



Using two Google tools: A case study

Presented by Burke Grandjean, University of Wyoming



Google Trends, Google Analytics, and the PBS Documentary “The National Parks: America’s Best Idea”

Presenting the results of WYSAC Technical Report No. SRC-915
By Brian Harnisch, Burke D. Grandjean, and Patricia A. Taylor

Outline



- About “Google Trends”
- About “Google Analytics”
- About the documentary
- About this study
- Findings from Google Trends
- Findings from Google Analytics
- Conclusions
- Questions

About Google Trends



Search Trends

Tip: Use commas to compare multiple search terms.



www.Google.com/trends

- A data tool that allows the user to see how often an expression has been searched on Google over time.
- Google Trends returns a graph of search volumes for the time frame and location selected.
 - Also allows user to export data points and relative standard error to CSV file.
 - ✦ Dealing with a sample of search volume
 - ✦ Google uses undisclosed, proprietary methods to sample search volume for producing the various indices.

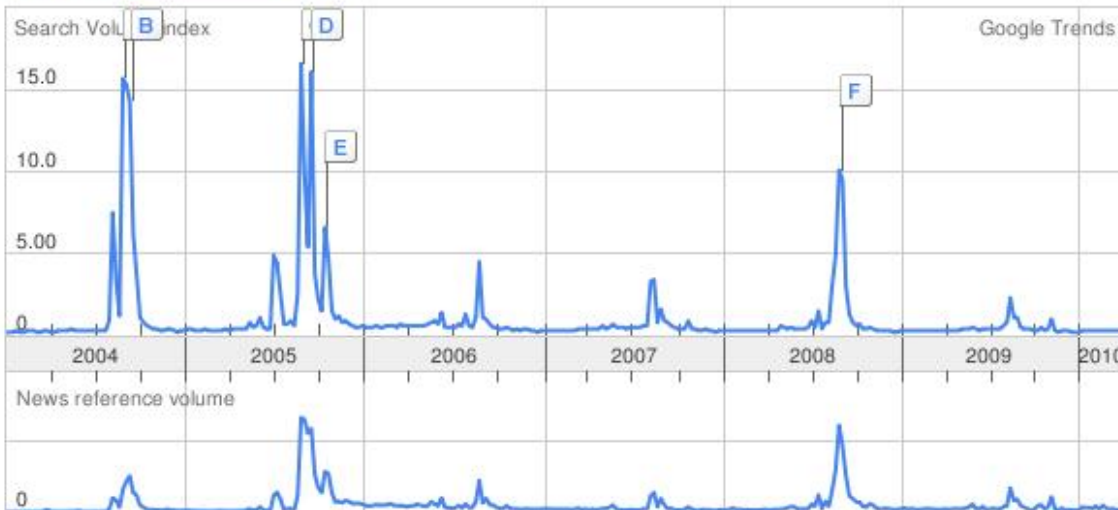
Tip: Use commas to compare multiple search terms.

Searches Websites

United States

Scale is based on the average traffic of [hurricane](#) from United States in all years. [Learn more](#)

hurricane 1.00



- A** [Florida braces for Hurricane Frances](#)
Fayetteville Online - Sep 3 2004
- B** [Hurricane Ivan](#)
Birmingham Post Herald - Sep 16 2004
- C** [AmeriCares Responds to Hurricane Katrina](#)
noticias.info - Sep 2 2005
- D** [Hurricane Rita Spins Toward Texas Coast](#)
Munster Times - Sep 22 2005
- E** [Wilma Hurricane strengthened](#)
Kazinform - Oct 20 2005
- F** [Hurricane Gustav weakens](#)
ABC Online - Sep 1 2008

[More news results »](#)

Rank by ▼

Subregions

- 1. [Louisiana](#), United States
- 2. [Florida](#), United States
- 3. [Mississippi](#), United States
- 4. [Alabama](#), United States
- 5. [Texas](#), United States
- 6. [South Carolina](#), United States

Cities

- 1. New Orleans, LA, USA
- 2. Baton Rouge, LA, USA
- 3. Boca Raton, FL, USA
- 4. Pensacola, FL, USA
- 5. Miami, FL, USA
- 6. Tampa, FL, USA

