



Esri International Developer Summit
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Designing and Building Responsive ArcGIS Web Apps with Web Frameworks

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Responsive Design

What is it?



Responsive Design

- Designing a single web page/app that works *well* across a variety of devices and screen sizes
- Re-use content and software
- Considers
 - Device limitations
 - User's behavior

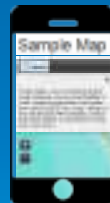


Most web mapping apps...

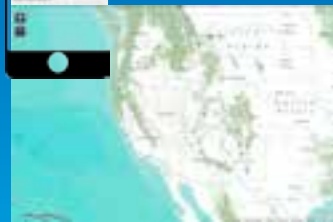
Scaling? Adapting?



Higher resolution device

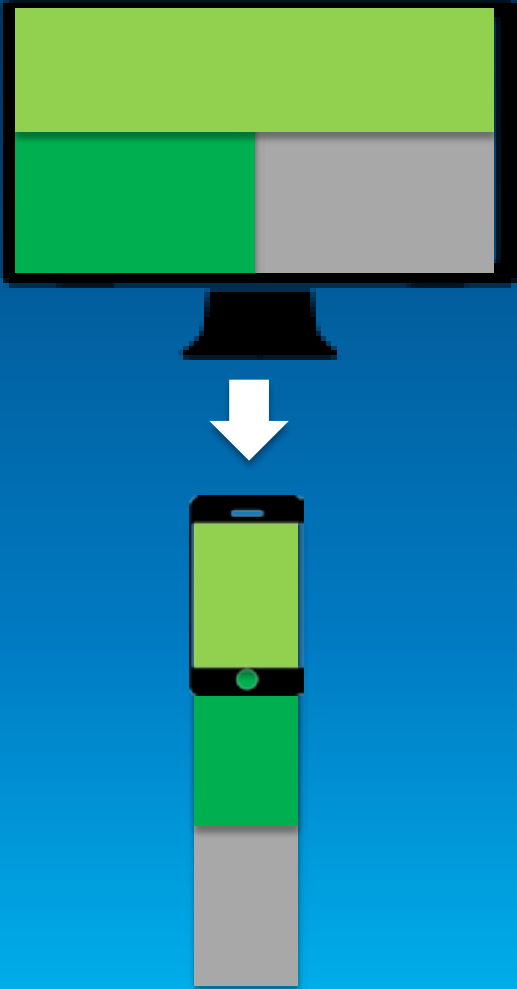


Lower resolution device

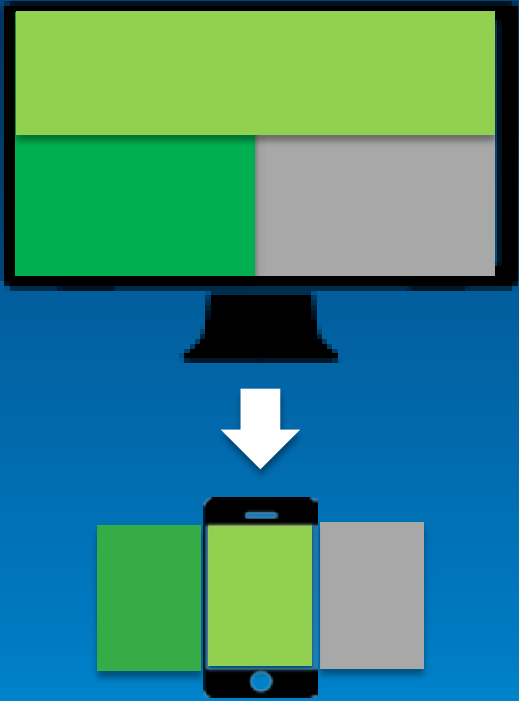


App Design Options

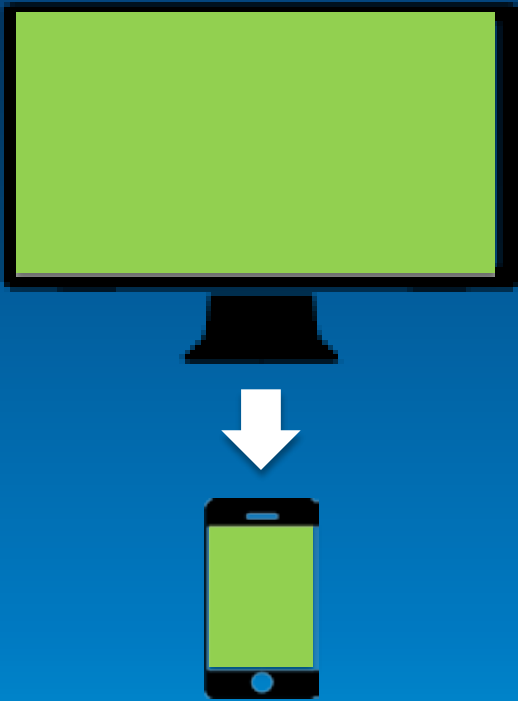
Vertical Stacking



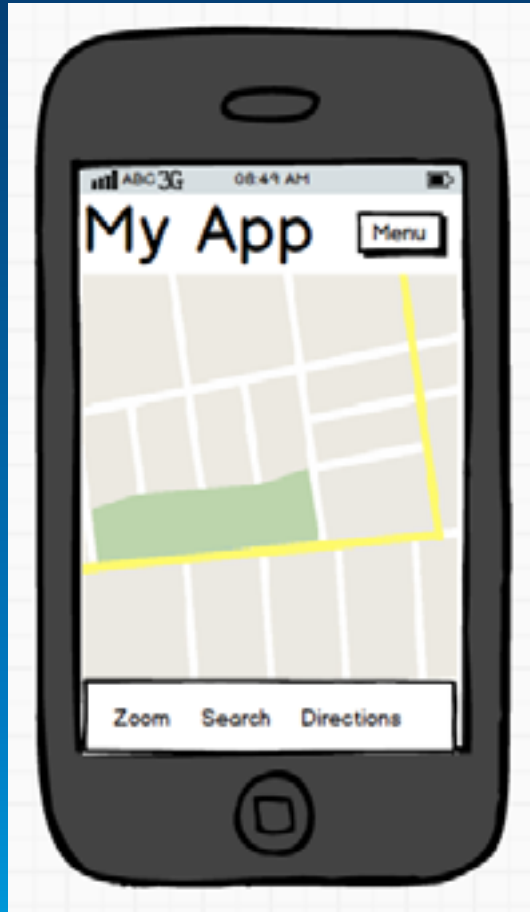
Horizontal Stacking



No Stacking



Think mobile first!



320px



Real estate is precious

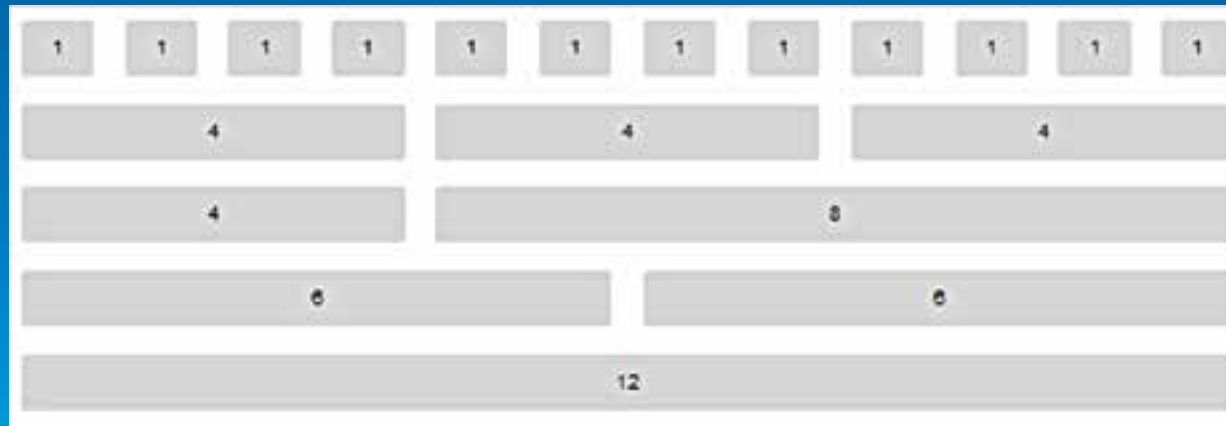
Components of Responsive Design

1 - 2 - 3



1. Fluid Grid System

- Layout adapts to different screen sizes
- Based on percentages
- 12 column / 960px



