\*\$0.1587
- Plus opportunity cost of time (1/3 of wage rate)
- Adjusted based on the proportion of total trip days spent at the park compared to other sites in AK
- Plus a fixed cost of \$744 to account for travel from Anchorage to the park

## ⦿ Demand equation:

$$PersonTrips = \exp \left( \begin{array}{l} B_0 + B_1TravelCost + B_2Income + B_3Age + B_4Gender + B_5Education \\ + B_6NonParkDays + B_7Guide + B_8Photo + B_9WildlifeView + B_{10}BearViewPark \end{array} \right)$$

# Valuing On-site Bear Viewing

- Results

CS per group per trip	\$1,300
CS per person per trip	\$630
CS per person per day	\$290

- Applying this value to 40% of ~31,000 visitors that came to the park from June-Sept., 2014 results in an aggregate value of \$7.8 million





# Valuing Virtual Bear Viewing

- ⦿ People don't have to travel all the way to Katmai to see these bears!
- ⦿ They can view the bears through webcams hosted by explore.org
- ⦿ In 2015, people spent more than **2.4 million** hours watching the cams



# Valuing Virtual Bear Viewing

## ◎ Four approaches identified:

- 1) *Benefit transfer approach* - adjust the on-site viewing value to get an hourly on-site value, and apply to hours of web viewing
- 2) *Price ratio valuation adjustment approach* - adjust hourly on-site value using a ratio based on the price of virtual use to the price of the same live event
- 3) *Time valuation approach* - value the web use based on the opportunity cost of time (Goolsbee and Klenow, 2006)
- 4) *Stated preference survey* - value web use directly using a stated preference method such as CVM

# Valuing Virtual Bear Viewing

## ◎ Results

1) *Benefit transfer approach*

$\$36.25/\text{hr.} * 2.4\text{M hrs.} = \text{\$87 million}$

2) *Price ratio valuation adjustment approach*

$\$36.25/\text{hr.} * 0.125 * 2.4\text{M hrs.} = \text{\$11 million}$

3) *Time valuation approach*

$\$6.6 \text{ to } \$10/\text{hr.} * 2.4\text{M hrs.} = \text{\$16 - \$24 million}$

# Conclusions & Next Steps

- ⦿ Virtual visitor experiences can provide considerable economic value
- ⦿ Various approaches exist to value people's use of NPS websites & webcams
- ⦿ Use survey data to refine estimates



- ⦿ Opportunity to use existing visitor survey data to estimate TC models for various national parks



# References

- Bell, F.W. and V.R. Leeworthy. 1990. Recreational demand by tourists for saltwater beach days. *Journal of Environmental Economics and Management* 18(3): 189-205.
- Bowker, J.M., English, D.B.K., & Donovan, J.A. (1996). Toward a value for guided rafting on southern rivers. *Journal of Agricultural and Applied Economics*, 28, 423-432.
- Champ, J. 2002. A Culturalist-Qualitative Investigation of Wildlife Media and Value Orientations. *Human Dimensions of Wildlife* 7:232-286.
- Goolsbee, A. and P. Klenow. 2006a. Valuing Consumer Products by the Time Spent Using Them: An Application to the Internet. *American Economic Review* 96(2): 108-112.
- Goolsbee, A. and P. Klenow. 2006b. Valuing Consumer Products by the Time Spent Using Them: An Application to the Internet. National Bureau of Economic Research Working Paper 11995. Cambridge, MA.
- Strawn, M., & Le, Y. (2015). Katmai National Park & Preserve Visitor Study: Summer 2014. Social and Economic Sciences Research Center, Washington State University, Pullman, WA.