



eDiscovery Webinar Series

Using the Wayback Machine in Litigation

About Our Webinars

- Lexbe eDiscovery Series webinars take place 1-4x per month and cover a variety of relevant topics in eDiscovery and digital forensics
- If you experience technical issues or have questions during today's presentation, please email us at webinars@lexbe.com
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About Lexbe Inc.

- Over 8,665 Legal Professionals Served
- Over 17 Years of eDiscovery development and experience
- We help legal professionals, with limited resources, successfully handle document intensive cases
- Lexbe provides legal teams with a highly affordable, full-featured, and lightning-fast DIY proprietary cloud eDiscovery platform
- Delivers the industry's fastest ROI
- CEDS-certified eDiscovery specialists, expert consultants, and a digital forensics lab



G2 finds that Lexbe "delivers best ROI in the industry and leads in 6 key metrics."



"Secure, easy-to-use and a great review tool for consideration"



"Cost-effective eDiscovery"



"A powerful litigation document management service"

Today's Speaker: Nicholas Taylor

- Expert Witness, Wayback Machine and Temporal Web Forensics
- Experience
 - 16+ years working in research libraries and technology firms
 - 9+ years working in the web archiving field
- Employment
 - Current: Los Alamos National Laboratory
 - Previous: Stanford University, Library of Congress, U.S. Supreme Court, Sun Microsystems, Google
- Education
 - Master of Library Science, University of Maryland
 - Master of Arts in Communication, Culture & Technology, Georgetown University
 - Bachelor of Arts, Media Studies and Psychology, Pomona College



Nicholas Taylor
Expert Witness
nullhandle.org

Session Agenda

Using the Wayback Machine in Litigation

Specht v. Google, Inc. (2010)

<http://www.androiddata.com:80/>

17 Aug 2000 - 25 Oct 2016

android data®
Bringing business into the age of e-commerce.

Content Manager Caching Server Administrator's Toolkit

Android Data® is a suite of software that enables the remote administration of ecommerce content.

The system is comprised of three modules:
the [Caching Server](#), the [Content Manager](#), and the [Administrator's Toolkit](#).

Copyright © 2002 Android Data Corporation. All Rights Reserved.

[Internet Archive: "android data"](#)

[Specht v. Google, Inc., 758 F. Supp.
2d 570 \(N.D. Ill. Dec. 17, 2010\)](#)

http://www.openhandsetalliance.com/android_overview.html

OCT NOV DEC
06 2006 2007 2008
2006 2007 2008 About this capture

506 captures
8 Nov 2007 - 16 Nov 2002

open handset alliance

Home | Alliance | [Android](#) | Developers | Press | Contact

[Overview](#) | FAQ

ANDROID

Introducing Android

Android™ will deliver a complete set of software for mobile devices: an operating system, middleware and key mobile applications. On November 12, we will release an early look at the Android Software Development Kit (SDK) to allow developers to build rich mobile applications.

Open
Android was built from the ground-up to enable developers to create compelling mobile applications that take full advantage of all a handset has to offer. It is built to be truly open. For example, an application could call upon any of the phone's core functionality such as making calls, sending text messages, or using the camera, allowing developers to create richer and more cohesive experiences for users. Android is built on the open Linux Kernel. Furthermore, it utilizes a custom virtual machine that has been designed to optimize memory and hardware resources in a mobile environment. Android will be open source; it can be liberally extended to incorporate new cutting edge technologies as they emerge. The platform will continue to evolve as the developer community works together to build innovative mobile applications.

All applications are created equal
Android does not differentiate between the phone's core applications and third-party applications. They can all be built to have equal access to a phone's capabilities providing users with a broad spectrum of applications and services. With devices built on the Android Platform, users will be able to fully tailor the phone to their interests. They can swap out the phone's homescreen, the style of the dialer, or any of the applications. They can even instruct their phones to use their favorite photo viewing application to handle the viewing of all photos.

Breaking down application boundaries
Android breaks down the barriers to building new and innovative applications. For example, a developer can combine information from the web with data on an individual's mobile phone – such as the user's contacts, calendar, or geographic location – to provide a more relevant user experience. With Android, a developer could build an application that enables users to view the location of their friends and be alerted when they are in the vicinity giving them a chance to connect.

Fast & easy application development
Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. For example, Android enables developers to obtain the location of the device, and allow devices to communicate with one another enabling rich peer-to-peer social applications. In addition, Android includes a full set of tools that have been built from the ground up alongside the platform providing developers with high productivity and deep insight into their applications.

[Internet Archive: "Open Handset Alliance"](#)





two contemporary(?) websites

Saturday, December 31, 2022 Today's Paper

U.S. INTERNATIONAL CANADA ESPAÑOL 中文

The New York Times

SUBSCRIBE FOR \$1/WEEK LOG IN

33°F 37° 31° Dow -0.22% ↓

World U.S. Politics N.Y. Business Opinion Science Health Sports Arts Books Style Food Travel Magazine Real Estate Cooking The Athletic Wirecutter Games

A Charity Tied to the Supreme Court Offers Donors Access to the Justices

The Supreme Court Historical Society has raised more than \$23 million in the last two decades, much of it from lawyers, corporations and special interests.

While ostensibly independent, the society has become a vehicle for those seeking access to nine of the most reclusive and powerful people in the nation.

8 MIN READ



Barbara Walters, a First Among TV Newswomen, Is Dead at 93

She broke barriers as a co-host of the "Today" show, a network evening news anchor and a creator of "The View," all while gaining her own kind of celebrity.

10+ MIN READ

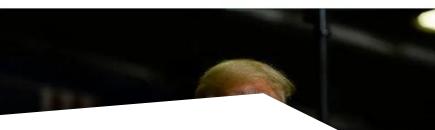


Print reporters, broadcasters, celebrities and others remembered Barbara Walters as a trailblazer in journalism.

2 MIN READ

Watch some of the most memorable moments from Barbara Walter's career.

6 MIN READ



Trump's Tax Returns Undermine His Image as a Successful Entrepreneur

The release of former President Trump's private tax documents shows heavy losses from his own ventures as he continued to cash in on inherited assets.

7 MIN READ

The New York Times



These Musicians Made an Album. Now It's Nominated for a Grammy.

The debut album of the New York Youth Symphony, featuring some players in middle school, is up against recordings by the world's top orchestras.

4 MIN READ

Press Box Shuttle

JAM CENTRAL

PLANET-B BALL

LUNAR TUNES

THE LINEUP

JUNIOR JAM

SPACE JAM

JUMP STATION

STELLAR SOUVENIRS

BEHIND THE JAM

WARNER STUDIO STORE

SITE MAP

Privacy Policy Terms Accessibility AdChoices

SPACE JAM, characters, names, and all related indicia are trademarks of Warner Bros. © 1996

Warner Brothers: "Space Jam"

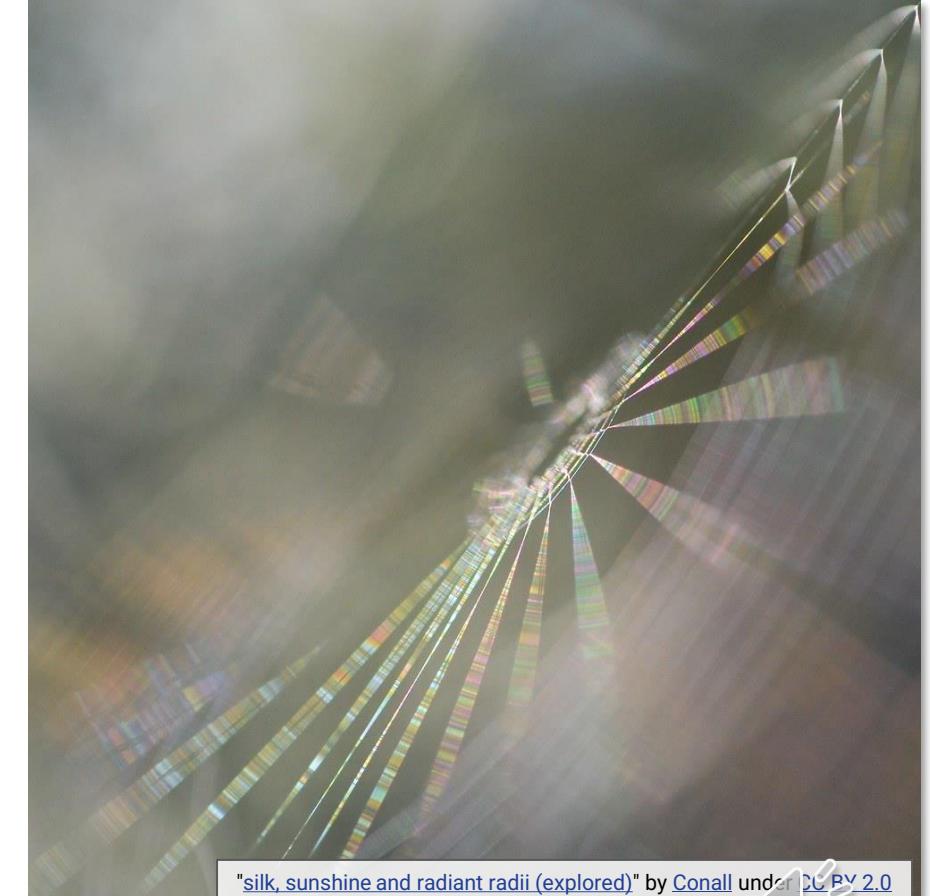
why do the temporal attributes of web content matter?

- cases may turn on when specific information was publicly available and/or discoverable on the web
 - when first published
 - when updated
 - when absent
- examples:
 - patent disclosures
 - use of marks or copyrighted materials
 - terms of service
 - advertised claims regarding products or services
 - business relationships



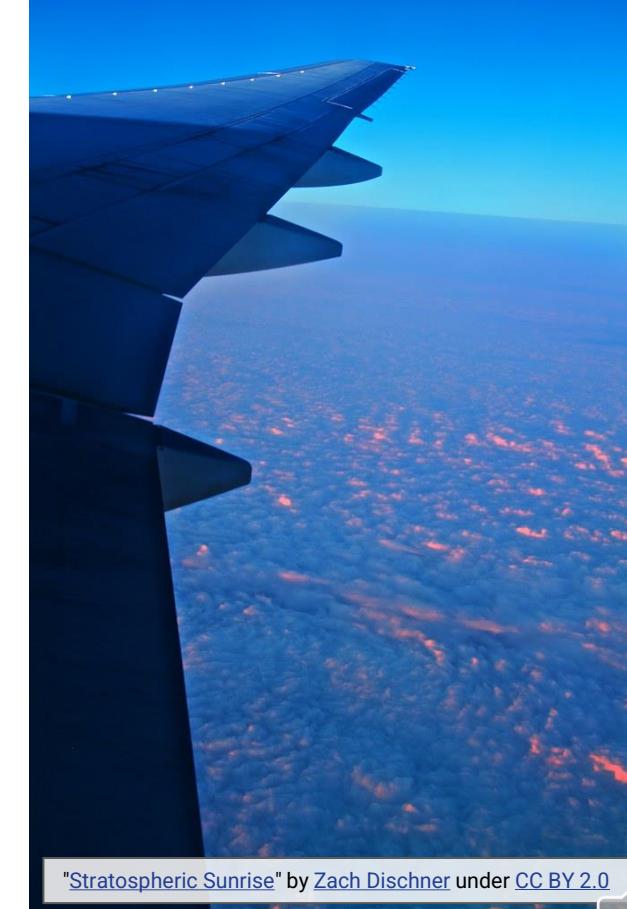
why not just rely on client's own records?

- unsystematic and/or incomplete recordkeeping
- savvy opposing counsel may check open sources for counter-indicative evidence
- material info disseminated via third-party platforms
- some questions (e.g., discoverability) can't be definitively settled w/ client records alone



overview

- background
- interface + features
- authentication + admissibility
- temporal coherence
- timestamping content changes



"Stratospheric Sunrise" by Zach Dischner under CC BY 2.0





IAWM background



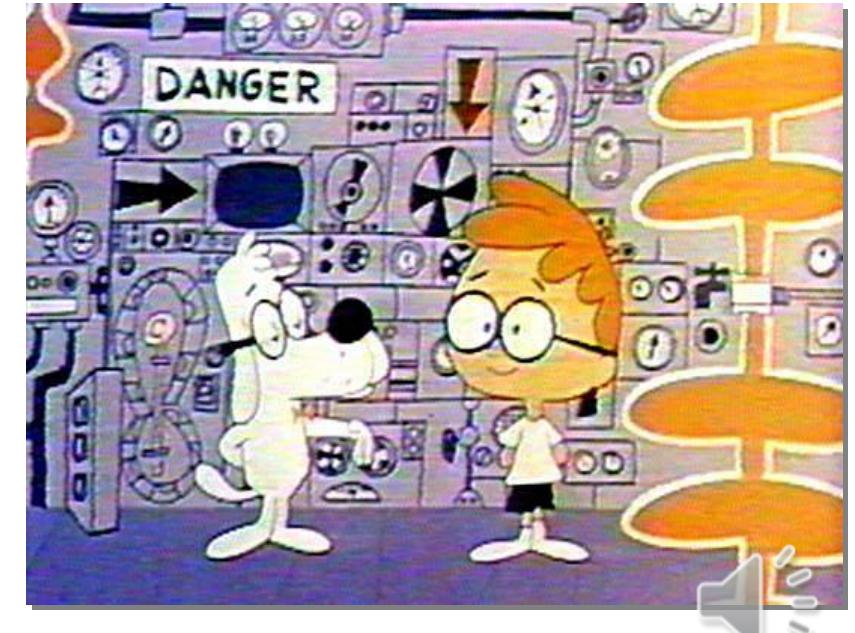
Internet Archive

- non-profit digital library
- “universal access to all knowledge”
- provides free public access to collections of all types of digital materials



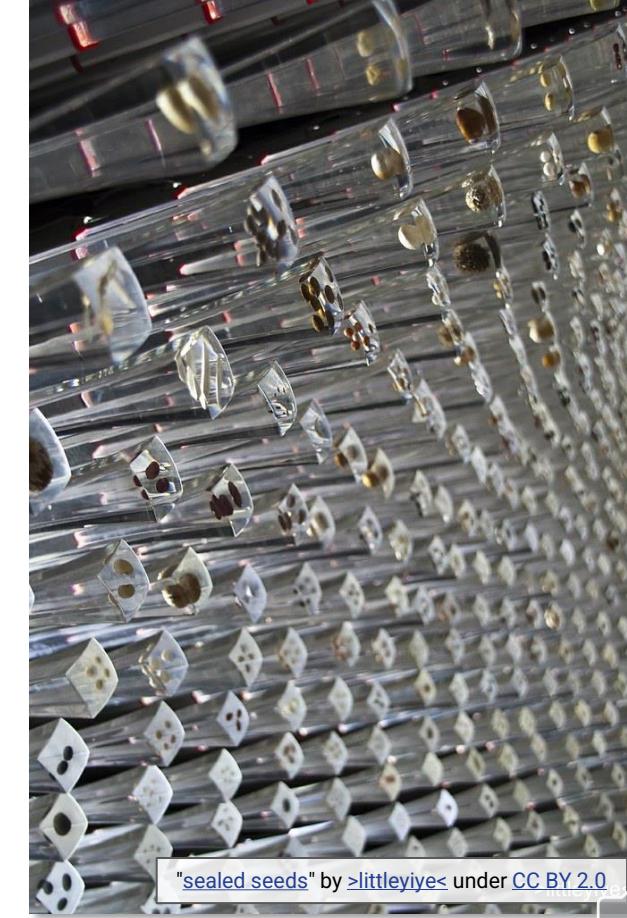
IAWM

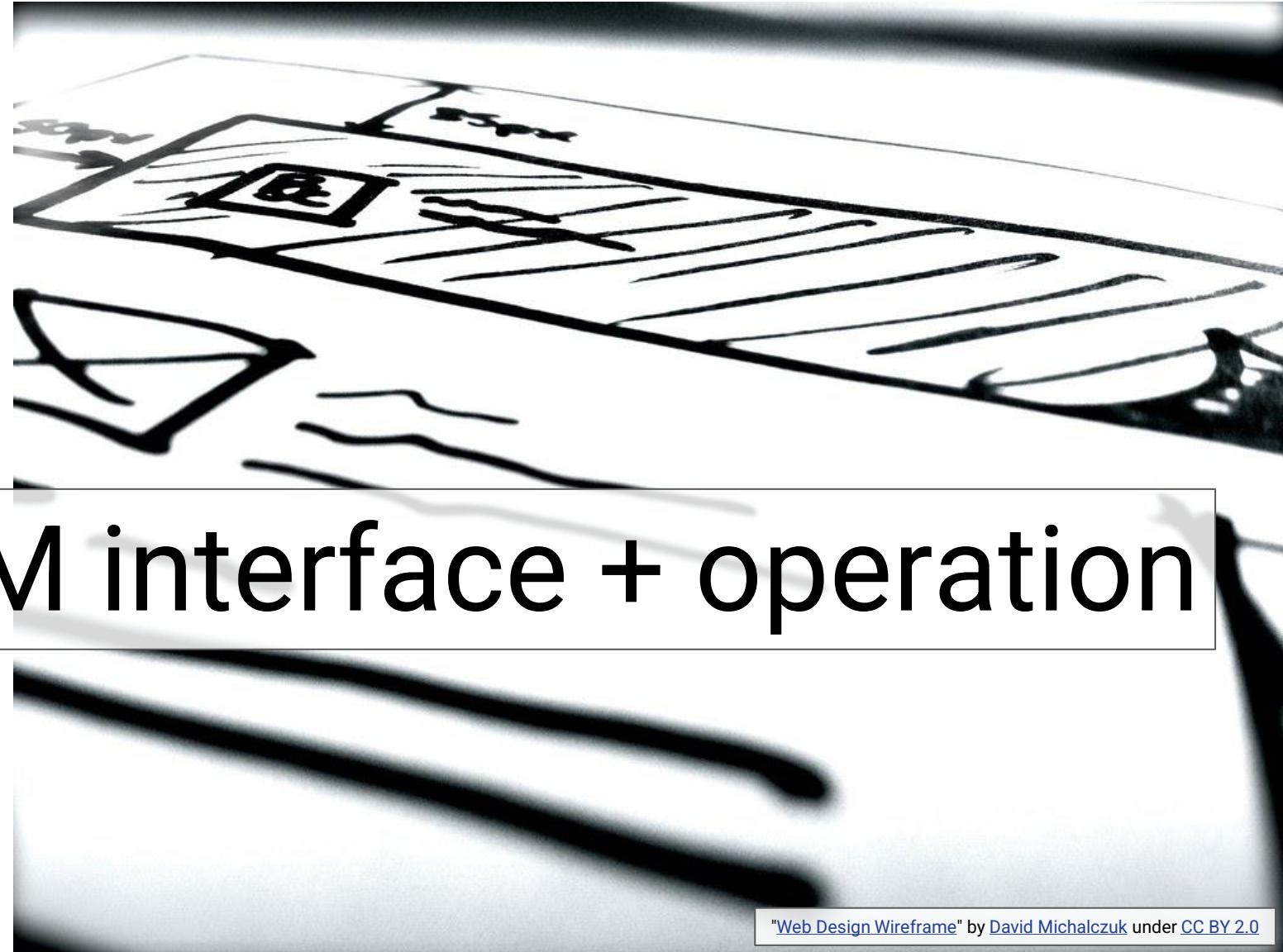
- free, open archive of websites
1996 – present
- web content is both culturally significant + ephemeral
- IAWM referenced in:
 - [a 2002 patent application](#)
 - [a 2003 PTAB proceeding](#)
 - [a 2004 U.S. federal court case](#)



IAWM archival coverage

- “best effort” archive
- popular + more recent content is better archived
- content of interest to cultural heritage orgs + public is increasingly better archived
- social media less well archived
- non-public web content not archived



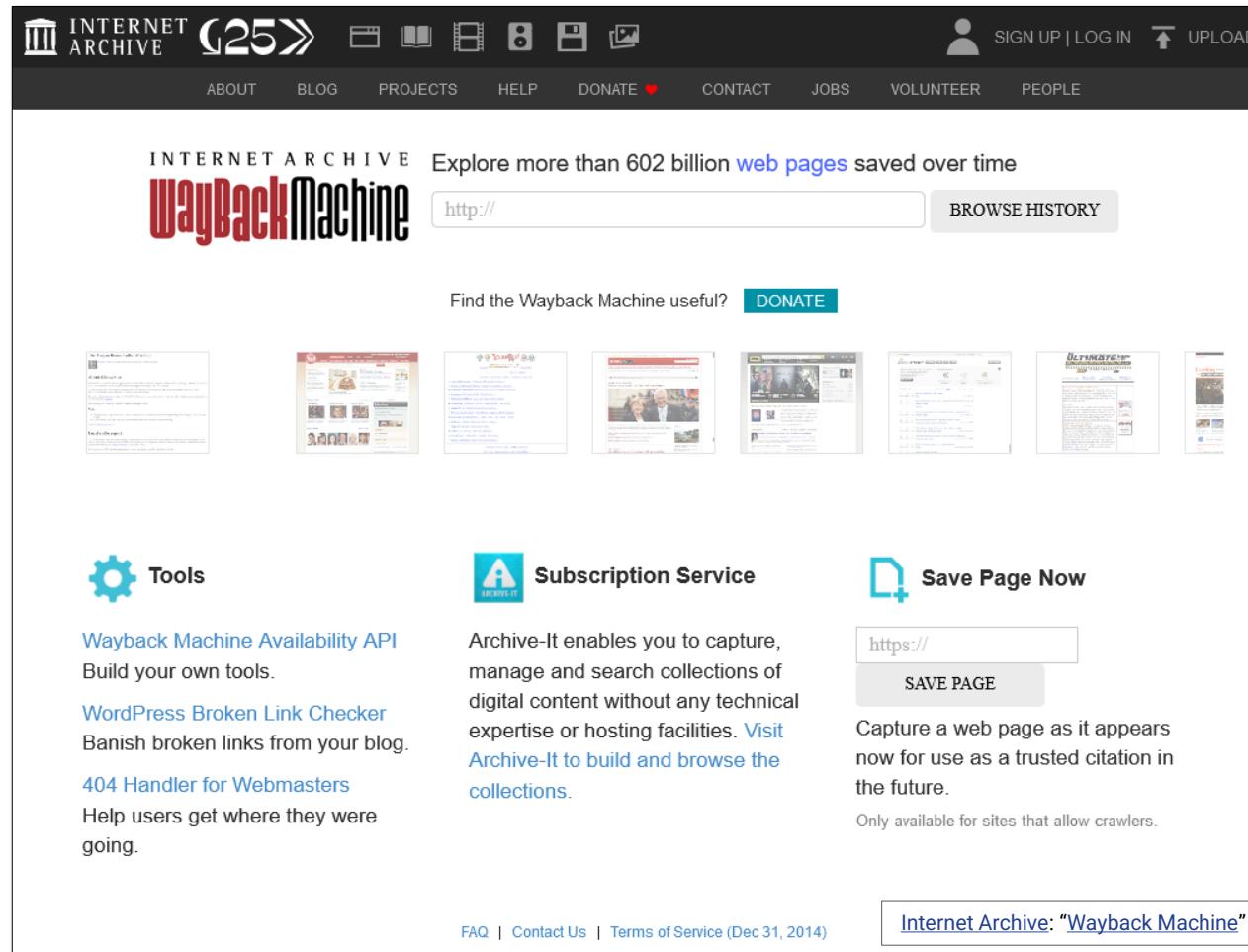


IAWM interface + operation

"Web Design Wireframe" by David Michalcuk under CC BY 2.0



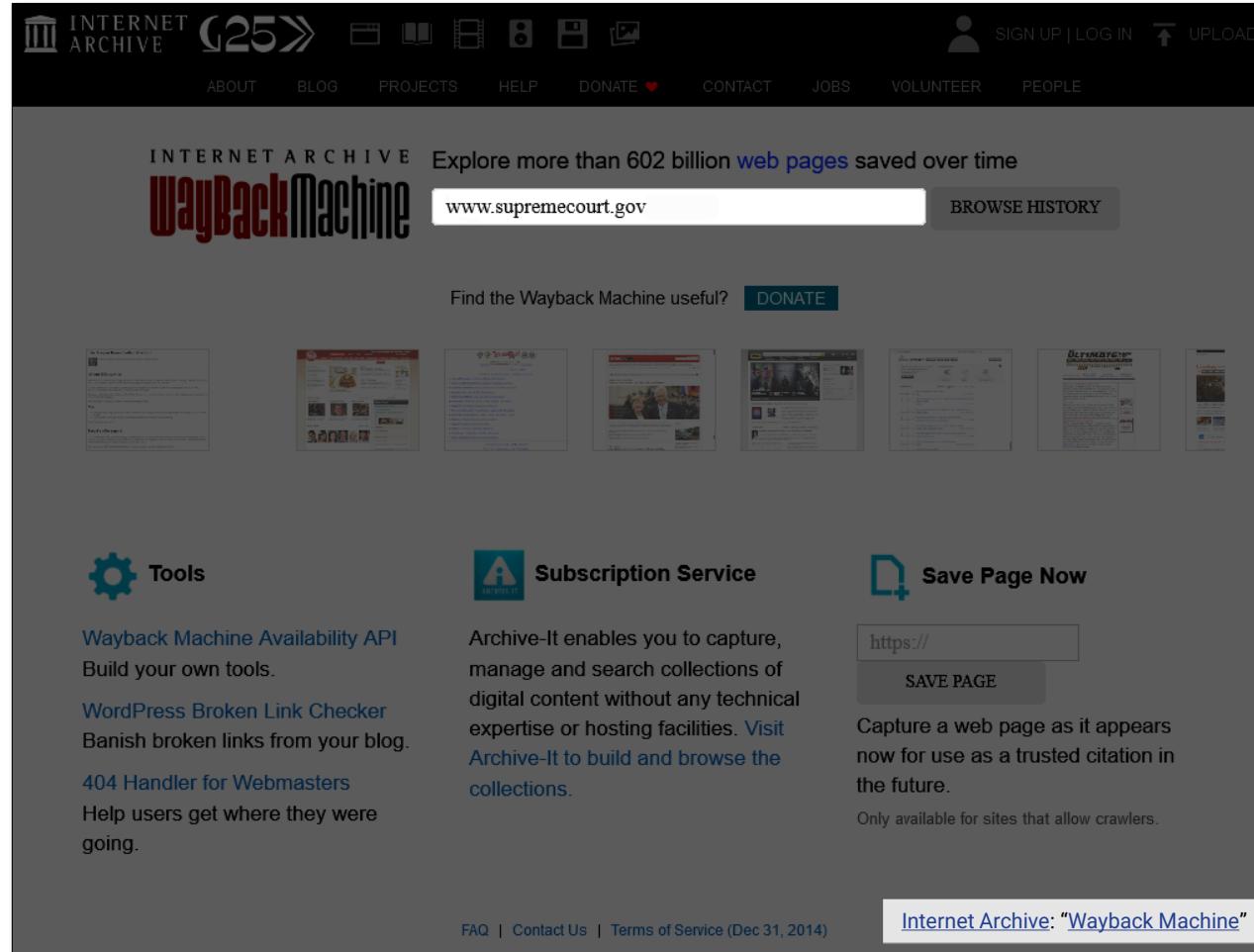
IAWM home



The screenshot shows the Internet Archive Wayback Machine homepage. At the top, there's a navigation bar with links for ABOUT, BLOG, PROJECTS, HELP, DONATE, CONTACT, JOBS, VOLUNTEER, and PEOPLE. On the right side of the bar are icons for SIGN UP | LOG IN, UPLOAD, and a user profile icon. Below the bar, the text "INTERNET ARCHIVE" and "Explore more than 602 billion web pages saved over time" is displayed, along with the "Wayback Machine" logo and a search bar with the placeholder "http://". A "BROWSE HISTORY" button is also present. In the center, there's a section titled "Find the Wayback Machine useful?" with a "DONATE" button. Below this are several thumbnail images of different web pages from the archive. At the bottom left, there's a "Tools" section with links to "Wayback Machine Availability API", "WordPress Broken Link Checker", and "404 Handler for Webmasters". The middle section features a "Subscription Service" for "Archive-It" with a description and a "SAVE PAGE" button. The bottom right contains a link to "Internet Archive: 'Wayback Machine'".



