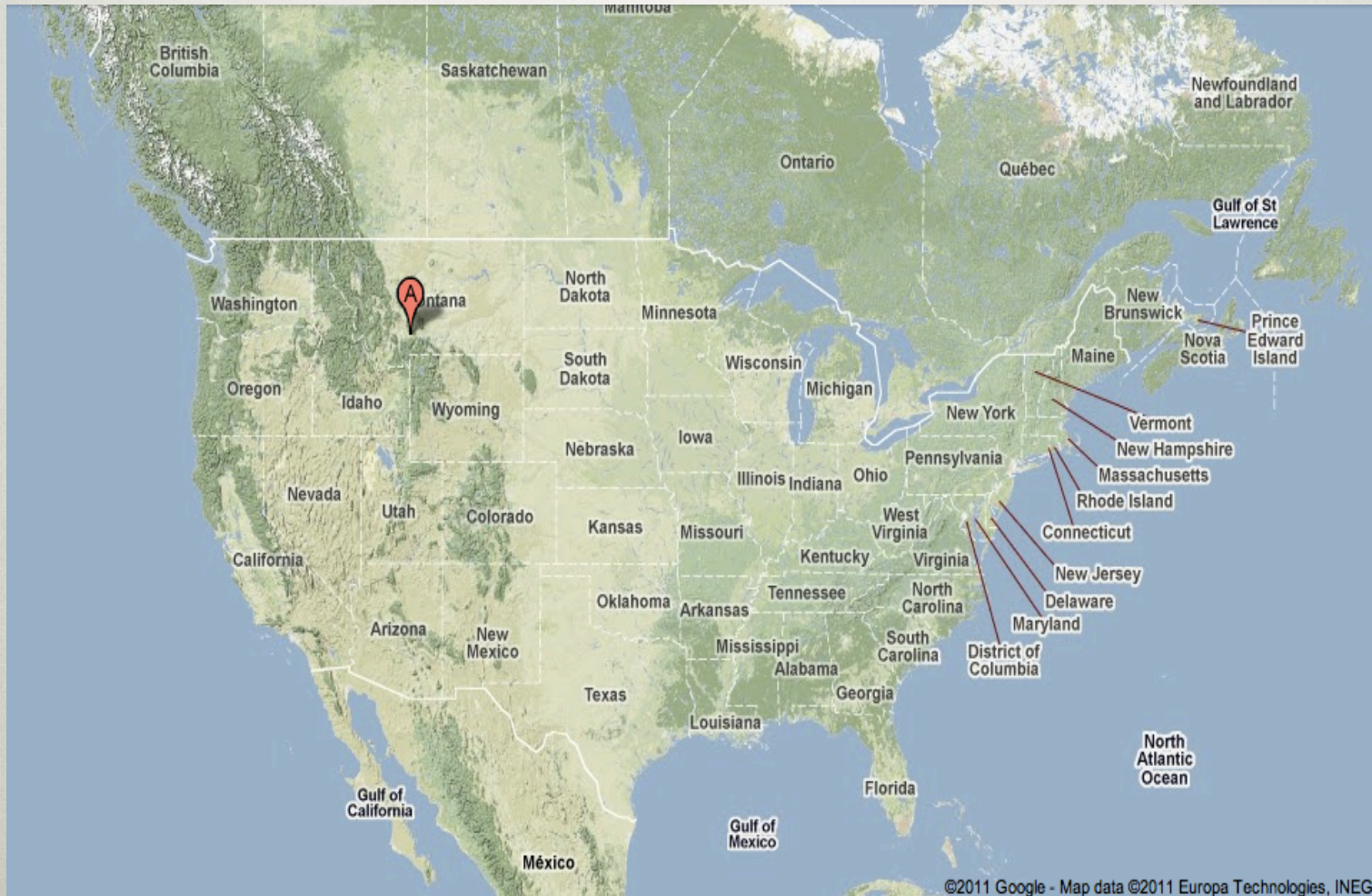


WEB SERVICES BOOTCAMP

COURSE OVERVIEW

- Why Web Services?
- Demos
- Key Terms & Background
- Practice and Exercises
- Code Samples
- Questions

JASON CLARK



www.jasonclark.info

WHAT ABOUT YOU?

- HTML and CSS proficiency?
- Javascript or PHP (server-side) programming proficiency?
- Why interested in web services?

WEB SERVICES

AN INTRO

PINBOARD.IN #TAG

`pinboard.in/u:jasonclark/t:web-services-bootcamp`

WHY SHOULD YOU CARE?

- Web Services are the backbone of mashups
- Web Services enable you to access and recombine data
- Move and share data across systems in real time

WEB SERVICES FOR INTEROPERABILITY

- Lots of different ways in which people can access information
- Different devices
 - Mobile devices, computers, special purpose devices
- Machine access to data