2. Media Queries

- § Detect device screen size and orientation
- § Apply CSS at specific break points
- § Typical: 480px, 768px, 1024px, 1280px

```
@media only screen and (max-device-width:480px) {  
    /* Custom css styles */  
    body {  
        font-size: 0.5em;  
    }  
    #titleArea{  
        display: none;  
    }  
}
```

3. HTML5 & CSS3

- **Mobile friendly HTML5**
 - Meta tags
 - Input types (text, dates...)
- **CSS3**
 - Selectors, transitions
- **JavaScript**
 - Touch events
 - Geolocation, localstorage, websockets, appcache....



Developing Responsive Mapping Apps - I

Roll your own approach

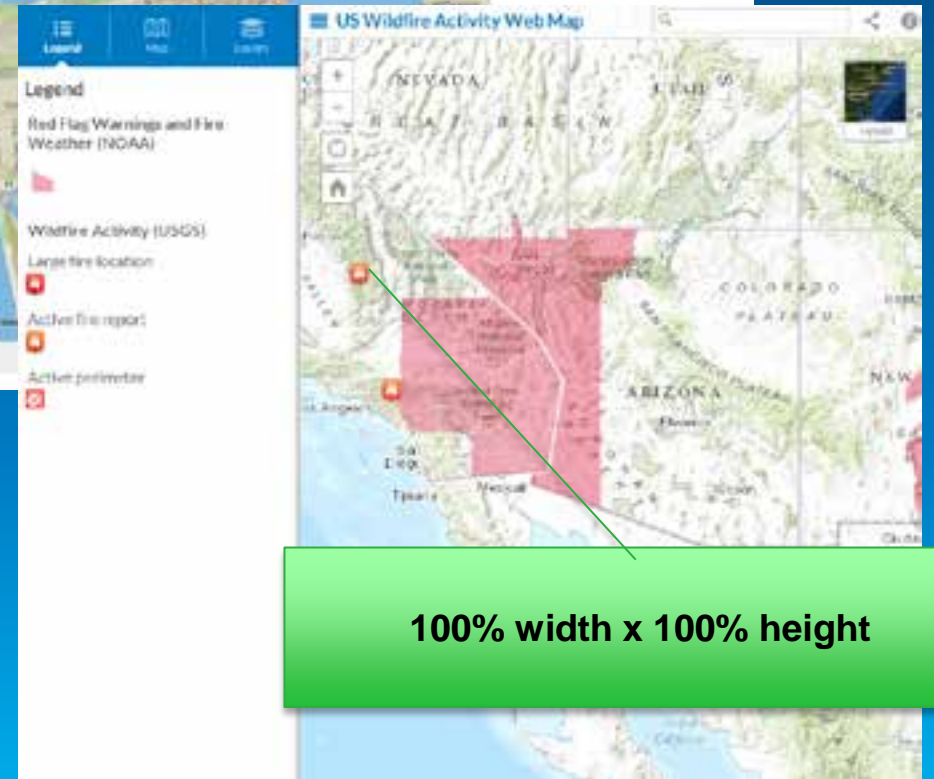
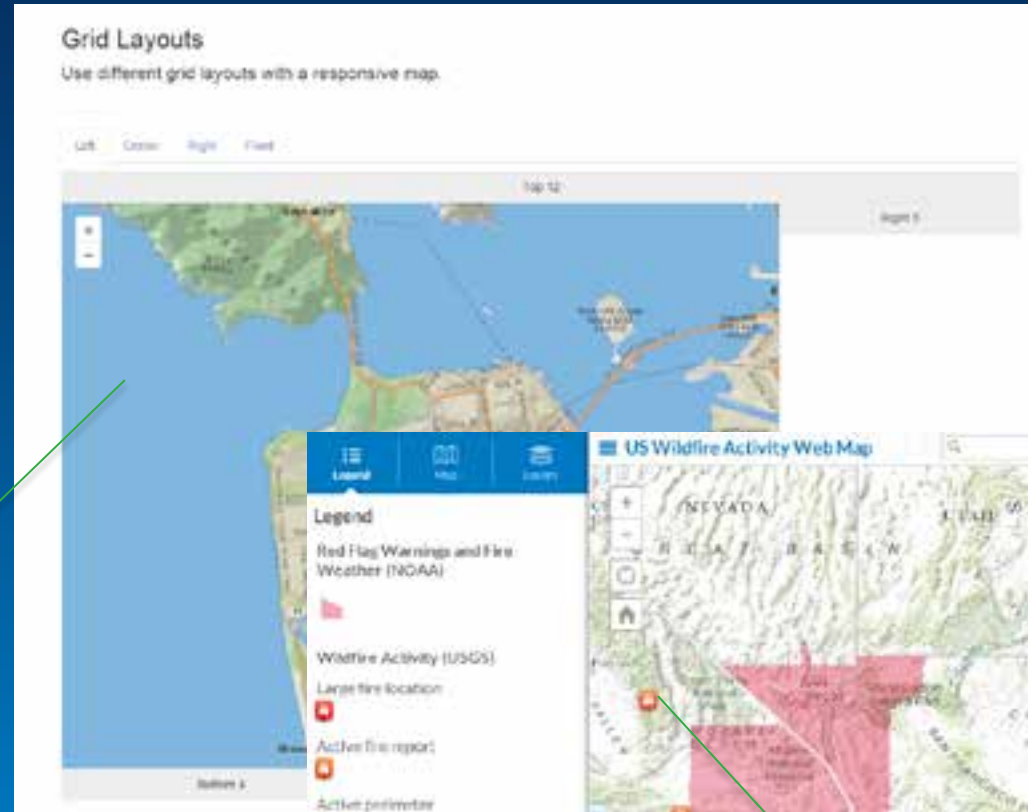