IAWM home: search box

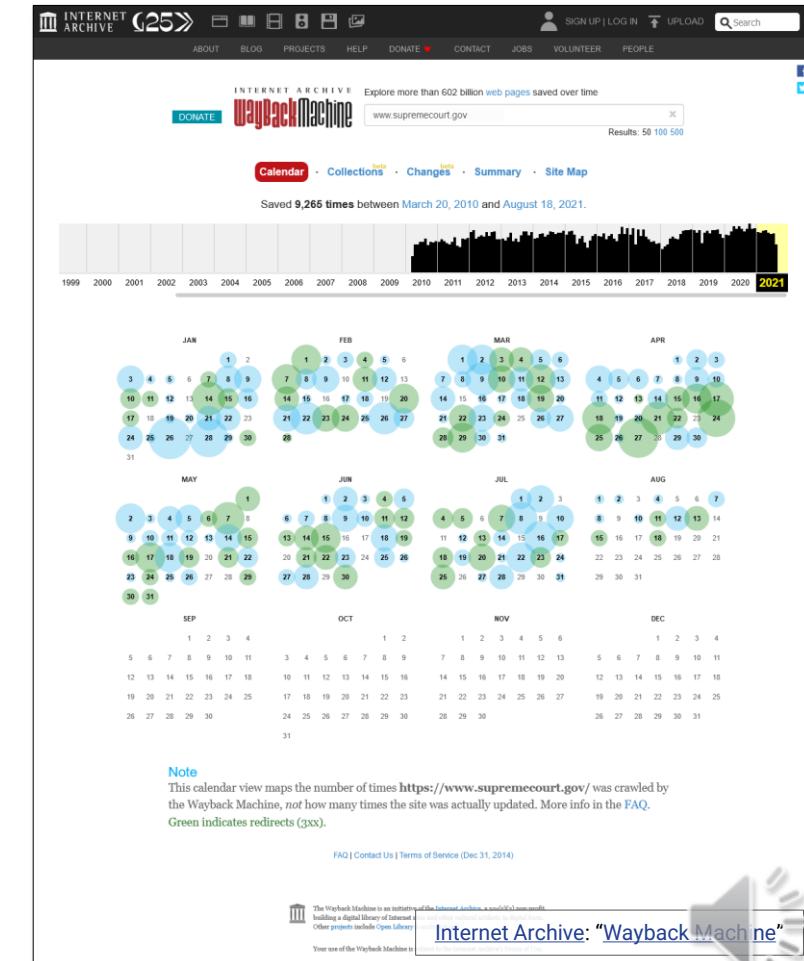


The screenshot shows the Internet Archive Wayback Machine homepage. At the top, there's a navigation bar with links for ABOUT, BLOG, PROJECTS, HELP, DONATE, CONTACT, JOBS, VOLUNTEER, and PEOPLE. On the far right of the bar are icons for SIGN UP | LOG IN, UPLOAD, and a user profile icon. Below the navigation bar, the text "INTERNET ARCHIVE" and "Explore more than 602 billion web pages saved over time" is displayed. The "Wayback Machine" logo is prominently featured. A search bar contains the URL "www.supremecourt.gov". To the right of the search bar are buttons for "BROWSE HISTORY" and "DONATE". Below the search bar, there's a section titled "Find the Wayback Machine useful?" with a "DONATE" button. Further down, there are several thumbnail images of different web pages from the archive. At the bottom left, there's a "Tools" section with links to "Wayback Machine Availability API", "WordPress Broken Link Checker", and "404 Handler for Webmasters". In the center, there's a "Subscription Service" section about "Archive-It". At the bottom right, there's a "Save Page Now" section with a form for entering a URL and a "SAVE PAGE" button. The footer of the page includes links for "FAQ", "Contact Us", and "Terms of Service (Dec 31, 2014)". A link "Internet Archive: "Wayback Machine"" is also present.



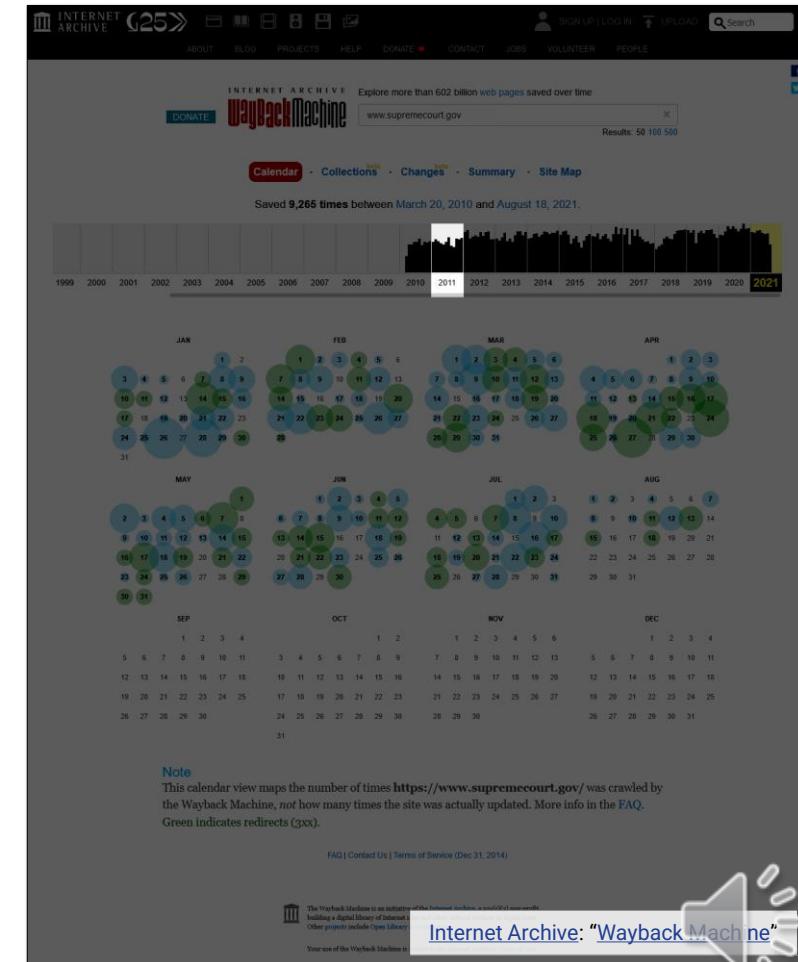
IAWM calendar page

- landing page presents archival coverage for specified web address for year selected in timeline
- bubble size indicates relative number of captures for that date
- bubble color indicates status code provided by the web server to the IA archiving agent
 - blue means a successful retrieval, with no errors
 - green means a redirect was encountered



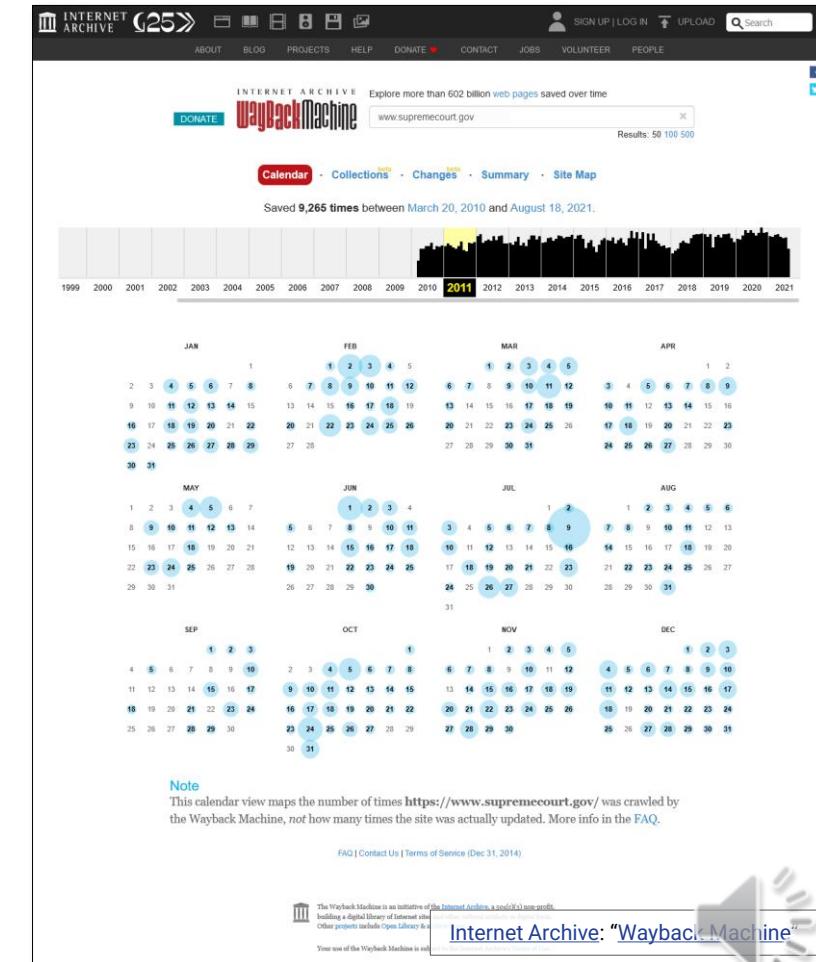
IAWM calendar page: captures by year

- click to another year in the timeline to change the calendar view below
- let's click to 2011



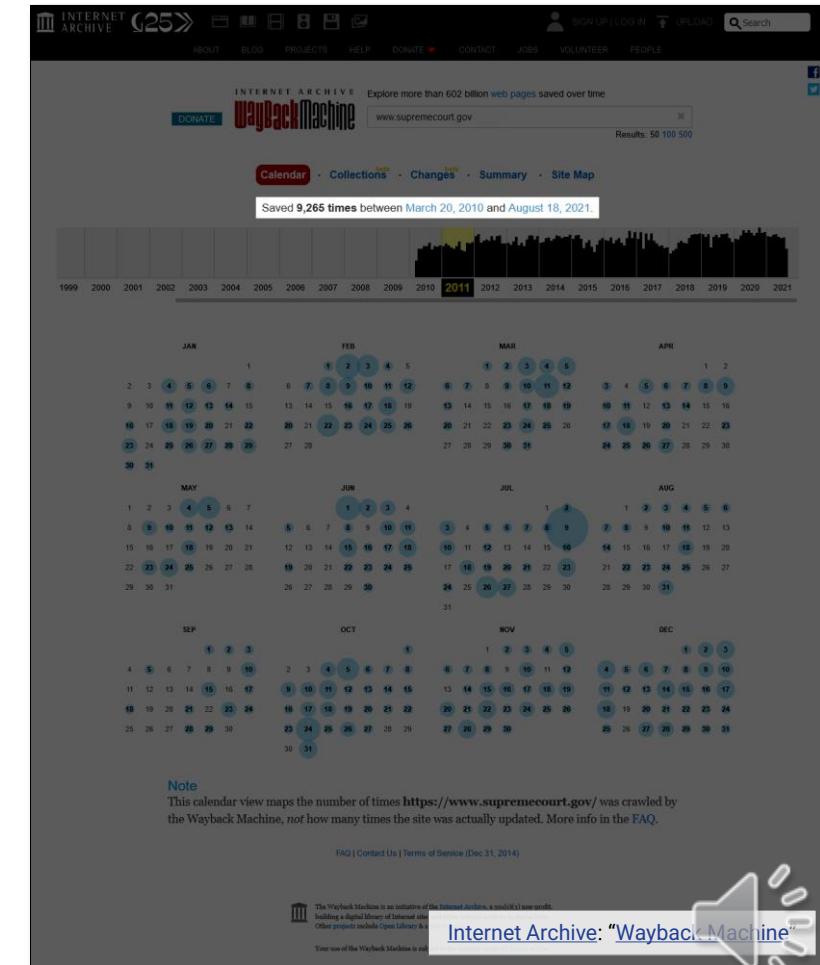
IAWM calendar page

- note that there are fewer captures in 2011, as indicated by:
 - shorter bars on the timeline histogram
 - generally smaller bubbles than in 2021
- general trend is that websites are better archived over time
- let's take a closer look at some of the other interface elements



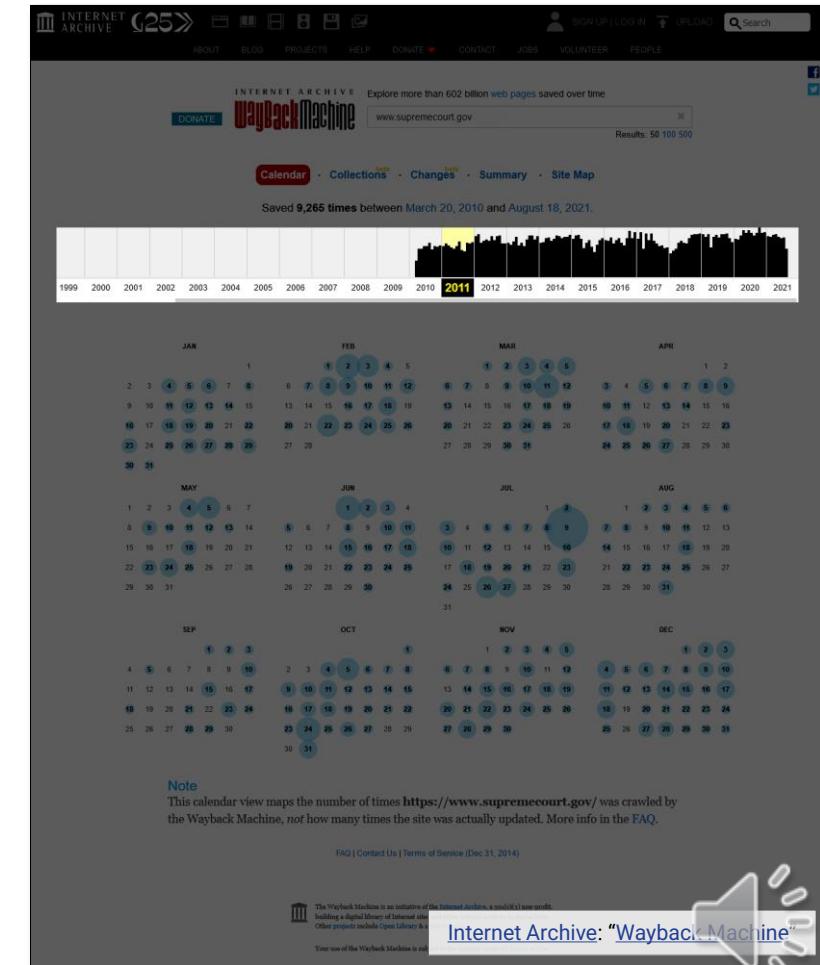
IAWM calendar page: captures range

- number of captures for the specified web address + their date range is displayed at the top
- links are provided to the first + last captures in the date range



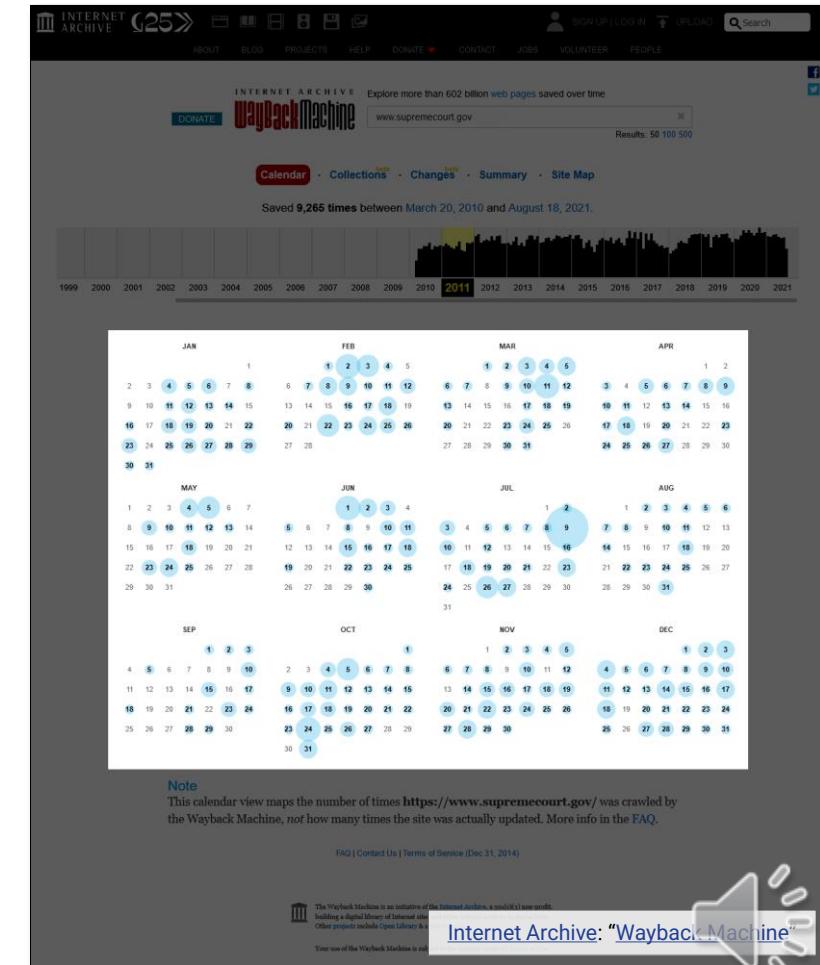
IAWM calendar page: timeline histogram

- the timeline histogram provides a visual summary of the relative number of captures over time
- each year segment has 12 columns – one for each month
- the year displayed in detail below is highlighted in yellow in the timeline



IAWM calendar page: calendar

- archival coverage for every day of the year selected in the timeline
- this is the 2011 calendar



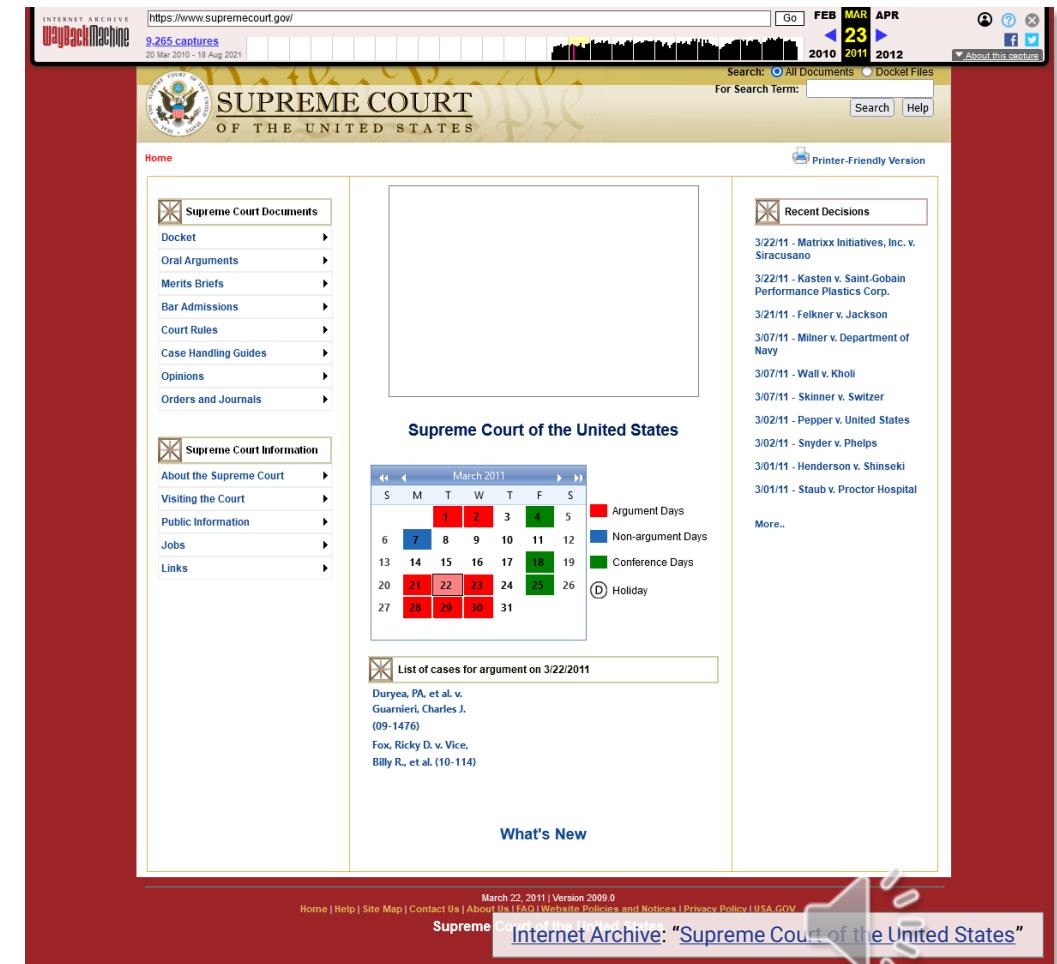
IAWM calendar page: 23 March 2011 capture

- hovering over a date for which there is at least one capture presents the number of captures + capture time(s)
- clicking on a capture time takes you to the re-presentation of the resource captured on that date at that time
- let's click through



IAWM resource page

- IAWM resource page for www.supremecourt.gov for the 23 March 2011 capture
- note that archived webpages have a top-justified IAWM overlay banner to:
 - remind the user they're within the IAWM context
 - facilitate navigation
 - provide additional info about the current capture + other captures of the resource located at the same web address
- let's look at the IAWM banner



IAWM banner



- IAWM overlay banner for the resource page for the 23 March 2011 capture of www.supremecourt.gov
- offers many of the same features as the calendar page: search box, captures range, timeline histogram



IAWM banner: temporal navigation



- yellow highlighted date is the capture date of the currently accessed web resource
- to the left and right are temporal navigation links for different intervals – from top to bottom:
 - one month ago / one month ahead
 - last preceding capture / next successive capture
 - one year ago / one year ahead
- for less-frequently captured web resources, intervals may be longer than a month or year





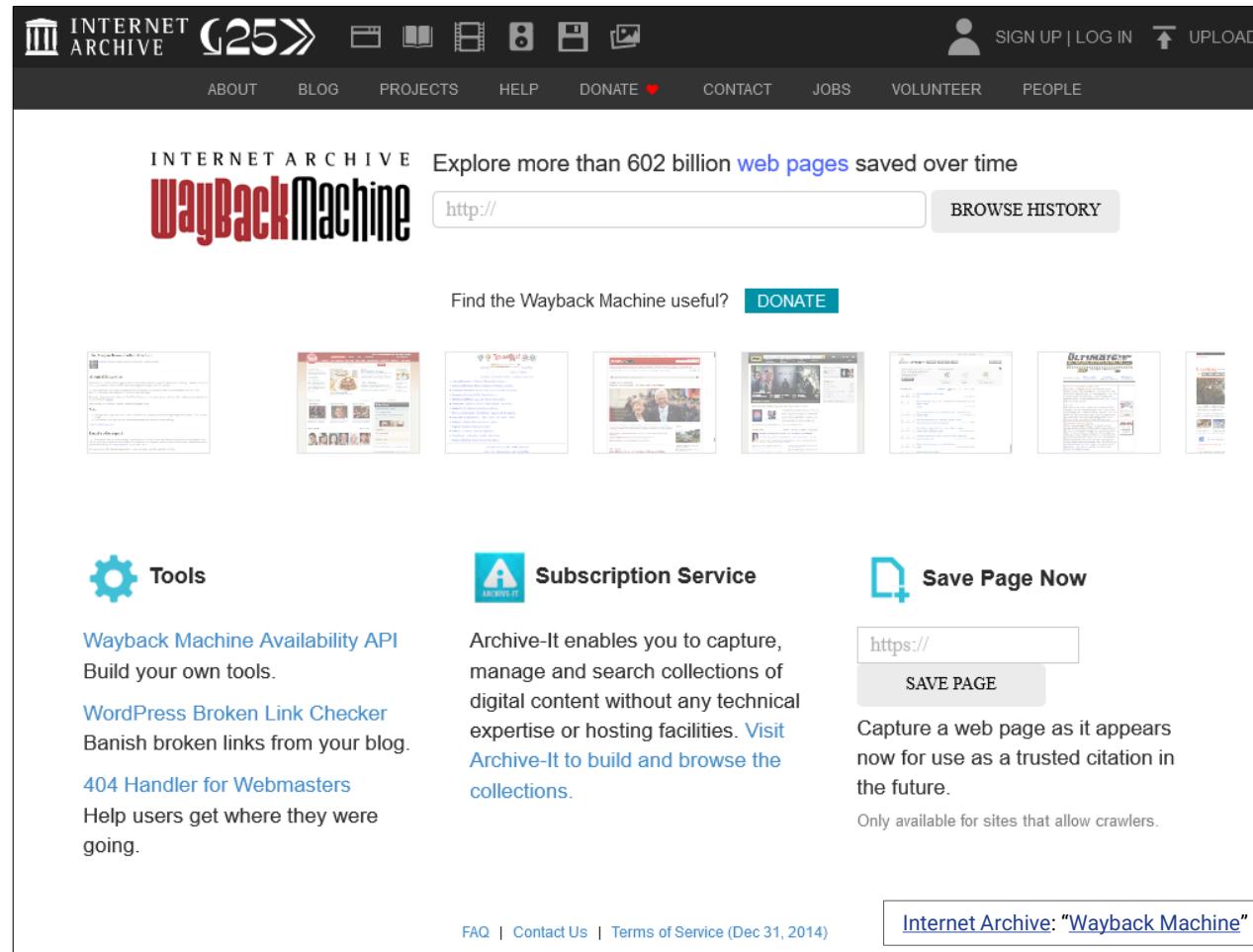
Full-Text Search (of Home Pages)



"Typeset" by Paul Hudson under CC BY 2.0



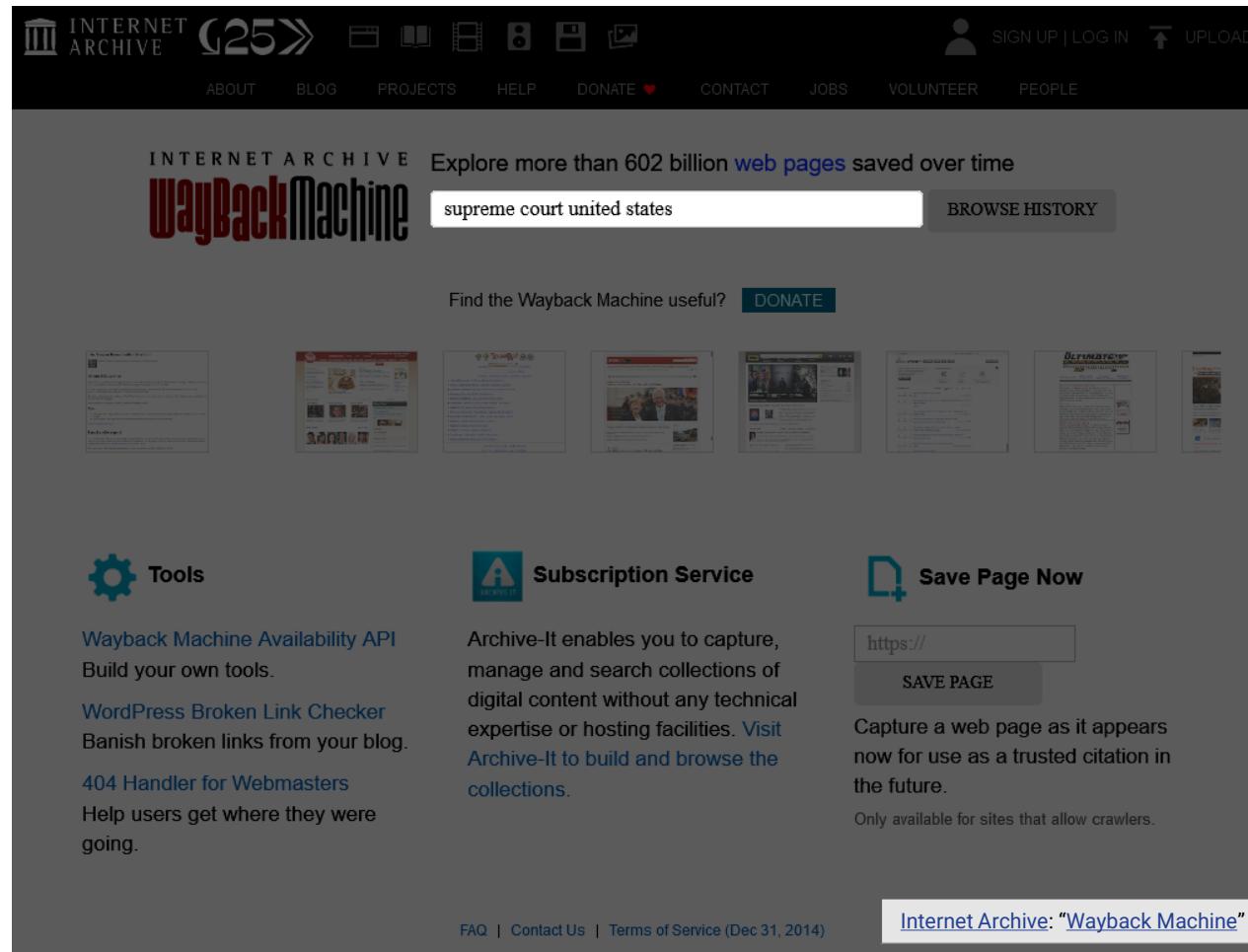
full-text search (of home pages)



The screenshot shows the Wayback Machine homepage. At the top, there's a navigation bar with links for Internet Archive, G25, About, Blog, Projects, Help, Donate, Contact, Jobs, Volunteer, and People. A sign-up/login form and an upload button are also present. The main heading is "INTERNET ARCHIVE" and "Wayback Machine". Below it, a search bar contains "http://", a "BROWSE HISTORY" button, and a "DONATE" button. There are several thumbnail previews of archived web pages from different years. On the left, there's a "Tools" section with links to the Wayback Machine Availability API, WordPress Broken Link Checker, and 404 Handler for Webmasters. In the center, there's a "Subscription Service" section about Archive-It and a "Save Page Now" section with a URL input field and a "SAVE PAGE" button. At the bottom, there are links for FAQ, Contact Us, Terms of Service (Dec 31, 2014), and a "Internet Archive: 'Wayback Machine'" button.



full-text search (of home pages): enter search string



INTERNET ARCHIVE 25 Explore more than 602 billion web pages saved over time

Wayback Machine supreme court united states BROWSE HISTORY

Find the Wayback Machine useful? DONATE

Tools

- Wayback Machine Availability API
- Build your own tools.
- WordPress Broken Link Checker
- Banish broken links from your blog.
- 404 Handler for Webmasters
- Help users get where they were going.