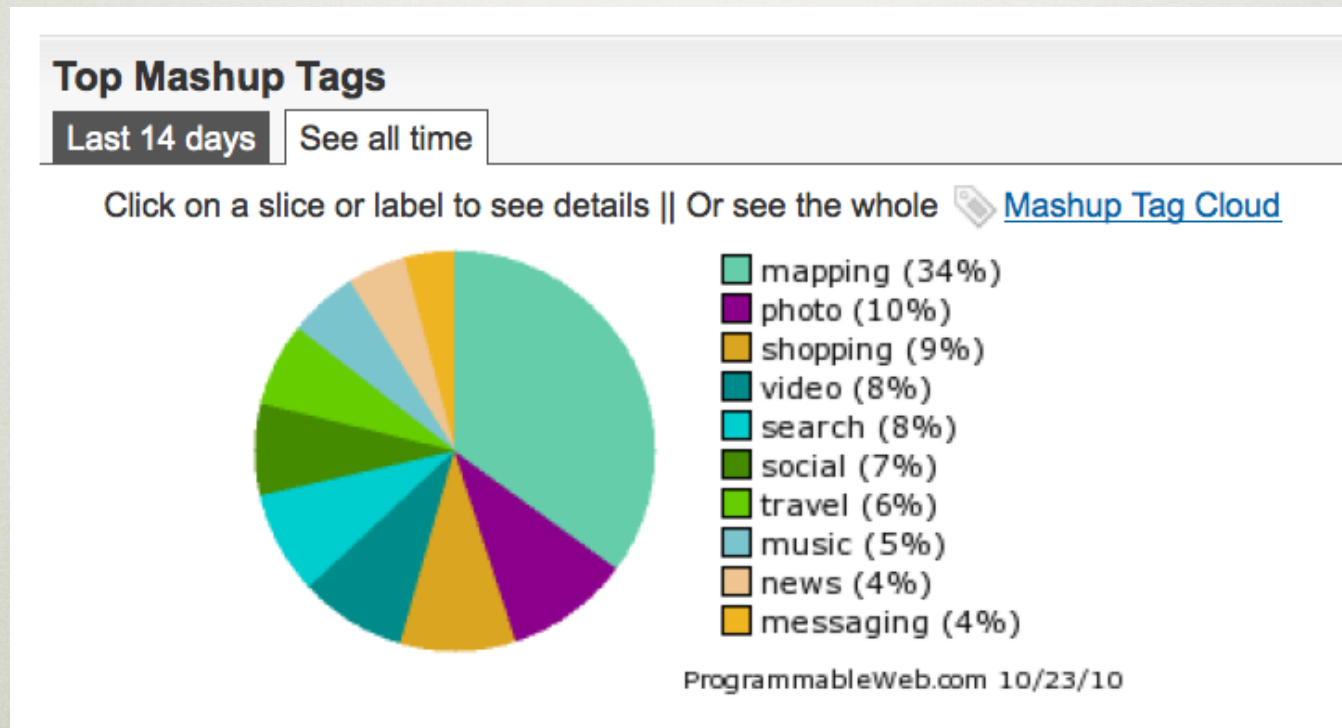
WHAT IS A MASHUP?

- a Web application that uses and/or combines data from multiple sources within a single tool

WHY CREATE A MASHUP

- Want to bring together disparate data sources
- Want to enhance a existing source of data
- Want to improve usability and user interfaces
- Want to make a web page more dynamic and engaging

TOP MASHUP TYPES



- <http://www.programmableweb.com/mashups>

SOME LIBRARY MASHUPS

- [Repository 66](#)
- MSU Theses – Research Locations
- [Texas A&M Geologic Atlas of the US](#)
- VuFind



All Fields [Advanced](#)

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English

 [Cite this](#)  [Text this](#)  [Email this](#) [Save this](#)  [Add to favorites](#)

Voss / Patrick White.



Main Author: [White, Patrick,](#)
Language: English
Published: Harmondsworth : Penguin, 1960, c1957
Tags: No Tags, Be the first to tag this [Add](#)
record!

[Holdings](#) [Description](#) [Comments](#) [Reviews](#) [Staff View](#)

★★★★★ **Into the wilderness**, February 6, 2009

The book opens with the delicacy of a Jane Austen. A young woman, alone in a Sydney drawing-room on a quiet Sunday morning around 1845, reluctantly receives a visitor from abroad. "That strange, foreign men should come on a Sunday when she herself had ventured on a headache was quite exasperating." The headache on which Laura Trevelyan, the heroine, has so deliciously ventured is a cover for her recent loss of faith in conventional Christianity, yet the vast novel that follows will soon plunge into mysticism and madness, a magnificent wrestling match between man and God.

For the foreign visitor is Johann Ulrich Voss, a German explorer who is to lead an expedition to traverse the unexplored Australian interior. Awkward and antisocial, he is nonetheless a secular messiah with an almost divine sense of his own destiny. Funded by Laura's uncle, he gathers together a motley collection of misfits and visionaries: a secret poet, a sensitive ornithologist, a simple-minded boy, a rich dilettante, and a former convict whose practical know-how rivals Voss's own. [White's fondness for visionary loners will get even greater play in his next book, *RIDERS IN THE CHARIOT*.] Accompanied by two aborigines, Voss leads the party into the bush and through the desert, encountering both beauty and hardship, but ultimately tested less by the physical world than by the terrible discovery of their own inner natures.

Similar Items

-  [Voss](#)
By: White, Patrick, 1912-
Published: (1991)
-  [Voss, a novel](#)
By: White, Patrick, 1912-
Published: (1957)
-  [The Twyborn affair](#)
By: White, Patrick, 1912-
Published: (1980)
-  [The eye of the storm](#)
By: White, Patrick, 1912-
Published: (1974)
-  [The cockatoos](#)
By: White, Patrick, 1912-
Published: (1975)

[Back to Search results](#)

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Record 4 of 59

 [Cite this](#)  [Email this](#)  [Add to favourites](#)

Voss / Patrick White

Availability

Bib ID	4315510
Format	Book
Author	White, Patrick, 1912-1990
Publisher	New York, N.Y. : Avon Books, 1975.
Description	445 p. ; 18 cm.
ISBN	0380002515
Notes	"Co-published by Avon Books and the Viking Press"--T.p. verso.

Holdings

Comments

Librarian's View

Details

Collect From

N A 823.3 W587vo
Copy: N pbk

Main Reading Room (Australian Collection)

Get this



Have a question?

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For comments and suggestions on the catalogue site, please [let us know](#).