Considerations

- Full Screen?
 - Pros
 - Can be embedded
 - More space to interact
 - Cons
 - No scroll
 - Requires different approach

Not Full Screen



Responsive Navigation

- [Mediaqueri.es](#)
- [Slide Drawer](#)
- [Toggle / slide down Menu](#)
- [Select Menu](#)
- [Footer anchor](#)
- [PIM Template](#)

Responsive Tips



Viewport

```
<meta name="viewport" content="width=device-width, initial-scale=1">
```



Web App Capable

- // Safari iOS – apps only
- `<meta name="apple-mobile-web-app-capable" content="yes">`
- // Chrome for Android - NEW!
- `<meta name="mobile-web-app-capable" content="yes">`



Finger Targets



Lend a hand to IE

- `<!--[if lt IE 9]><script type="text/javascript" src="js/respond.min.js"></script><![endif]-->`
- <https://github.com/scottjehl/Respond>



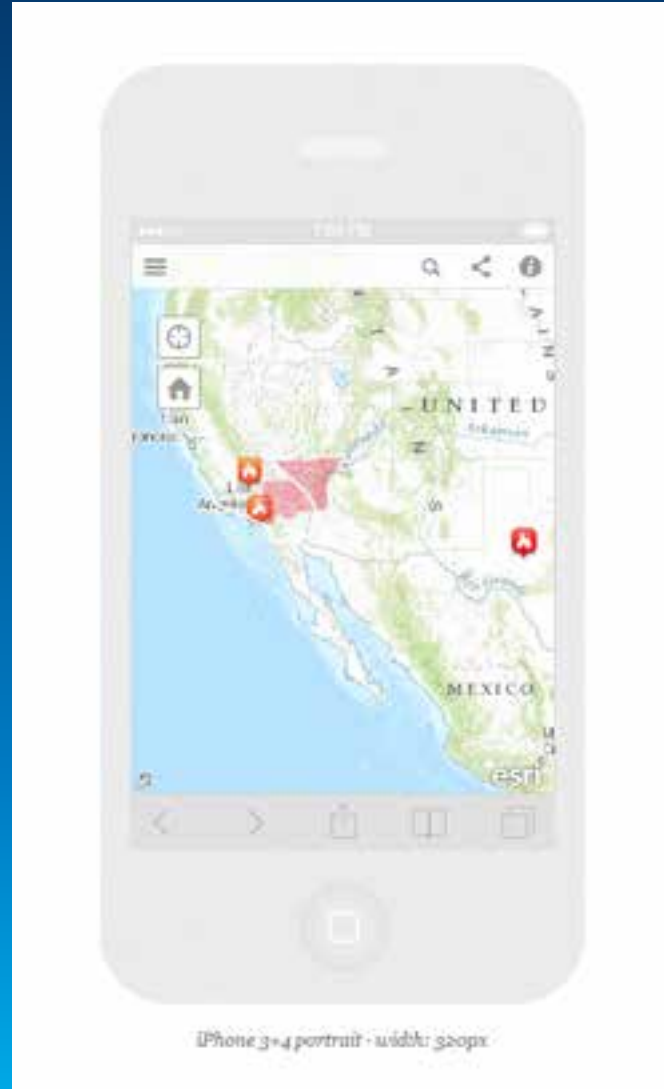
Make sure your assets **Scale**

- Icon Fonts
- SVG
- Responsive image techniques



Responsinator

www.responsinator.com/?url=



github.com/esri/responsive-map-js

Developing Responsive Mapping Apps - II

Web Frameworks



Responsive Web Frameworks

Standardized set of HTML, CSS and JS

- **Bootstrap 3**
- **Foundation 3**
- **HTML5**
- **Skeleton**
- **YAML 4**

Fonts, images, media queries, components...

www.getbootstrap.com

“mobile first”

Bootstrap-map-js

ArcGIS JavaScript in a responsive web framework

- Bootstrap ver 3 framework
- Responsive map
- Resize and re-center
- Pop-ups, widgets
- Touch
- CSS Styles



Bootstrap-map Example

```
<div class="container">
  <div id="mapDiv"></div>
</div>
...
<script>
  <!-- Load Bootstrap Map - responsive map -->
  require([ "esri/map",
            ".../src/js/bootstrapmap.js",
            "dojo/domReady!" ],
    function(Map, BootstrapMap) {
      <!-- Get a reference to the ArcGIS Map -->
      var map = BootstrapMap.create("mapDiv", {
        basemap:"national-geographic",
        center:[-122.45,37.77],
        zoom:12
      });
    });
</script>
```