Subscription Service

Archive-It enables you to capture, manage and search collections of digital content without any technical expertise or hosting facilities. Visit [Archive-It to build and browse the collections.](#)

Save Page Now

https://

SAVE PAGE

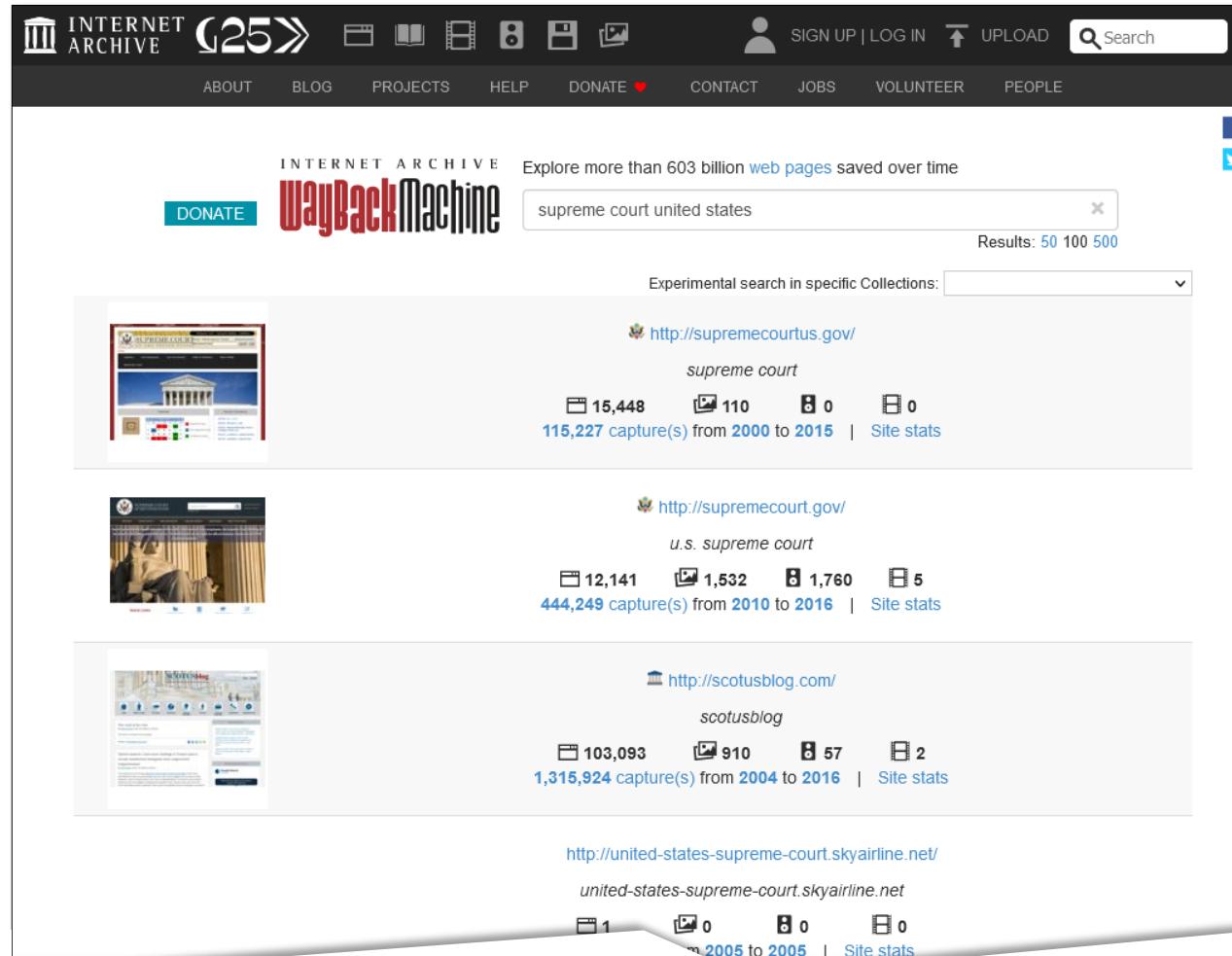
Capture a web page as it appears now for use as a trusted citation in the future.

Only available for sites that allow crawlers.

Internet Archive: "Wayback Machine"



full-text search (of home pages): search results



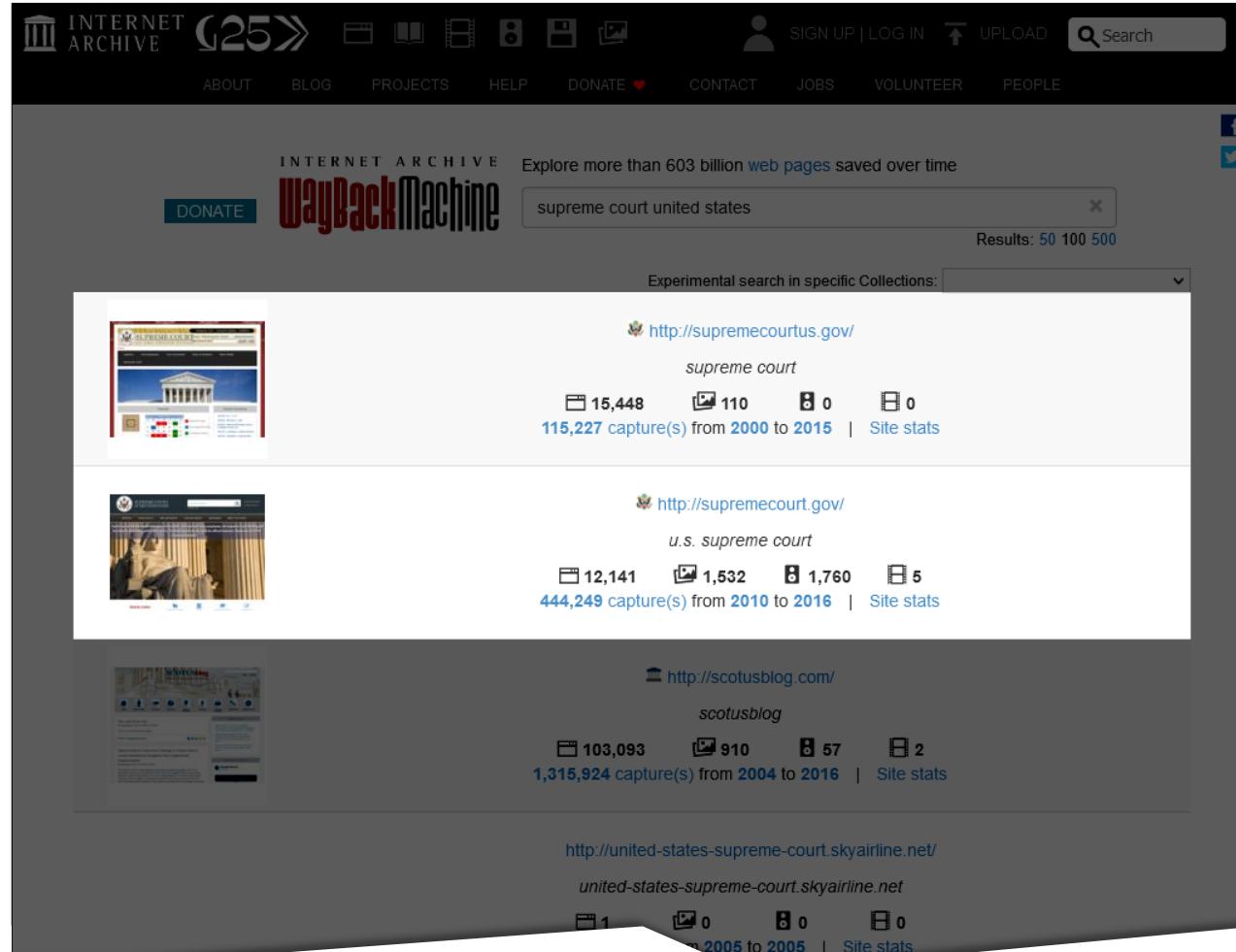
The screenshot shows the Wayback Machine interface on the Internet Archive website. The search query "supreme court united states" is entered in the search bar, with results showing 115,227 captures from 2000 to 2015. The results are presented in three cards:

- http://supremecourtus.gov/**
supreme court
15,448 captures from 2000 to 2015 | Site stats
- http://supremecourt.gov/**
u.s. supreme court
12,141 captures from 2010 to 2016 | Site stats
- http://scotusblog.com/**
scotusblog
103,093 captures from 2004 to 2016 | Site stats

Below these cards, there is a partial result for **http://united-states-supreme-court.skyairline.net/** with 1 capture from 2005 to 2005.



full-text search (of home pages): top two results



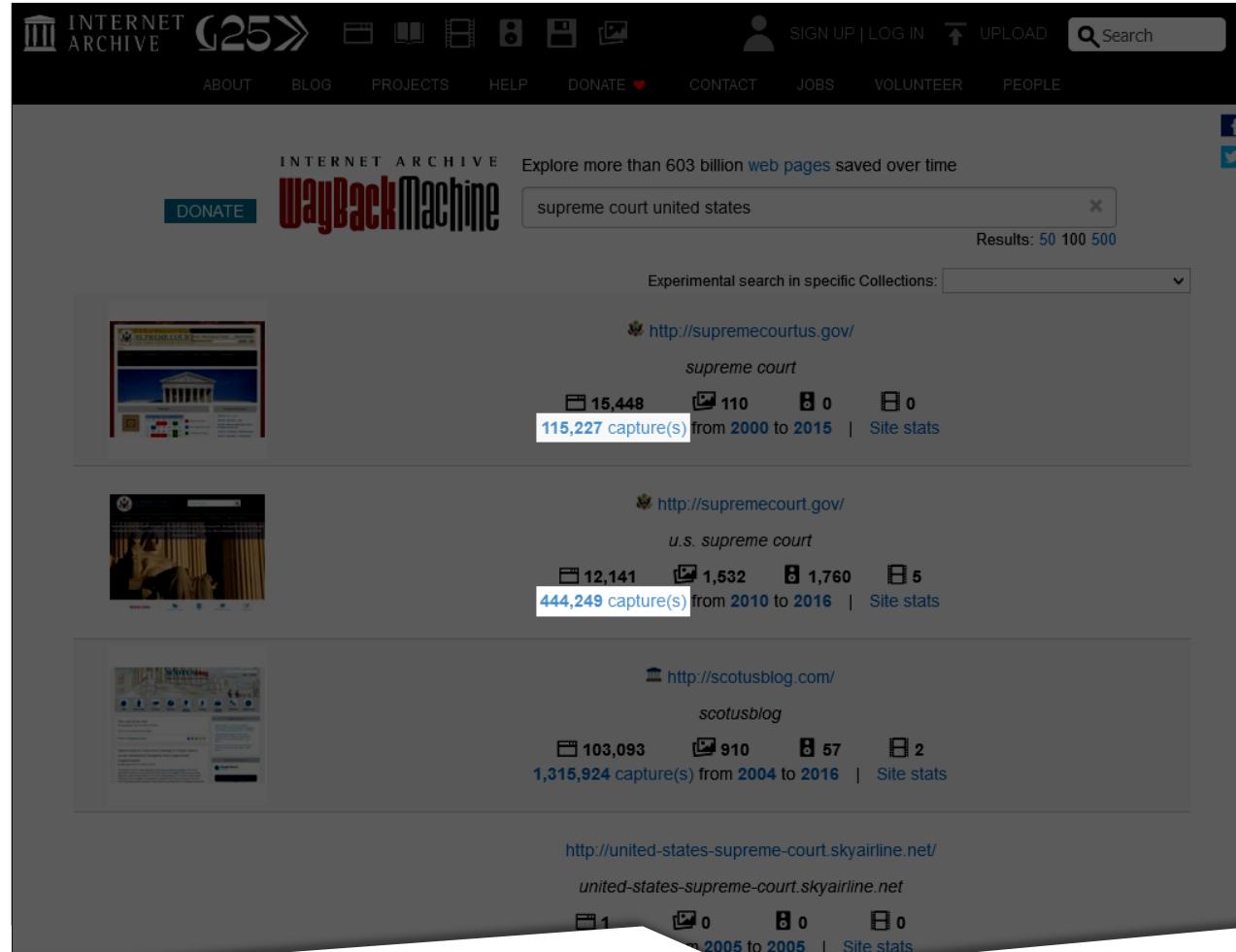
The screenshot shows the Wayback Machine search interface on the Internet Archive website. The search query "supreme court united states" is entered in the search bar. The results are displayed in a list format, showing three main entries:

- http://supremecourtus.gov/**
supreme court
15,448 captures from 2000 to 2015 | Site stats
- http://supremecourt.gov/**
u.s. supreme court
12,141 captures from 2010 to 2016 | Site stats
- http://scotusblog.com/**
scotusblog
103,093 captures from 2004 to 2016 | Site stats

Below the main results, there is a partial result for "http://united-states-supreme-court.skyairline.net/".



full-text search (of home pages): capture counts for top two results



The screenshot shows the Wayback Machine interface on the Internet Archive website. The search query "supreme court united states" is entered in the search bar. The results page displays three main items:

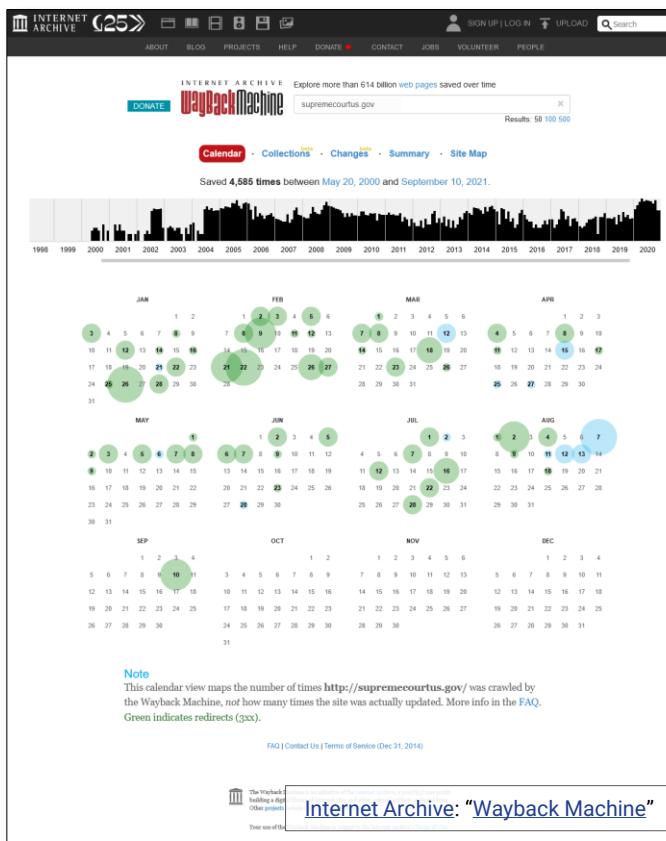
- http://supremecourtus.gov/**
supreme court
15,448 captures from 2000 to 2015 | Site stats
- http://supremecourt.gov/**
u.s. supreme court
12,141 captures from 2010 to 2016 | Site stats
- http://scotusblog.com/**
scotusblog
103,093 captures from 2004 to 2016 | Site stats

Below these results, there is a partial fourth result for <http://united-states-supreme-court.skyairline.net/>.

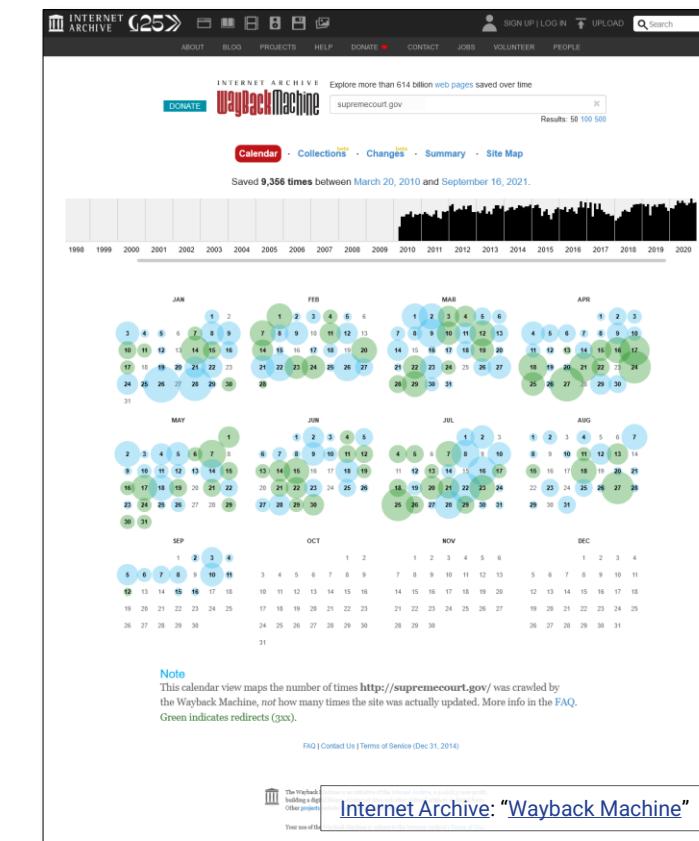


IAWM calendar pages

supremecourtus.gov

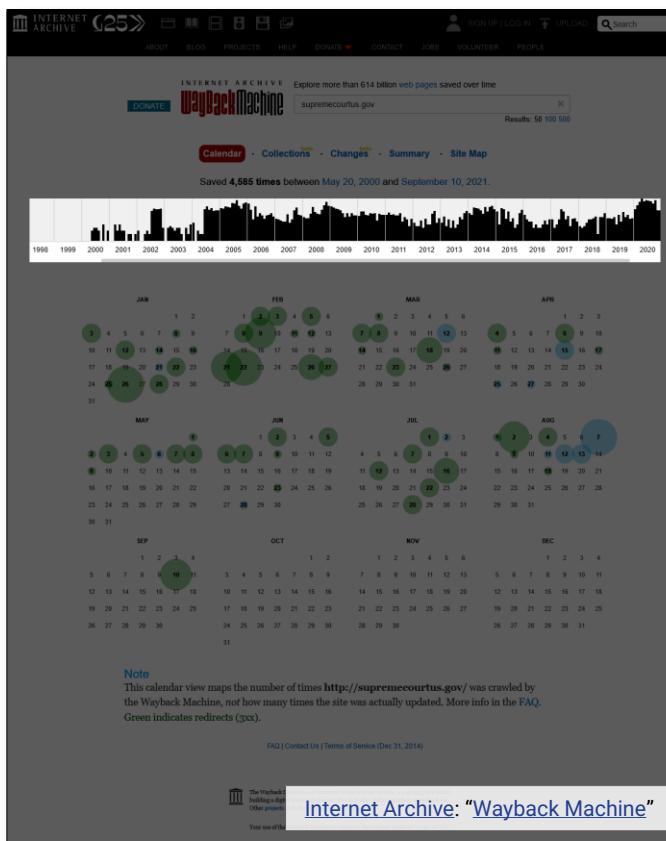


supremecourt.gov

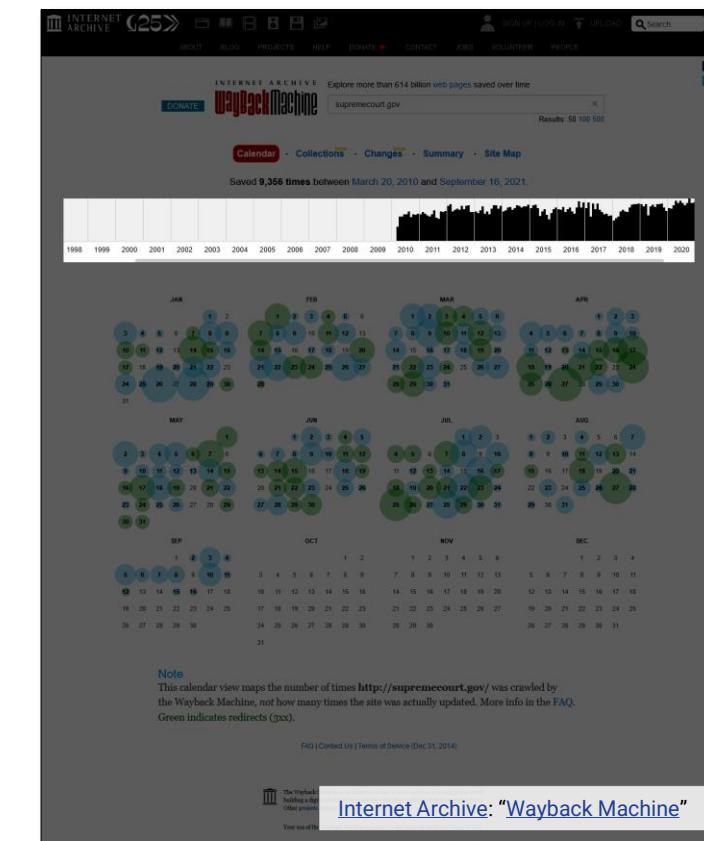


IAWM calendar pages: timeline histograms

supremecourtus.gov



supremecourt.gov



IAWM resource page

- this is the first capture for supremecourtus.gov, from 20 May 2000





Collections Tool + Full-Text Search



"Boxes in the University Archives" by University of Illinois Library under CC BY 2.0

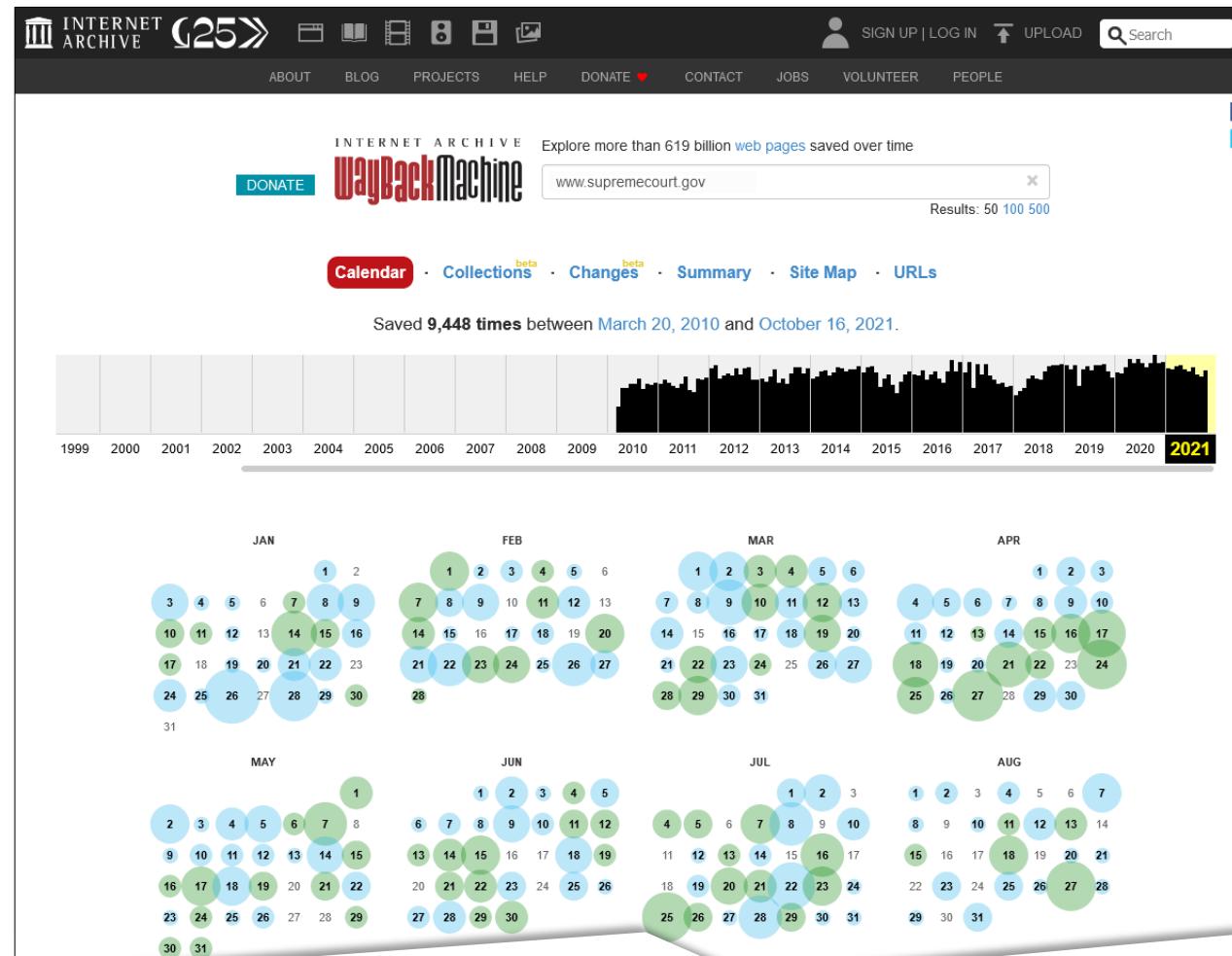


Collections tool

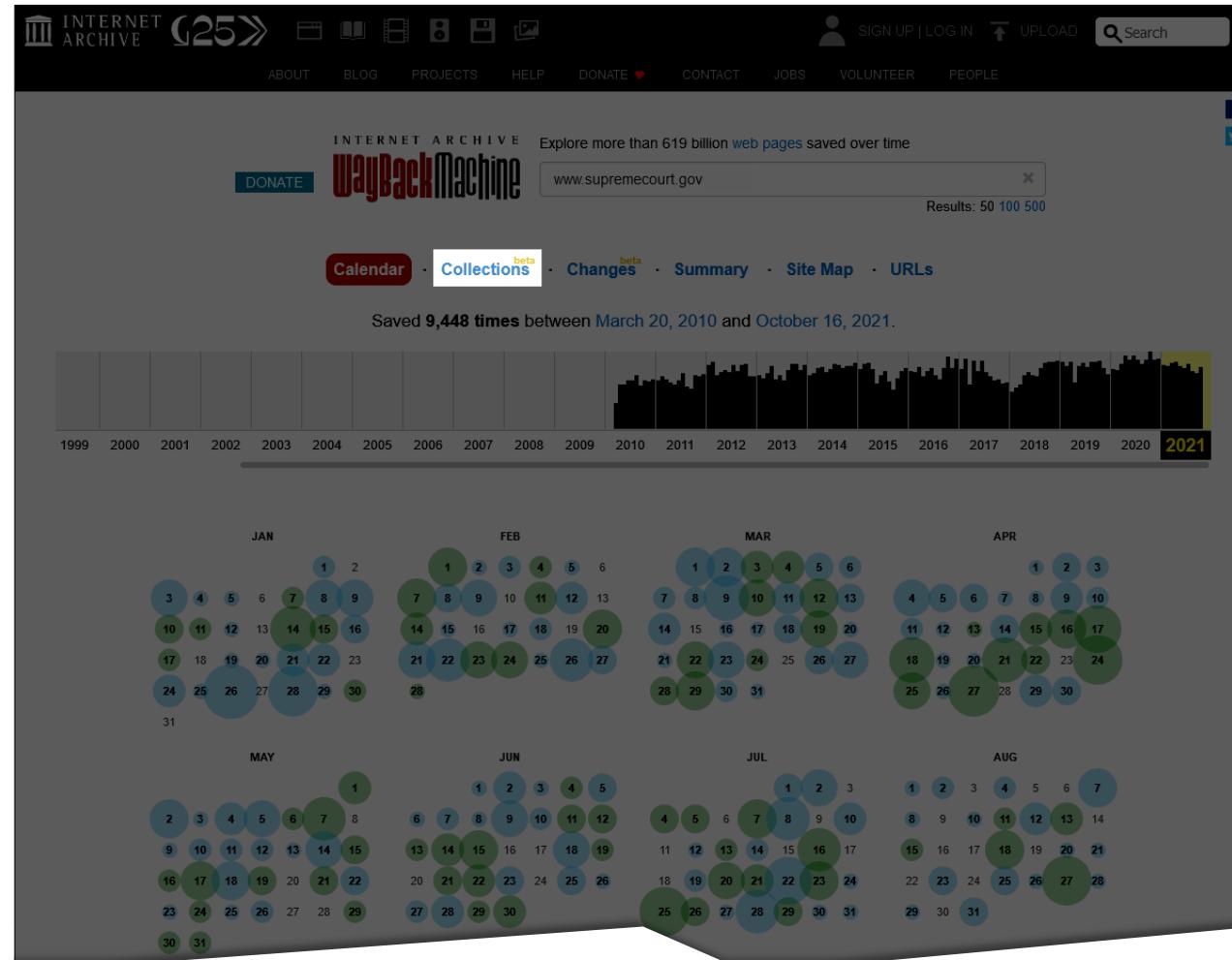
- IAWM captures have diverse provenance:
 - [web-wide crawls](#)
 - [contract crawls](#)
 - [Archive-It crawls](#)
 - [Alexa donations](#)
 - [ArchiveTeam crawls](#)
 - [Save Page Now](#)
- Collections tool shows sources of captures
- why does provenance matter?
 - some sources have more focused crawls, indicating quality
 - some sources offer additional search + discovery options



