

Symbol Groups



Facilitating discovery through a global outdoor recreation basemap

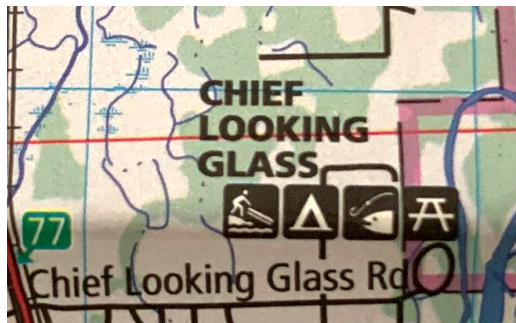
Presented by Lee France & John Czaplewski



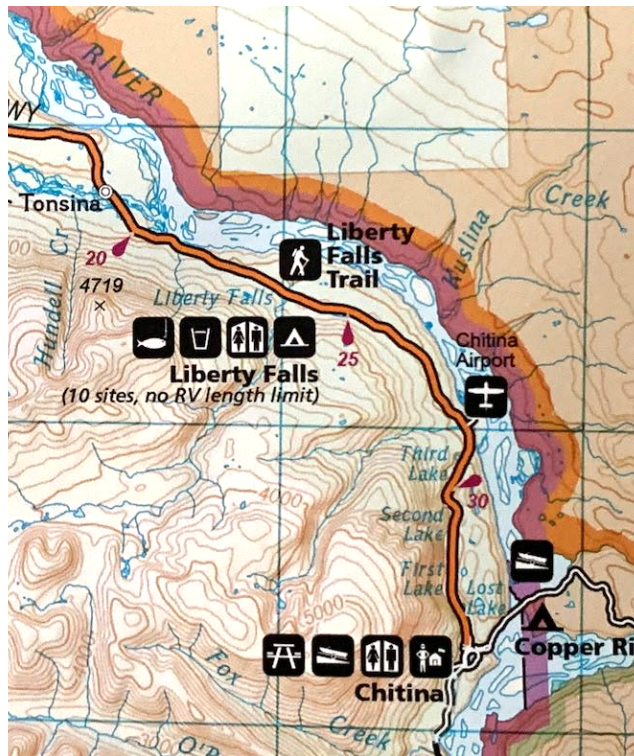
What are symbol groups and why use them?



Chugach State Park, Imus Geographics



Selway-Bitterroot Wilderness,
Cairn Cartographics



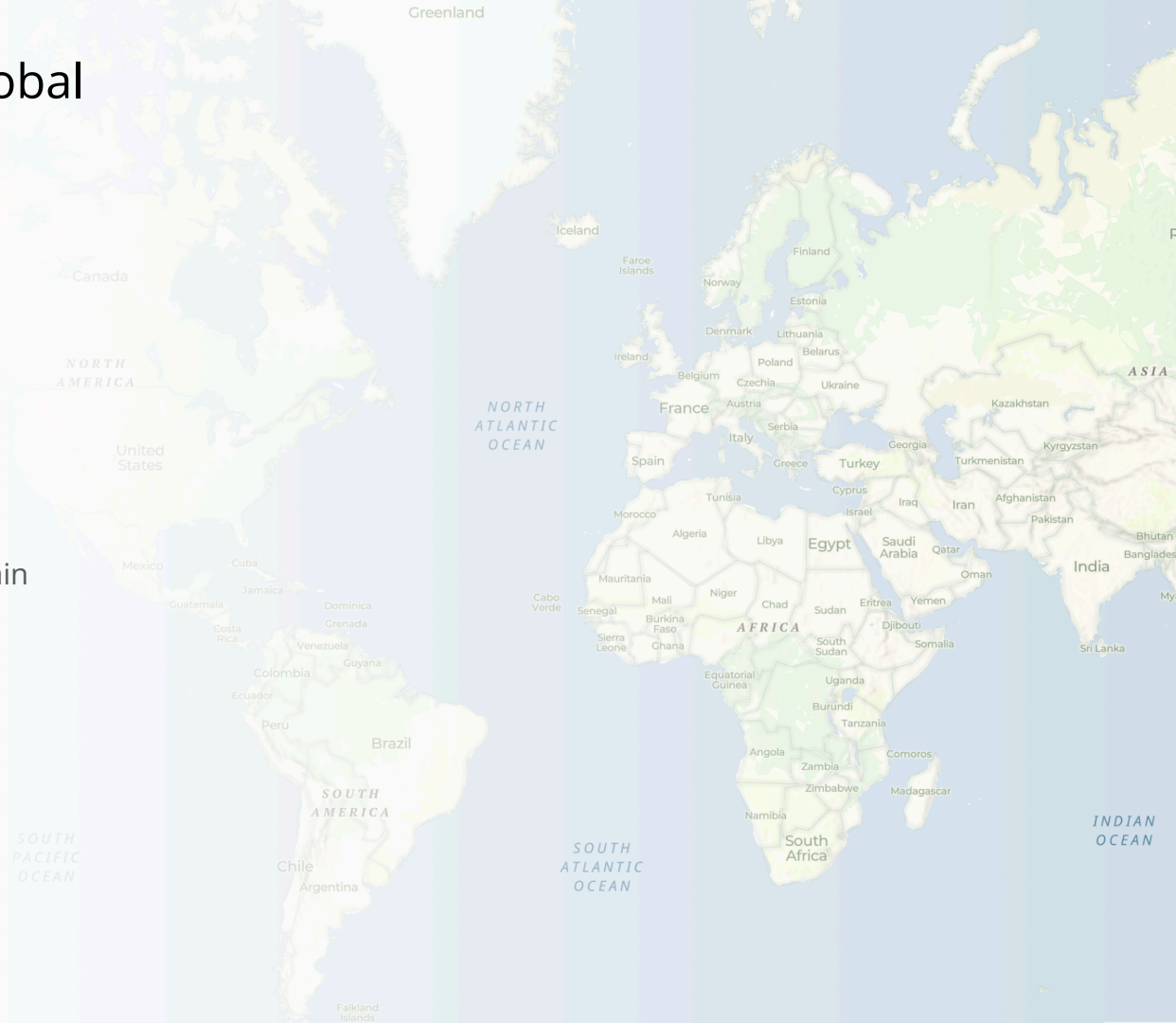
Wrangell-St. Elias National Park and Preserve,
National Geographic Trails Illustrated

