



Ricardo Morin
FOSS4G 2017
@jimmieangel

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Highlighting Oregon's WildLands

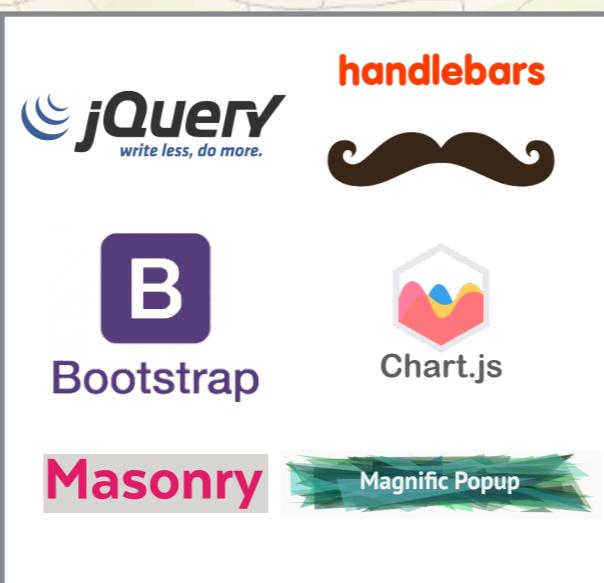
oregonhowl.org

“It was once said that if something is not understood, it is not valued; if it is not valued, it is not loved; if it is not loved, it is not protected, and if it is not protected, it is lost.”

Wilderness Connect
Threats to Wilderness From Lack of Public Awareness

DEMO

HOWL's Free and Open Source foundation...