Language

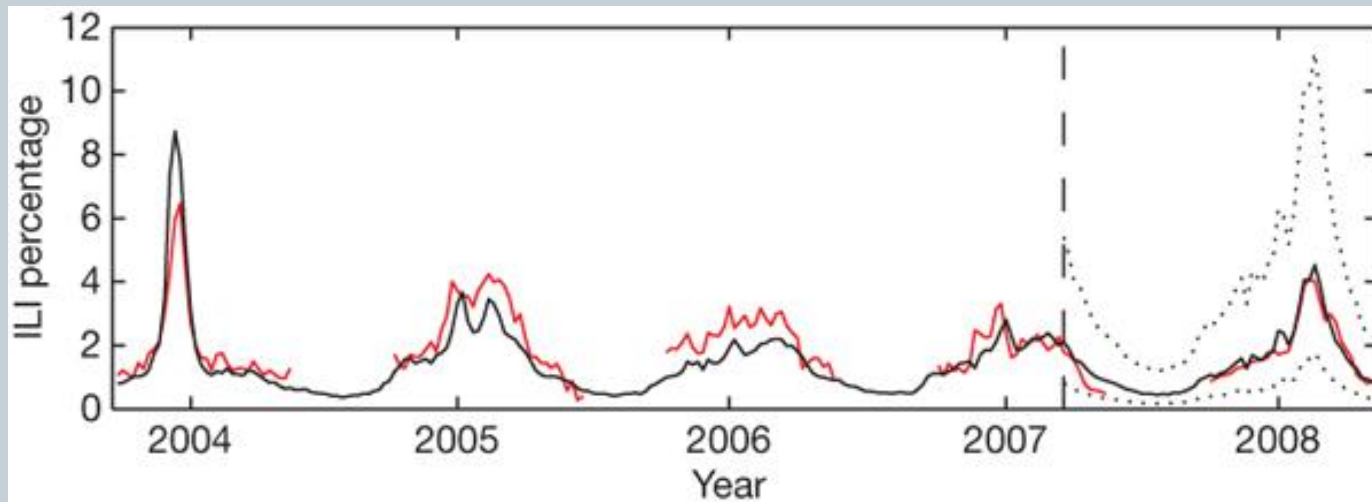
- 1. English

Detecting influenza epidemics using search engine query data.

Jeremy Ginsberg, Matthew H. Mohebbi, Rajan S. Patel, Lynnette Brammer, Mark S. Smolinski & Larry Brilliant
In NATURE (November 19, 2009)



- “...we can accurately estimate the current level of weekly influenza activity in each region of the United States, with a reporting lag of about one day... The CDC publishes national and regional data from [traditional] surveillance systems on a weekly basis, typically with a 1–2-week reporting lag.”



Correlation of Google flu search term trends (black) with actual CDC reported cases (red).

Google Trends, cont'd



- Does not provide raw search volumes. Instead, indexed values are provided for comparison purposes.
- Data available for download in either *relative* or *fixed* scaling:
 - Relative Scaling- The index is normed to the average search volume for any selected time period (e.g., the average search volume for May, 2009 is indexed to 1.0 for the given expression).
 - Fixed Scaling- The reference period is a fixed point in time – January 2004 (e.g., the average search volume for the given expression in May, 2009 is relative to the average search volume in Jan., 2004 of 1.0).

Google Trends, cont'd



- SO, in *relative scaling*:
 - ✦ In a search for “hurricane” with all of 2009 as our reference period, the average search volume is 1.0.
 - ✦ The week of Aug. 28th has an index value of 8.3, or over 8 times the average search volume for “hurricane” 2009.

- And in *fixed scaling*:
 - ✦ A search for “snowboarding” for Jan., 2009 has an index value of .46. The average search volume for the term was less than half of the average volume in Jan., 2004.

About Google Analytics



Google Analytics



- A data tool that provides “hit count” information for a specific website.
- Counts total visits, unique visitors, page views, etc.
- Not a freely available public resource.
- NPS supplied us with Google Analytics reports for the technical website, www.nature.nps.gov.