- Point clusters representing concentrations of relevant amenities
- A way to cluster many points but still display the individual relevant icons
- Enable us to depict important map information at smaller scale
- Vector tiled slippy map: aids in discovery of recreation opportunities that would otherwise require zooming deep into the map

How to achieve this at a global scale without manual manipulation

- Keeping our limitations to what is possible with mapbox styling
- Has to be built into our global vector tiles
- Has to be fast enough we can maintain our weekly global update

Map symbols in Mapbox GL typically represented using Sprites (png images)



We know we can place labels on point symbols for a **name** or other relevant information

*What if the **label** was the **symbol** also?*

What if we don't use sprites and instead use....

FONT

Can we build a font made up of symbols?...**YES!**



Lots of good options available for creating a custom font:

Glyphs (\$):



Fontographer
by FontLab (\$):



FontForge



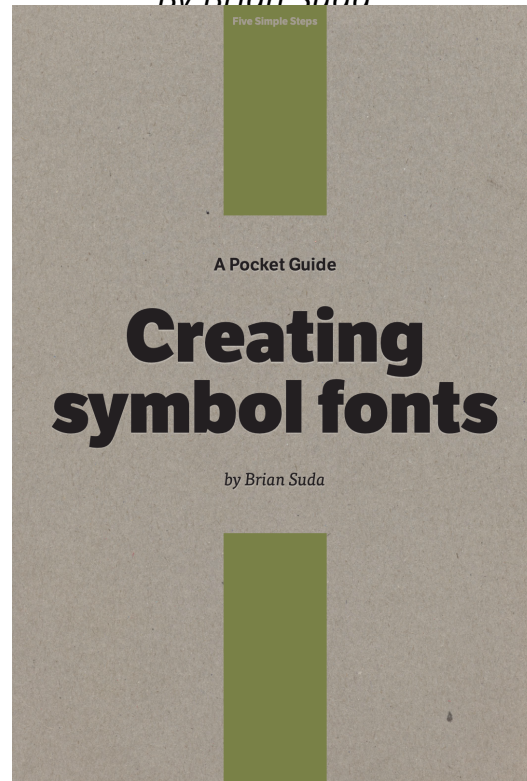
IcoMoon:



Recommended Reading:

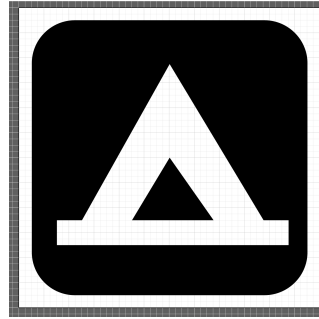
Creating Symbol Fonts

By Brian Suda



What they all have in common:

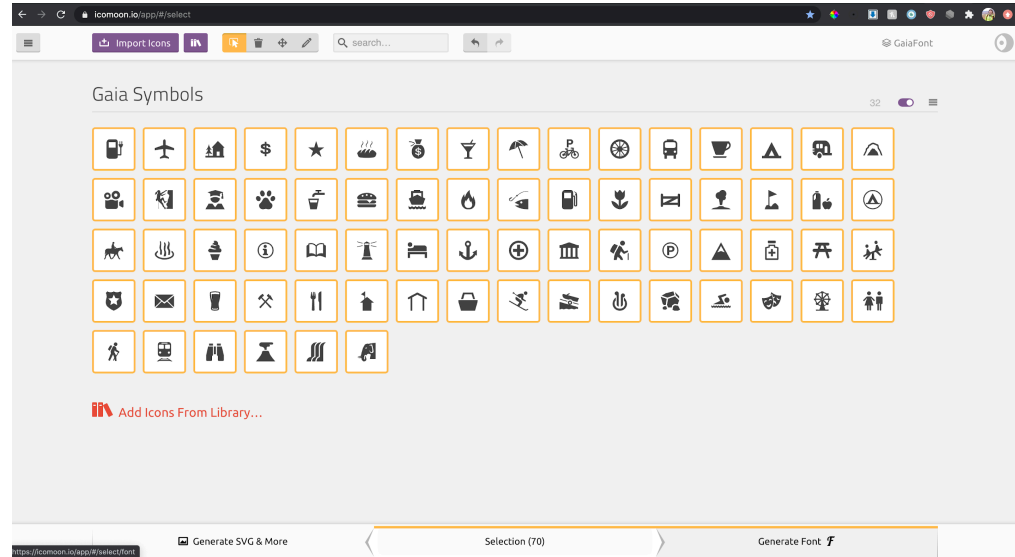
- Edges need to be snapped to a grid
- Can only be single paths or compound paths
- Can't have shapes on top of shapes
- Export as svgs



Collection of svgs → Font

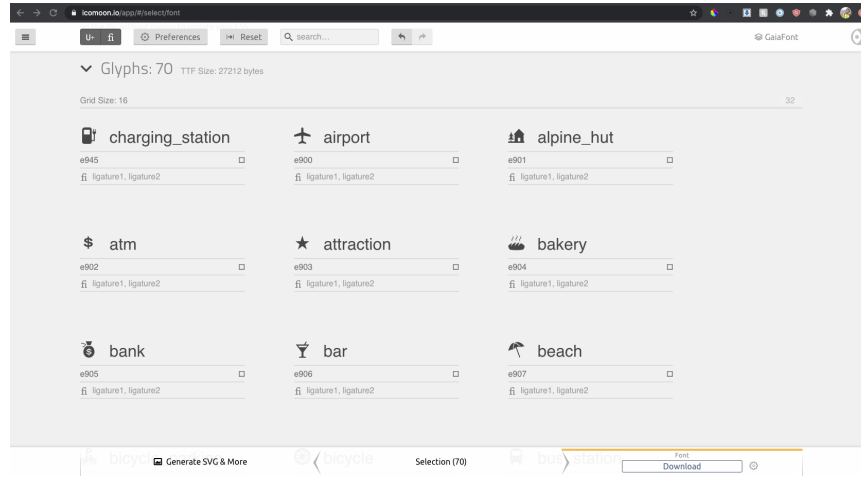
We decided to use the **icomoon** app

- Smooth workflow with familiar software (Adobe Illustrator)
- Easy to update and manage project
- Very sufficient free options
- Short learning curve
- Generates .ttf file we can use to build glyphs from font file



IcoMoon

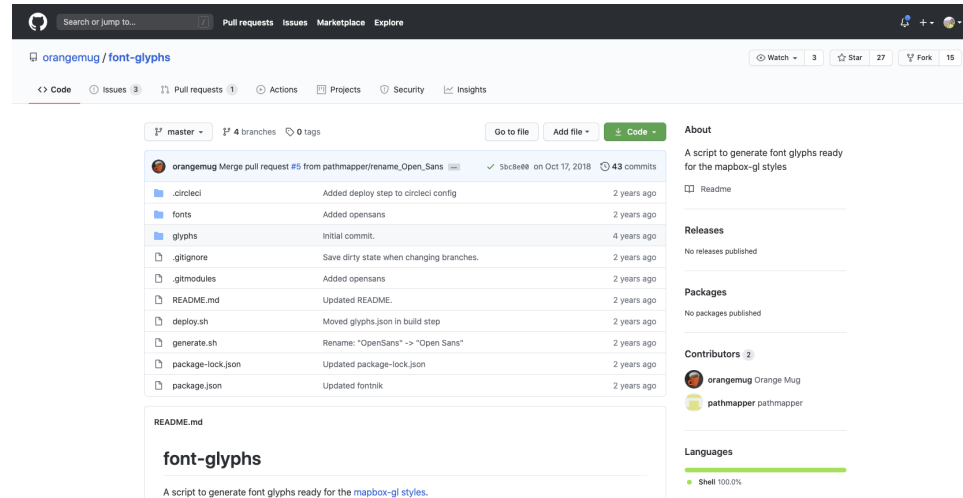
- Upload a set of icons
- Reset grid size (16)
- select “Generate Font”
- Can dive into details of each icon
- Can replace icon with another svg
- Download font file (ttf)
- Download project json for later restoration