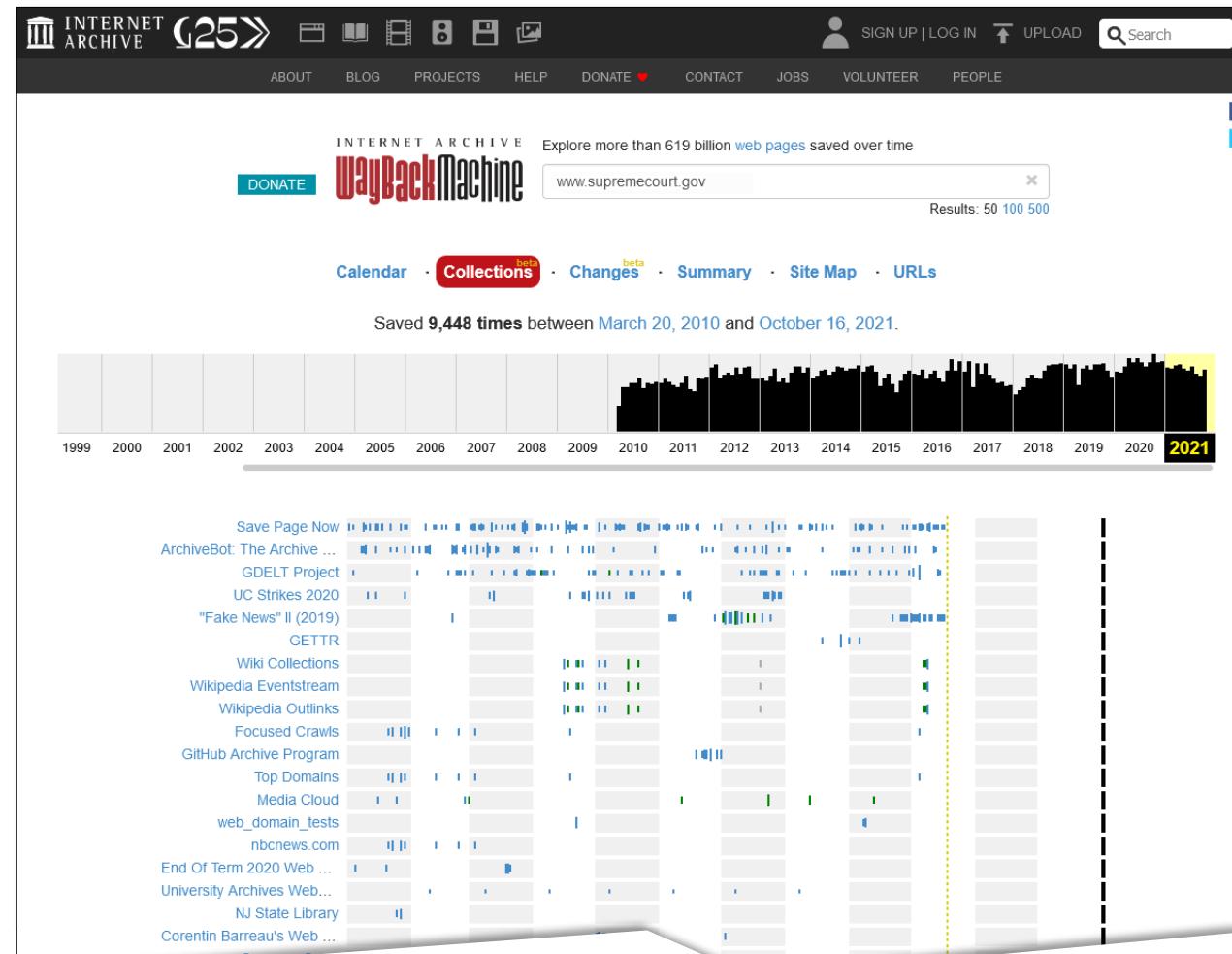
IAWM calendar page



IAWM calendar page

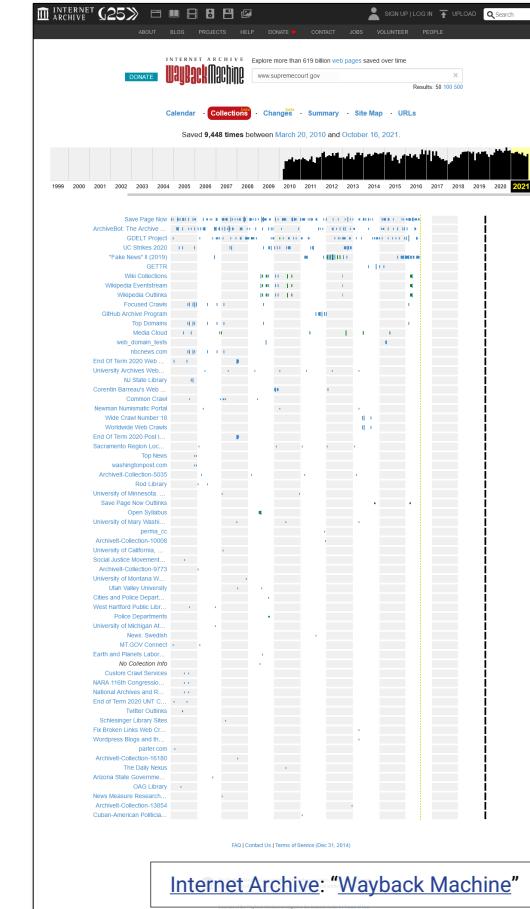


Collections tool



Collections tool

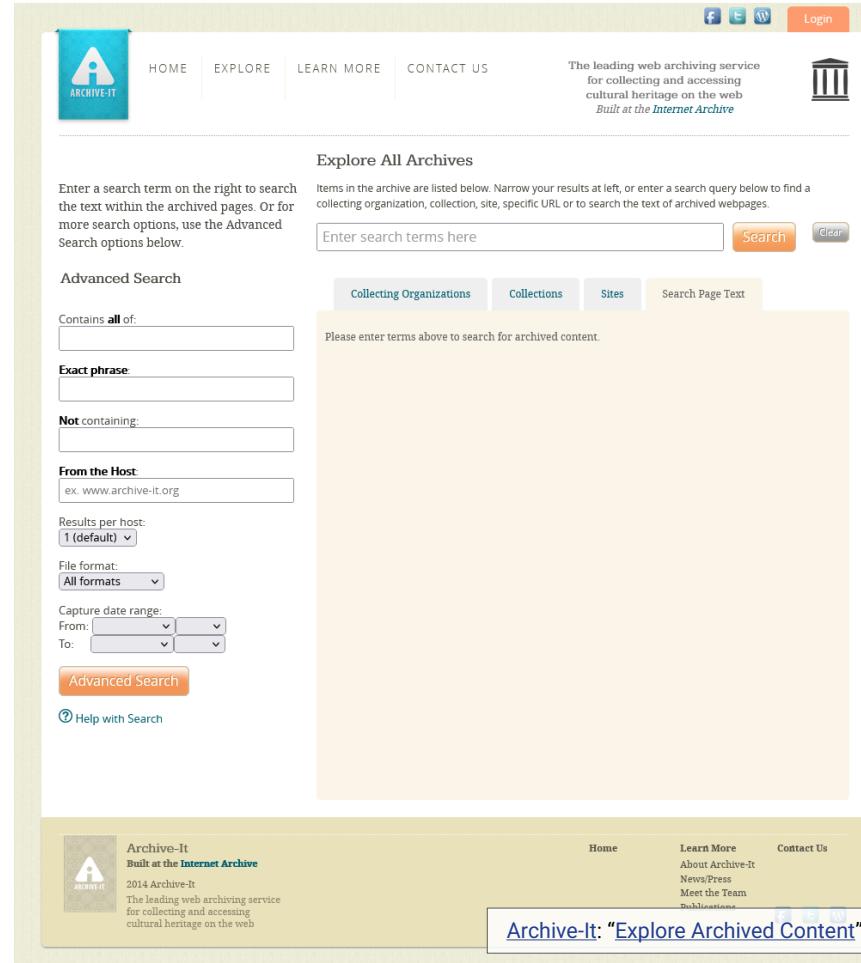
- hover over individual collection names
- look for string in link target web address: *ArchiveIt-Collection*
- Archive-It is IA's subscription web archiving service
- used by 100s of orgs to run selective web crawls + curate topical collections
- has its own discovery portal w/ full-text search



FAQ | Contact Us | Terms of Service (Dec 31, 2014)

Internet Archive: "Wayback Machine"

Archive-It full-text search



The screenshot shows the Archive-It search interface. At the top, there's a navigation bar with links for HOME, EXPLORE, LEARN MORE, and CONTACT US. On the right side of the header, there are social media icons for Facebook, Twitter, and LinkedIn, along with a 'Login' button. Below the header, a banner states: "The leading web archiving service for collecting and accessing cultural heritage on the web. Built at the Internet Archive".

The main search area is titled "Explore All Archives". It features a search bar with placeholder text "Enter search terms here" and buttons for "Search" and "Clear". Below the search bar are four tabs: "Collecting Organizations", "Collections", "Sites", and "Search Page Text". A message below the tabs says "Please enter terms above to search for archived content".

On the left side of the search area, there is an "Advanced Search" section with several input fields and dropdown menus:

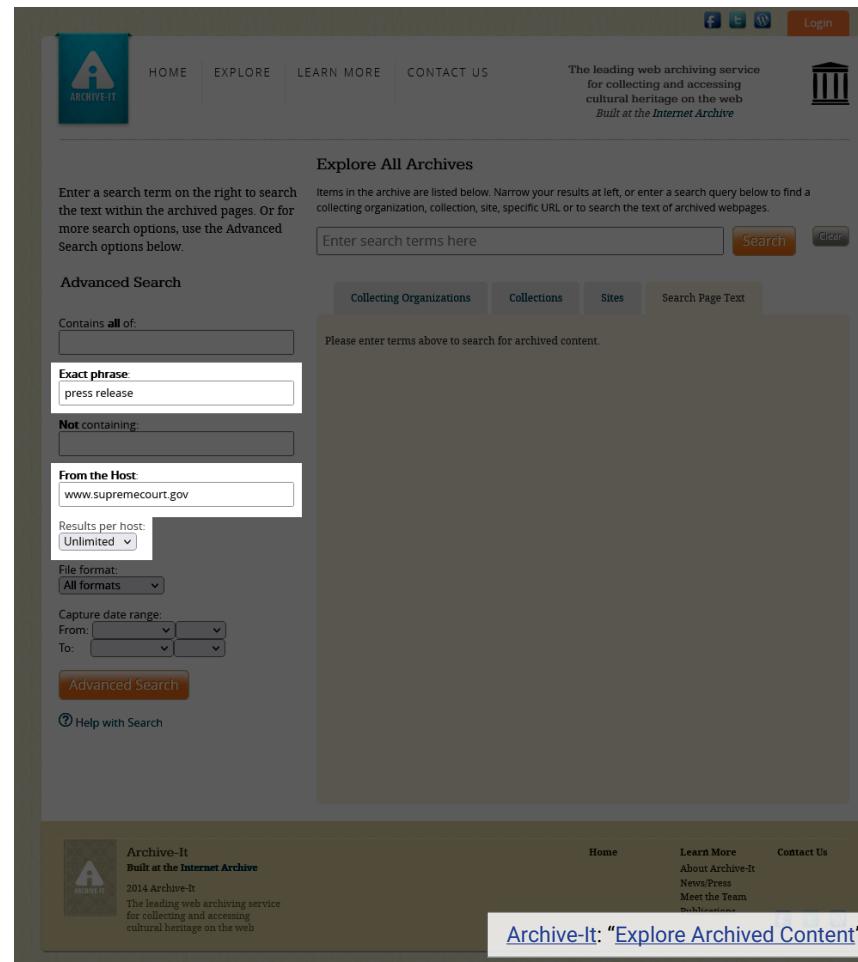
- "Contains all of:" input field
- "Exact phrase" input field
- "Not containing:" input field
- "From the Host" dropdown menu set to "ex. www.archive-it.org"
- "Results per host:" dropdown menu set to "1 (default)"
- "File format:" dropdown menu set to "All formats"
- "Capture date range:" dropdown menus for "From" and "To" dates

At the bottom of the search area, there are buttons for "Advanced Search" and "Help with Search".

At the very bottom of the page, there's a footer with the Archive-It logo, the text "Built at the Internet Archive", and links for "Home", "Learn More", "Contact Us", "About Archive-It", "News/Press", "Meet the Team", and "Publications". A call-to-action button at the bottom right says "Archive-It: Explore Archived Content".



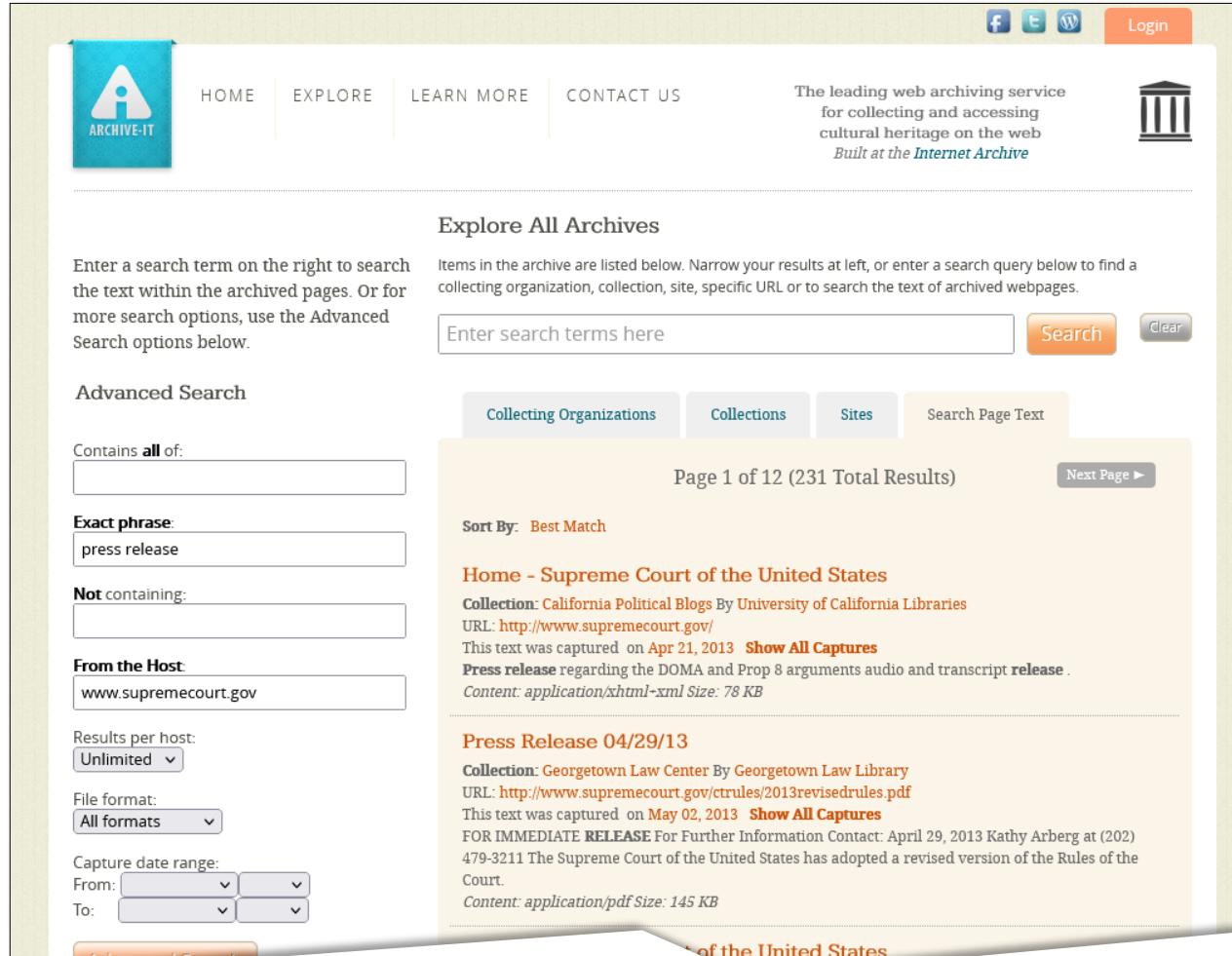
Archive-It full-text search



The screenshot shows the Archive-It search interface. At the top, there's a navigation bar with links for HOME, EXPLORE, LEARN MORE, and CONTACT US. To the right of the navigation is a brief description: "The leading web archiving service for collecting and accessing cultural heritage on the web. Built at the Internet Archive". Below the navigation, there's a search bar with the placeholder "Enter search terms here" and a "Search" button. Underneath the search bar are four tabs: "Collecting Organizations", "Collections", "Sites", and "Search Page Text". A message below the tabs says "Please enter terms above to search for archived content." On the left side of the main content area, there's a sidebar titled "Advanced Search" containing several search fields and dropdown menus. These fields include "Contains all of:" (with the value "press release"), "Exact phrase" (with the value "press release"), "Not containing:" (empty), "From the Host" (with the value "www.supremecourt.gov"), "Results per host" (set to "Unlimited"), "File format" (set to "All formats"), and "Capture date range" (with dropdown menus for "From" and "To"). At the bottom of the sidebar is a red "Advanced Search" button and a link to "Help with Search". The footer of the page includes the Archive-It logo, the text "Built at the Internet Archive", and copyright information for 2014. It also features links for "Home", "Learn More", "Contact Us", and "About Archive-It", "News/Press", "Meet the Team", and "Sponsorships". A call-to-action button at the bottom right says "Archive-It: Explore Archived Content".



Archive-It full-text search



The screenshot shows the Archive-It search interface. At the top, there's a navigation bar with links for HOME, EXPLORE, LEARN MORE, and CONTACT US. To the right of the navigation is a logo for "The Internet Archive" and a "Login" button. Below the navigation, there's a section titled "Explore All Archives" with a search bar containing "Enter search terms here" and a "Search" button. There are also buttons for "Collecting Organizations", "Collections", "Sites", and "Search Page Text". The main content area displays search results for "press release". It shows two items:

- Home - Supreme Court of the United States**
Collection: California Political Blogs By University of California Libraries
URL: <http://www.supremecourt.gov>
This text was captured on Apr 21, 2013 [Show All Captures](#)
Press release regarding the DOMA and Prop 8 arguments audio and transcript release.
Content: application/xhtml+xml Size: 78 KB
- Press Release 04/29/13**
Collection: Georgetown Law Center By Georgetown Law Library
URL: <http://www.supremecourt.gov/ctrules/2013revisedrules.pdf>
This text was captured on May 02, 2013 [Show All Captures](#)
FOR IMMEDIATE RELEASE For Further Information Contact: April 29, 2013 Kathy Arberg at (202) 479-3211 The Supreme Court of the United States has adopted a revised version of the Rules of the Court.
Content: application/pdf Size: 145 KB





Changes Tool

["the before-after-situation" by Michael Mueller under CC BY 2.0](#)

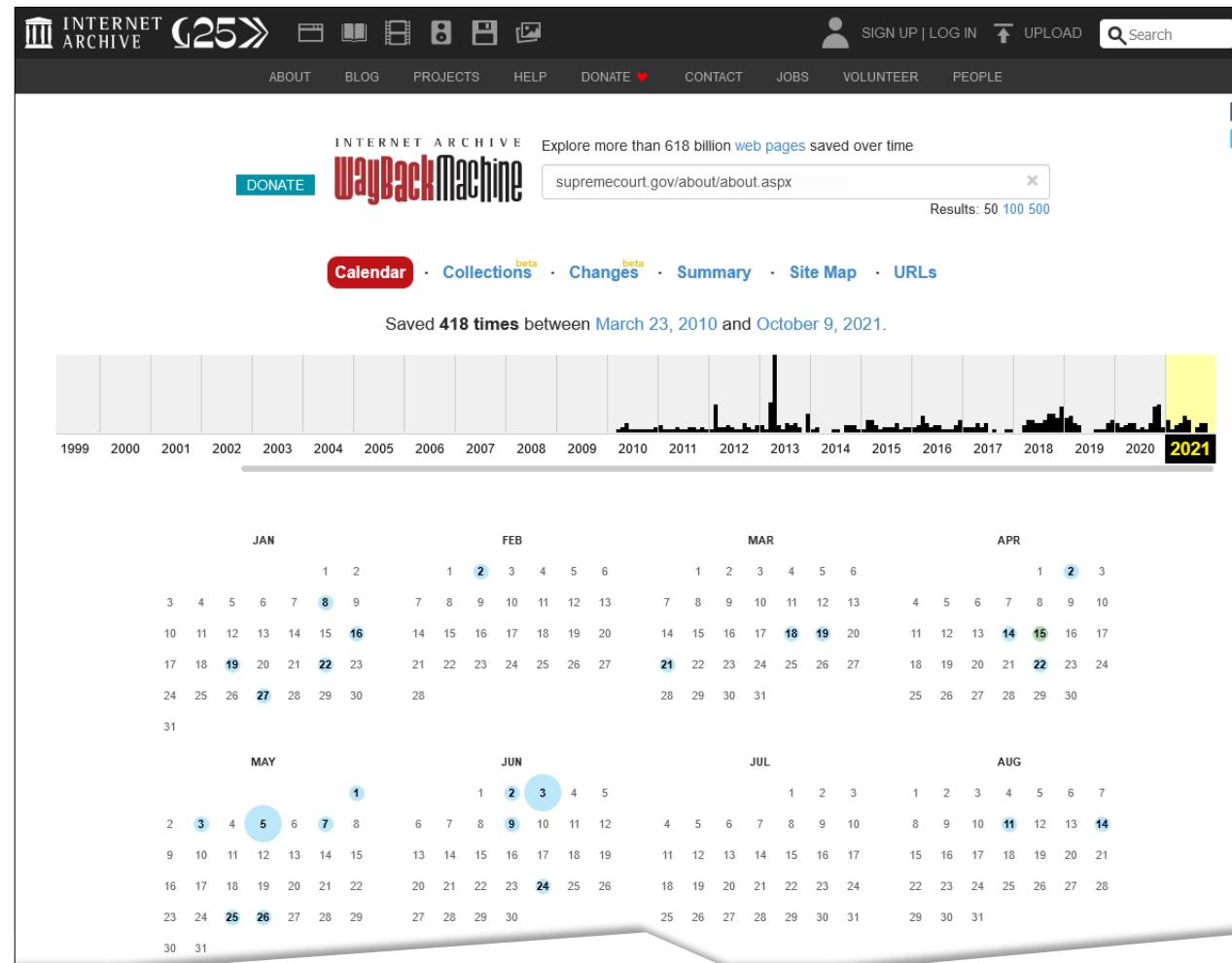


Changes tool

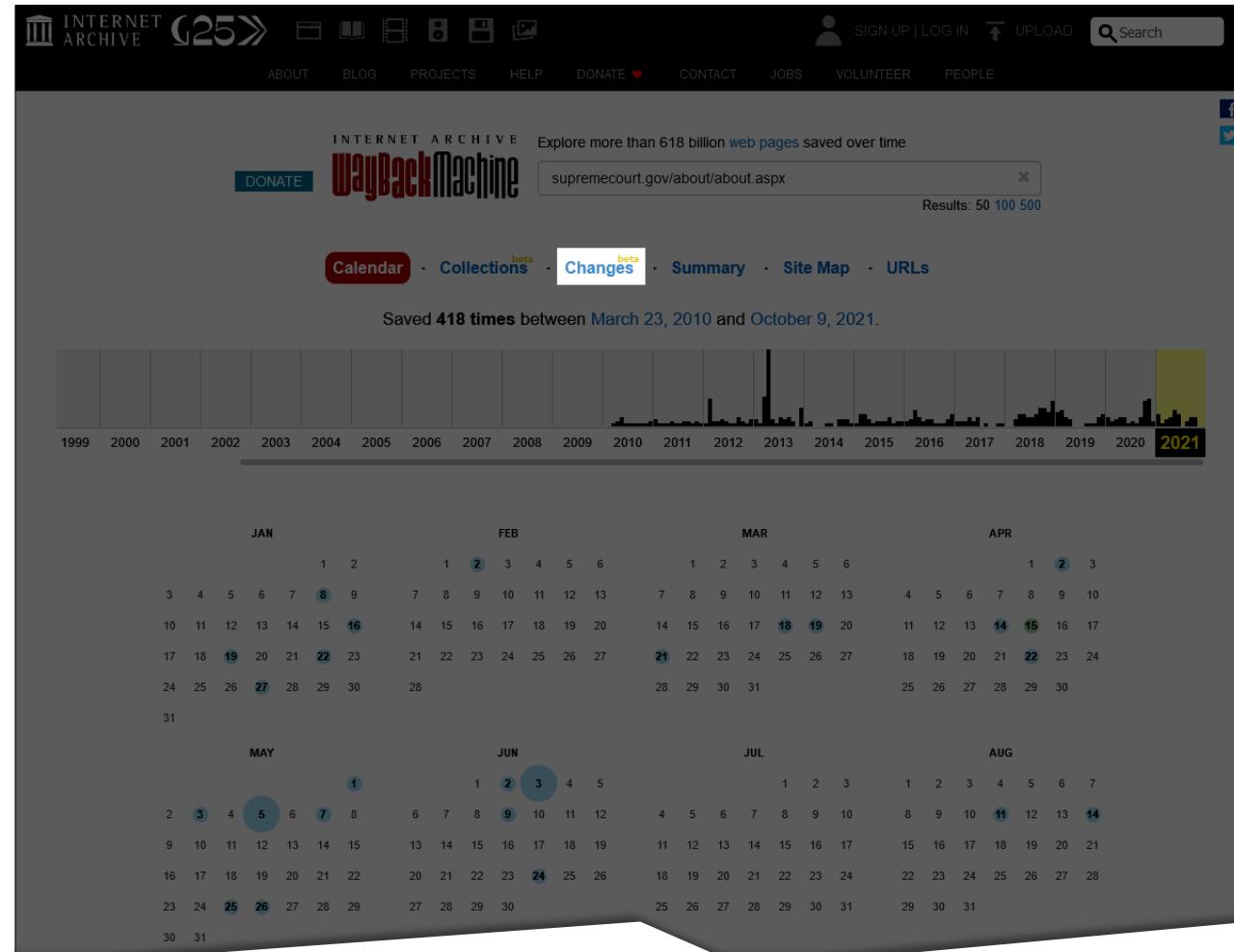
- flags differences in text b/t 2 captures of same web page
- caveats:
 - doesn't consider non-textual elements
 - doesn't account for intermediate changes
 - changes may not matter for legal issue
- use to:
 - identify when a web page changed
 - quickly visualize the text changes over time
 - establish when web page text was substantially identical