About the Documentary



About the Documentary



- “The National Parks: America’s Best Idea”

A documentary by Ken Burns and Dayton Duncan

- ✦ Traces the birth of the national park idea in the mid-1800s and follows its evolution for 150 years.
- Six two-hour episodes aired consecutively from Sunday, September 27th to Friday, October 2nd, 2009
- Nation-wide promotional campaign leading up to the broadcast
 - ✦ 538 million paid-media impressions
 - ✦ 381,000 additional impressions through appearances by Burns on every major network and in every major national and regional publication
 - ✦ PBS estimates 33 million viewers
 - ✦ Nielsen rating of 3.4 (4 million households per night)

About this Study



Our Project



- Study commissioned by NPS (as Cooperative Agreement H2370094000)
- Attempt to quantify the impact of this series on public awareness of the National Park system
- Spikes in Google searches and/or website hits will quantify the extent to which the media “buzz” translates into public curiosity about the parks
- A low-cost approach to assessing media impact

Findings from Google Trends



**A WIDE-ANGLE VIEW: THE TREND IN
SEARCH VOLUME, 2004-2009**

**A MID-RANGE VIEW:
SEARCHES DURING 2009**

**A CLOSE-UP VIEW: SEARCH VOLUME
IN THE FALL OF 2009**

**EPISODE-SPECIFIC TERMS & SEARCH
VOLUMES BY STATE AND CITY**

A Wide-angle View: The trend in search volume, 2004-2009



- General downward trend in search volume for “national parks” since 2004
 - ✦ Consistent with a gradual decline in visitation over the past few years
- Cyclical highs in the early summer and lows in the winter
 - ✦ Typically, search volume peaks near Memorial Day
- From January 2004 through August 2009, the highest search volume occurred in the week of May 23, 2004, with an index value just over 2.0

Search volume, 2004-2009



Relative weekly search volume since 2004 for the term “national parks”



- Search volume spikes to nearly 4.3 in the week of Sept. 27th, 2009
 - *(Over 4 times the average search volume since 2004)*
- Corresponds precisely with the initial airing of “The National Parks: America’s Best Idea”