Glyphs

In order to use our new font in our map it needs to be converted to a set of glyphs

Open source options available such a font-glyphs on Github (<https://github.com/orangemug/font-glyphs>)



Mapping point data to our new font

Our custom font contains a special character for each symbol from our symbol library. This can be found in the project json that can be downloaded from icomoon

```
1  airport □
2  alpine_hut □
3  atm □
4  attraction □
5  bakery □
6  bank □
7  bar □
8  beach □
9  bicycle_parking □
10 bicycle □
11 bus_station □
12 cafe □
13 camp_site □
14 caravan_site □
15 cave_entrance □
16 cinema □
17 charging_station □
18 climbing □
```

We hard code that special character in the map tiles for the point data we want to represent with a symbol

```
poi x
$type      Point
category   recreation
class      bold
name       Salida Gulch Tr
osm_id     819985686
symbol     □
type       trailhead
```


Cartographic Styling

Now all that's left to do is create a symbol layer in our stylesheet, and label it using our custom font!

- Use Mapbox *Format Expression* in order to label points with a **Name** and the **Symbol**
- Gives us the ability to label a point using two different fields **and** two different fonts!

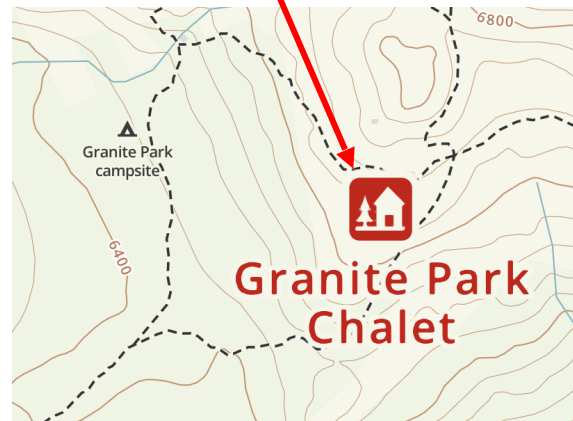
Other advantages of font based symbols:

- Can change color of symbols without needing different versions of a symbol in a spritesheet
- Can shrink and expand the symbol with no loss of quality / crisp edges!

```
"text-field": [
  "format",
  [
    "get",
    "symbol"
  ],
  {
    "text-font": [
      "literal",
      [
        "GaiaSquare"
      ]
    ],
    "font-scale": 1
  },
  "\n",
  {},
  [
    "get",
    "name"
  ],
  {
    "text-font": [
      "literal",
      [
        "Open_Sans-SemiBold"
      ]
    ],
    "font-scale": 0.8
  }
],
```