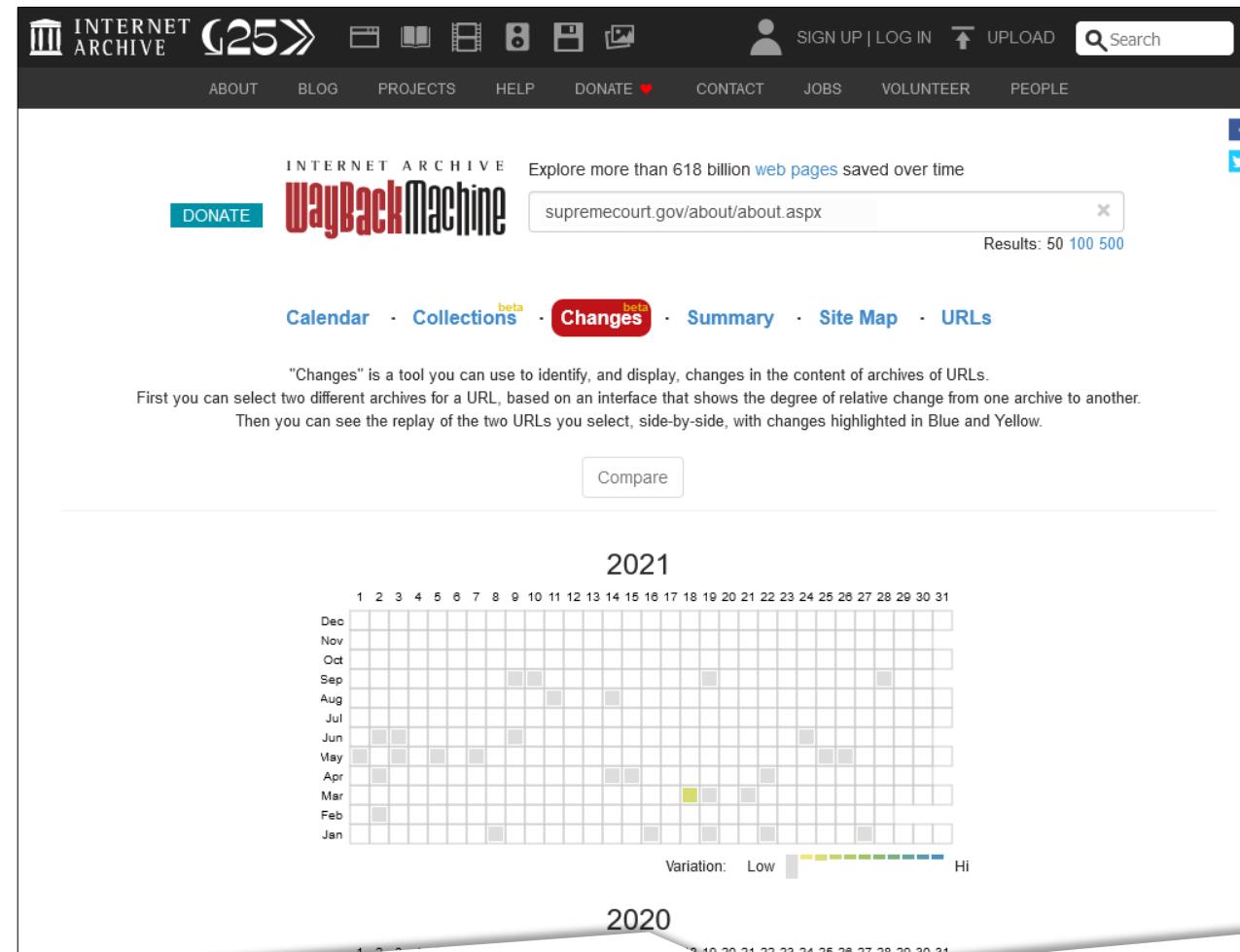
IAWM calendar page



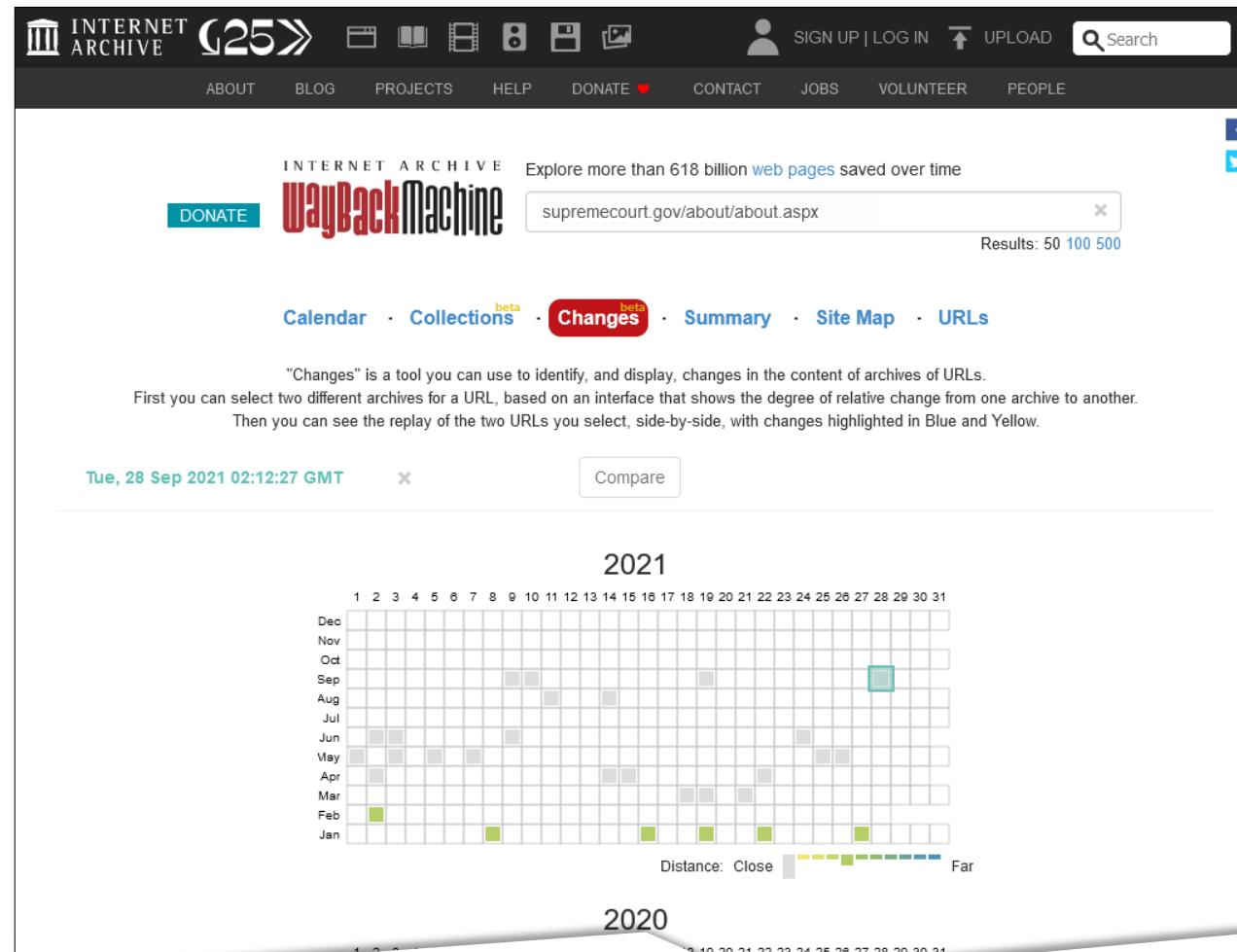
IAWM calendar page



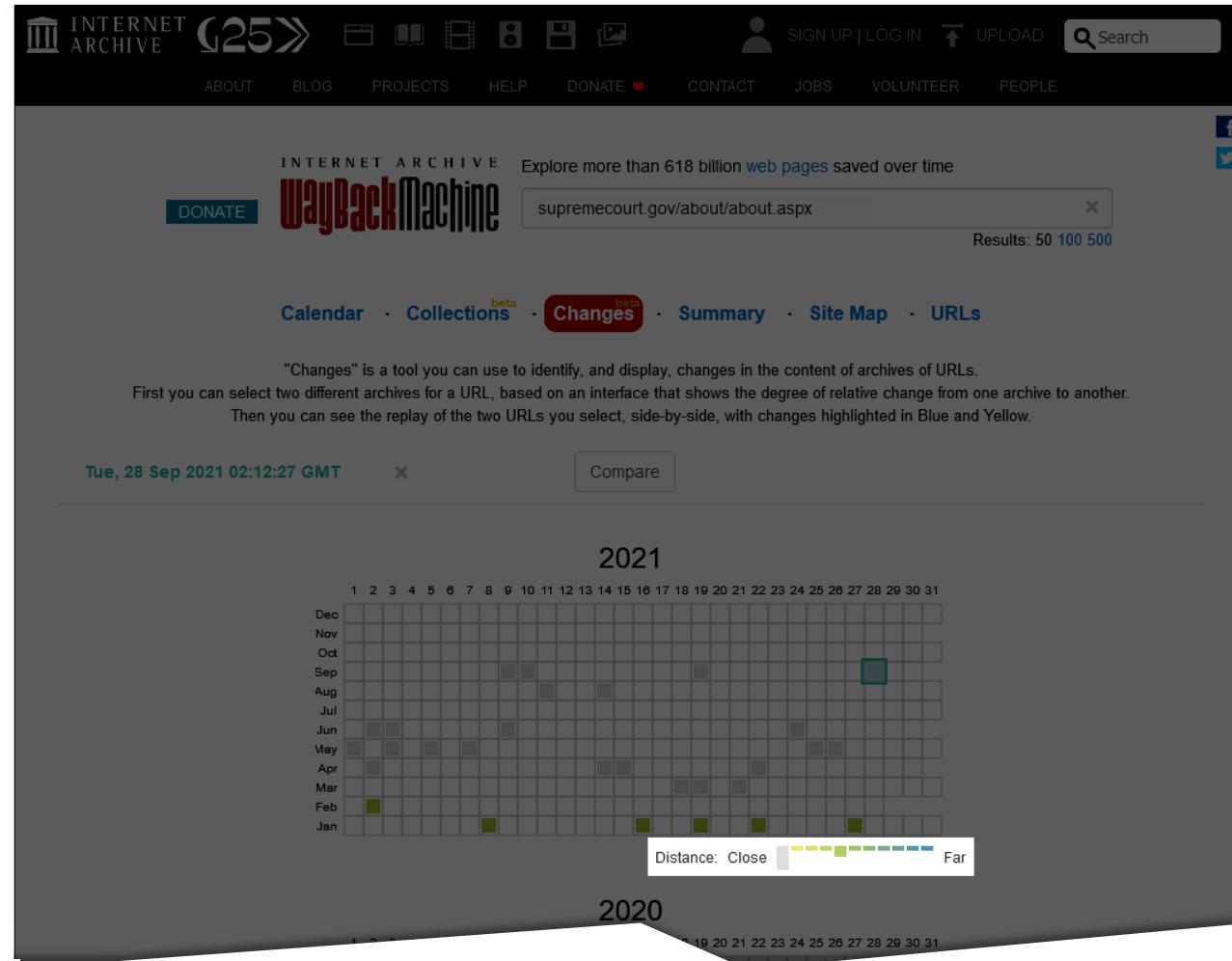
Changes tool



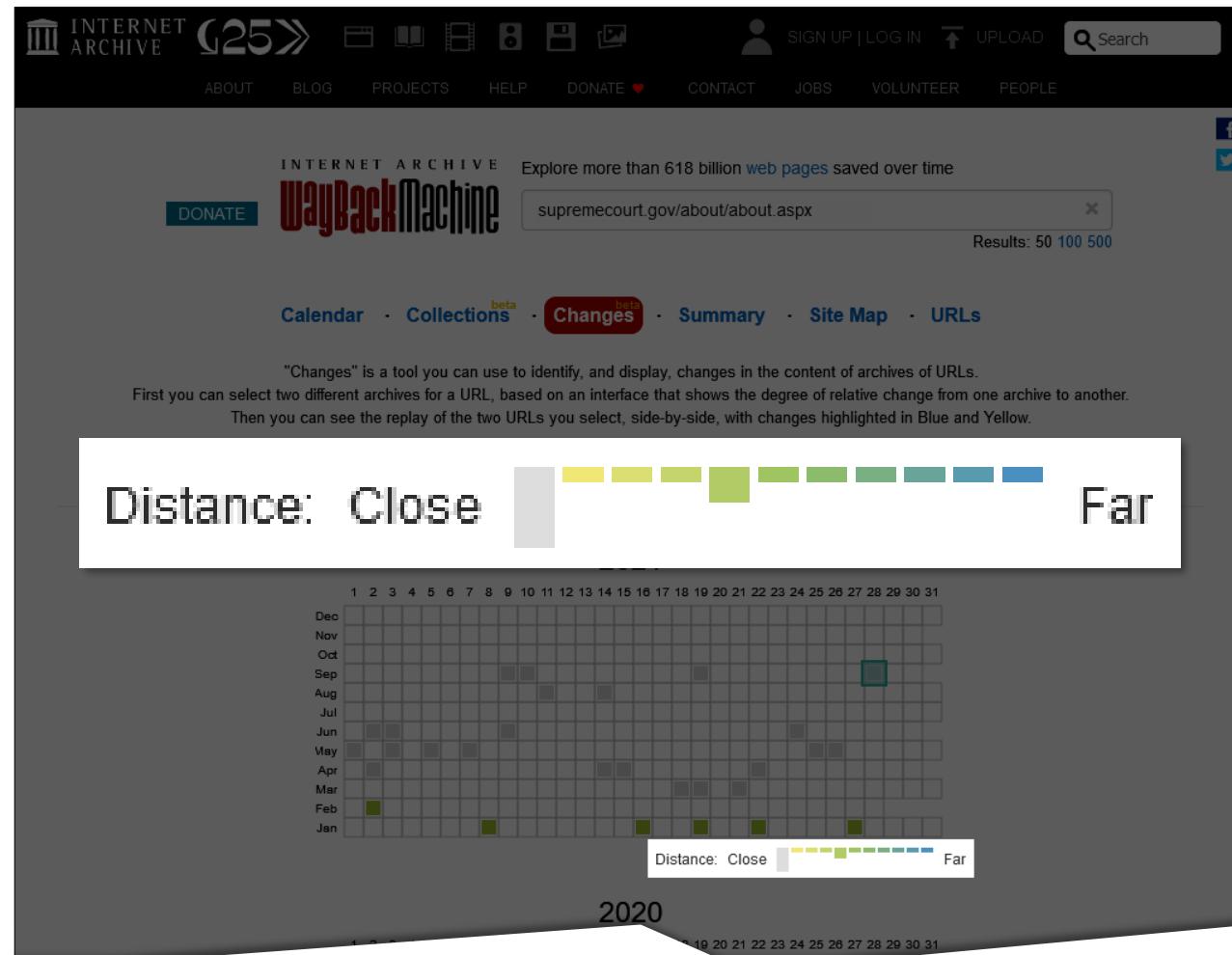
Changes tool: choose 28 September 2021 capture



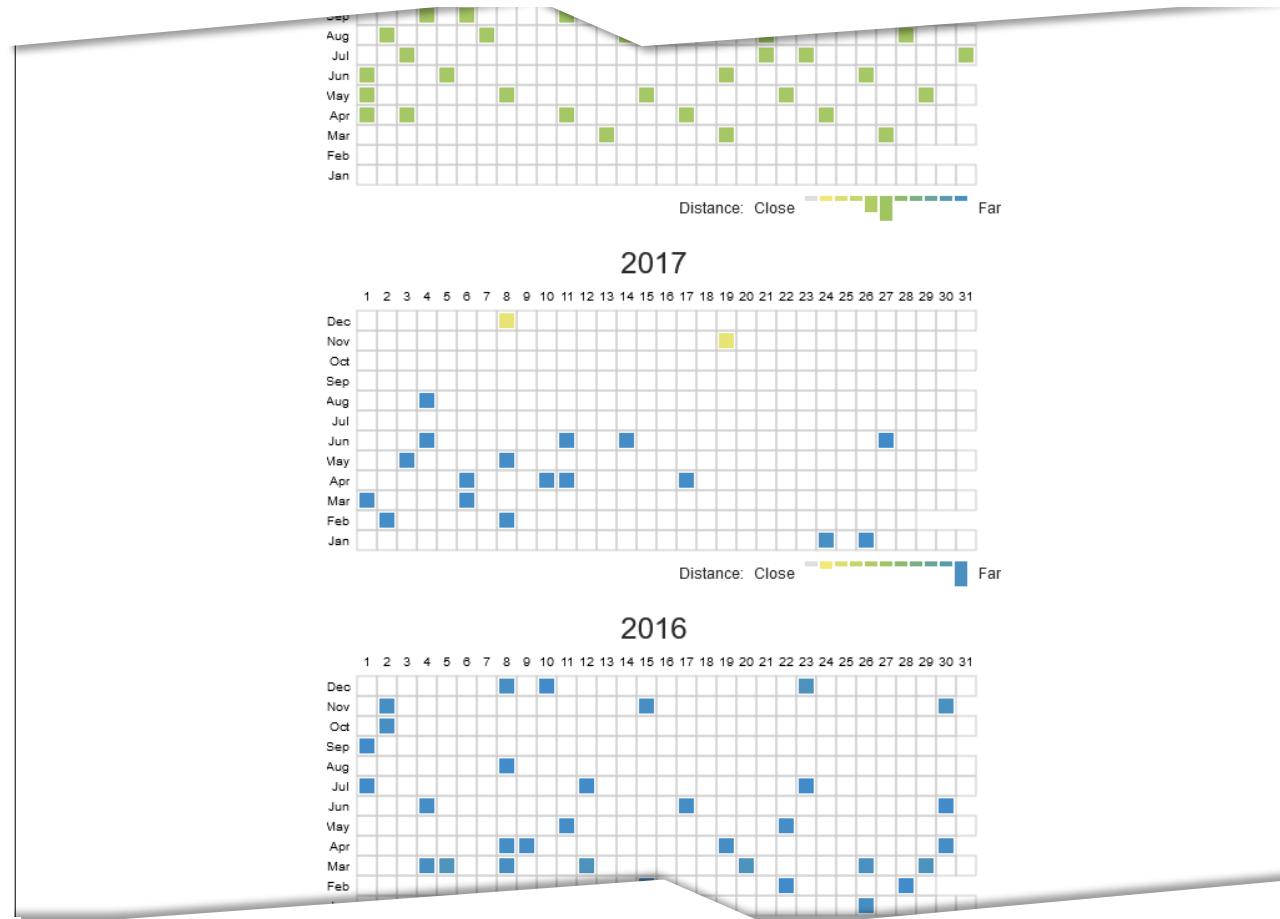
Changes tool: degree of difference key



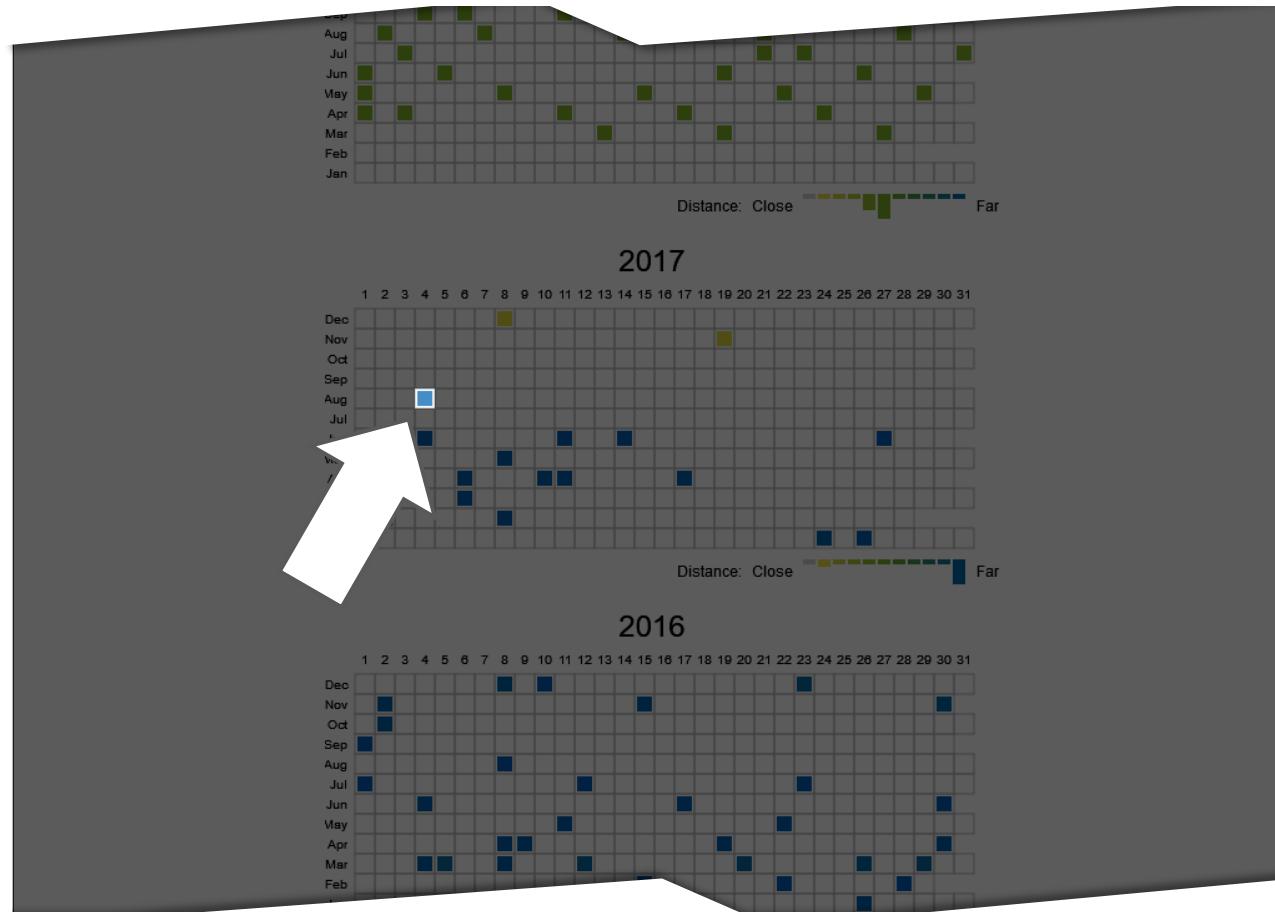
Changes tool: degree of difference key



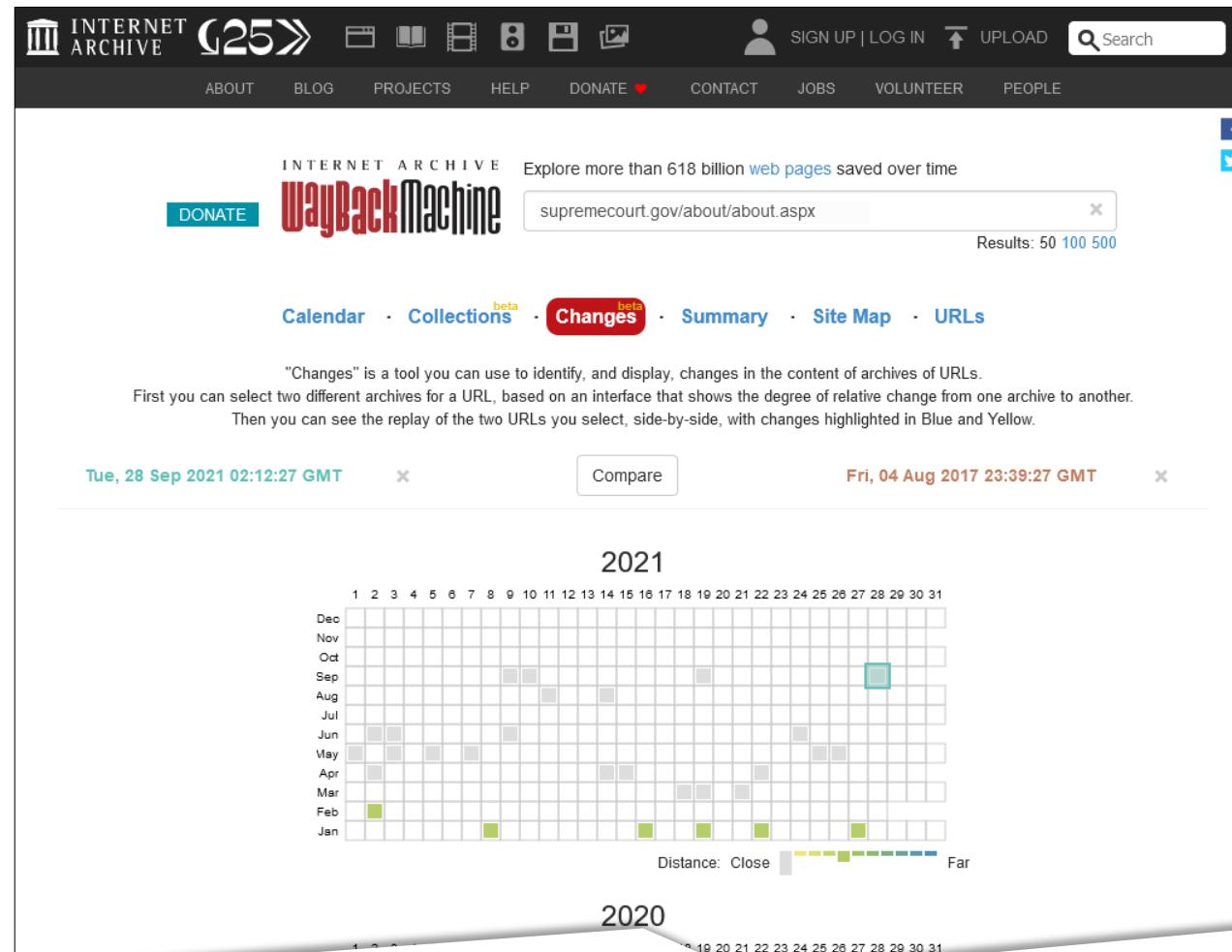
Changes tool: difference from 2017 captures



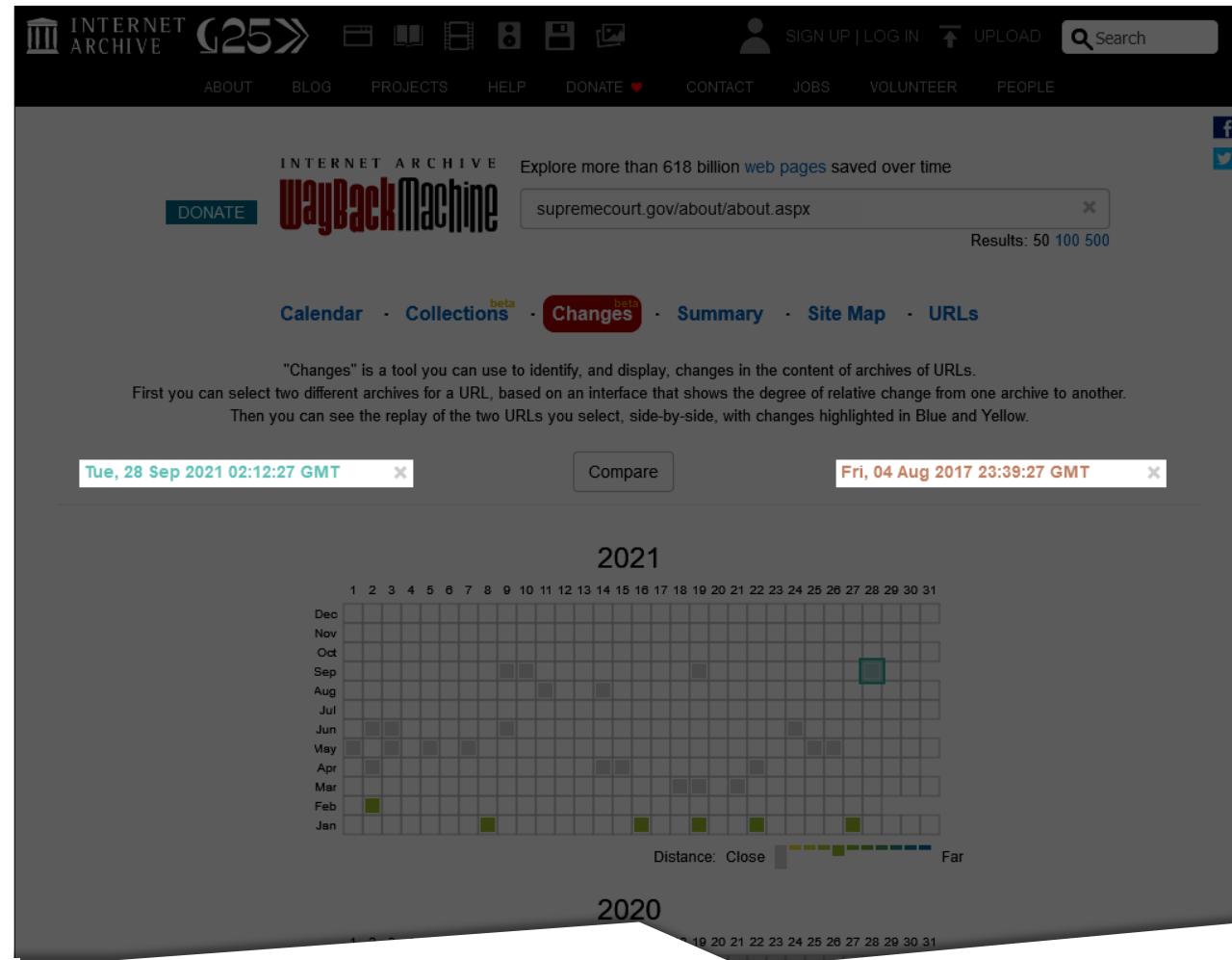
Changes tool: compare w/ 4 August 2017 capture