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-  [Patrick White](#)
-  [Patrick White](#)
-  [The aunt's story / Patrick White](#)
-  [Voss / Patrick White](#)

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 [411 entries, 4 reviews at LibraryThing](#) 

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> You're searching: **Johns Hopkins University**

Item Information

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Electronic full text

Not Available

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from Google Book Search

[Find in other libraries](#)
from OCLC Worldcat.org

[About White, Patrick 1912-1990](#)
from WorldCat Identities

Direct Export to RefWorks

Off-campus users use Group Code: RWJHMI

MARC Display

Search inside this resource

via HathiTrust:

Title: Voss, a novel.
Author: White, Patrick, 1912-1990.
Publisher: New York, Viking Press, 1957.
Description: 442 p. 21 cm.
Control No.: **724872**
AAS0165E1
(MdBJ)57009493
LCCN: 57009493

Copy/Holding information

Collection	Call No.	Copy	Status	 Add Copy to MyList
Eisenhower Stacks	PO9619.3.W5 V6 1957	c. 1	Item being held	

Related Subjects

[White, Patrick 1912-](#)
[Authors, Australian](#)
[Australian literature](#)
[Feature films](#)
[Novelists, Australian](#)
[Smith, Alice R.](#)
[Suburban life](#)

[« Back to Search Results](#)

Patrick White

Patrick Victor Martindale White (1912 – 1990) was an Australian author who was widely regarded as a major English-language novelist of the 20th century. From 1935 until his death, he published 12 novels, two short-story collections and eight plays. His fiction freely employs shifting narrative vantage points and a [stream of consciousness technique](#). In 1973, he was awarded the Nobel Prize in Literature.

Provided by Wikipedia

Showing **1 - 20** of **34** Library items by **Patrick White**:

[Big toys](#)

by [White, Patrick 1912-](#)

Call Number: PR9619.3 W55 B5 (LC)

Located: LSF- click "Place Requests" for delivery to any Yale library

• [Not Checked Out](#)

 **Book**

[The Twyborn affair](#)

by [White, Patrick 1912-](#)

Call Number: PR9619.3 W55 T8

Located: LSF- click "Place Requests" for delivery to any Yale library

• [Not Checked Out](#)

 **Book**

[A fringe of leaves](#)

by [White, Patrick 1912-](#)

Call Number: PR9619.3 W55 F7

Located: LSF- click "Place Requests" for delivery to any Yale library

• [Not Checked Out](#)

 **Book**

MASHUP EXAMPLES

- Wildlifenearyou.com
- HousingMaps.com
- [McMaster University Mashup of Air Photos](#)
- go2collegeMT



Yellowstone Park

General information

✉ [United States](#) 

Animals you might see

American Badger

American Beaver

American Bison

American black bear

Brown Bear

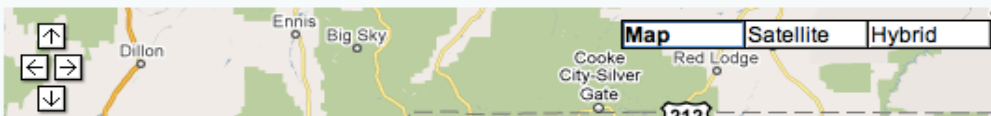
Coyote

⊕ Have you been here?

Tell us which animals you saw.

I saw a

Search



Average rating

Based on ratings of 1 trip by 1 spotter.



⊕ Have you been here? Why not [add your trip?](#)



Have we got our facts right? [Suggest changes](#) to our information

Photos



For Rent For Sale Rooms Sublets

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(this site is in no way affiliated with craigslist or Google)

[About / Feedback](#)

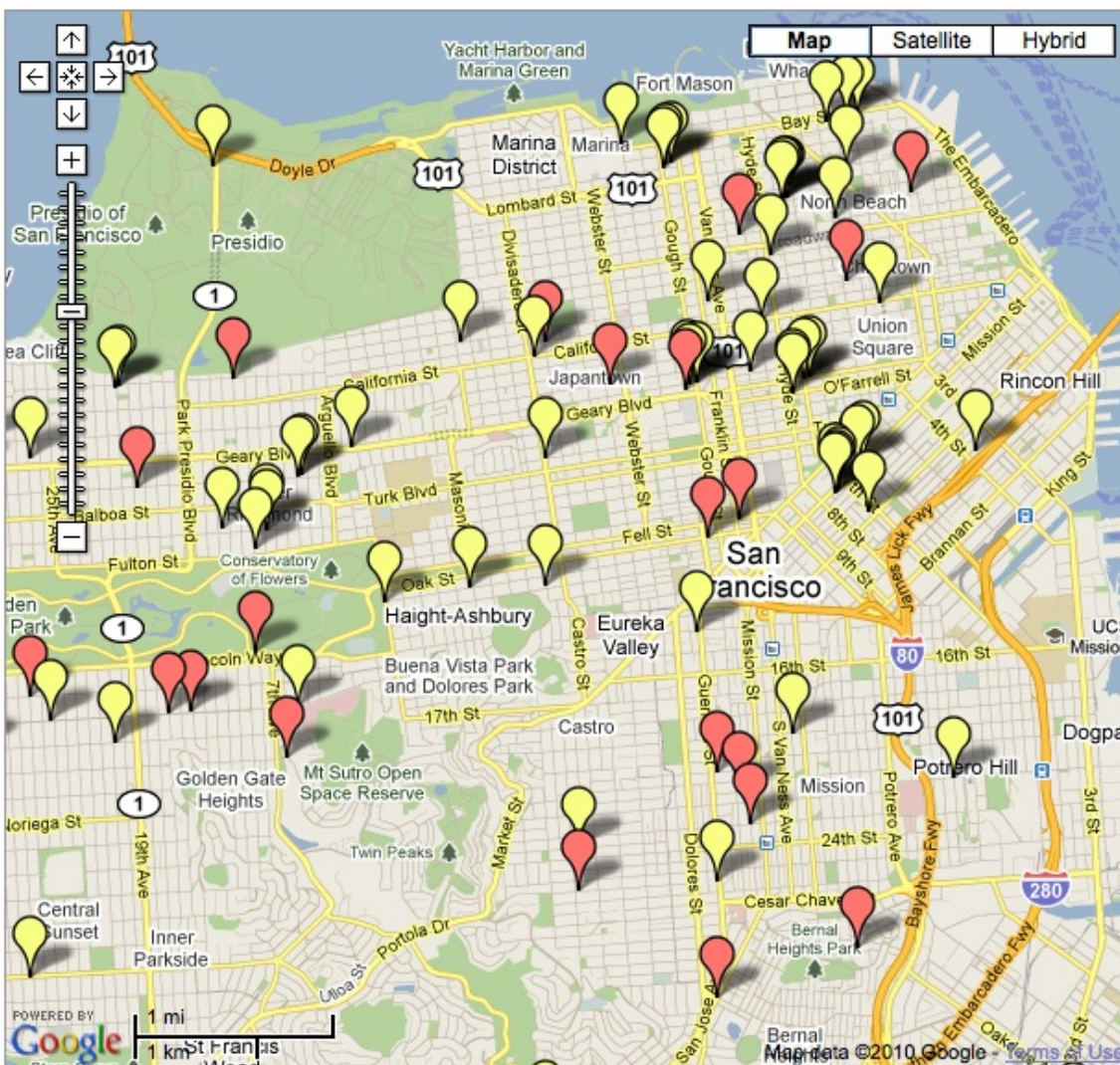
City:

Price:

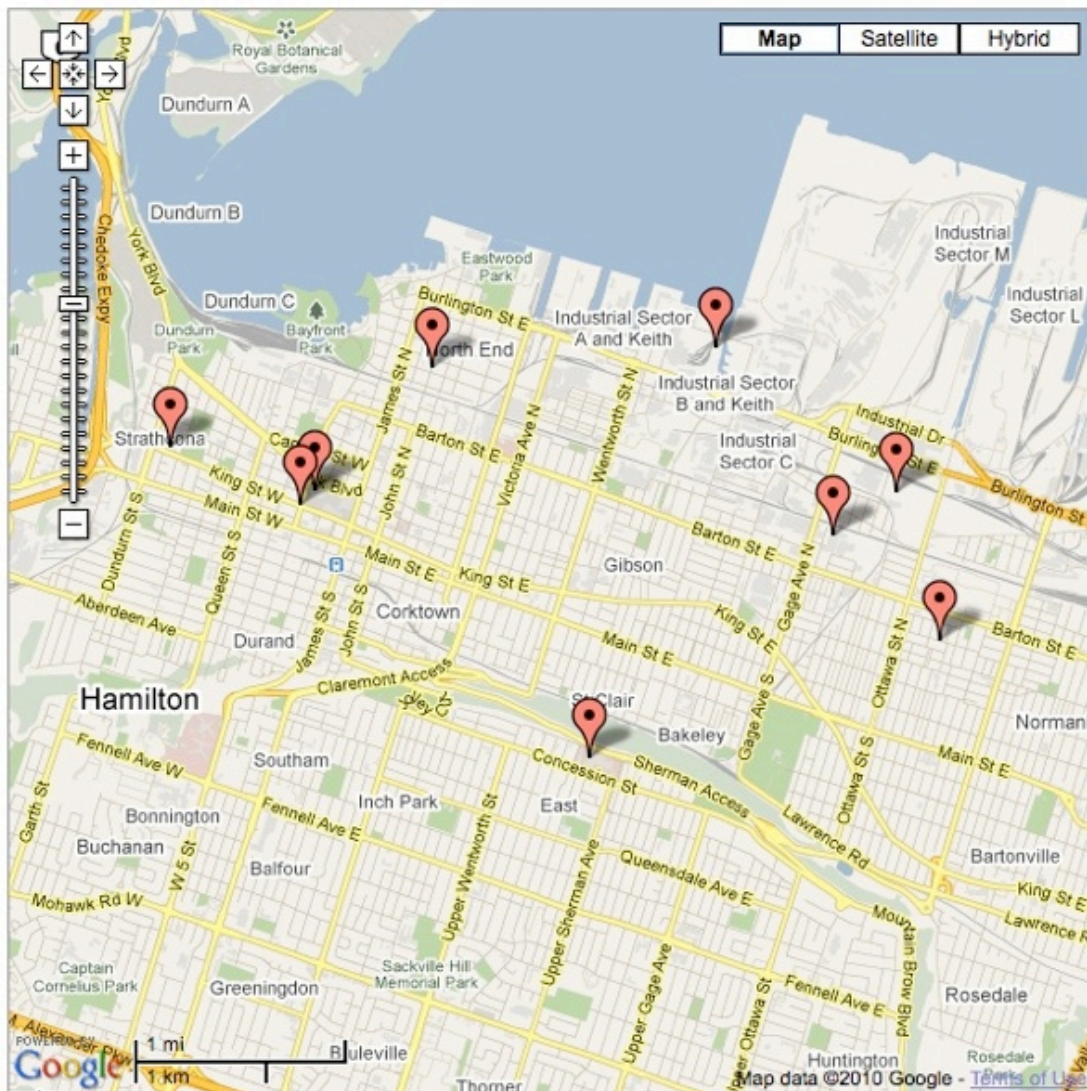
[Show Filters](#) ^{New}

[Refresh](#)