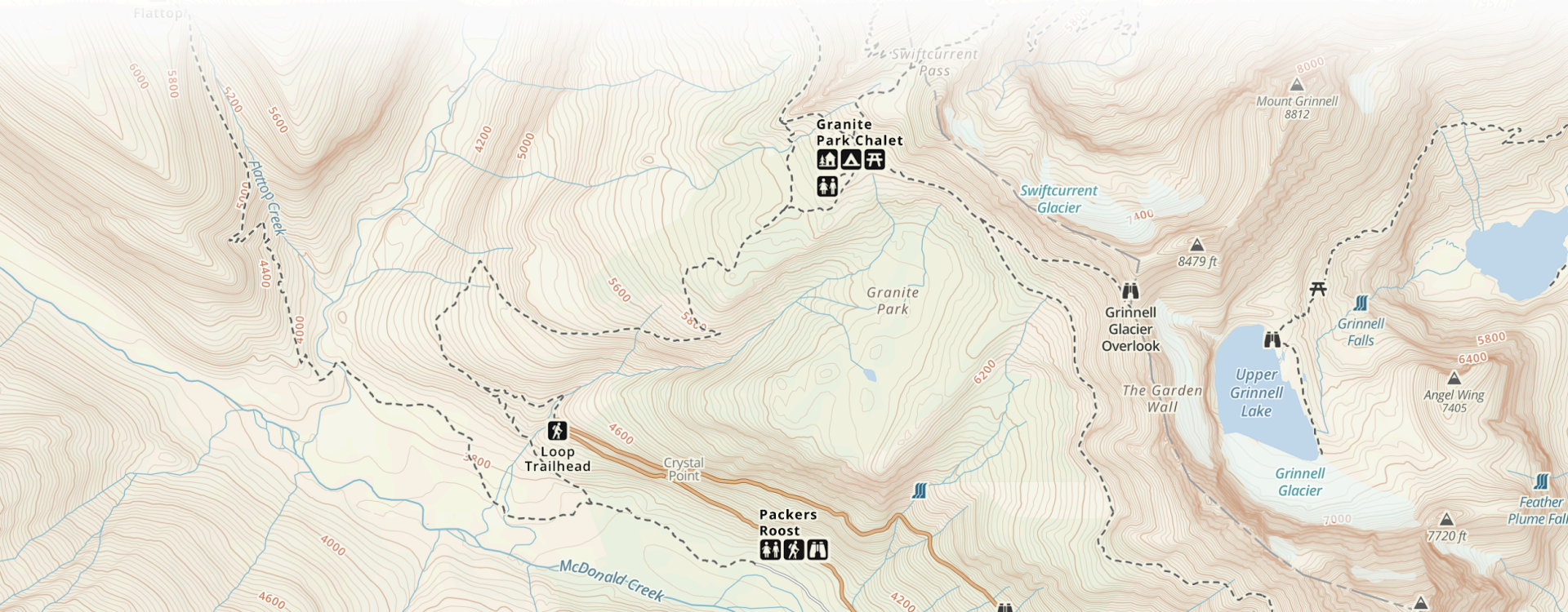


Font halo acts as fill for center of the icon!



Now we've achieved font based symbols on our map!

But what about the symbol groups?