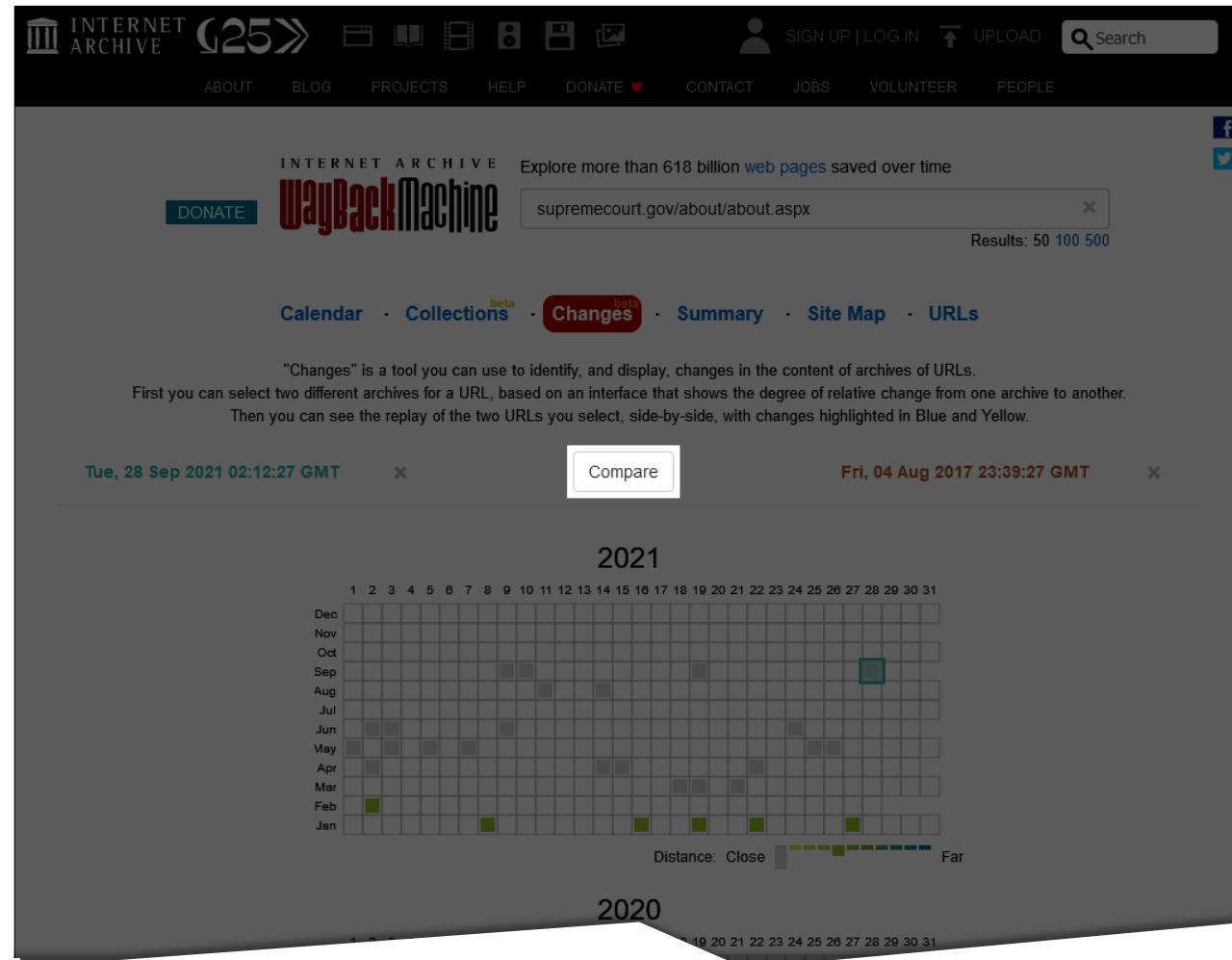
Changes tool: two captures selected



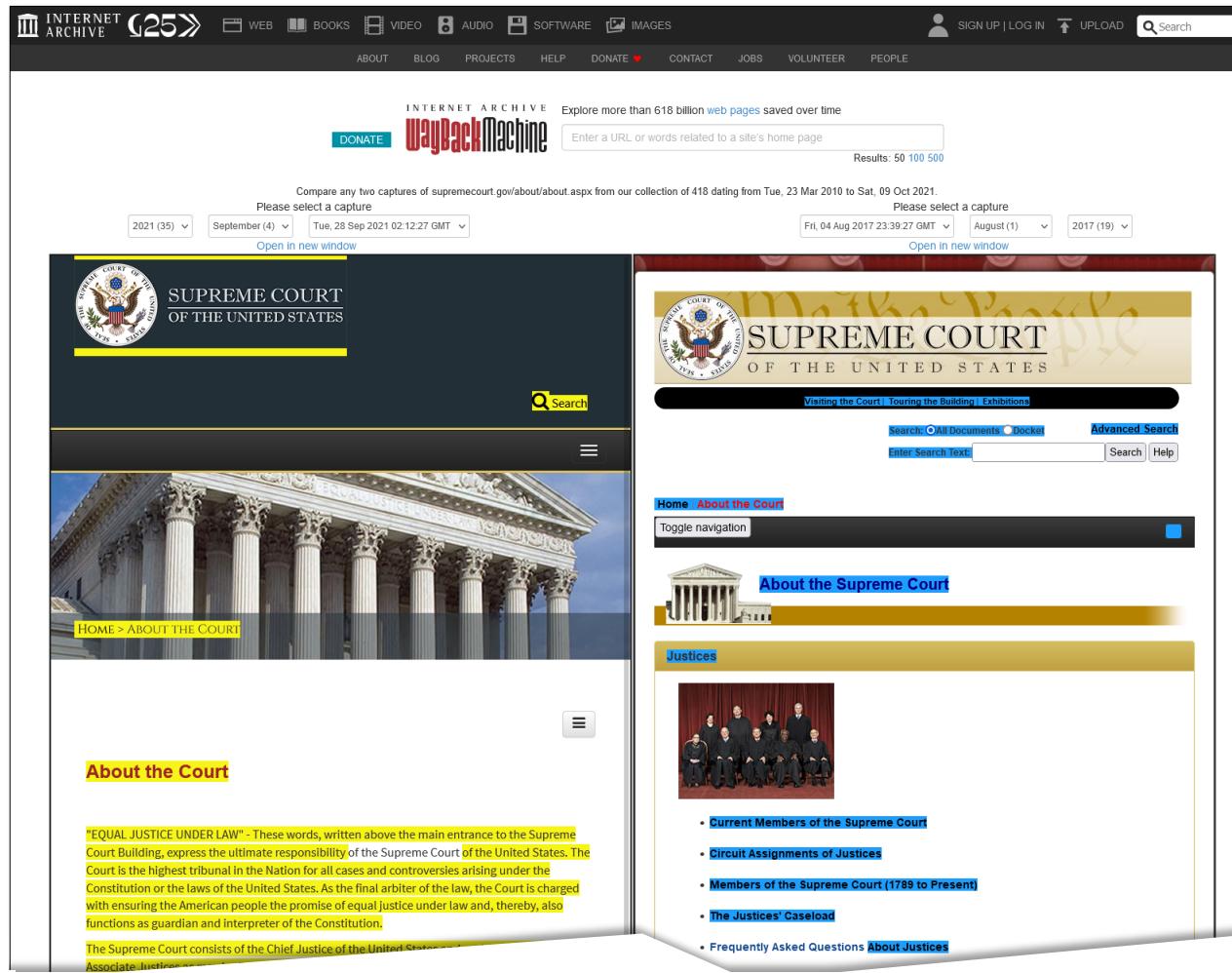
Changes tool: two captures selected



Changes tool: click Compare



Changes tool: compare 28 Sep. 2011 + 4 Aug. 2017 captures

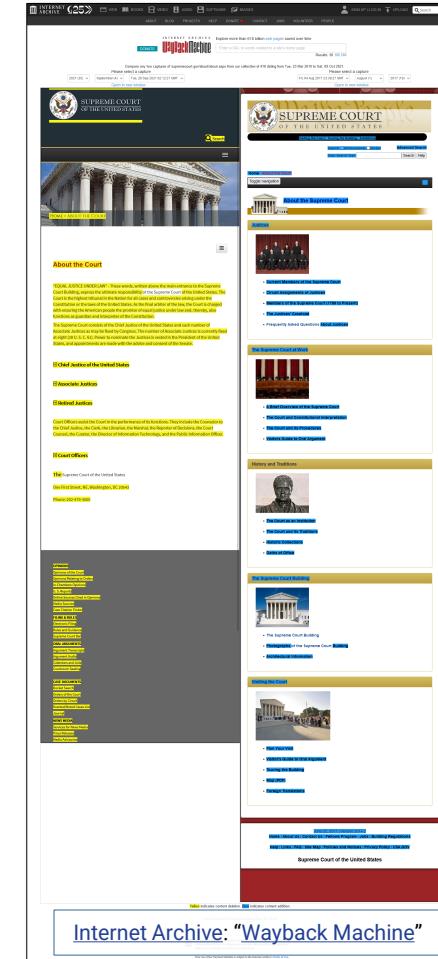


The screenshot shows the Wayback Machine interface on the Internet Archive website. At the top, there are links for WEB, BOOKS, VIDEO, AUDIO, SOFTWARE, and IMAGES. Below that is a navigation bar with links for ABOUT, BLOG, PROJECTS, HELP, DONATE, CONTACT, JOBS, VOLUNTEER, and PEOPLE. The main heading is "INTERNET ARCHIVE Explore more than 618 billion web pages saved over time". A "Wayback Machine" logo is prominently displayed. A search bar says "Enter a URL or words related to a site's home page" with results "Results: 50 100 500". Below the search bar, it says "Compare any two captures of supremecourt.gov/about/about.aspx from our collection of 418 dating from Tue, 23 Mar 2010 to Sat, 09 Oct 2021." Two dropdown menus show "2021 (35)" and "September (4)" on the left, and "Tue, 28 Sep 2021 02:12:27 GMT" on the right. On the right, another dropdown shows "Fri, 04 Aug 2017 23:39:27 GMT" and "August (1)" with "2017 (19)" below it. Both dropdowns have "Open in new window" links. The main content area shows two versions of the Supreme Court's "About the Court" page. The left version (2021) has a dark blue header with the seal and "SUPREME COURT OF THE UNITED STATES". The right version (2017) has a gold-colored header with the seal and "SUPREME COURT OF THE UNITED STATES". Both versions show the same content, including the "About the Court" section with text about the Equal Justice Under Law motto and the Justices' Caseload section.

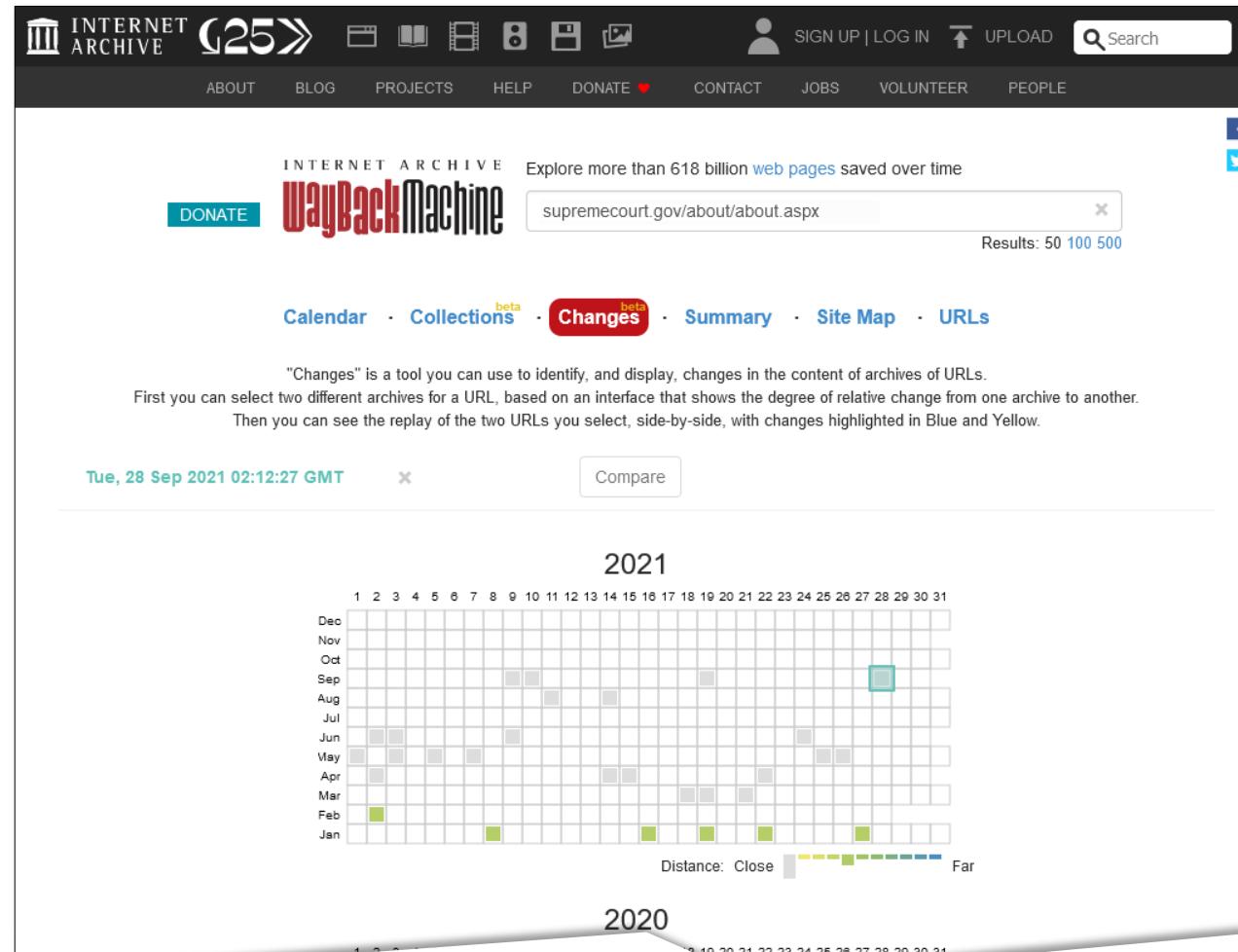


Changes tool: comparing captures

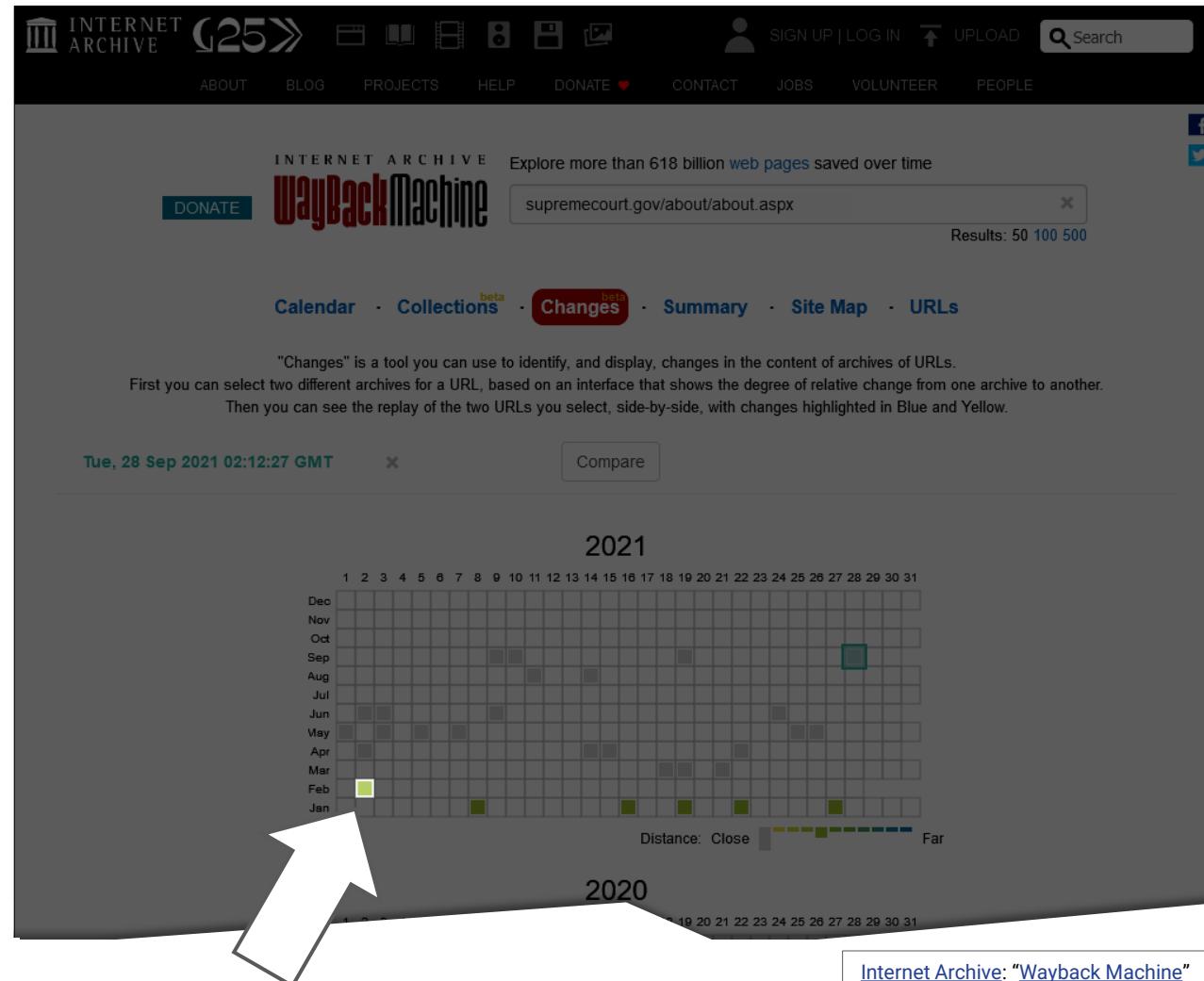
- yellow highlighted text was deleted
- blue highlighted text was added
- note that the website design has changed significantly, but this isn't specifically detected by the Changes tool
- however, major text changes often accompany major website design changes



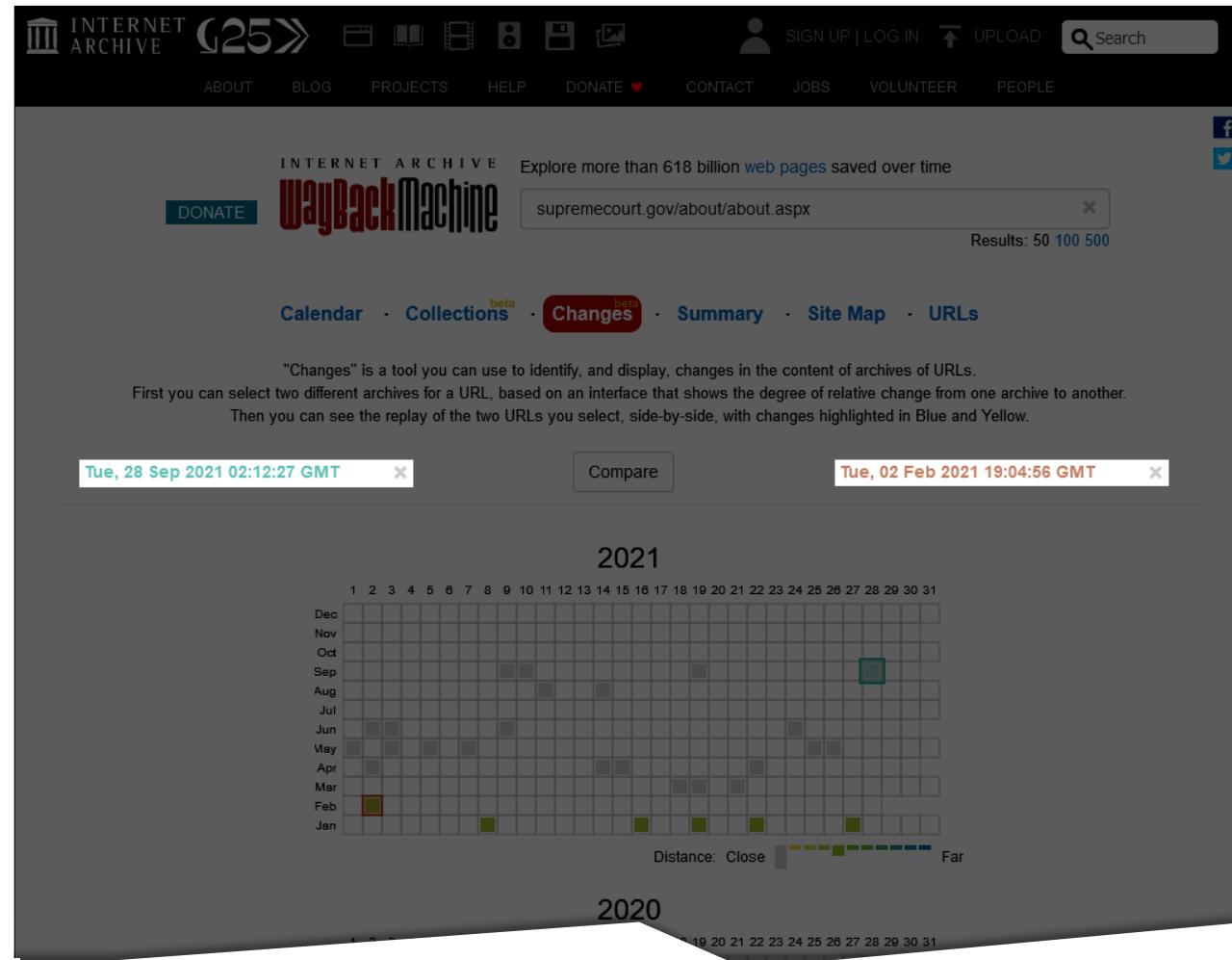
Changes tool: choose 28 September 2021 capture



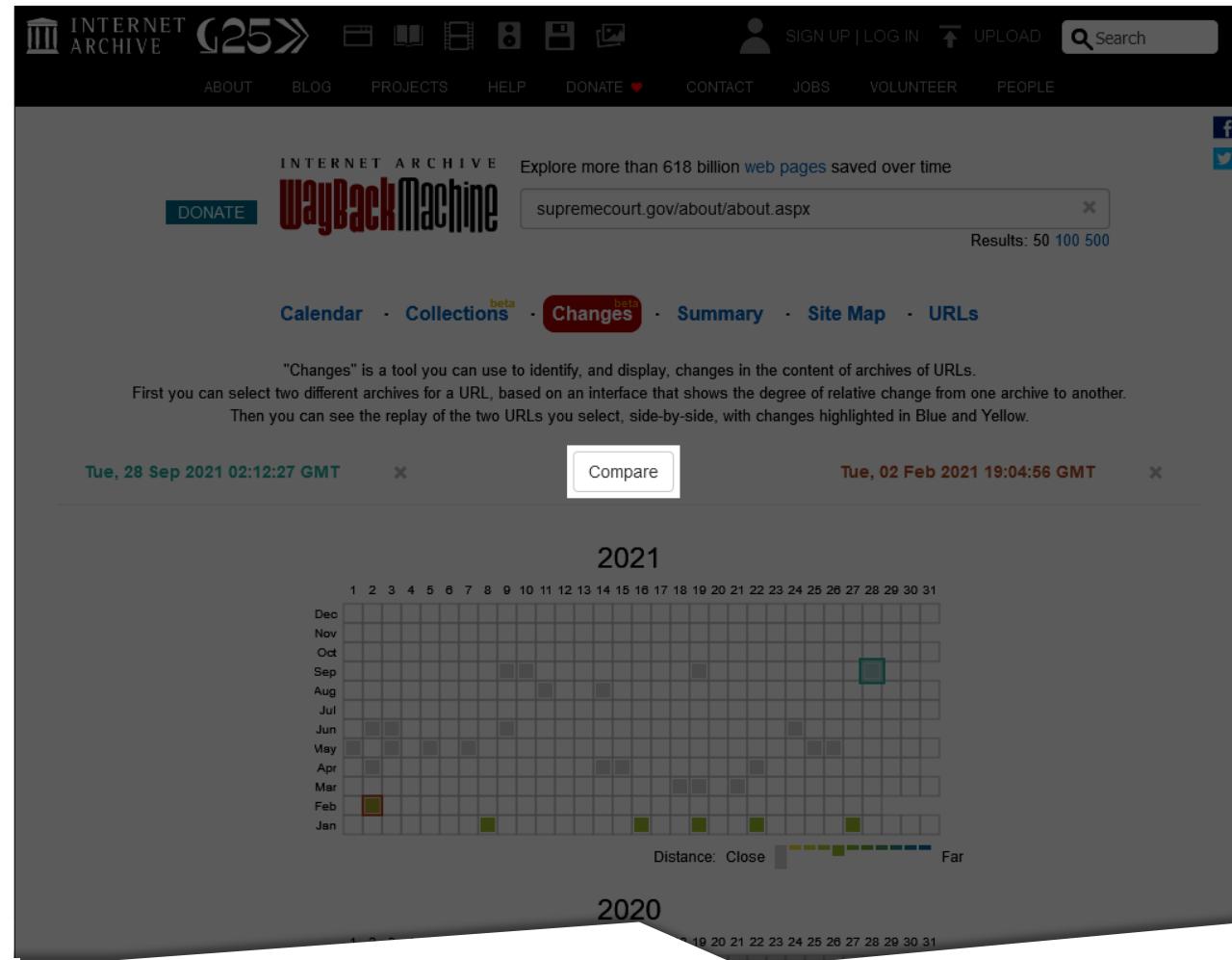
Changes tool: compare w/ 2 February 2021 capture



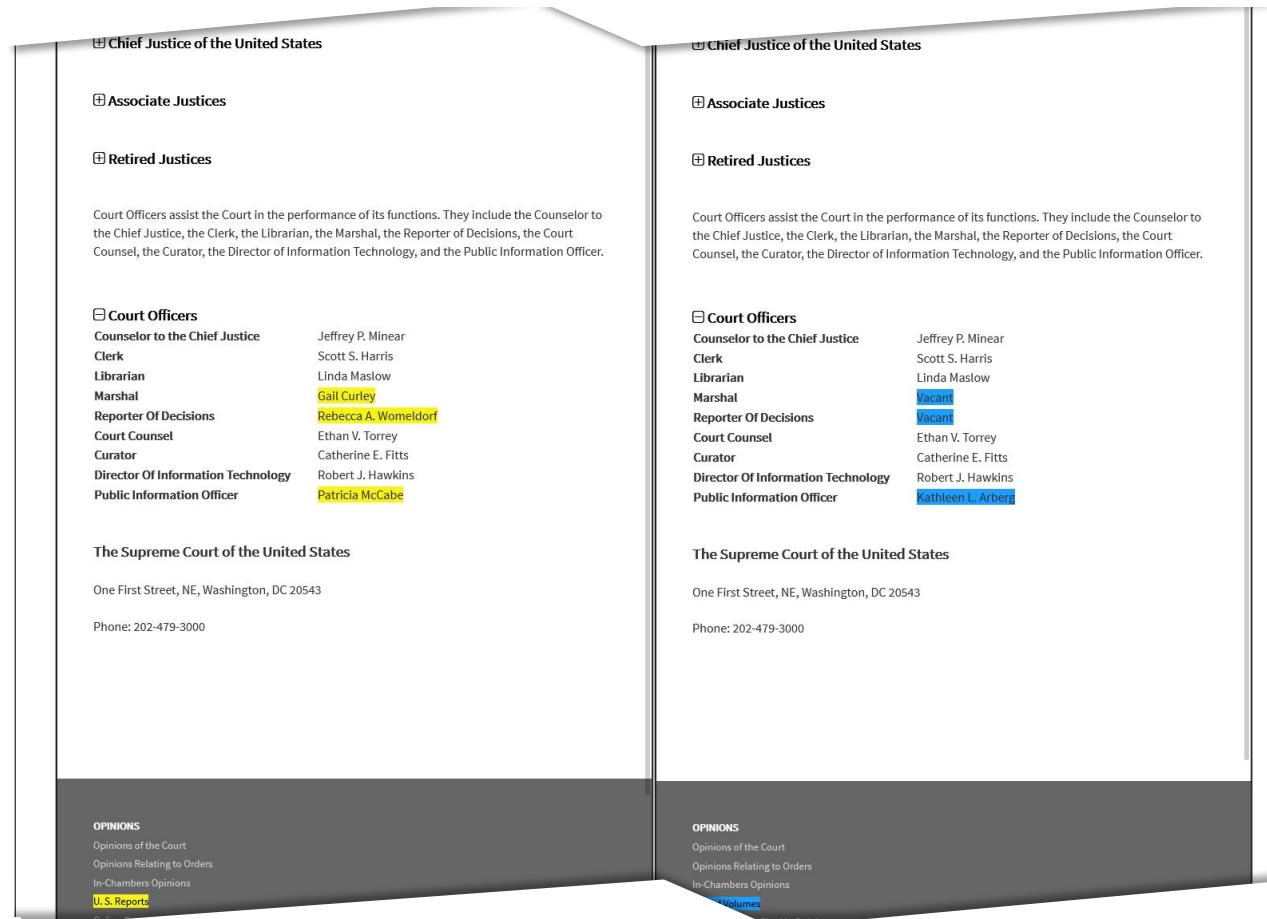
Changes tool: two captures selected



Changes tool: click Compare



Changes tool: compare 28 Sep. 2021 + 2 Feb. 2021 captures



Chief Justice of the United States

Associate Justices

Retired Justices

Court Officers assist the Court in the performance of its functions. They include the Counselor to the Chief Justice, the Clerk, the Librarian, the Marshal, the Reporter of Decisions, the Court Counsel, the Curator, the Director of Information Technology, and the Public Information Officer.