Single Page Application

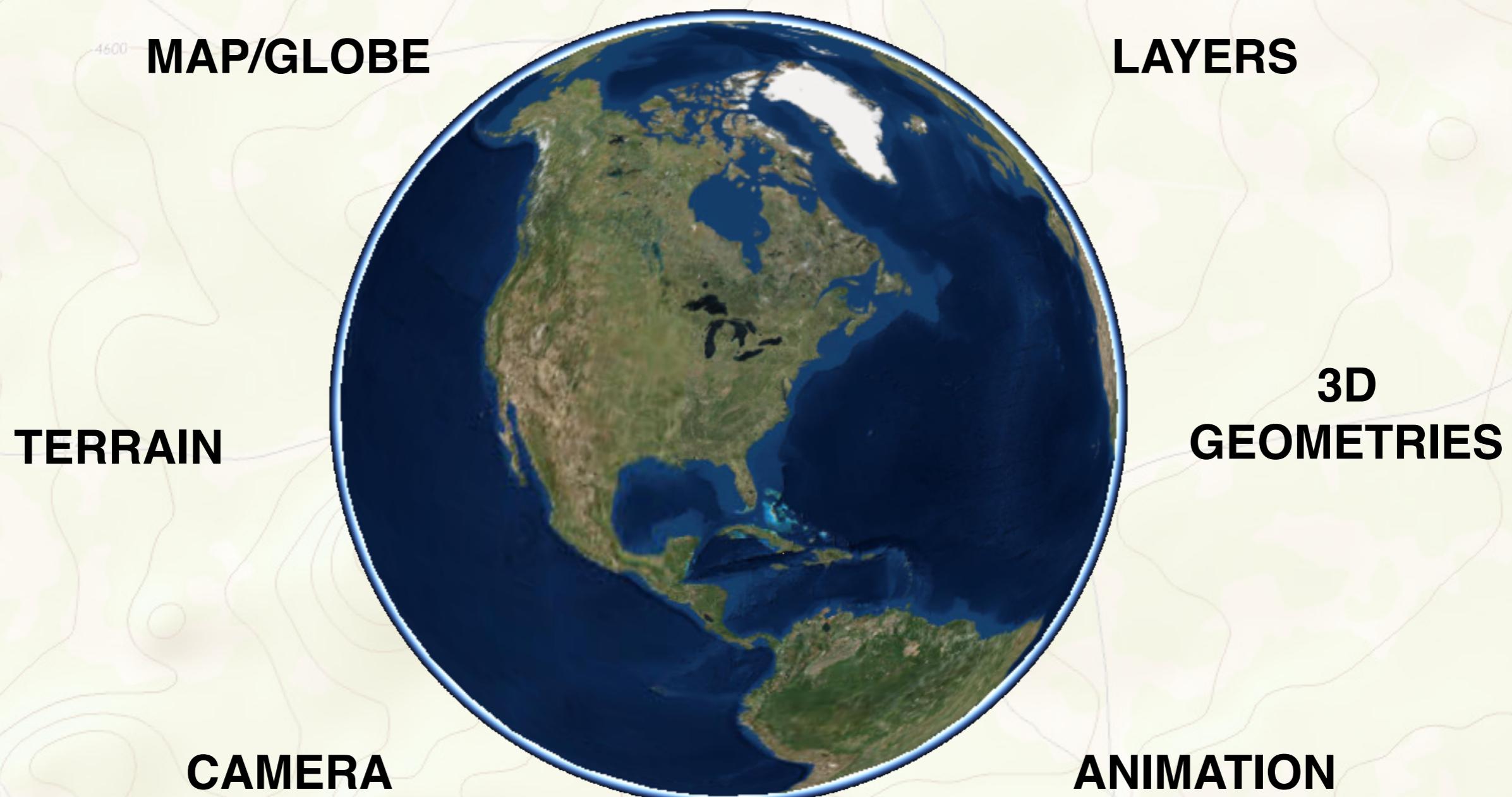


*Static Hosting
Code & Data*



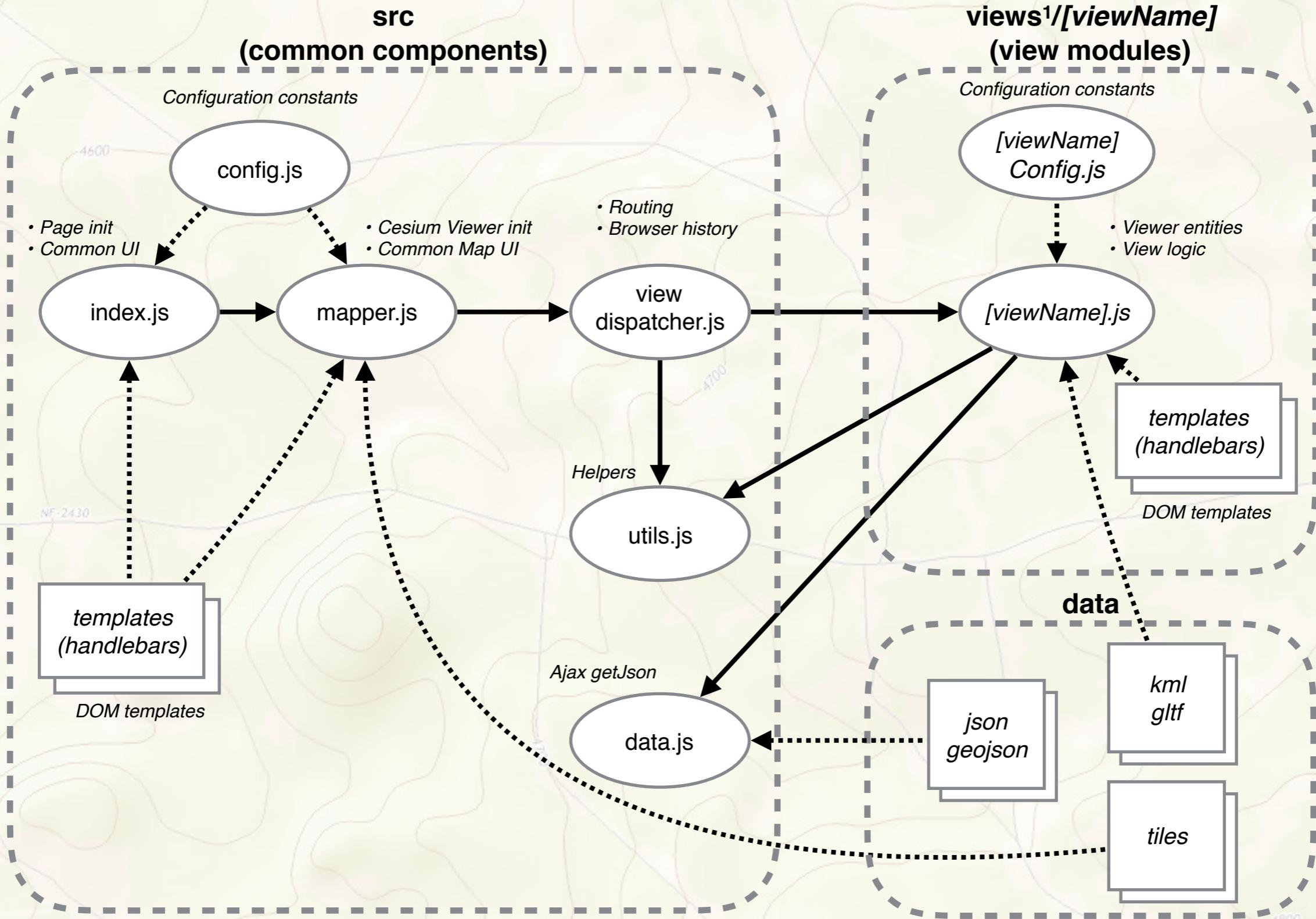
...sorry, no React

HOWL is built on top of CesiumJS