Points of Interest...of Interest



campsite



alpine_hut



picnic_site



group_camp



trailhead



fishing



slipway



horse_riding



train_station



bus_station



caravan_site



beach



viewpoint



swimming_area



climbing



ski_area



marina



fuel

z10+



grocery

z11+



toilets



lodging

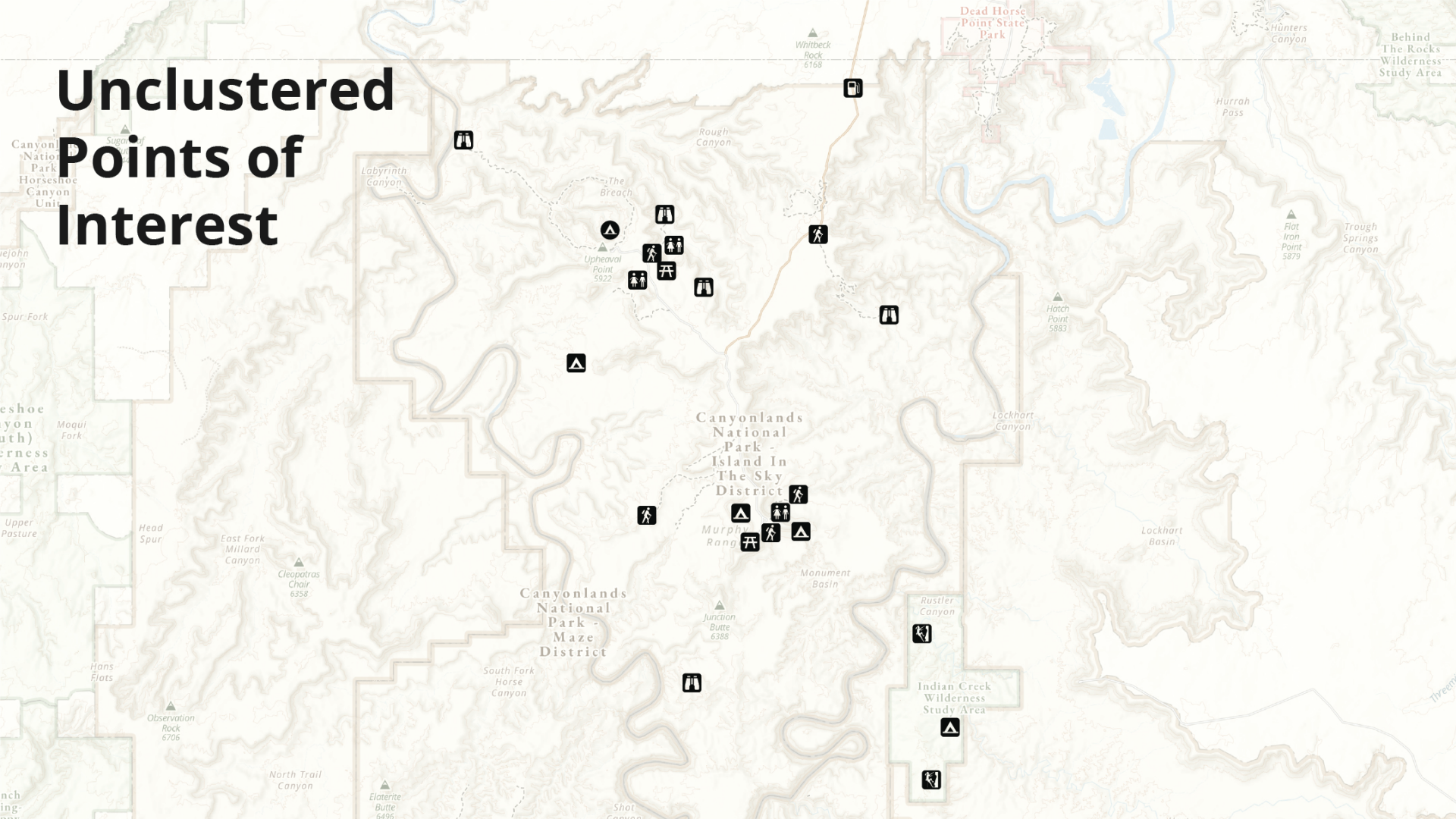


restaurant

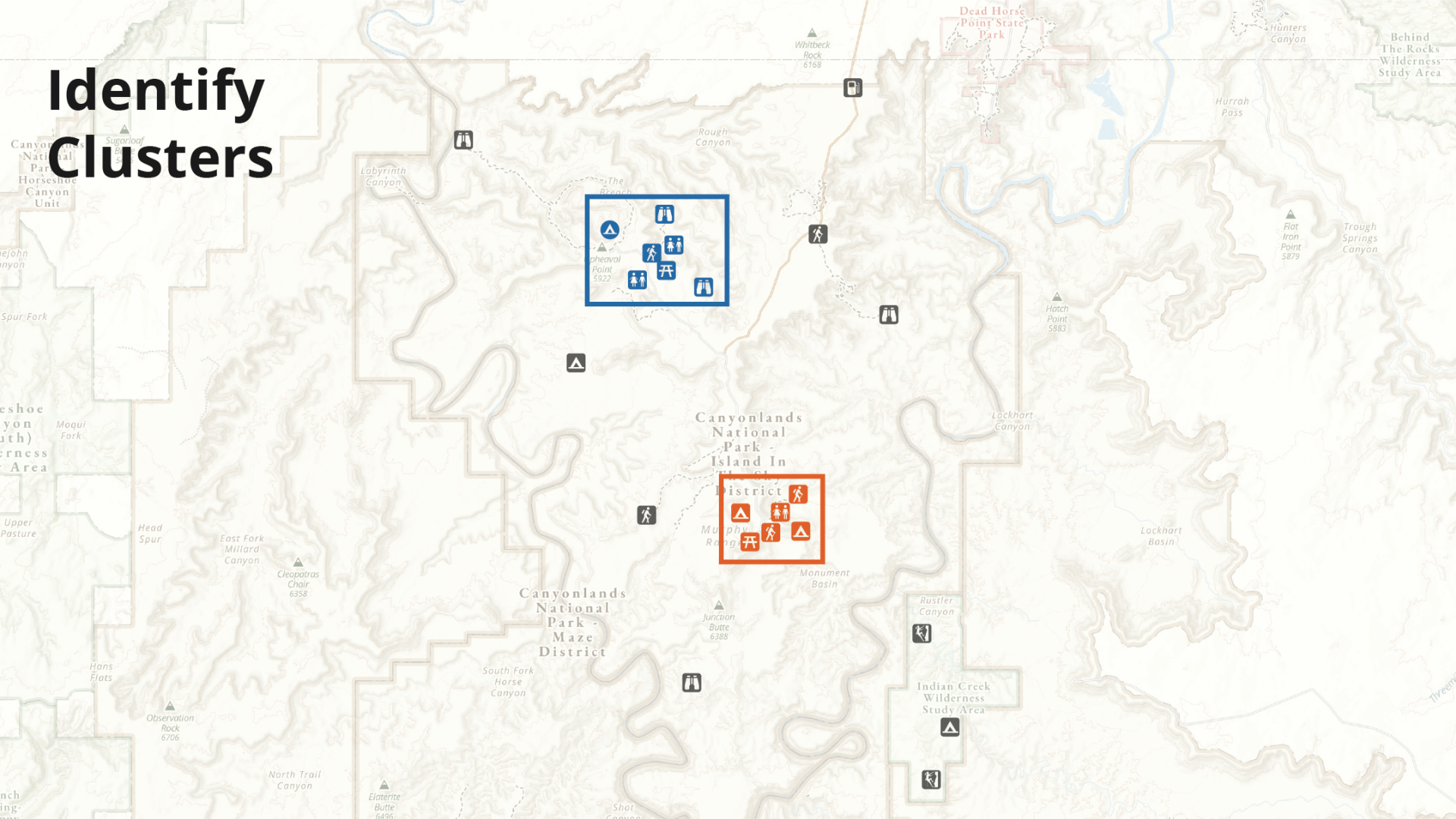


museum

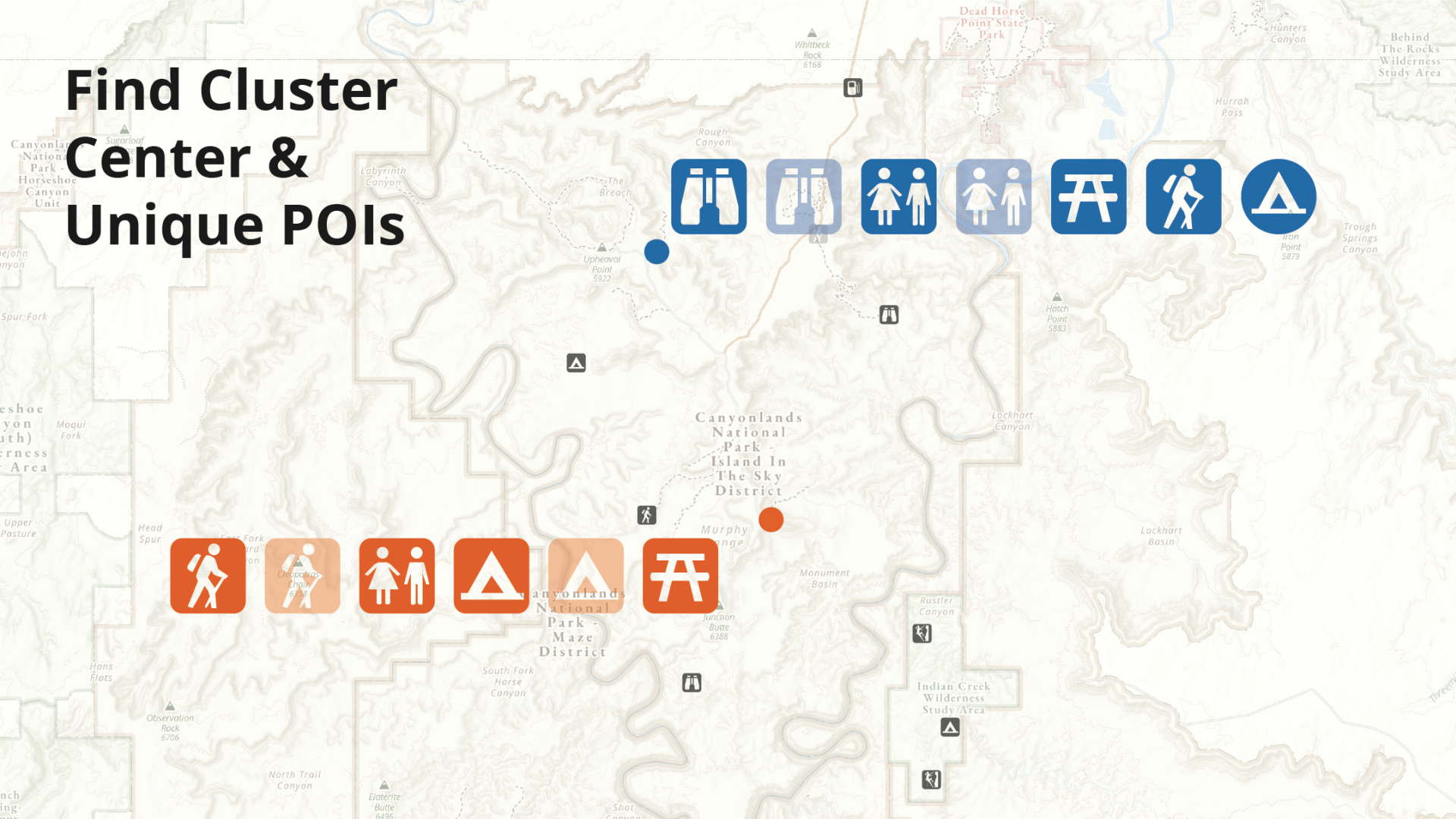
Unclustered Points of Interest



Identify Clusters

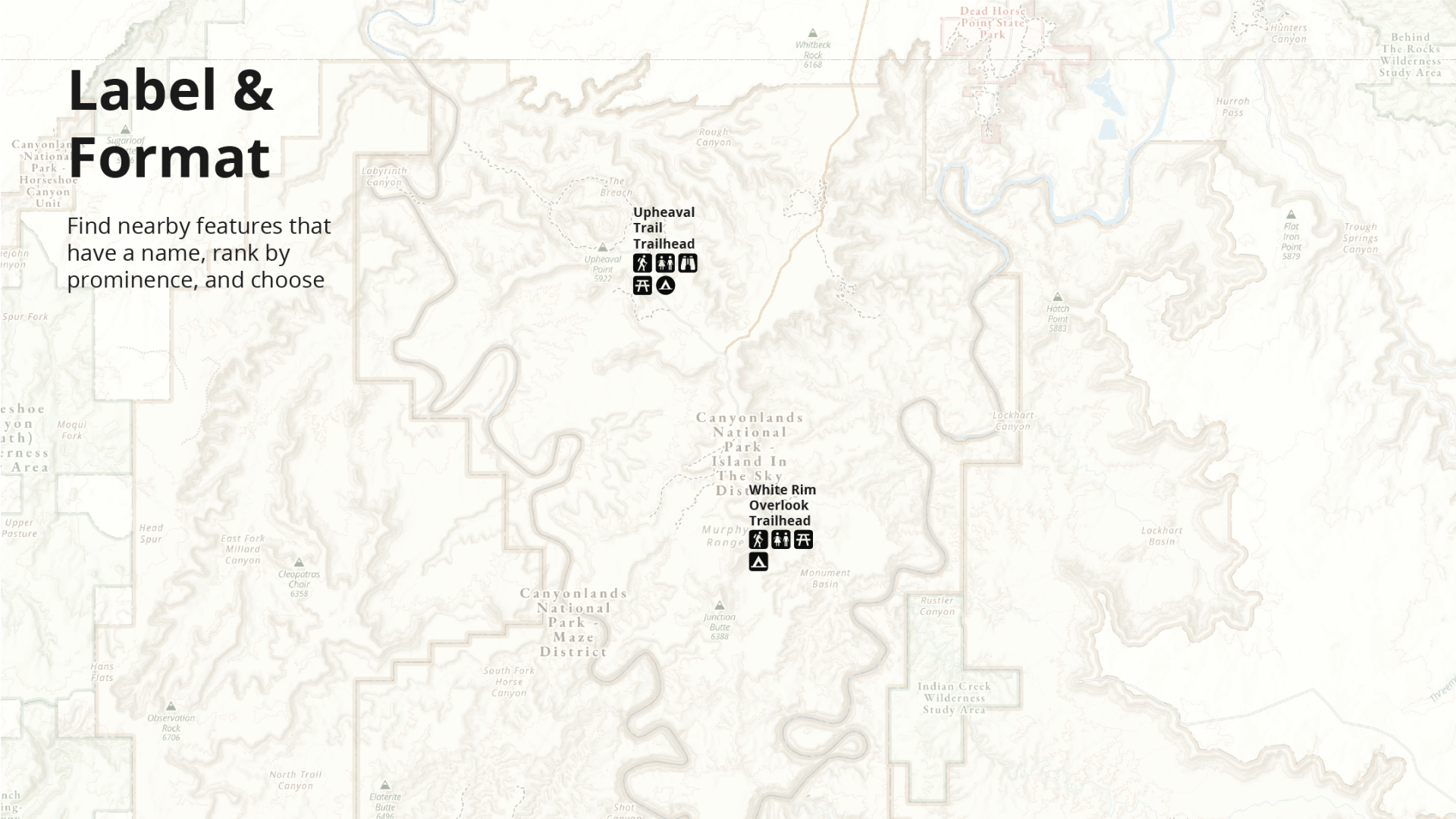


Find Cluster Center & Unique POIs



Label & Format

Find nearby features that have a name, rank by prominence, and choose



Thanks!

See these symbol groups in action at

gaiagps.com/map

or

Download Gaia GPS



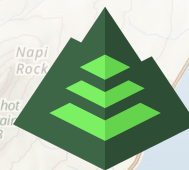
Questions, comments, feedback

@leegraper

@johnjcz



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