A Mid-range View: Searches during 2009

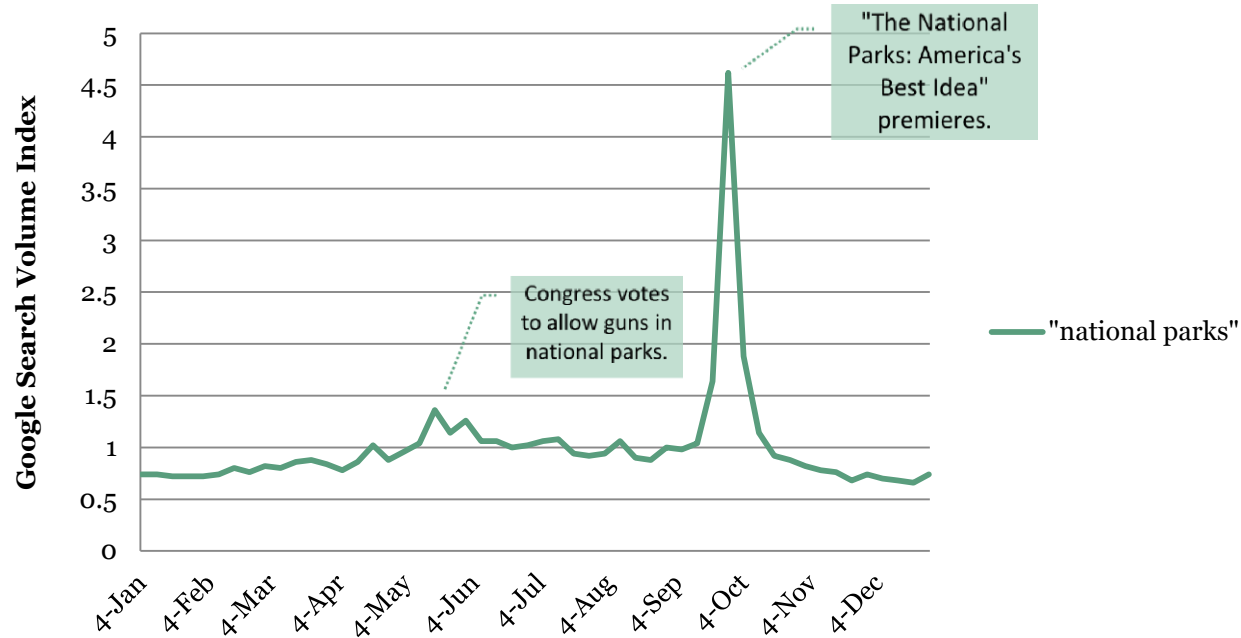


- Average search volume for the term “national parks” in 2009 indexed to 1.0
- Search volume peaked at over 4.6 during the last week in September, when the series was first aired
- Comparing “national parks” to additional terms
 - ✦ “Yellowstone” and “Yosemite”
- Index values for the additional terms are scaled using the 1.0 average search volume for “national parks” during the year

Searches during 2009

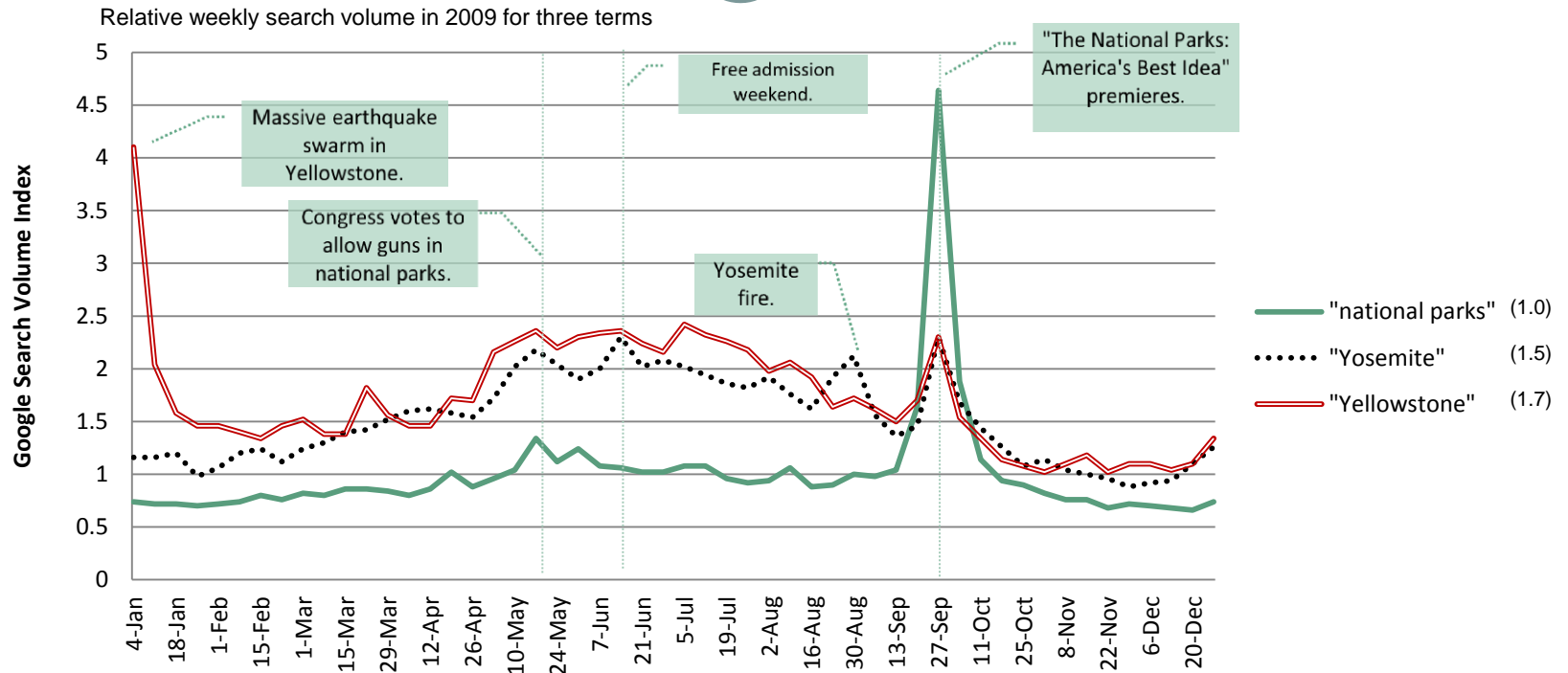


Relative weekly search volume in 2009 for the term "national parks"



- Search volume during the documentary 4.6 times the average for 2009
- For perspective, we can compare to a spike in early May of almost 1.4
 - Start of summer vacation
 - Considerable media attention on Congressional action on the issue of guns in national parks.