Responsive Mapping Tips

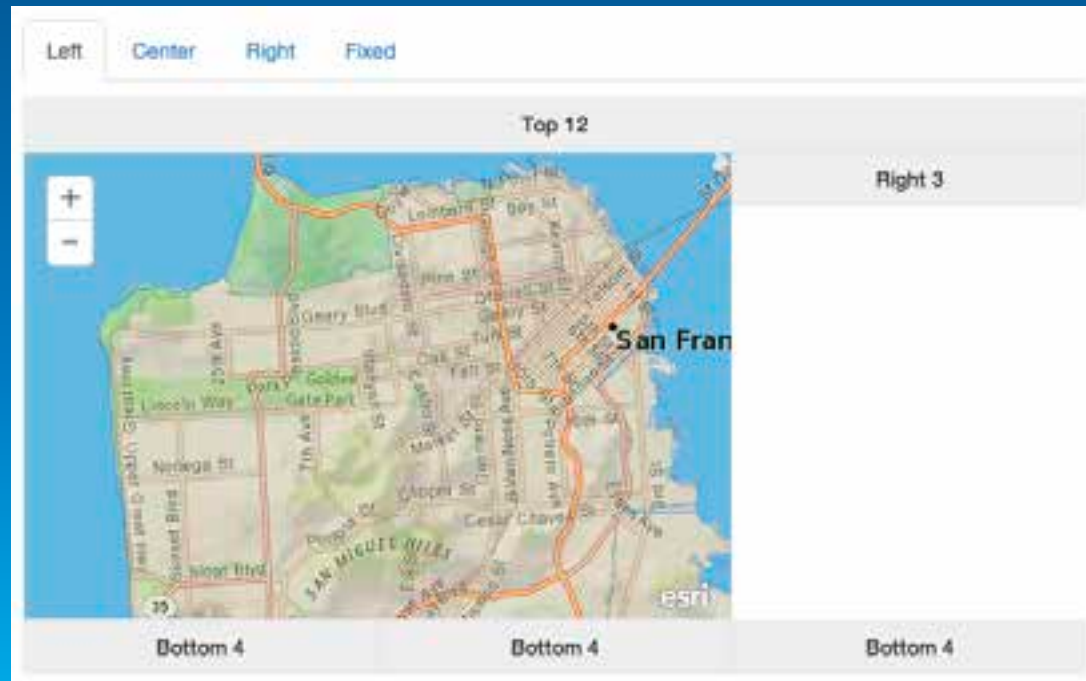
Responsive grid styling

CSS to define row and column behavior

Row 1: col-lg-12 = 100%

Row 2: col-lg-9 = 75% + col-lg-3 = 25%

Row 3: col-xs-4 + col-xs-4 + col-xs-4 = 100%



Auto map re-centering

Maintain the geographic center

```
var recenter = function(extent, width, height) {
    this._map.__resizeCenter = this._map.extent.getCenter();
    var timer = function() {
        this._map.centerAt(this._map.__resizeCenter);
    }
    setTimeout(lang.hitch(this, timer), this._delay);
}

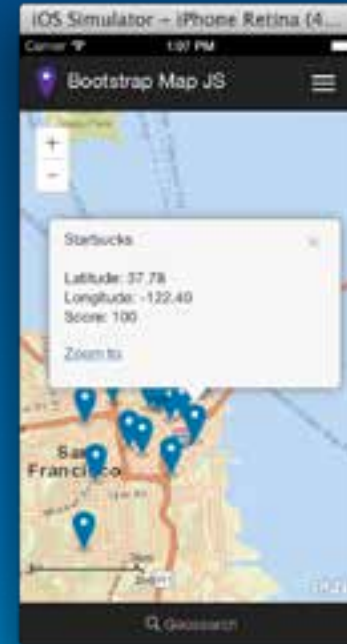
on(window, "resize", lang.hitch(this, recenter));
```

Responsive popups

Full-view position and fast touch

```
// Smart-center popup
var updatePopup = function(obj) {
    var infoW = obj._map.infoWindow;
    updateTitle(infoW);
    obj._repositionInfoWin(infoW.features[0]);
}

on(this._map.graphics, "click", lang.hitch(this,
    function(){
        updatePopup(this);
    }));
```



Tip: Listen for onTouchStart and onClick

Page scroll without panning

Separate page and map navigation

```
// Set touch behavior
createMap: function() {
    var options = {smartNavigation:false});
    var map = new Map(mapDiv,options);
    map.on('load', this.setTouchBehavior);
    return map;
},

setTouchBehavior: function() {
    this.disableScrollWheelZoom();
},
```


Responsive map auto-resizing

Scale to all devices and windows

```
// Responsive resize
var resizeWin function() {
    var w = window.innerWidth;
    if (w != this._w) {
        this._w = w;
        var b = document.body.clientHeight;
        var mh = this._mapDiv.clientHeight;
        var ms = this._calcSpace(this._mapDiv);
        var mh1 = mh - ms;
        var room = w - b;
        var mh2 = room + mh1;
        style.set(this._mapDivId, {"height": mh2+"px"});
    }
}

on(window, "resize", lang.hitch(this, resizeWin));
```

github.com/esri/bootstrap-map-js

ami.responsive.is

Final Notes

- Design for mobile first
- Write code once
- Write code “responsively”
- Use frameworks
- Use online tools to test



Small responsive enhancements go a long way...



Understanding our world.