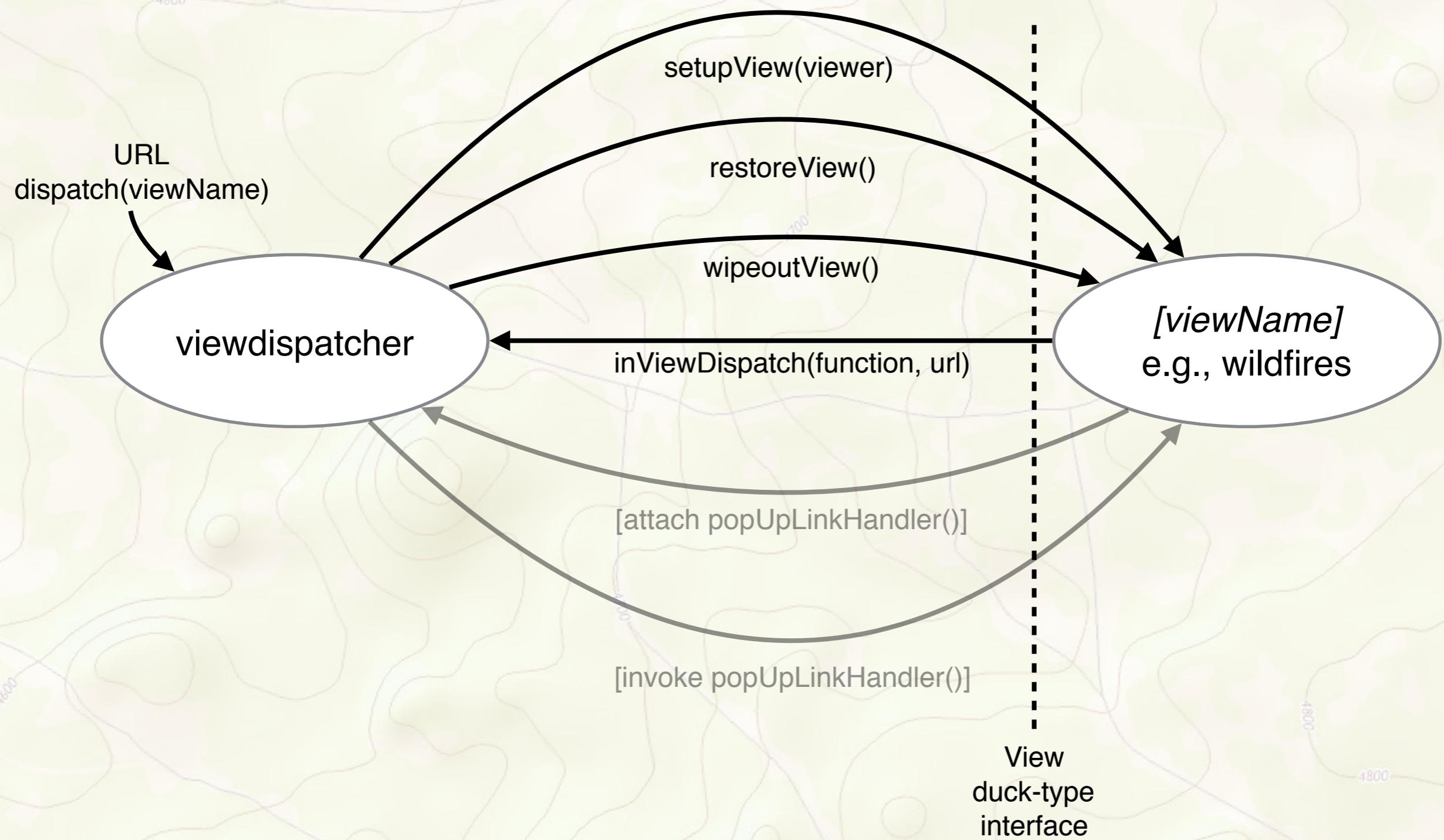
Javascript API, WebGL, No Plugins

HOWL is extensible: ‘spotlights’ ~ mini-apps

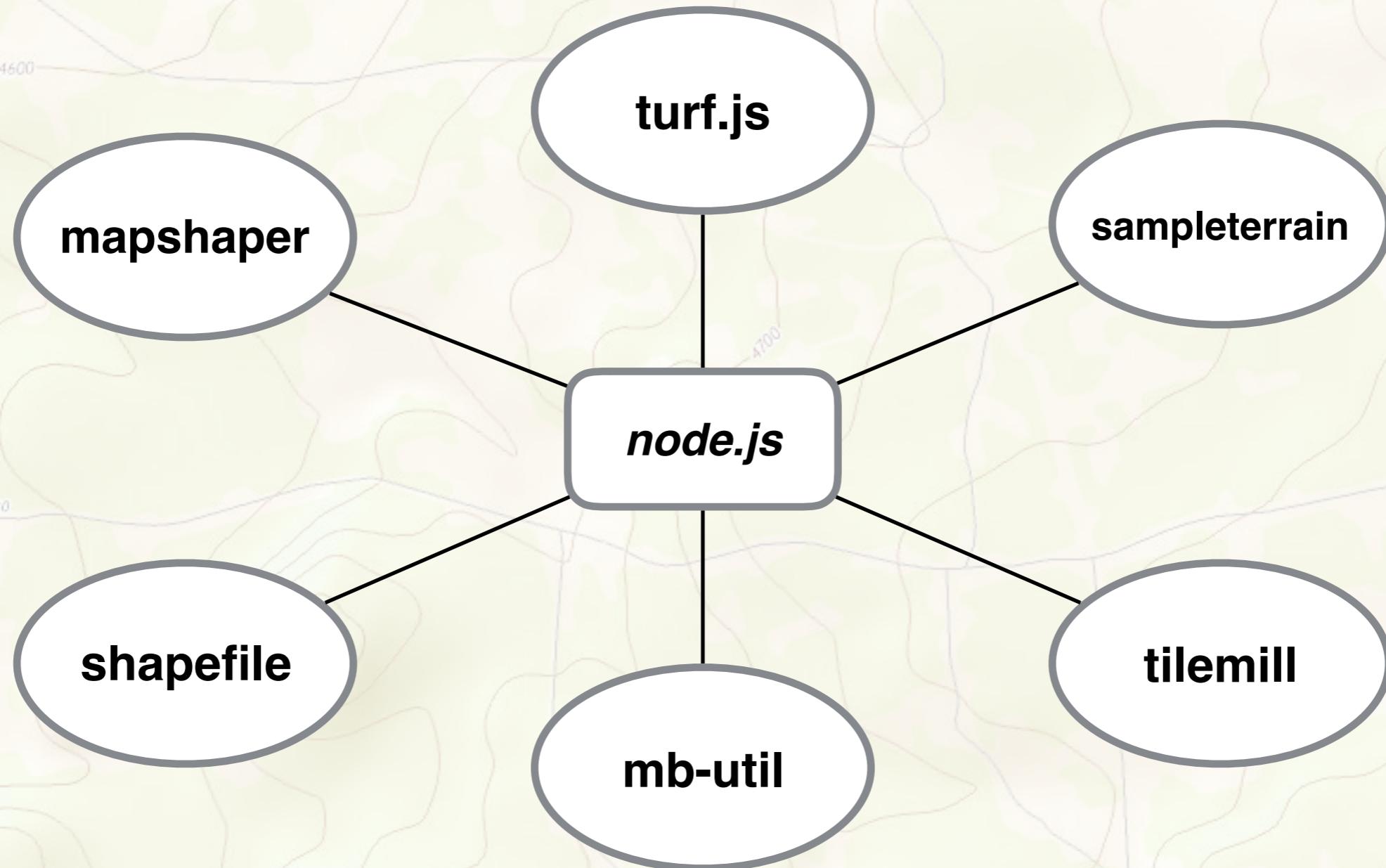


(1) Views implement 'Spotlights'