Searches during 2009



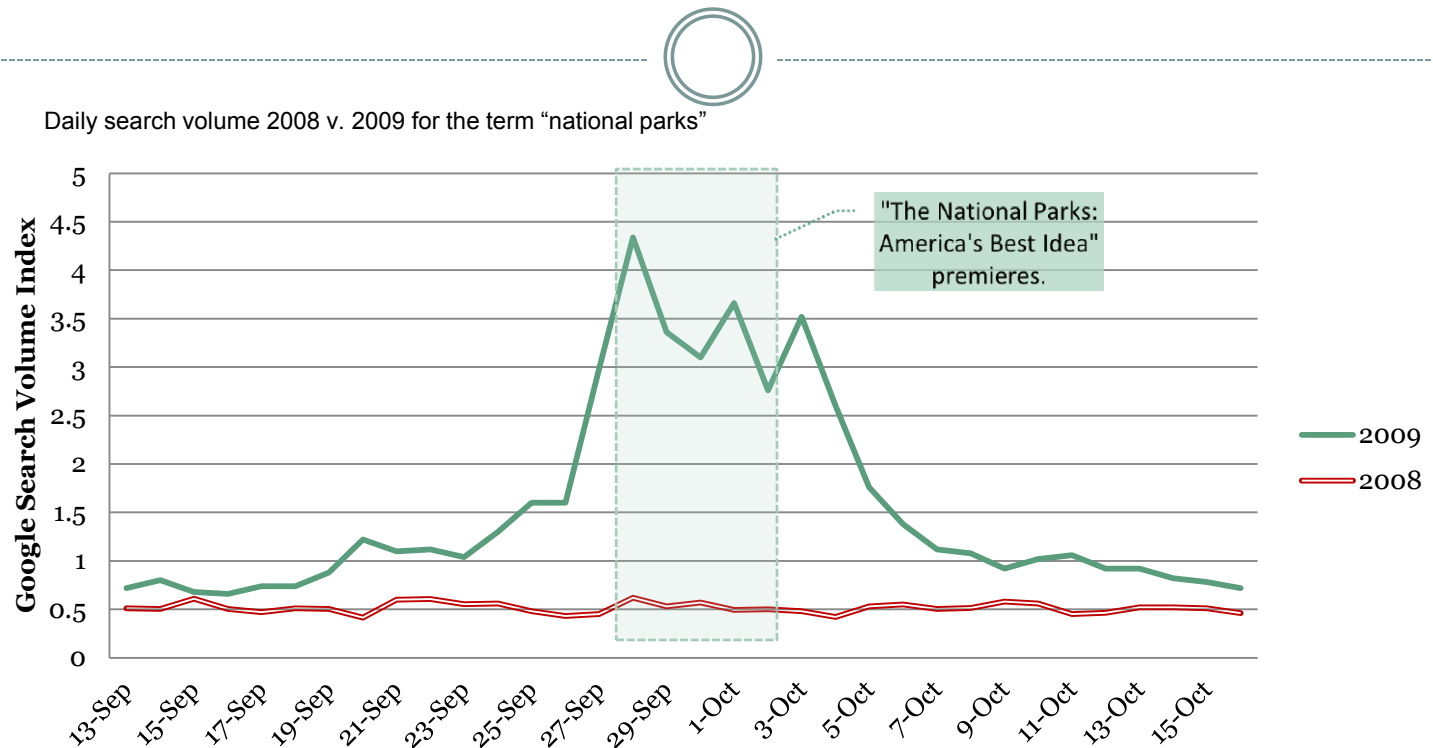
- Both Yosemite and Yellowstone featured in first episode of the documentary
- “Yellowstone” peaks at 4.1 in early January
 - Earthquake swarm at Yellowstone received extensive media coverage
- “Yosemite” alone experienced a spike in August, corresponding with a 5,000 acre fire caused by a prescribed burn