Court Officers

Counselor to the Chief Justice	Jeffrey P. Minear
Clerk	Scott S. Harris
Librarian	Linda Maslow
Marshal	Gail Curley
Reporter Of Decisions	Rebecca A. Womeldorf
Court Counsel	Ethan V. Torrey
Curator	Catherine E. Fitts
Director Of Information Technology	Robert J. Hawkins
Public Information Officer	Patricia McCabe

The Supreme Court of the United States

One First Street, NE, Washington, DC 20543

Phone: 202-479-3000

OPINIONS

Opinions of the Court
Opinions Relating to Orders
In-Chambers Opinions
U.S. Reports

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Director Of Information Technology	Robert J. Hawkins
Public Information Officer	Kathleen L. Arberg

The Supreme Court of the United States

One First Street, NE, Washington, DC 20543

Phone: 202-479-3000

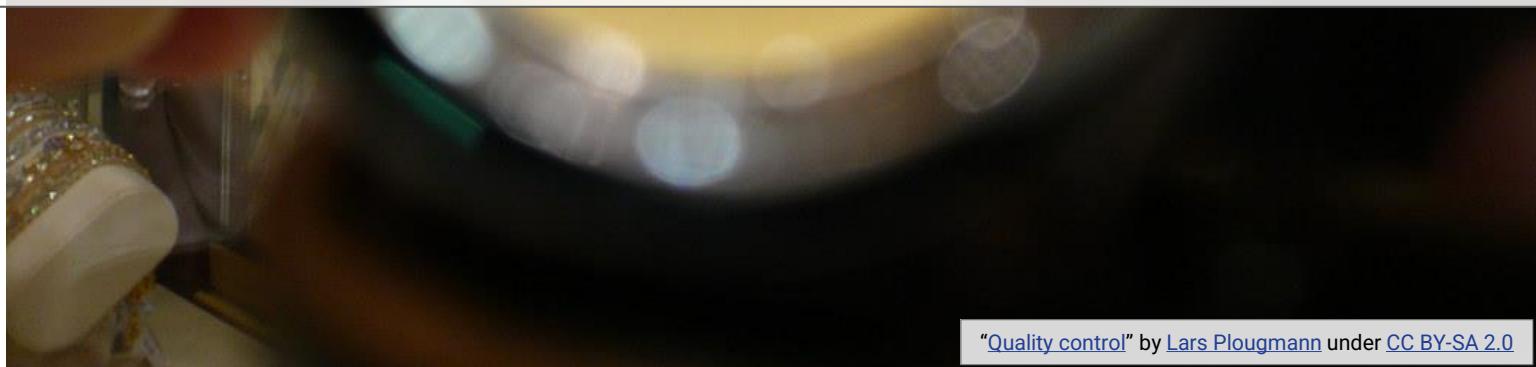
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Volumes





Authentication + Admissibility



"Quality control" by Lars Plougmann under CC BY-SA 2.0



authentication + admissibility overview

- IAWM cited in 300+ U.S. federal court cases
- harder to authenticate than other web content
- strategies include:
 - judicial notice
 - IA affidavit
 - witness w/ personal knowledge
 - expert witness
 - mutual stipulation



"Dollar" by Images Money under CC BY 2.0

judicial notice (FRE 201)

Wikipedia

*"Judicial notice is a rule in the law of evidence that allows a fact to be introduced into evidence if the truth of that fact is so notorious or well known, or so authoritatively attested, that it **cannot reasonably be doubted**... Facts and materials admitted under judicial notice are accepted without being formally introduced by a witness or other rule of evidence"*

[Wikipedia: "Judicial notice"](#)

FRE 201

Judicial Notice of Adjudicative Facts

- b. Kinds of Facts That May Be Judically Noticed. The court may judicially notice a fact that is not subject to reasonable dispute because it:
 - 2. can be accurately and readily determined from sources whose accuracy cannot reasonably be questioned.

[Legal Information Institute: "Rule 201. Judicial Notice of Adjudicative Facts | Federal Rules of Evidence"](#)

authentication via judicial notice

- efficient but inconsistent + jurisdiction-sensitive
- vital to research a given court's disposition towards IAWM evidence
- judges may themselves introduce IAWM evidence
- more likely to prevail in absence of specific assertions of unreliability



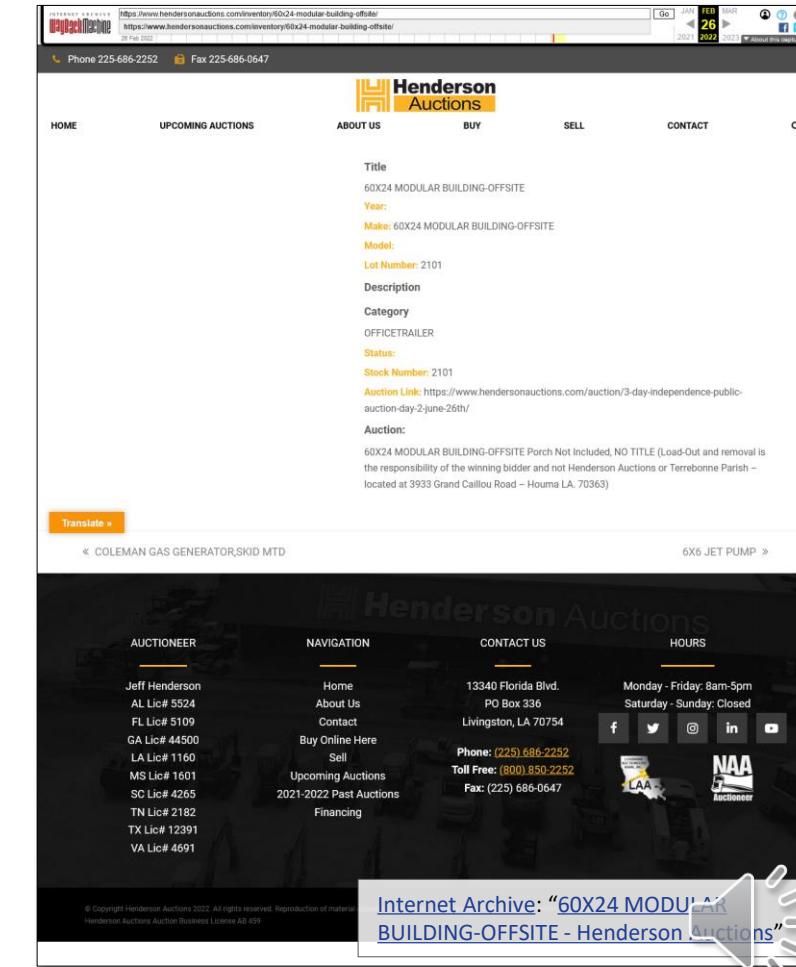
"Earthrise" by Bill Anders under Public Domain

Weinhoffer v. Davie Shoring, Inc. (2022)

- IAWM used to show online auction terms of sale
- district court's admission of IAWM evidence via judicial notice reversed

"Here, there was no testimony to authenticate the archived webpage. Our sister circuits' decisions that the Wayback Machine is not self-authenticating are persuasive in the context of judicial notice. In sum, the district court erred in taking judicial notice of the terms because a private internet archive falls short of being a source whose accuracy cannot reasonably be questioned as required by Rule 201."

[Weinhoffer v. Davie Shoring, Inc., No. 20-30568, at *7 \(5th Cir. Jan. 20, 2022\)](#)



authentication via IA affidavit

- reliable + efficient
- incorrect application explains most of its authentication failures
- works best for simple cases
- but less ideal when conclusions require interpretation



"Paperwork" by Damian Gadal under CC BY 2.0



IA affidavit guidance

Do I really need an affidavit from the Internet Archive?

No. Please consider alternatives to an affidavit from the Internet Archive. Judicial notice and stipulation to a document's authenticity are two typical and straightforward options that might be used instead of an affidavit. Since our resources are limited, we urge you to pursue these alternatives before coming to us with authentication requests.

Does the Internet Archive's affidavit mean that the printout was actually the page posted on the Web at the recorded time?

The Internet Archive's affidavit only affirms that the printed document is a true and correct copy of our records. It remains your burden to convince the finder of fact what pages were up when.

[Internet Archive: "Legal FAQ"](#)

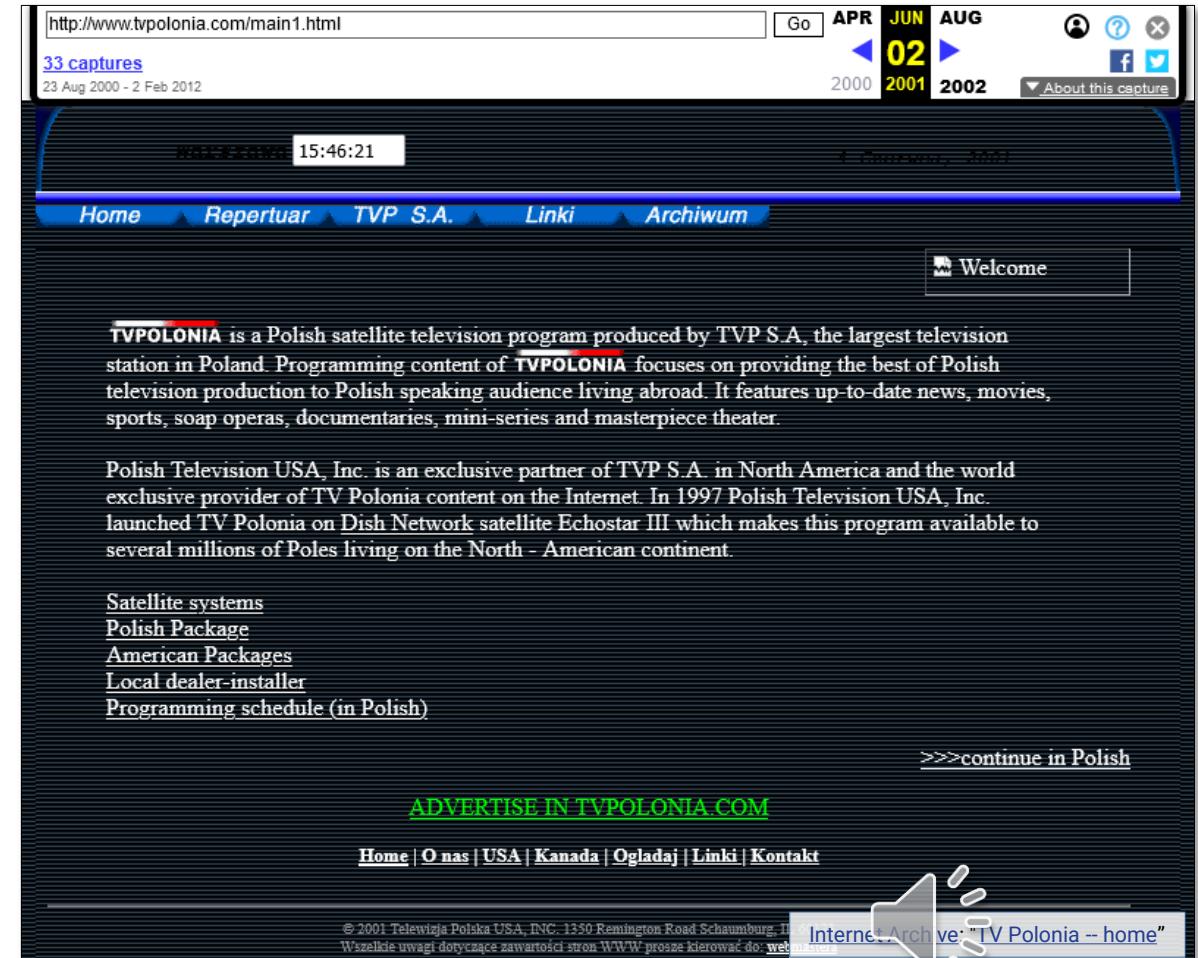


Telewizja Polska USA, Inc. v. Echostar Satellite Corp. (2004)

- IAWM used to show advertisement of partner business service after contract expiration
- IAWM evidence admitted

“...Plaintiff has presented no evidence that the Internet Archive is unreliable or biased. And Plaintiff has neither denied that the exhibit represents the contents of its website on the dates in question, nor come forward with its own evidence challenging the veracity of the exhibit. Under these circumstances, the Court is of the opinion that [the IA affidavit] is sufficient to satisfy Rule 901's threshold requirement for admissibility. Plaintiff is free to raise its concerns regarding reliability with the jury.”

[Telewizja Polska USA, Inc. v. Echostar Satellite Corp., 02 C 3293, at *14 \(N.D. Ill., Jun. 3 2004\)](#)



witness w/ personal knowledge – FRE 901(b)(1)

Authenticating or Identifying Evidence

- b) Examples. The following are examples only – not a complete list – of evidence that satisfies the requirement:
 - 1) Testimony of a Witness with Knowledge. Testimony that an item is what it is claimed to be.



authentication via witness w/ personal knowledge

- more effective when leveraging witness w/ personal knowledge of historical web content
- less effective when instrumentally entering into record a comparison performed by a random person



"One year + of journals" by Pain Chaud under CC BY-ND 2.0

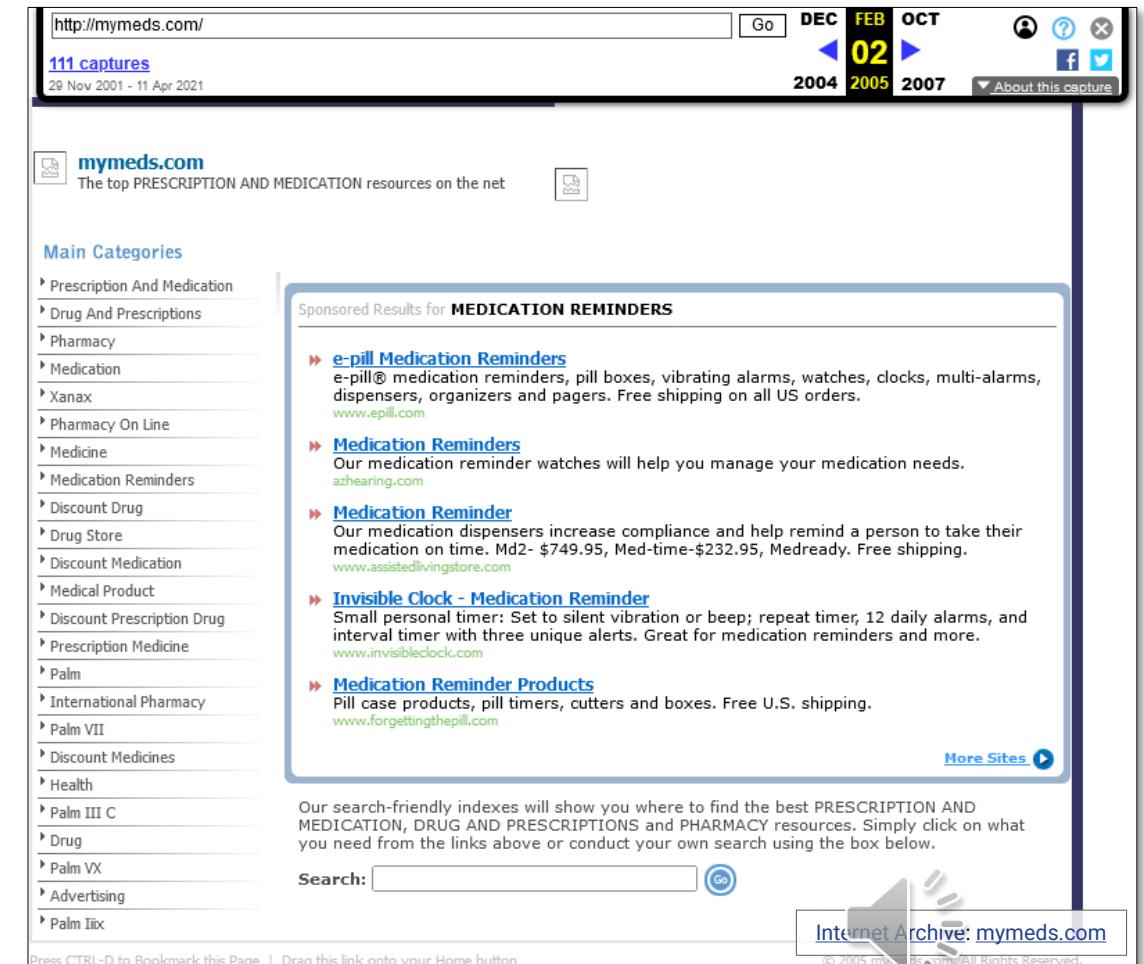


United States v. Bansal (2011)

- IAWM used to show operation of an online pharmacy
- IAWM evidence admitted

*"To authenticate that the screen-shot was what it purported to be, the government called a witness to testify about how the Wayback Machine website works and how reliable its contents are. **The witness also compared the screenshots with previously authenticated and admitted images from Bansal's website and concluded, based upon her personal knowledge, that the screenshots were authentic.** This was evidence 'sufficient to support a finding' that the screenshots were 'what they purport[ed] to be,' rendering them admissible under Rule 901(b)(1). Accordingly, we will affirm the District Court."*

[United States v. Bansal, 663 F.3d 634, 652, at *667-668 \(3d Cir.2011\)](#)



expert witnesses – FRE 702

Testimony by Expert Witnesses

- a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- b) the testimony is based on sufficient facts or data;
- c) the testimony is the product of reliable principles and methods; and
- d) the expert has reliably applied the principles and methods to the facts of the case.



authentication via expert witness

- reliable but more involved + less-used mechanism
- use when interpretation, explanation, or qualification needed
- expert witnesses have included:
 - digital forensics specialists
 - patent examiners
 - web archiving professional(s)



"Test tubes and other recipients in chemistry lab" by Old Photo Profile under CC BY 2.0



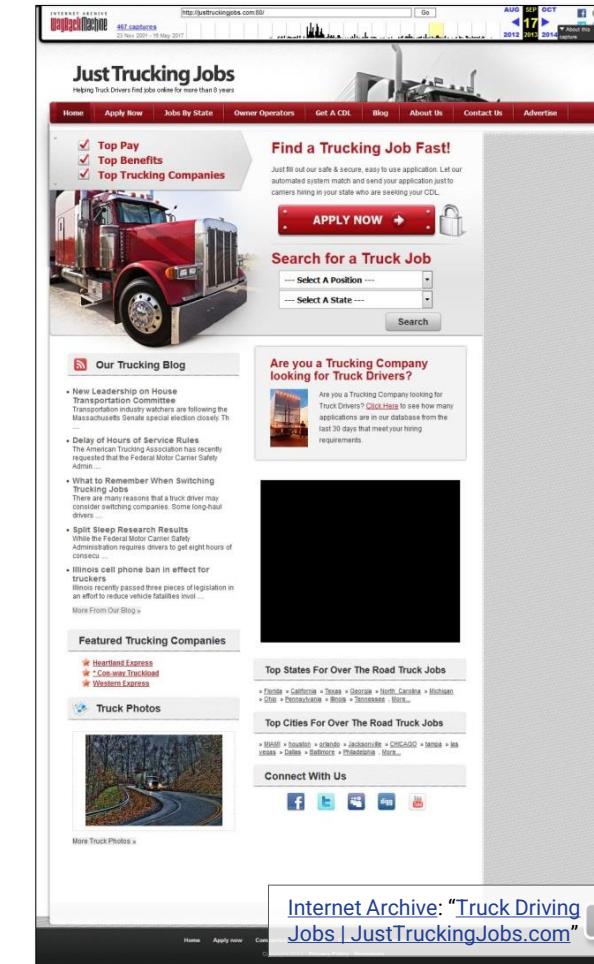
Marten Transport, Ltd. v. PlattForm Advertising, Inc. (2016)

- IAWM used to show ongoing use of mark over period of time
- IAWM evidence admitted

"PlattForm argues that Mr. Fischer, in opining that certain websites referenced Marten in the past as shown by the Wayback Machine, improperly acts as a surrogate for the experts who created the Internet Archive.

The Court rejects this challenge. **PlattForm relies on Khoday v. Symantec Corp.**, 93 F.Supp.3d 1067 (D.Minn.2015), but in that case, the court rejected an argument that the expert was not qualified because he had not worked at the Internet Archive to design the Wayback Machine archives or the web crawler that it used...PlattForm notes that the expert in Khoday at least had experience creating web archives, but **the court in that case did not suggest that such archiving experience was required**...In this case, Mr. Fischer has experience using tools to recover electronic data, **including the use of the Wayback Machine**, and the Court finds such experience to be sufficient to withstand a Daubert challenge."

Marten Transp., Ltd. v PlattForm Advertising, Inc.
184 F. Supp. 3d 1006, at *1009 (D. Kan. 2016)



Frye + Daubert standards

Frye standard

- established in *Frye v. United States, 293 F. 1013 (D.C. Cir. 1923)*
- “*...the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.*”

[Legal Information Institute: "Frye Standard"](#)

Daubert standard

- established in *Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993)*
- “*...the trial judge...must make a preliminary assessment of whether the testimony's underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue.*”

[Legal Information Institute: "Daubert Standard"](#)

admissibility trends summary – U.S. federal courts

	judicial notice		IA standard affidavit		witness w/ personal knowledge		expert witness	
admitted?	yes	no	yes	no	yes	no	yes	no
U.S. district court	51	13	15	3	6	4	7	0
U.S. circuit court	1	2	2	0	3	1	2	0

- based on analysis of ~300 U.S. federal court cases mentioning IAWM
- affidavit + expert witness succeed most consistently
- examples of all strategies succeeding at circuit court level, but recent ruling will likely make judicial notice less successful going forward





Temporal (In)coherence

"clock composition" by Lisa Ann Yount under CC0 1.0



temporal (in)coherence

INTERNET ARCHIVE
Wayback Machine

http://www.wunderground.com/cgi-bin/findweather/getForecast?query=50593 Go AUG DEC MAR 09 2003 2004 2006 About this capture

27 Oct 2002 - 10 Jun 2017

Find the Weather for any City, State or ZIP Code, or Airport Code or Country

wunderground.com PDA/Mobile

Member Benefits:
No Ads
Weather Email
\$5 a year
[Signup Here](#)

Email
taylor@gmail.com
Password

[Login](#)

[Print This Page](#)

Maps
Temperature
Heat Index
Windchill
Humidity
Radar
Dew Point
Wind
Visibility
Visible Satellite
Satellite
Fronts
Snow Depth
Jet Stream
Flight Rules
Health Maps
UV Forecast
Air Quality
Peak Air Quality
Index
International
United States
Canada
Mexico
Central America
South America
Northern Asia

Features: Wunder Photos NEXRAD radar Regional Radar NEW Zoom Satellite Maps Trip Planner
Tropical / Hurricane Marine Severe Astronomy Ski Education Favorites Personal Weather Stations

Varina, Iowa

Local Time: 1:09 PM CST Set My Timezone [Add this page to your Favorites](#) [Weather Email](#)
Lat/Lon: 42.6° N 94.8° W | [MSN Map](#)

Current Conditions
Updated: 12:55 PM CST on December 09, 2004
Observed at Storm Lake, Iowa ([History](#))
Elevation: 1486 ft / 453 m

41 °F / 5 °C
Light Drizzle
Windchill: 37 °F / 3 °C
Humidity: 100%
Dew Point: 41 °F / 5 °C
Wind: 6 mph / 9 km/h from the South
Pressure: 29.56 in / 1001 hPa
Visibility: 5.0 miles / 8.0 kilometers
UV: 1 out of 12
Clouds Overcast 6500 ft (AGL): Overcast 6500 ft / 1981 m
[Show full METARS \(help\)](#)

[Local Radar](#) [Regional Radar](#) [Local Satellite](#) [Ski Conditions](#) [Trip Planner](#) [Personal Weather Stations](#)

5-Day Forecast for ZIP Code 50593

Thu	Fri	Sat	Sun	Mon
43° 29°	36° 22°	47° 34°	41° 15°	31° 15°
Chance of Rain	Mostly Cloudy	Mostly Cloudy	Partly Cloudy	Partly Cloudy
Detail				

Click [Detail](#) for hourly wind, temperature, humidity and UV forecasts.

Alternate Computer Forecast: [AVN MOS Weather Graph](#) | [Local Allergy Info from Pollen.com](#)

Meet Locals
read their Hotel Tips and Travel Guides for [Varina IA](#)

Unbiased reviews and advice for [Varina](#) hotels and other cities

Wunder Photos

Show
•Varina or •Iowa

Now
Dense fog will persist along and west of Highway 169 through the early afternoon. Locations from Algona to Estherville can expect visibilities to remain around a quarter mile or less with localized areas in low lying spots under one eighth of a mile.

Forecast for Pocahontas County
Updated: 11:20 am CST on December 9, 2004
No Active Advisories ([US Severe Weather](#))

This Afternoon
Cloudy with a chance of light rain showers. High in the lower 40s. West wind 10 to 15 mph. Chance of rain 30 percent.
[Detail](#)

Tonight
Light rain likely through the evening. Light snow likely after midnight. Little or no snow around 30. Northwest wind 15 to 20 mph. Chance of rain 30 percent.

Scott G. Ainsworth, et al.: "Only One Out of Five Archived Web Pages Existed as Presented"

Internet Archive: "Weather Underground: Varina, Iowa Forecast"



temporal (in)coherence

The screenshot shows a Wayback Machine capture of the Weather Underground website for Varina, Iowa, dated December 9, 2004. The page displays current conditions (41°F / 5°C, Light Drizzle), a 5-day forecast (Thu: 43° / 29°, Fri: 36° / 22°, Sat: 47° / 34°, Sun: 41° / 15°, Mon: 31° / 15°), and a nowcast (Dense fog will persist along and west of Highway 169 through the early afternoon). The interface includes member benefits like no ads and weather email, and links to radar, satellite, and trip planner services.



temporal (in)coherence

The screenshot shows a Wayback Machine capture of the Weather Underground website for Varina, Iowa, dated December 9, 2004. The page displays current conditions (41°F / 5°C, Light Drizzle), a 5-day forecast (Thu: 43° / 29°, Fri: 36° / 22°, Sat: 47° / 34°, Sun: 41° / 15°, Mon: 31° / 15°), and a nowcast (Dense fog will persist along and west of Highway 169 through the early afternoon). The interface includes member benefits like 'No Ads' and 'Weather Email \$5 a year', and links to radar, satellite, and trip planner features.

Member Benefits:
No Ads
Weather Email
\$5 a year
[Signup Here](#)

Email
taylor@gmail.com

Password

[Login](#)

[Print This Page](#)

Maps
Temperature
Heat Index
Windchill
Humidity
Radar
Dew Point
Wind
Visibility
Visible Satellite
Satellite
Fronts
Snow Depth
Jet Stream
Flight Rules
Health Maps
UV Forecast
Air Quality
Peak Air Quality Index
International
United States
Canada
Mexico
Central America
South America
Northern Asia

Features: Wunder Photos NEXRAD radar Regional Radar NEW Zoom Satellite Maps Trip Planner
Tropical / Hurricane Marine Severe Astronomy Ski Education Favorites Personal Weather Stations

Varina, Iowa
Local Time: 1:09 PM CST Set My Timezone

Updated: 12:55 PM CST on December 09, 2004
Observed at Storm Lake, Iowa ([History](#))
Elevation: 1486 ft / 453 m

Current Conditions
41 °F / 5 °C
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Dew Point: 41 °F / 5 °C
Wind: 6 mph / 9 km/h from the South
Pressure: 29.56 in / 1001 hPa
Visibility: 5.0 miles / 8.0 kilometers
UV: 1 out of 12
Clouds Overcast 6500 ft (AGL): 1981 m
[Show full METARS \(help\)](#)

5-Day Forecast for ZIP Code 50593

Thu	Fri	Sat	Sun	Mon
43° 29°	36° 22°	47° 34°	41° 15°	31° 15°
Chance of Rain	Mostly Cloudy	Mostly Cloudy	Partly Cloudy	Partly Cloudy
Detail				

Click [Detail](#) for hourly wind, temperature, humidity and UV forecasts.
Alternate Computer Forecast: [AVN MOS Weather Graph](#) | [Local Allergy Info from Pollen.com](#)

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in Varina
Best Rates GUARANTEED
Discount Hotels

Wunder Photos

Show
•Varina or •Iowa

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Light rain likely through the evening. Light snow likely after midnight. Little or no snow around 30. Northwest wind 15 to 20 mph. Chance of snow 30 percent.

Scott G. Ainsworth, et al.: "Only One Out of Five Archived Web Pages Existed as Presented"

Internet Archive: "Weather Underground: Varina, Iowa Forecast"



temporal (in)coherence

INTERNET ARCHIVE
Wayback Machine

34 captures
27 Oct 2002 - 10 Jun 2017

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Features Wunder Photos Regional Radar Regional Satellite Map Trip Planner

TIME STAMPS

Add this page to your Favorites Weather Email Lat/Lon: 42.6° N 94.8° W | MSN Forecast

5-Day Forecast for ZIP Code 50593

Thu	Fri	Sat	Sun	Mon
43° 29° Chance of Rain	36° 22° Mostly Cloudy	47° 34° Mostly Cloudy	41° 15° Partly Cloudy	31° 15° Partly Cloudy
Detail	Detail	Detail	Detail	Detail

Windchill: 37°F / 3°C
Humidity: 100%
Dew Point: 41°F / 5°C
Wind: 6 mph / 9 km/h from the South
Pressure: 29.56 in / 1001 hPa
Visibility: 5.0 miles / 8.0 kilometers
UV: 1 out of 12
Clouds: Overcast 6500 ft / 1981 m
[Show full METARS \(help\)](#)

Local Radar Regional Radar Local Satellite Ski Conditions Trip Planner Personal Weather Stations

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in Varina Best Rates GUARANTEED Discount Hotels

Now
Dense fog will persist along and west of Highway 169 through the early afternoon. Locations from Algona to Estherville can expect visibilities to remain around a quarter mile or less with localized areas in low lying spots under one eighth of a mile.