[Link](#)



pics	price	bd	description	date
	\$1600	2bd	2 BR/1 BA Apartment With A In-Law Unit Available For Rent	10/23
	\$1950	1bd	Marina -1 bedroom-showing today 11-12 noon-pets ok!	10/23
	\$1595	1bd	Sunny In-Law Unit	10/23
	\$1600	1bd	Spotless Apt. Good Location, open Sat. & Sun. 1:00-2:30	10/22
	\$1900	2bd	Two Bedrooms & Garage	10/22
	\$1790	2bd	Bungalo Apartment, Quiet, Private	10/22
	\$1750	2bd	Showing Sun 10/24: Charming 2bdm/1bath Unit with Washer!	10/22
	\$1550	1bd	Charming Jr. 1 BR In Great Location (laurel hts / presidio)	10/22
	\$1845	2bd	2 bedrm apt. in nice area (18th ave.)	10/22
	\$1895		massive, Huge Closets, Great Floor Plan! Call Now	10/22
	\$1550	1bd	Spacious 1 BR: Open living room- kitchen: Hardwoods: Walk to Downtown	10/22
	\$1800	2bd	8th/Fulton: next to Gg Park, near Usf: Parking included	10/22
	\$1500	1bd	1 Bedroom 1 Bath	10/22
	\$1800		2 Bed, 2 BA Ingleside near Bart	10/22
	\$1950	2bd	Open Sat 11-1pm. New Remodeled Kitchen,	10/22
	\$1800	2bd	2Bd/1BR, newly renovated	10/22
	\$1700	1bd	Beautiful Total Remodel New Kitchen, bath, hardwood floors, garage,	10/22
	\$1800		ground floor office, warehouse, art studio or ?	10/22
	\$1600	1bd	Large Sunny 11 Win, 3 Clos Cath Hill*Open Sun 3:30-4*	10/22
	\$1750	1bd	Stylish! New! Remodeled! View! *Excellent Location!*Near Bart*	10/22
	\$2000		Studio, Doorman, Garage, Pool, Healthclub, Noh Hill	10/22



Click here to select years

Select any date from the dropdown menu to see an index of McMaster's air photo holdings for that year.

Click on any marker on the map to see information about that photo.

Each marker represents the approximate centre of one air photo. Air photos often overlap, so a site may appear on 2 or 3 adjacent photos.

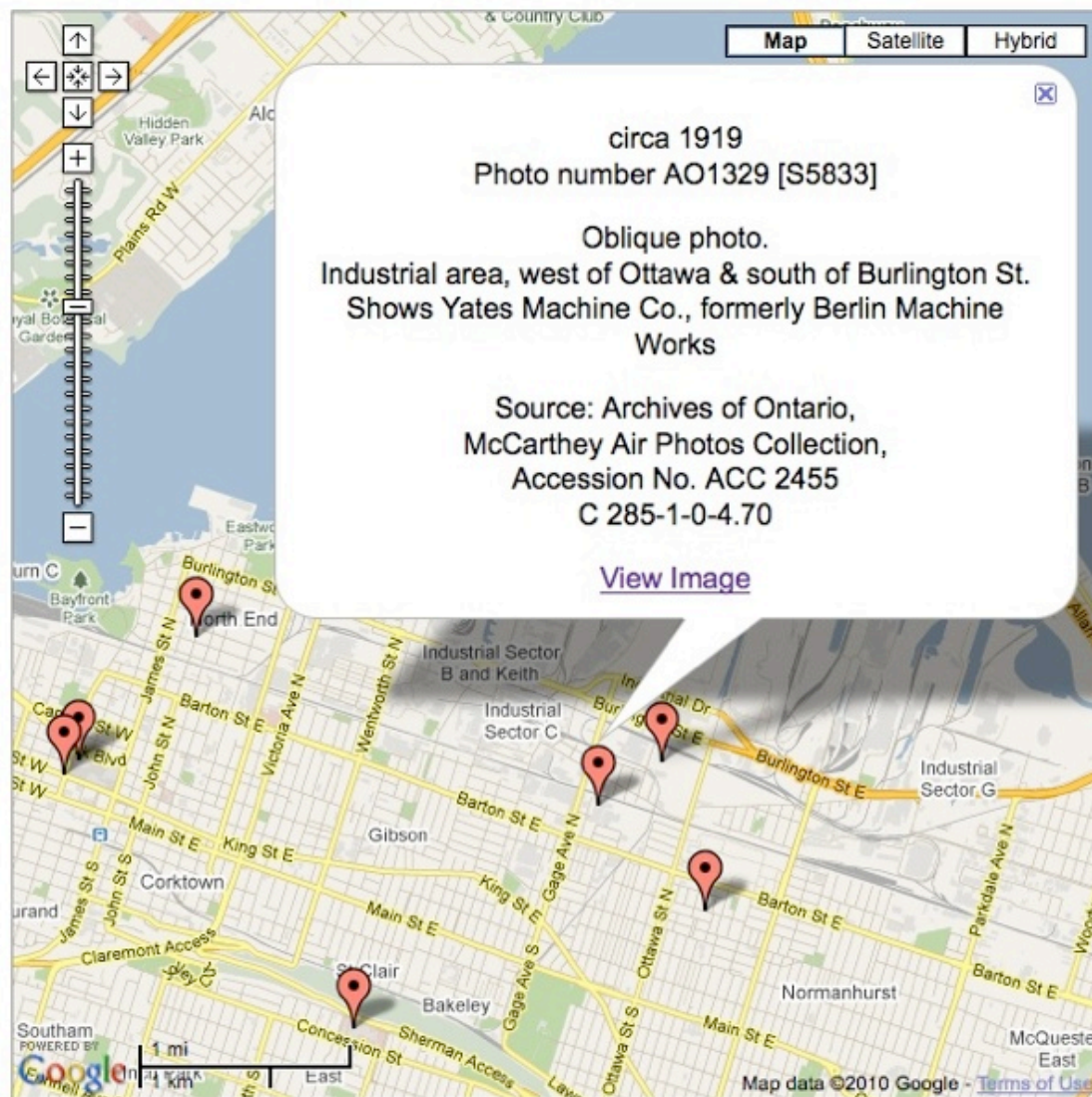
[Click here for information about viewing the airphotos at McMaster University Library.](#)

circa 1919

Taken at an oblique angle

9 black & white air photos,
21x26 cm.