A Close-up View: Search volume in the fall of 2009



- Day by day search volumes from mid Sept. through mid Oct., compared to average in Jan., 2004 (1.0)
- 2004-2008, “national parks” volumes remained flat in Sept. and Oct., but spiked significantly in 2009

Search volume in the fall of 2009



- “National Parks” peaked at 4.3 in during the series
 - Seven times higher than same date in 2008 (0.6)
 - Four times higher than same date in 2004 (1.1)

Episode-specific terms



- An exploration of search volume for specific topics, themes, and parks that were featured in the series.
- Index relative to the average for 2009
- Investigated search volumes for 52 terms; notables include:

Search Term	Index, week of series
John Muir ^{1,2}	4.60
Kings Canyon ¹	1.55
Yosemite ^{1,2,4}	1.47
Mesa Verde ^{2,4}	1.62
Acadia National Park ⁵	1.65
Steven Mather ⁵	49.00*

* Relative standard error >10%

Search volumes by state and city



- Google Trends also provides geographic scaling of search volume
 - ✦ Calculates a search ratio, in essence dividing (1) the searches for a specified term that originate in each geographic unit by (2) the total of all Google searches coming from there over the same time period.
 - ✦ Geographic unit with highest proportion is assigned index of 1.0, other ratios relative to that.

Search volumes by state and city



Rank	2009	Index	August '09	Index	September '09	Index	October '09	Index
1	Utah	1.00	Utah	1.00	Maine	1.00	Utah	1.00
2	Montana	0.99	Colorado	0.74	New Mexico	0.89*	New Hampshire	0.86*
3	Colorado	0.74	Oregon	0.60*	Utah	0.80*	Maine	0.83*
4	New Mexico	0.67	Washington	0.54	Colorado	0.74	New Mexico	0.79*
5	Oregon	0.52	District of Columbia	0.46	Iowa	0.67*	Iowa	0.70*

Rank	2009	Index	August '09	Index	September '09	Index	October '09	Index
1	Salt Lake City	1.00	Salt Lake City	1.00	Salt Lake City	1.00	Salt Lake City	1.00
2	Denver	0.82	Denver	0.99*	Denver	0.70*	Madison, WI	0.86*
3	Portland, OR	0.51	Seattle	0.64*	Louisville	0.64*	Denver	0.80*
4	Seattle	0.49	Portland, OR	0.59*	Sacramento	0.58*	Portland, OR	0.64*
5	Washington, DC	0.48	Washington, DC	0.50*	Pleasanton, CA	0.56*	Minneapolis	0.60*