Nowcast as of 11:42 am CST on December 9, 2004

Forecast for Pocahontas County
Updated: 11:20 am CST on December 9, 2004
No Active Advisories ([US Severe Weather](#))

This Afternoon
Cloudy with a chance of light rain showers. High in the lower 40s. West wind 10 to 15 mph. Chance of rain 30 percent.
[Detail](#)

Tonight
Light rain likely through the evening. Light snow likely after midnight. Little or no snow around 30. Northwest wind 15 to 20 mph. Chance of rain 30 percent.
[Detail](#)

STATE FARMS TALK TO STATE FARM INSURANCE AGENTS NEAR YOU

Conditions Nearby

City	Temp	Conditions	Updated
Storm	41°F / 5°C	Light Drizzle	12:55 PM CST
Lake	41°F / 5°C	Drizzle	12:55 PM CST
Fort Dodge	41°F / 5°C	Partly Cloudy	12:55 PM CST
Dodge	41°F / 5°C	Cloudy	12:55 PM CST

Scott G. Ainsworth, et al.: "Only One Out of Five Archived Web Pages Existed as Presented"

Internet Archive: "Weather Underground: Varina, Iowa Forecast"



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http://www.wunderground.com/cgi-bin/findweather/getForecast?query=50593

34 captures
27 Oct 2002 - 10 Jun 2017

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Features Wunder Photos NEXRAD Radar Regional Radar Webcams Maps Trip Planner

TIME STAMPS

http://icons.wunderground.com/data/wximagerew/a/abby/29-banner.jpg +9 years 5 months
http://icons.wunderground.com/data/wximagerew/d/d7dave0/thumb.jpg +9 years 18 days
http://banners.wunderground.com/cgi-bin/statefarmbanner?ip=50593&width=150 +1 year 3 months
http://www.wunderground.com/data/nids/DMX19.thumb.jpg +9 months 7 days
http://icons.wunderground.com/graphics/smash/blue/localRadar.gif -20 days 1 minute
http://icons.wunderground.com/graphics/smash/blue/weatherStation.gif -20 days 52 seconds
http://icons.wunderground.com/graphics/mightyfr/GIE -20 days 48 seconds
http://icons.wunderground.com/graphics/smash/blue/noWarning.gif -20 days 43 seconds
http://icons.wunderground.com/graphics/smash/red/satellite.gif -20 days 38 seconds
http://icons.wunderground.com/graphics/mightyfr/GIF -20 days 37 seconds
http://icons.wunderground.com/graphics/fowlfrt/GIF -20 days 18 seconds
http://icons.wunderground.com/graphics/smash/blue/add3.gif -20 days 16 seconds
http://icons.wunderground.com/graphics/smash/blue/ski.gif -20 days 13 seconds
http://icons.wunderground.com/graphics/smash/blue/envelope2.gif -20 days 11 seconds
http://icons.wunderground.com/graphics/smash/blue/tripPlanner.gif -20 days 4 seconds
http://icons.wunderground.com/graphics/lowright/GIF -20 days 2 seconds
http://icons.wunderground.com/graphics/smash/blue/radar.gif -19 days 23 hours

Add this page to your Favorites Weather Email Lat/Lon: 42.6° N 94.8° W | MSN Weather

5-Day Forecast for ZIP Code 50593

Thu	Fri	Sat	Sun	Mon
43° 29°	36° 22°	47° 34°	41° 15°	31° 15°
chance of Rain	Mostly Cloudy	Mostly Cloudy	Partly Cloudy	Partly Cloudy
Detail				

Click Detail for hourly wind, temperature, humidity and UV forecasts.

Heat Index Windchill Humidity Radar Dew Point Wind Visibility Visible Satellite Satellite Fronts Snow Depth Jet Stream Flight Rules Health Maps UV Forecast Air Quality Peak Air Quality Index International United States Canada Mexico Central America South America Northern Asia

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Now Dense fog will persist along and west of Highway 169 through the early afternoon. Locations from Algona to Estherville can expect visibilities to remain around a quarter mile or less with localized areas in low lying spots under one eighth of a mile.

Forecast for Pocahontas County Updated: 11:20 am CST on December 9, 2004

No Active Advisories (US Severe Weather)

This Afternoon Cloudy with a chance of light rain showers. High in the lower 40s. West wind 10 to 15 mph. Chance of rain 30 percent.

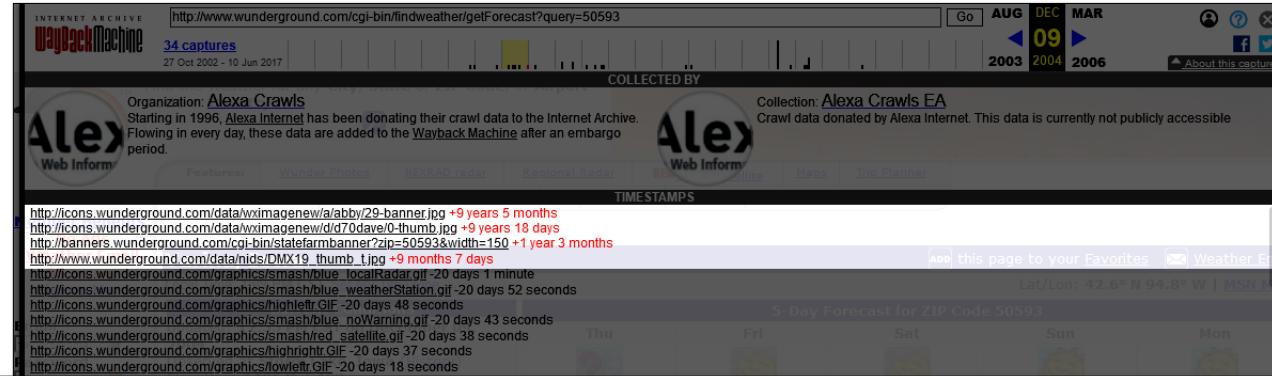
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temporal (in)coherence



[http://icons.wunderground.com/data/wximagenew/a/abby/29-banner.jpg +9 years 5 months](http://icons.wunderground.com/data/wximagenew/a/abby/29-banner.jpg)
[http://icons.wunderground.com/data/wximagenew/d/d70dave/0-thumb.jpg +9 years 18 days](http://icons.wunderground.com/data/wximagenew/d/d70dave/0-thumb.jpg)
[http://banners.wunderground.com/cgi-bin/statefarmbanner?zip=50593&width=150 +1 year 3 months](http://banners.wunderground.com/cgi-bin/statefarmbanner?zip=50593&width=150)
[http://www.wunderground.com/data/nids/DMX19_thumb_t.jpg +9 months 7 days](http://www.wunderground.com/data/nids/DMX19_thumb_t.jpg)

Visibility: 5.0 miles / 8.0 kilometers
UV: 1 out of 12
Clouds: Overcast 6500 ft / 1981 m
Show full METARS (help)

Now Dense fog will persist along and west of Highway 169 through the early afternoon. Locations from Algona to Estherville can expect visibilities to remain around a quarter mile or less with localized areas in low lying spots under one eighth of a mile.

Forecast for Pocahontas County
Updated: 11:20 am CST on December 9, 2004
No Active Advisories (US Severe Weather)

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Detail

Tonight Light rain likely through the evening. Light snow likely after midnight. Little or no snow around 30. Northwest wind 15 to 20 mph. Chance of snow 30 percent.



temporal (in)coherence

The screenshot shows a Wayback Machine capture of the Weather Underground website for Varina, Iowa, dated December 9, 2004. The page displays current conditions (41°F / 5°C, Light Drizzle), a 5-day forecast (Thu: 43° / 29°, Fri: 36° / 22°, Sat: 47° / 34°, Sun: 41° / 15°, Mon: 31° / 15°), and a nowcast (Dense fog will persist along and west of Highway 169 through the early afternoon). The interface includes member benefits like no ads and weather email, and links to radar, satellite, and trip planner services.



temporal (in)coherence

http://www.wunderground.com/cgi-bin/findweather/getForecast?query=50593

34 captures
27 Oct 2002 - 10 Jun 2017

INTERNET ARCHIVE
Wayback Machine

Find the Weather for any City, State or ZIP Code, or Airport Code or Country

Features: Wunder Photos NEXRAD radar Regional Radar NEW Zoom Satellite Maps Tropical / Hurricane Marine Severe Astronomy Ski Education Favorites Personal Weather Stations

Varina, Iowa

Local Time: 1:09 PM CST Set My Timezone

Updated: 12:55 PM CST on December 09, 2004

Observed at Storm Lake, Iowa (History)

Elevation: 1486 ft / 453 m

41 °F / 5 °C
Light Drizzle

Windchill: 37 °F / 3 °C
Humidity: 100%
Dew Point: 41 °F / 5 °C
Wind: 6 mph / 9 km/h from the South
Pressure: 29.56 in / 1001 hPa
Visibility: 5.0 miles / 8.0 kilometers
UV: 1 out of 12
Clouds: Overcast 6500 ft (AGL): 1981 m
Show full METARS (help)

Local Radar Regional Radar Local Satellite Ski Conditions Trip Planner Personal Weather Stations

5-Day Forecast for ZIP Code 50593

Thu	Fri	Sat	Sun	Mon
43° 29° Chance of Rain	36° 22° Mostly Cloudy	47° 34° Mostly Cloudy	41° 15° Partly Cloudy	31° 15° Partly Cloudy
Detail	Detail	Detail	Detail	Detail

Click Detail for hourly wind, temperature, humidity and UV forecasts.

Alternate Computer Forecast: AVN MOS Weather Graph | Local Allergy Info from Pollen.com

Meet Locals
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in Varina
Best Rates GUARANTEED
Discount Hotels

Wunder Photos
Show ·Varina or ·Iowa

Now
Dense fog will persist along and west of Highway 169 through the early afternoon. Locations from Algona to Estherville can expect visibilities to remain around a quarter mile or less with localized areas in low lying spots under one eighth of a mile.

Forecast for Pocahontas County

Updated: 11:20 am CST on December 9, 2004

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[Detail](#)

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Webpage was captured on 9 December 2004 at 1:09p CST.



temporal (in)coherence

http://www.wunderground.com/cgi-bin/findweather/getForecast?query=50593

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27 Oct 2002 - 10 Jun 2017

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Find the Weather for any City, State or ZIP Code, or Airport Code or Country

Features: Wunder Photos NEXRAD radar Regional Radar NEW Zoom Satellite Maps Tropical / Hurricane Marine Severe Astronomy Ski Education Favorites Personal Weather Stations

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Observed at Storm Lake, Iowa (History)

Elevation: 1486 ft / 453 m

41 °F / 5 °C
Light Drizzle

Windchill: 37 °F / 3 °C

Humidity: 100%

Dew Point: 41 °F / 5 °C

Wind: 6 mph / 9 km/h from the South

Pressure: 29.56 in / 1001 hPa

Visibility: 5.0 miles / 8.0 kilometers

UV: 1 out of 12

Clouds: Overcast 6500 ft (AGL): 1981 m

Show full METARS (help)

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in Varina Best Rates GUARANTEED Discount Hotels

Wunder Photos

Now Dense fog will persist along and west of Highway 169 through the early afternoon. Locations from Algona to Estherville can expect visibilities to remain around a quarter mile or less with localized areas in low lying spots under one eighth of a mile.

Forecast for Pocahontas County

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Webpage was captured on 9 December 2004 at 1:09p CST.

Timestamp in text on webpage corroborates time of capture (i.e., 9 December 2004 at 1:09p CST).

Weather Email 48° W | MSN Map

Thu Fri Sat Sun Mon

43° | 29° 36° | 22° 47° | 34° 41° | 15° 31° | 15°

Chance of Rain Mostly Cloudy Mostly Cloudy Partly Cloudy Partly Cloudy

Detail Detail Detail Detail Detail

Click Detail for hourly wind, temperature, humidity and UV forecasts.

Alternate Computer Forecast: AVN MOS Weather Graph | Local Allergy Info from Pollen.com

Conditions Nearby

City	Temp	Conditions	Updated
Storm Lake	41 °F / 5 °C	Light Drizzle	CST
Fort Dodge	41 °F / 5 °C	Partly Cloudy	12:55 PM

Scott G. Ainsworth, et al.: "Only One Out of Five Archived Web Pages Existed as Presented"

Internet Archive: "Weather Underground: Varina, Iowa Forecast"

temporal (in)coherence

Internet Archive Wayback Machine
34 captures
27 Oct 2002 - 10 Jun 2017

<http://www.wunderground.com/cgi-bin/findweather/getForecast?query=50593>

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Maps
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Features: Wunder Photos NEXRAD radar Regional Radar NEW Zoom Satellite Maps Tropical / Hurricane Marine Severe Astronomy Ski Education Favorites Personal Weather Stations

Varina, Iowa

Local Time: 1:09 PM CST Set My Timezone

Updated: 12:55 PM CST on December 09, 2004
Observed at Storm Lake, Iowa (History)
Elevation: 1486 ft / 453 m

41 °F / 5 °C Light Drizzle Windchill: 37 °F / 3 °C Visibility: 100 ft Point: 41 °F / 5 °C Precip: 0.0 in / h from the south Dew: 29.6 in / 100 hPa Wind: 5.0 miles / 8.0 kilometers UV: 1 out of 12 Clouds: Overcast 6500 ft (AGL): Show full METARS (help)

Local Radar Regional Radar Local Satellite Ski Conditions Trip Planner Personal Weather Stations

Talk to State Farm agents near you: STATE FARM INSURANCE

Conditions Nearby

City	Temp	Conditions	Updated
Storm Lake	41 °F / 5 °C	Light Drizzle	CST
Fort Dodge	41 °F / 5 °C	Partly Cloudy	12:55 PM

Webpage was captured on 9 December 2004 at 1:09p CST.

Timestamp in text on webpage corroborates time of capture (i.e., 9 December 2004 at 1:09p CST).

7:30 AM | 37° | 29° 36° | 22° 47° | 34° 41° | 15° 31° | 15°
Chance of Rain Mostly Cloudy Mostly Cloudy Partly Cloudy Partly Cloudy

Detail Detail Detail Detail Detail

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Meet Locals
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Wunder Photos
Show Varina or Iowa

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Forecast for Pocahontas County
Updated: 11:20 am CST on December 9, 2004
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34 captures
27 Oct 2002 - 10 Jun 2017

<http://www.wunderground.com/cgi-bin/findweather/getForecast?query=50593>

Go AUG DEC MAR ▲ 09 ▶ 2004 2006 ▼ About this capture

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\$5 a year
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Temperature

Features: Wunder Photos NEXRAD radar Regional Radar NEW Zoom Satellite Maps Tropical / Hurricane Marine Severe Astronomy Ski Education Favorites Personal Weather Stations

Varina, Iowa

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Current Conditions
Updated: 12:55 PM CST on December 09, 2004
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Local Radar Regional Radar Local Satellite Ski Conditions Trip Planner Personal Weather Stations

Talk to State Farm agents near you: STATE FARM INSURANCE

Conditions Nearby

City	Temp	Conditions	Updated
Storm Lake	41 °F / 5 °C	Light Drizzle	CST
Fort Dodge	41 °F / 5 °C	Partly Cloudy	12:55 PM

Webpage was captured on 9 December 2004 at 1:09p CST.

Timestamp in text on webpage corroborates time of capture (i.e., 9 December 2004 at 1:09p CST).

43° | 29° 36° | 22° 47° | 34° 41° | 15° 31° | 15°
Chance of Rain Mostly Cloudy Mostly Cloudy Partly Cloudy Partly Cloudy

Detail Detail Detail Detail Detail

Click Detail for hourly wind, temperature, humidity and UV forecasts.
Alternate Computer Forecast: AVN MOS Weather Graph | Local Allergy Info from Pollen.com

Radar graphic reflects weather conditions (clear) at the time of its capture: 12 September 2005 at 5:34p CDT.

Varina, IA and advice for Varina hotels and other cities Discount Hotels

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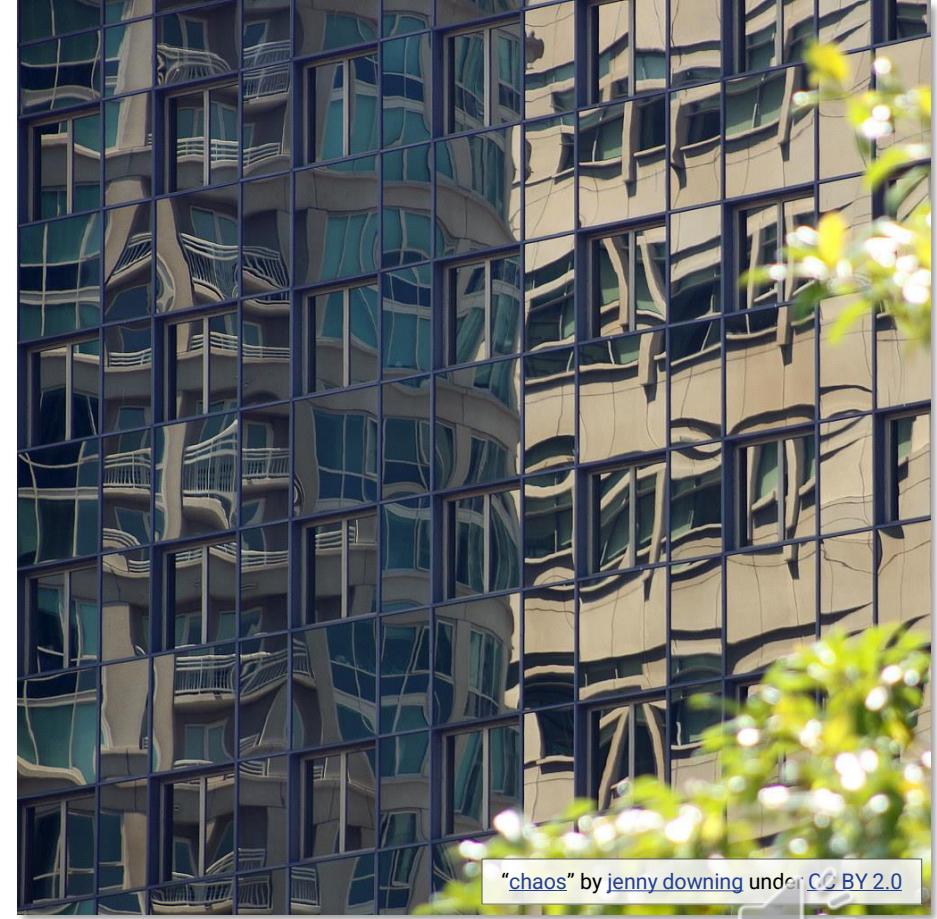
Show ·Varina or ·Iowa

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Internet Archive: "Weather Underground: Varina, Iowa Forecast"

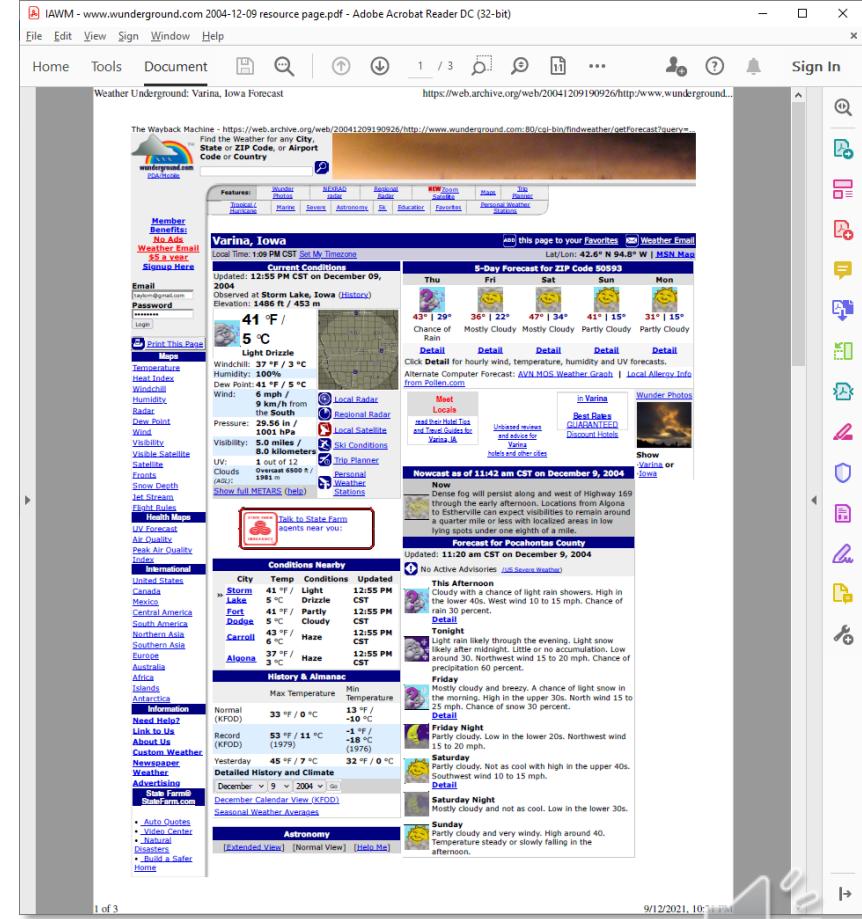
what's going on here?

- archiving of web resources is time-staggered
- IAWM reconstitutes archived webpage w/ most temporally proximate elements
- IAWM may therefore re-present fictitious web pages
- examine capture dates + assess materiality of temporal incoherence



problems w/ PDF

- IAWM evidence submitted as PDF screenshots
- temporal variations no longer apparent
- if temporal coherence is an issue, provide supplementary info



how to have admitted

- IA will still provide an affidavit
- however, this IAWM evidence is more easily contested
- or viewed as less credible by judge
- consider an expert witness



"Door Ajar" by Jenn Turner under CC BY 2.0



Timestamping Content Changes



"Annual_rings" by Lige Eglite under CC BY 2.0



sources of temporal information

conspicuous

- (system-generated) datetime string in webpage text
- IAWM capture timestamp

less obvious

- (system-generated) datetime string in webpage source code
- Google [before: operator](#)
- Twitter [until: operator](#)
- IAWM capture datetime of webpage w/ inlinks
- web server ⇄ client network headers (e.g., X-Archive-Origin, last-modified)
- timestamps in embedded image metadata (e.g., [Exif](#), [XMP](#))



timestamping content changes

when first published

- easier when there are many traces
 - + via diverse services
- more typical to be working w/ fragments
- key limitations on assertions:
 - generally only establish *no later than*
 - don't necessarily establish *the moment when*

when continuously available

- use similar techniques to document availability across successive short intervals
- continuous intermediate availability more reasonable to assume than up-down-up
- can get complicated for content situated deep in a website across redesigns or platform changes
 - content may persist, but specific web address may change





“Editing” IAWM Contents

[“What lies behind the walls - Desert X 2021” by Ted Drake under CC BY-ND 2.0](#)



can IAWM contents be edited?

- not as such; archive is append-only
- missing content may be captured later
- content can be excluded from access
- IA has made no public claims that content is ever deleted
- individual webpages or web resources can be manually archived



"Stone engraving" by Jinx McCombs under CC BY-ND 2.0

exclusion requests + crawler directives

exclusion requests

- domain owner can request exclusion of their content from IAWM
- criteria unclear, but IA exercises discretion
- if granted, IAWM access to content will be disabled + IA archiving will cease

crawler directives

- domain owner can configure a robots.txt file to ward off IA archiving agents
- again, IA exercises discretion
- updates to robots.txt directives can restore access

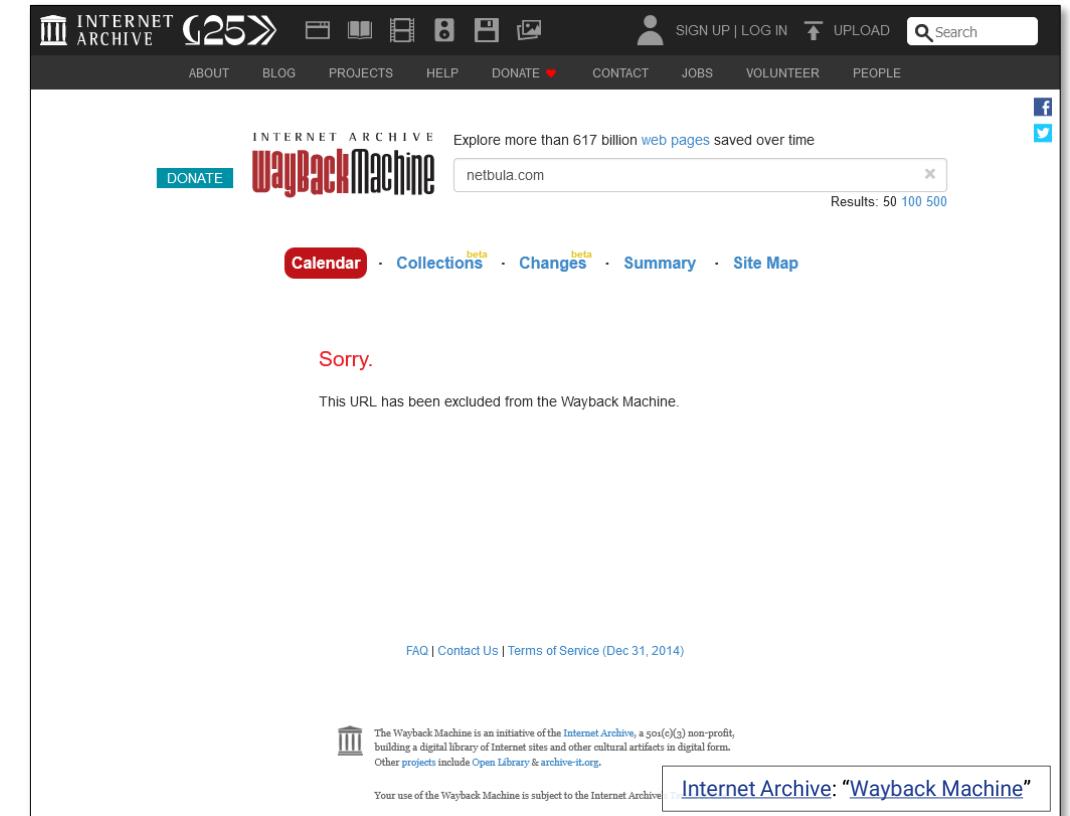


Netbula, LLC v. Chordiant Software, Inc. (2009)

- IAWM (would be) used to show expressed or implied licenses for copyrighted software

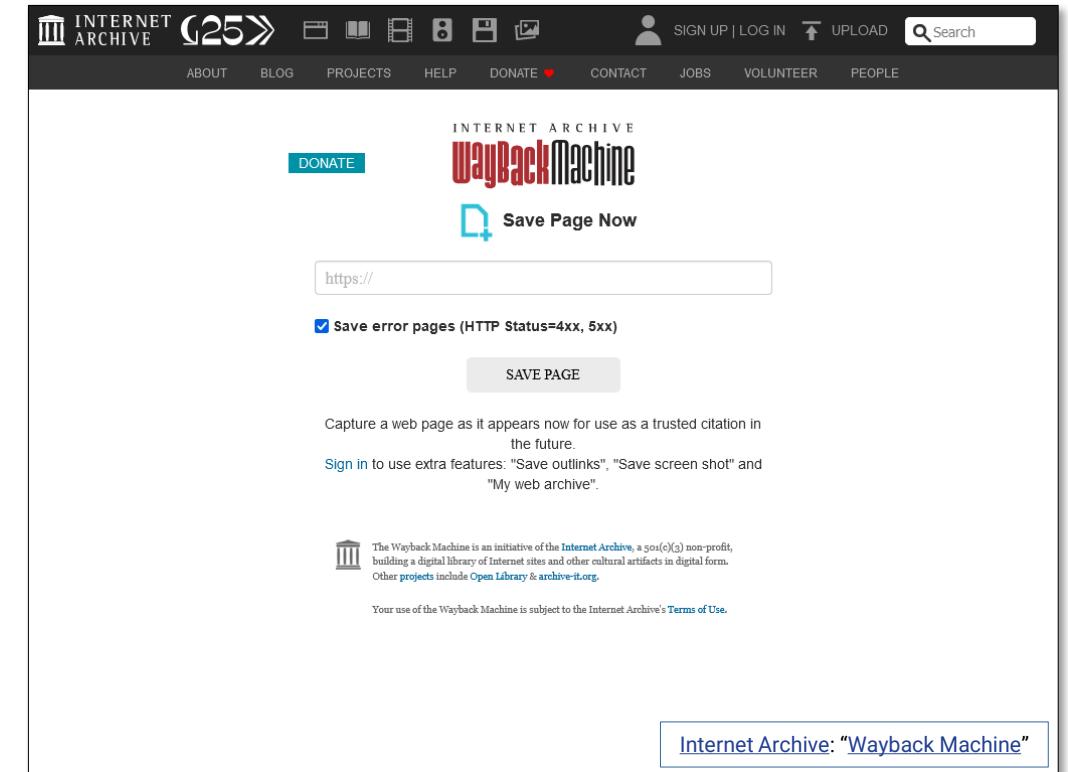
"[P]laintiffs oppose defendants' motion for an order compelling them to temporarily disable the robot.txt file so that access to the archived records may be had...Here, plaintiffs argue that they do not have exclusive contractual or statutory rights to control the Internet Archive's 'archiving activities.'...The issue, however, is not control over 'archiving activities,' but control over access to the archived Netbula web pages. There can be no serious dispute that plaintiffs control that information. Indeed, they have unilaterally blocked access to the same."

[Netbula, LLC v. Chordiant Software, Inc., Case No. 08-cv-00019, 2009 WL 3352588, at *1 \(N.D. Cal. Oct. 15, 2009\)](#)



IAWM Save Page Now feature

- manually archive to IAWM a real-time webpage snapshot
- good habit when relying on live web evidence
- works for error pages (i.e., document absence)
- when signed in, can archive current webpage + 1 hop out





Takeaways

["Party Favors" by Carlos Saldivia under CC BY 2.0](#)



takeaways

- temporal attributes of web content can matter (a lot)
- IAWM is a powerful tool for surfacing historical web info
- don't take archived webpages at face value
- there are multiple ways to timestamp web content
- employ strategies for authentication of IAWM evidence
 - IA affidavit
 - witness
 - judicial notice
- for any strategy, don't neglect to provide foundation for admission





"Thank You" by Brian Crawford under CC BY-SA 2.0





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