Source: Archives of Ontario,
McCarthy Air Photos Collection,
Accession Number ACC 2455



[Click here to select years](#)

Select any date from the dropdown menu to see an index of McMaster's air photo holdings for that year.

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Each marker represents the approximate centre of one air photo. Air photos often overlap, so a site may appear on 2 or 3 adjacent photos.

[Click here for information about viewing](#) the airphotos at McMaster University Library.

circa 1919

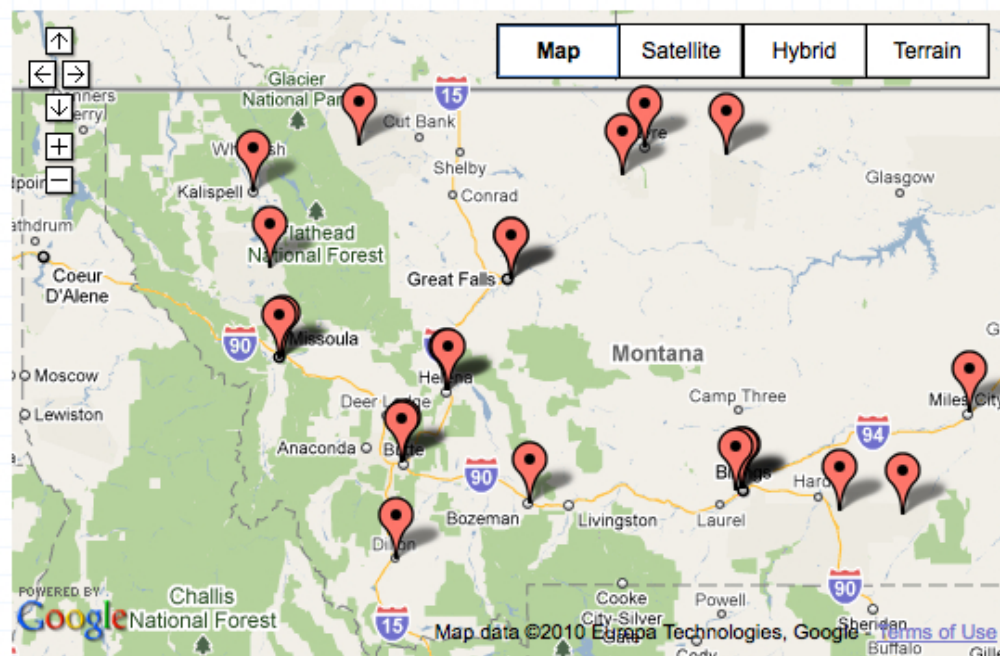
Taken at an oblique angle

9 black & white air photos,
21x26 cm.

Source: Archives of Ontario,
McCarthy Air Photos Collection,
Accession Number ACC 2455

Montana Education Maps

Map for colleges-all



Find a Montana College

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+ more

+ [Tribal Colleges](#) + more

+ [Community Colleges](#) + more

+ [Private Colleges](#) + more

+ [Two Year Colleges](#) + more

Online & Distance Learning Campuses

+ [Distance Learning Programs](#)

+ more

College Fairs

+ [MPSEOC 2010 Tribal College](#)

[Fairs](#) + more

+ [MPSEOC 2009 Fall College Fairs](#)

+ more

HOW DO MASHUPS WORK?

- Retrieve data from another source(s) typically via a web service
- Mix these datasets together and integrate them into your website

BASIC CONCEPTS

- API
- Web Service
- Structured Data

TERMS: API

- An application programming interface (or API) is a way for developers to access parts of a remote web site and integrate it with their own site.

[MSU Libraries "lofiAPI" Example](#)

TERMS: WEB SERVICE

- Provides access to data and/or procedures (API)
- On a remote/external system (usually)
- Use structured data for data exchange (often XML)
- Come in 3 flavors : RPC, SOAP, REST

TERMS: STRUCTURED DATA

- Structured data = XML and JSON
 - Extensible Mark-up Language and Javascript Object Notation
 - Flexible mark-up languages
 - Lightweight and easy to parse
 - Allow communication between disparate systems

PUTTING IT ALL TOGETHER

- Data access = Web Services (REST, SOAP, XML-RPC)
- Data typically formatted in XML or JSON
- Data display = 1 or more scripting languages (javascript, PHP, python, etc)

WHAT IS XML-RPC

- XML Remote Procedure Call
- Provides a means to call methods/ procedures on a remote server and make changes and / or retrieve data
- Most common implementation of XML-RPC used today is that of blog ping services: Technorati, Flickr, FeedBurner, others

WHAT IS SOAP?

- “Simple Object Access Protocol”
- Specification maintained at [w3.org](http://www.w3.org)
- XML based
- There's nothing simple about SOAP!