View Dispatcher handles app inversion of control and manages browser history



HOWL's data prep pipeline toolbox is based on node.js, js libs & command-line utilities



...plus zlib, tar-stream, xml2js, geojson-precision

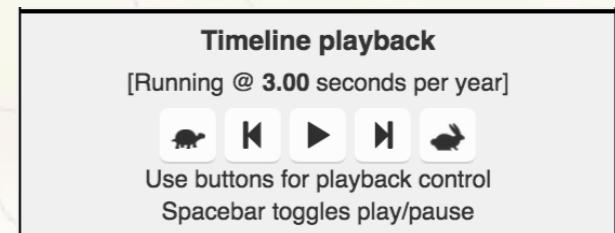
Setting up wildfires playback with CZML

In function makeCZMLAndStatsForListOfFires...

```
var mtbsCZML = [
  {
    id: 'document',
    name: 'MTBS',
    version: '1.0',
    clock: {...} .....▶ Interval, current time, multiplier
  },
  {
    id: feature.properties.id,
    availability: .....▶ The time range of the fire cylinder visibility
    cylinder : {...}, ....▶ Cylinder entity definition (color, height, radius)
    position: {...} .....▶ Cylinder entity location
  },
  ...
}
];
```

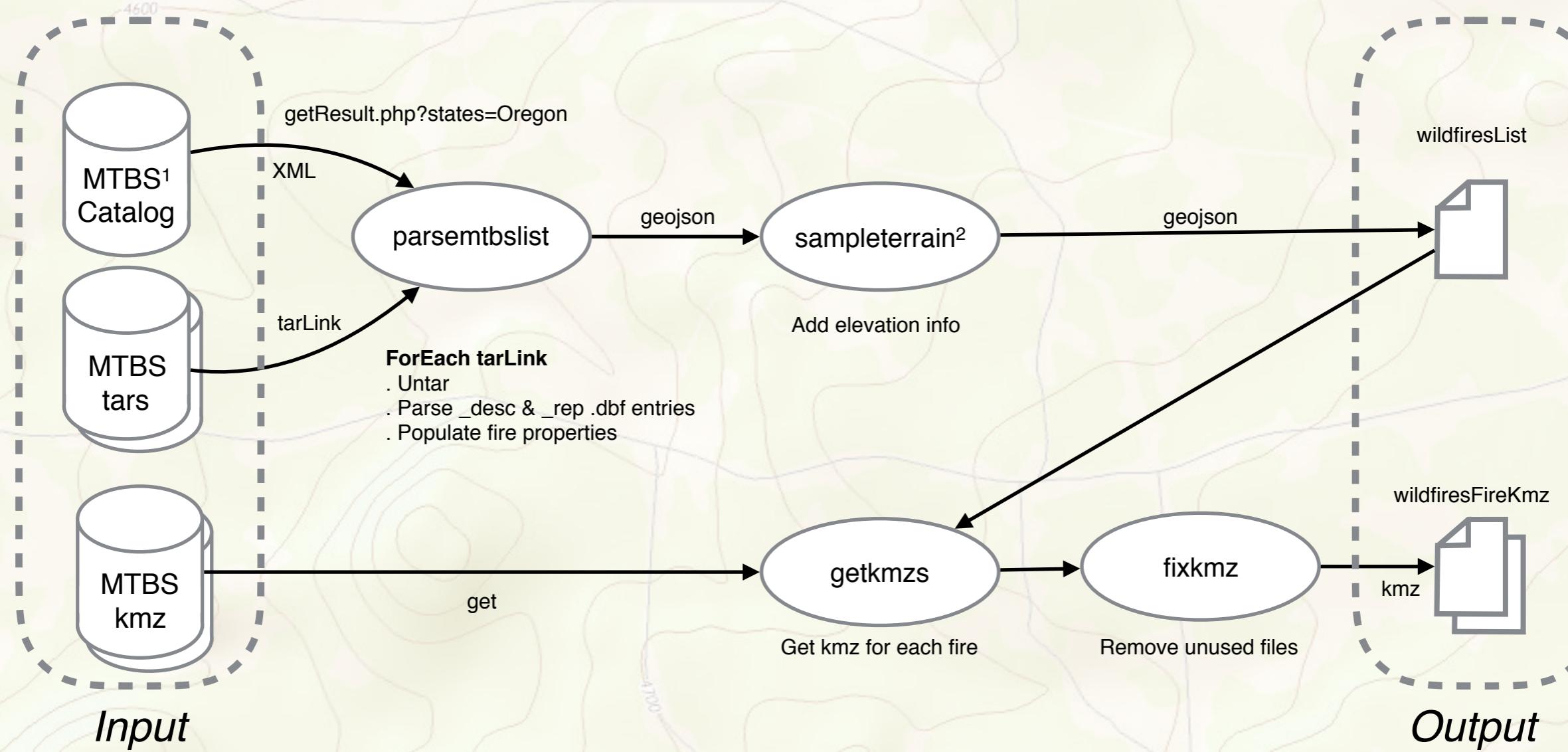
In function setupView...

```
Cesium.CzmlDataSource.load
  (statsAndCZML.czml).then(function(ds) {
    _viewer.dataSources.add(ds).then(function() {
      ...
      set up event listeners (e.g., update viewLabel)
    });
});
```