* Relative standard error >10%

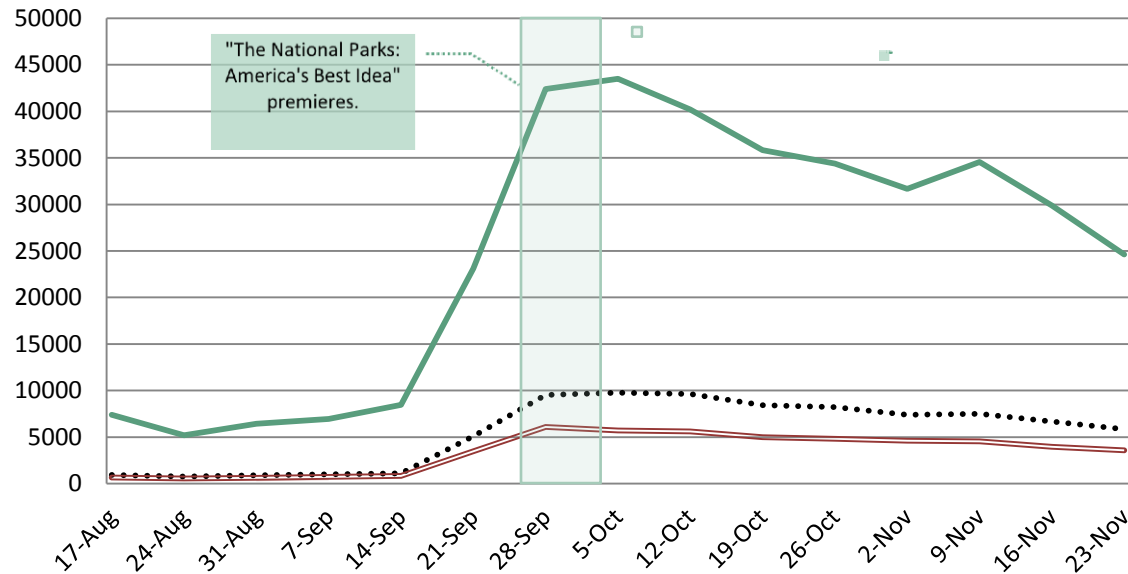
Findings from Google Analytics



Hit counts in the fall of 2009



Weekly page views, visits, and unique visitors for www.nature.nps.gov, Fall 2009



- Page views (solid green line), total visits (dotted) and unique visitors (open red) all rose at least 8-fold when the series aired.
- All three measures remained elevated longer than the spikes in search volume.
 - This technical website is hard to find from a search engine, and hence the Google Analytics results are largely independent of the Google Trends findings.
 - Details show changes in the typical visitor to this site.

Summary statistics for www.nature.nps.gov, Fall 2009



Week	Total Visits	Pages per Visit	% Unique Visitors	Avg. Time on Site	% Bounce Visits	% from Referring Sites	% Direct Traffic	% from Search Engines
17-Aug	918	8.05	71.5%	5:23	20.8%	49.4%	35.5%	15.1%
24-Aug	768	6.78	74.1%	4:26	22.3%	55.5%	30.9%	13.7%
31-Aug	903	7.14	69.8%	4:36	21.2%	51.1%	35.2%	13.7%
7-Sep	1002	6.94	73.0%	4:01	20.8%	53.3%	35.0%	11.7%
14-Sep	1109	7.63	76.1%	5:13	19.6%	51.9%	31.2%	17.0%
21-Sep	5091	4.54	68.1%	3:29	40.9%	62.5%	31.1%	6.4%
28-Sep	9540	4.44	63.7%	3:31	42.2%	63.6%	31.9%	4.6%
5-Oct	9758	4.46	58.4%	3:55	40.4%	65.9%	28.7%	5.4%
12-Oct	9646	4.17	58.1%	3:28	41.4%	69.7%	24.9%	5.4%
19-Oct	8431	4.25	59.0%	4:04	42.7%	70.0%	24.6%	5.5%
26-Oct	8231	4.18	58.4%	3:34	42.2%	67.8%	27.2%	5.0%
2-Nov	7411	4.28	62.3%	3:20	42.4%	67.2%	28.2%	4.6%
9-Nov	7487	4.62	60.9%	3:27	41.8%	66.3%	29.3%	4.4%
16-Nov	6661	4.49	59.5%	3:50	40.7%	66.5%	29.3%	4.2%
23-Nov	5852	4.20	61.3%	3:27	45.1%	66.9%	28.8%	4.3%

Conclusions



A few warnings



- Google cautions, “the data Trends produces may contain inaccuracies for a number of reasons, including data-sampling issues and a variety of approximations that are used to compute results.”
- **Sampling Error**
 - ✦ undisclosed, proprietary methods to sample search volume
 - ✦ High RSE for search terms with low volumes/small timeframe
- Google trends has its limitations, but has shown its value for gauging public interest in a particular topic

Conclusions



- “The National Parks: America’s Best Idea,” appears to have generated a marked increase in the public’s interest in the National Park System.
- Slow decline in search volume since 2004 dramatically reversed in fall, 2009
 - ✦ Future research may indicate how enduring the change was...
 - ✦ 2010 levels generally climbed back to 2007 levels.
- 42 of 52 specific parks-related terms showed an above average search volume during the series
- Trends data immediately available, whereas park visitation information may take months to be compiled.
- Potential impact on park visitation this past summer?

Questions?



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WYSAC. (2010). *Exploring the Impact of the PBS Documentary “The National Parks: America’s Best Idea,”* by B. Harnisch, B. D. Grandjean & P. A. Taylor. (WYSAC Technical Report No. SRC-915). Laramie, WY: Wyoming Survey & Analysis Center, University of Wyoming.