SOAP EXAMPLE

- EBAY wsdl
<http://api.google.com/GoogleSearch.wsdl>
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="urn:ebay:apis:eBLBaseComponents">
<SOAP-ENV:Header>
...
</SOAP-ENV:Header>
<SOAP-ENV:Body>
<ns1:GetSearchResultsRequest>
<ns1:Version>425</ns1:Version>
<ns1:Query>*</ns1:Query>
<ns1:TotalOnly>true</ns1:TotalOnly>
</ns1:GetSearchResultsRequest>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>

WHAT IS REST?

- The greatest thing since sliced...
- Representational State Transfer
- Unique data resources with addresses

THEORY OF REST

- Focus on diversity of resources (nouns), not actions (verbs)
- Every resource is uniquely addressable
- All resources share the same constrained interface for transfer of state (actions)
- Must be stateless, cacheable, and layered

REST = WEB PROTOCOL

- Web As Prime Example
 - URLs uniquely address resources
 - HTTP methods (GET, POST, HEAD, etc.) and content types provide a constrained interface
 - All transactions are atomic
 - HTTP provides cache control

REST VERBS

- Create, Read, Update Delete
- POST, GET, PUT, DELETE

REST IN PRACTICE

- REST
- Google APIs
 - Google Calendar
 - Google Spreadsheet
- RESTful
- Flickr

REST: FINAL THOUGHTS

- Similarity to web - easy to understand
- URL is the method
- Most popular type of web service

FORMATS FOR DATA FROM WEB SERVICES

- XML
 - Can use a particular standard, such as: MARC XML, Dublin Core, RSS, Atom
 - May be a proprietary format
- JSON (Javascript Object Notation)
 - very popular
 - easy to use with Javascript
 - can be simpler to work with
- HTML

WHAT IS JSON?

- Javascript Object Notation
- Text file used to pass information from one system to another
- Javascript treats it as an object
 - which makes it easily navigated and specific pieces cherry-picked


```
ProcessGBSBookInfo({  "ISBN0765304368":  
  {    "bib_key":"ISBN0765304368",  
    "info_url": "http://books.google.com/books?  
id=gfg13CM\_kU8C&source=gbs\_ViewAPI",  
    "preview_url": "http://books.google.com/books?  
id=gfg13CM\_kU8C&printsec=frontcover&sig=jlrSb\_SkcQRhy\_VvtnKbTXjmvos&source=gbs\_ViewAPI",  
    "t  
humbnail_url": "http://books.google.com/books?  
id=gfg13CM\_kU8C&pg=PP1&img=1&zoom=5&sig=LsTwGVAsy\_qWYMPM6HVDTPAMokg",  
    "preview": "full"  
  }  });
```

CROSS SERVER SCRIPTING ISSUES

- AJAX doesn't allow you to access "scripts" across servers
 - XML, PHP or other scripting languages
- Can access JSON across servers
 - Reason why JSON popular
- Workaround

CROSS SERVER SCRIPTING WORKAROUNDS

- Proxy the script via the webserver
 - Apache mod_proxy
- Use an intermediary to transform content into JSON
 - Use PHP to convert XML to JSON

SOME SKILLS YOU'LL NEED

- XML
- XPath
- Basic understanding of namespaces
- JSON
- Javascript, preferably a library like JQuery
- Some server side scripting language
- PHP, Ruby on Rails, Python, Perl, etc

PRACTICE AND EXERCISES

- XML and JSON Parsing
- Yahoo Pipes
- Code Preview

GETTING STARTED

- Practice & Exercises

www.lib.montana.edu/~jason/files/web-services/

- Handouts & Code

www.lib.montana.edu/~jason/talks/amigos2011-web-services-handout.pdf

SOME TOOLS FOR DEVELOPMENT

- Bitnami
- Text editor or some other IDE (Eclipse)
- oXygen XML Editor
- JSONLint
- Firefox Extensions
 - Firebug, JSONovitch, Web Developer's Toolbar

BITNAMI

BITNAMI

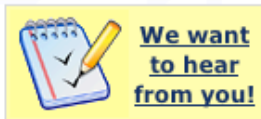
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Business Intelligence



MAMPStack

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Technologies: [Apache](#) [HTTP Server](#) [MySQL](#) [PHP](#)

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BitNami MAMPStack greatly simplifies the development and deployment of PHP applications. It includes ready-to-run versions of Apache, MySQL, PHP and phpMyAdmin and required dependencies. It can be deployed using a [native installer](#). BitNami MAMPStack is distributed for free under the Apache 2.0 license.

PHP is an HTML-embedded scripting language. Much of its syntax is borrowed from C, Java and Perl with a couple of unique PHP-specific features thrown in. The goal of the language is to allow web developers to write dynamically generated pages quickly.

The MySQL software delivers a very fast, multi-threaded, multi-user, and robust SQL (Structured Query Language) database server. MySQL Server is intended for mission-critical, heavy-load production systems as well as for embedding into mass-deployed software. MySQL is a registered trademark of Sun Microsystems, Inc.

The BitNami MAMPStack native installers were packaged using BitRock's [cross platform installer](#) tool.