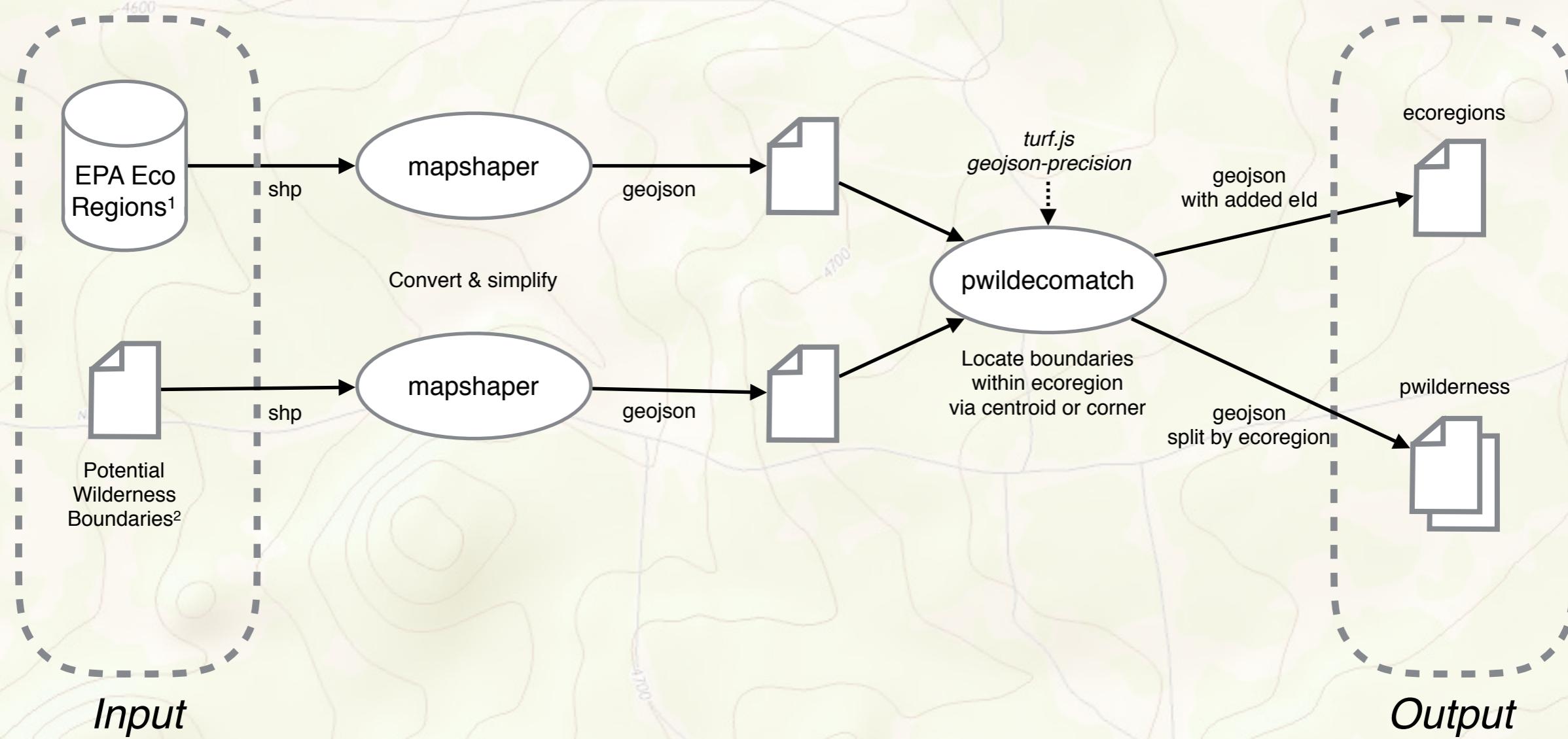
```
animationViewModel.  
playForwardViewModel.command()  
animationViewModel.  
pauseViewModel.command()
```

Processing wildfires view data sources



(1) Monitoring Trends in Burn Severity, http://mtbs.gov/mtbs_mysql/dataquery
(2) <https://www.npmjs.com/package/sampleterrain>

Processing ecopwilderness view data sources



(1) <https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-state>

(2) Oregon Wild

Sometimes we need duct tape and bubble gum...

Polyline clamp to ground not supported	<ul style="list-style-type: none">✓ Replace with Corridor<ul style="list-style-type: none">• ... but outlineWidth is in meters vs width in pixels✓ Adjust corridor width using camera height change listener✓ Use a step function to reduce flicker
KML image overlay clamp to ground not supported	<ul style="list-style-type: none">✓ Load KML data source but show=false✓ Add SingleTileImageryProvider using KML data source image url and rectangle coordinates
No explicit z-order support	<ul style="list-style-type: none">✓ Load entities in z-order<ul style="list-style-type: none">• ...but changing entity appearance (e.g., opacity) draws on top✓ SO, pretend to change entity colors in the correct order✓ e.g., entity.corridor.material = entity.corridor.material.color.getValue()
Geo-located HTML popups not supported	<ul style="list-style-type: none">✓ Handle click events and use viewer.scene.drillPick to open popup✓ Use postRender event listener to track entity window coordinates✓ Use css translate to move popup

In summary...

- ***Open source is awesome*** - it is like having a huge team on your project!
- ***Open data is awesome*** - your imagination is the limit, but be prepared to bend over backwards!
- ***CesiumJS is awesome*** - it is a very active and super helpful community!
- ***Oregon Wild is awesome*** - they fight to protect our state's wilderness!

Contributions welcome!

<i>I just want to see the spotlights</i>	Just go to oregonhowl.org
<i>I want the author to fix bugs</i>	Create issues on Github: github.com/jimmyangel/howl/issues
<i>I want the author to consider and work on new features</i>	Comment on the blog: blog.rikitraki.com
<i>I want to create my own and/or contribute code</i>	Fork & PR repos: https://github.com/jimmyangel/howl

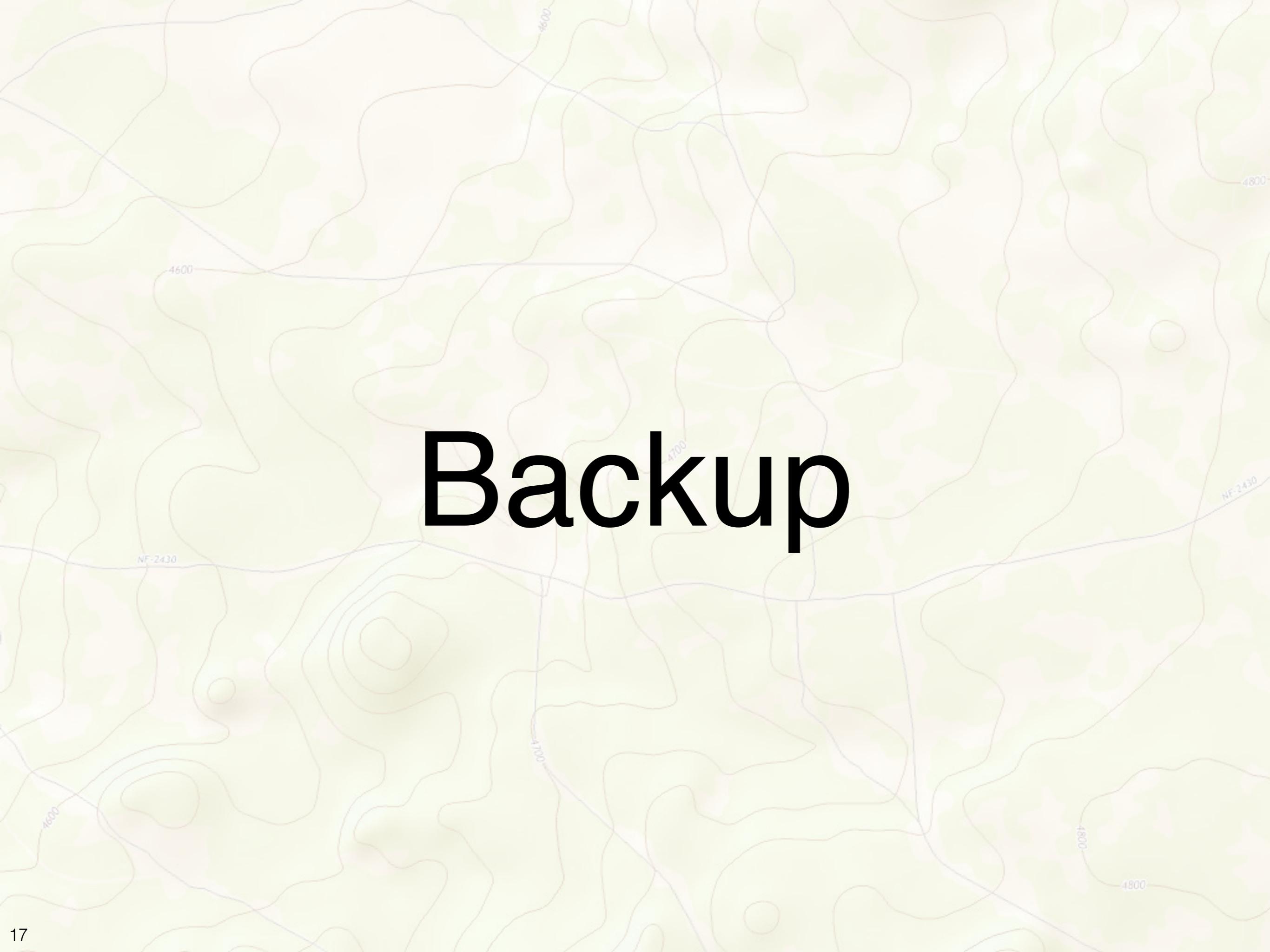
Find me:
@jimmieangel on Twitter
my blog.rikitraki.com
Cesium booth on Friday @ ~noon

Many thanks to...

- Erik Fernandez of Oregon Wild for his support, feedback and direction
- The MTBS team for their responsiveness and feedback
- The CesiumJS team for their support and encouragement



Thank you!