[Readme](#) [Changelog](#) [Quick Start Guide](#)



JSONLINT

JSONLint

The JSON Validator



A Tool from the Arc90 Lab. [Follow us on Twitter.](#)

Props to [Douglas Crockford](#) of [JSON](#) and [JS Lint](#) and Ben Spencer of [jsonval](#).

```
1 {
2   "version": "1.0",
3   "encoding": "UTF-8",
4   "feed": {
5     "xmlns": "http://www.w3.org/2005/Atom",
6     "xmlns$openSearch": "http://a9.com/-/spec/opensearchrss/1.0/",
7     "xmlns$gsx": "http://schemas.google.com/spreadsheets/2006/extended",
8     "id": {
9       "$t": "https://spreadsheets.google.com/feeds/list/0Aitqc3TBbtGmdHJJZTBXVkk5UzVnaVhIekRJN3E3WEE/od
10     },
11     "updated": {
12       "$t": "2010-10-22T20:19:37.169Z"
13     },
14     "category": [
15       {
16         "scheme": "http://schemas.google.com/spreadsheets/2006",
17         "term": "http://schemas.google.com/spreadsheets/2006#list"
18       }
19     ],
20   },
21 }
```

Validate

JSON Lint is an idea sparked at Arc90 by

[FAQ](#)



An Idea Management & Collaboration Tool

Results

Valid JSON

FIREBUG

What is Firebug?
Introduction and Features

Documentation
FAQ and Wiki

Community
Discussion forums and lists

Get Involved
Hack the code, create
extensions



Firebug

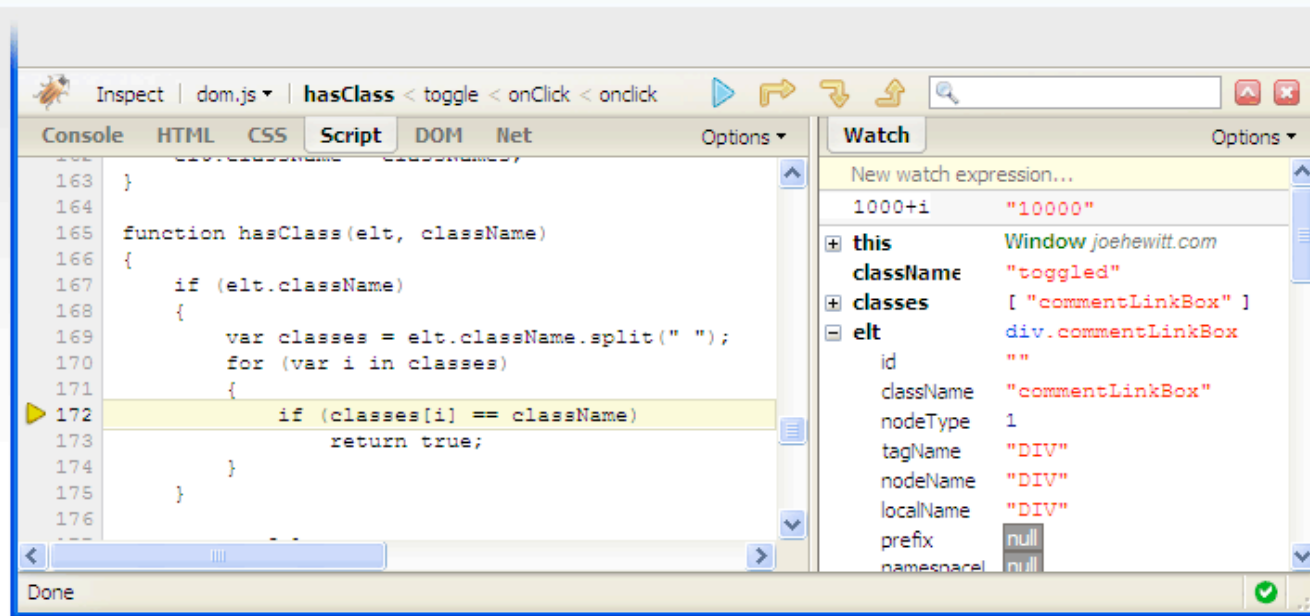
Web Development Evolved.

Install Firebug For Firefox
100% free and open source

[Other Versions](#)

[Firebug Lite](#)

[Extensions](#)



JSONOVITCH

```
1 {
2   "version": "1.0",
3   "encoding": "UTF-8",
4   "feed": {
5     "xmlns": "http://www.w3.org/2005/Atom",
6     "xmlns$openSearch": "http://a9.com/-/spec/opensearchrss/1.0/",
7     "xmlns$gsx": "http://schemas.google.com/spreadsheets/2006/extended",
8     "id": {
9       "$t": "https://spreadsheets.google.com/feeds/list/0Aitqc3TBbtGmdHJJZTBXVkk5UzVnaVhIekRjN3E3WEE/od6/public/values"
10    },
11    "updated": {
12      "$t": "2010-10-22T20:19:37.169Z"
13    },
14    "category": [
15      {
16        "scheme": "http://schemas.google.com/spreadsheets/2006",
17        "term": "http://schemas.google.com/spreadsheets/2006#list"
18      }
19    ],
20    "title": {
21      "type": "text",
22      "$t": "Sheet1"
23    },
24    "link": [
25      {
26        "rel": "alternate",
27        "type": "text/html",
28        "href": "https://spreadsheets.google.com/pub?key=0Aitqc3TBbtGmdHJJZTBXVkk5UzVnaVhIekRjN3E3WEE"
29      },
30      {
31        "rel": "http://schemas.google.com/g/2005#feed",
32        "type": "application/atom+xml",
33        "href": "https://spreadsheets.google.com/feeds/list/0Aitqc3TBbtGmdHJJZTBXVkk5UzVnaVhIekRjN3E3WEE/od6/public/values"
34      },
35      {
36        "rel": "self",
37        "type": "application/atom+xml",
38        "href": "https://spreadsheets.google.com/feeds/list/0Aitqc3TBbtGmdHJJZTBXVkk5UzVnaVhIekRjN3E3WEE/od6/public/values"
39      }
40    ],
41    "author": [
42      {
```

DEMO FILES

- Jason Clark Demos

www.lib.montana.edu/~jason/files.php

CONTACT INFO

- Jason Clark
email - jaclark@montana.edu
twitter - @jaclark