Backup

HOWL Concepts

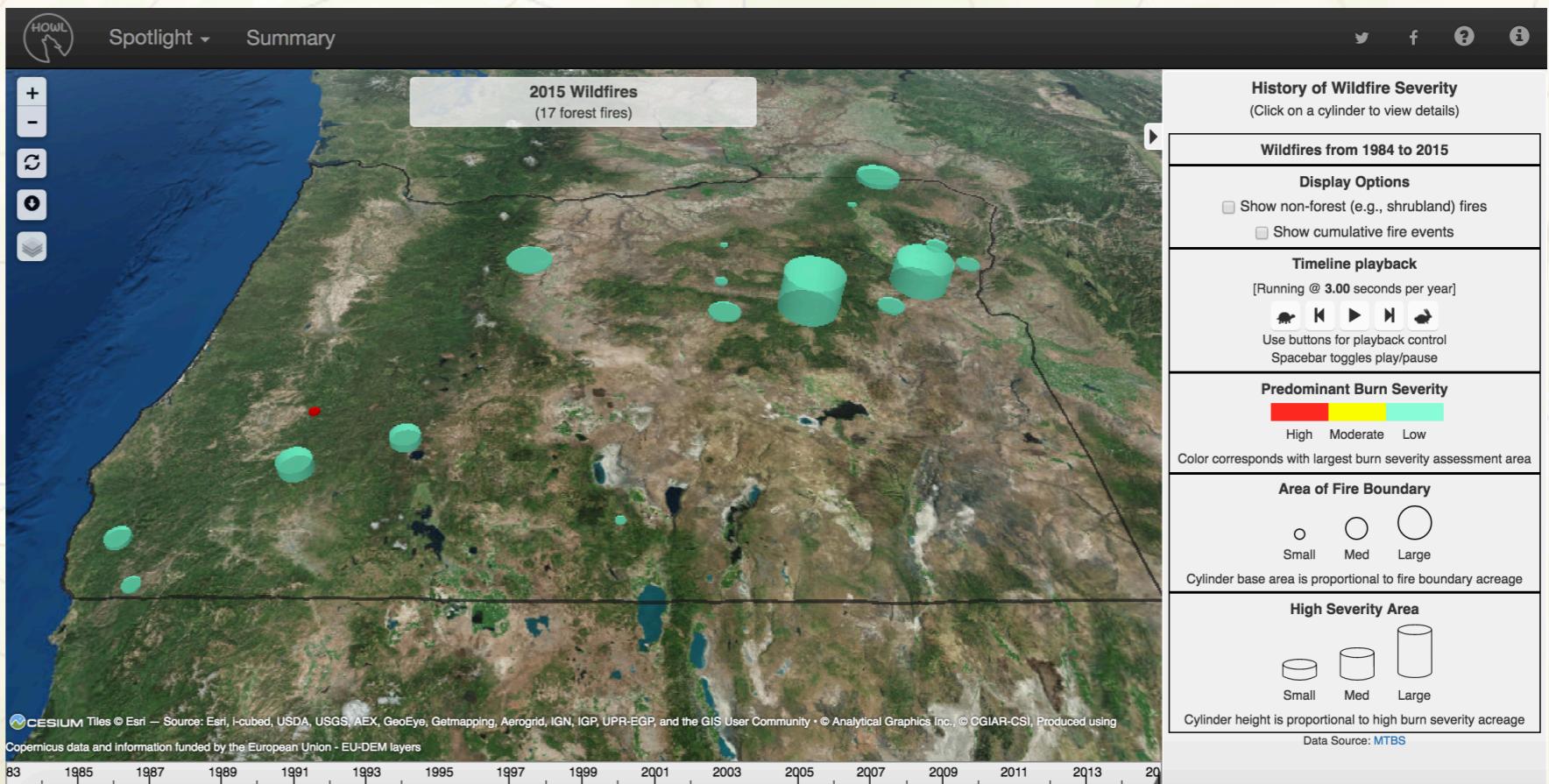
Cards and Spotlights



Photo by the Oregon Department of Forestry

HISTORY OF WILDFIRE SEVERITY

In the Pacific Northwest, fire is a natural part of healthy forests. Since 2004 the Federal Government has been conducting detailed wildfire severity assessments by analyzing before and after LANDSAT satellite images of fire boundaries. This 'spotlight' shows the history of wildfires in Oregon and their severity since 1984.



Home Card

Spotlight

Spotlight's Common UI Elements

The screenshot displays the Spotlight application interface, which includes the following common UI elements:

- Top Bar:** Contains the "HOWL" logo, a "Spotlight" dropdown menu, a "Summary" link, and social media sharing icons for Twitter, Facebook, and others.
- Left Sidebar:** Includes a vertical stack of control buttons for zooming (+/-), panning (arrow), and other map functions.
- Map View:** Shows a satellite map of a geographic area with numerous cylinders representing wildfire events. A specific cylinder for the "PUEBLO FIRE" in 2006 is highlighted and expanded into a detailed information card.
- Information Card (PUEBLO FIRE):** Provides details about the fire, including its name, ignition date, total acres, forest acres, and acreage of burn severity. It also lists predominant burn severity and areas of fire boundary.
- Timeline Playback:** A section titled "Wildfires from 1984 to 2015" featuring a timeline slider and playback controls (rewind, forward, play/pause).
- Display Options:** Includes checkboxes for "Show non-forest (e.g., shrubland) fires" and "Show cumulative fire events".
- Legend:** A color-coded legend for "Predominant Burn Severity" (High, Moderate, Low) and a size legend for "Area of Fire Boundary" (Small, Med, Large).
- High Severity Area:** A legend showing cylinder sizes corresponding to high burn severity acreage.
- Data Source:** MTBS
- Bottom Navigation:** A timeline bar at the bottom showing years from 1983 to 2015.

Map Legend:

- Predominant Burn Severity:** High (Red), Moderate (Yellow), Low (Green)
- Area of Fire Boundary:** Small (Small circle), Med (Medium circle), Large (Large circle)
- High Severity Area:** Small (Small cylinder), Med (Medium cylinder), Large (Large cylinder)

Information Card Data (PUEBLO FIRE):

- Fire Name:** PUEBLO FIRE
- Ignition Date:** Mon Aug 21 2006
- Total Fire Acres:** 67,852
- Forest Acres:** 9
- Acreage of Burn Severity:**
 - High: 5,369 (8%)
 - Moderate: 25,362 (37%)
 - Low: 24,158 (36%)
 - Unburned: 12,942 (19%)
 - Increased Greeness: 21 (0%)
 - Not Assessed: 0 (0%)

Timeline: Wildfires from 1984 to 2015

Display Options:

- Show non-forest (e.g., shrubland) fires
- Show cumulative fire events

Timeline playback: [Running @ 3.00 seconds per year]

Use buttons for playback control
Spacebar toggles play/pause

Predominant Burn Severity:

High	Moderate	Low
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Color corresponds with largest burn severity assessment area

Area of Fire Boundary:

Small	Med	Large
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Cylinder base area is proportional to fire boundary acreage

High Severity Area:

Small	Med	Large
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Cylinder height is proportional to high burn severity acreage

Data Source: MTBS

CESIUM Tiles © Esri — Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, UPR-EGP, and the GIS User Community • © Analytical Graphics Inc., © CGIAR-CS, Produced using Copernicus data and information funded by the European Union - EU-DEM layers

Spotlight's Customizable UI Containers

The screenshot displays the Spotlight application interface, which includes a map viewer, summary chart, view label, info box, and info panel.

UI Components:

- summaryChart**: A summary chart located on the left side of the map.
- viewLabel**: A view label located on the left side of the map.
- infoBox**: An info box located on the right side of the map, displaying details about the PUEBLO FIRE.
- map viewer**: The main map area showing wildfire data.
- infoPanel**: An info panel located at the bottom of the map, displaying details about the PUEBLO FIRE.

Map Data:

2006 Wildfires (44 fires)

PUEBLO FIRE

Ignition Date: Mon Aug 21 2006
Total Fire Acres: 67,852
Forest Acres: 9

Acreage of Burn Severity

Burn Severity	Acreage	Percentage
High	5,369	(8%)
Moderate	25,362	(37%)
Low	24,158	(36%)
Unburned	12,942	(19%)
Increased Greeness	21	(0%)
Not Assessed	0	(0%)

History of Wildfire Severity
(Click on a cylinder to view details)

Wildfires from 1984 to 2015

Display Options

- Show non-forest (e.g., shrubland) fires
- Show cumulative fire events

Timeline playback
[Running @ 3.00 seconds per year]

Use buttons for playback control
Spacebar toggles play/pause

Predominant Burn Severity

High Moderate Low

Color corresponds with largest burn severity assessment area

Area of Fire Boundary

Small Med Large

Cylinder base area is proportional to fire boundary acreage

High Severity Area

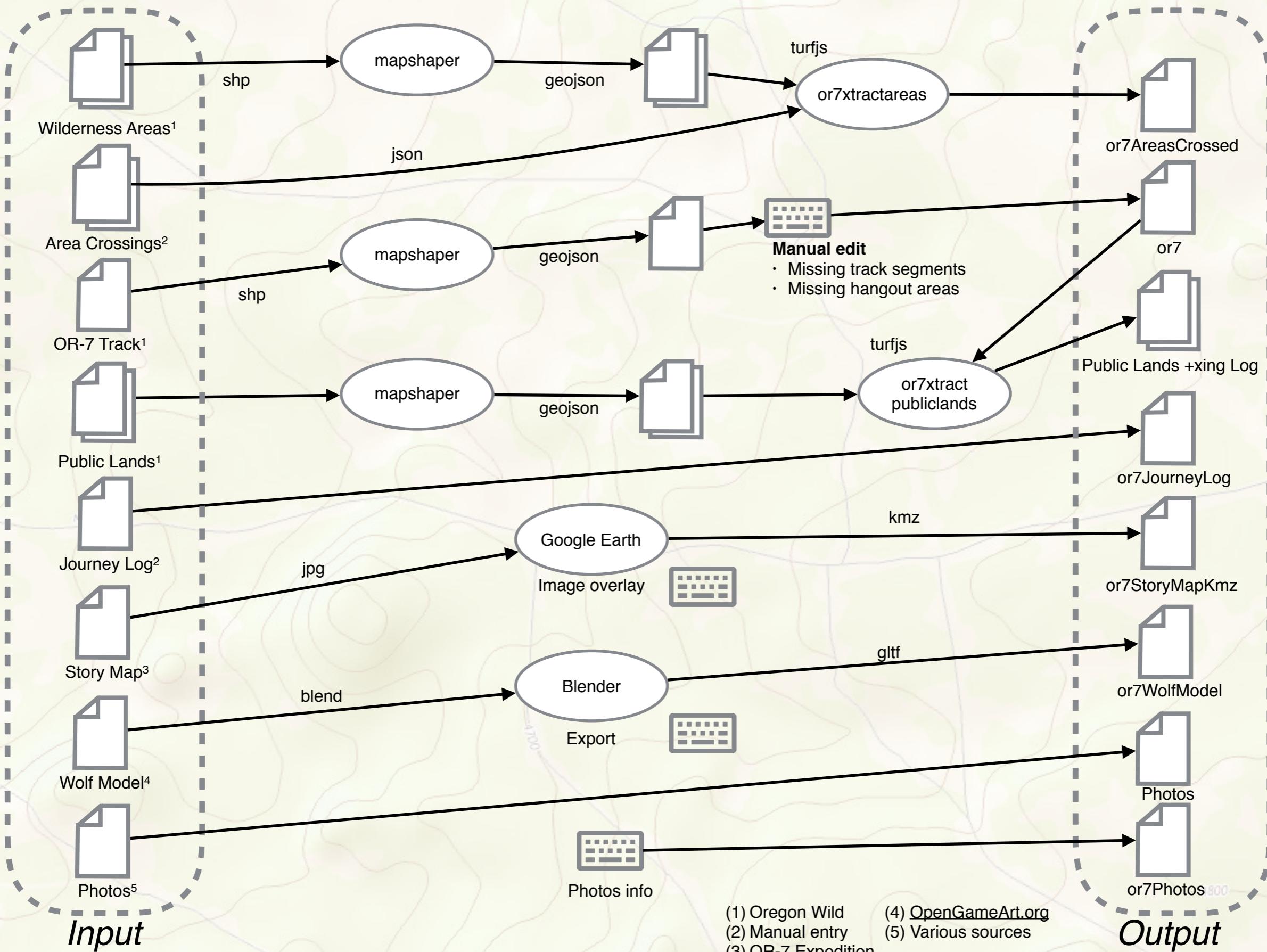
Small Med Large

Cylinder height is proportional to high burn severity acreage

Data Source: [MTBS](#)

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or7 view data sources



tiles

