Using Modern GIS to Support Interagency Fuels Treatment Decisions
Create a Responsive Decision Support System

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IBM

Applications

Description

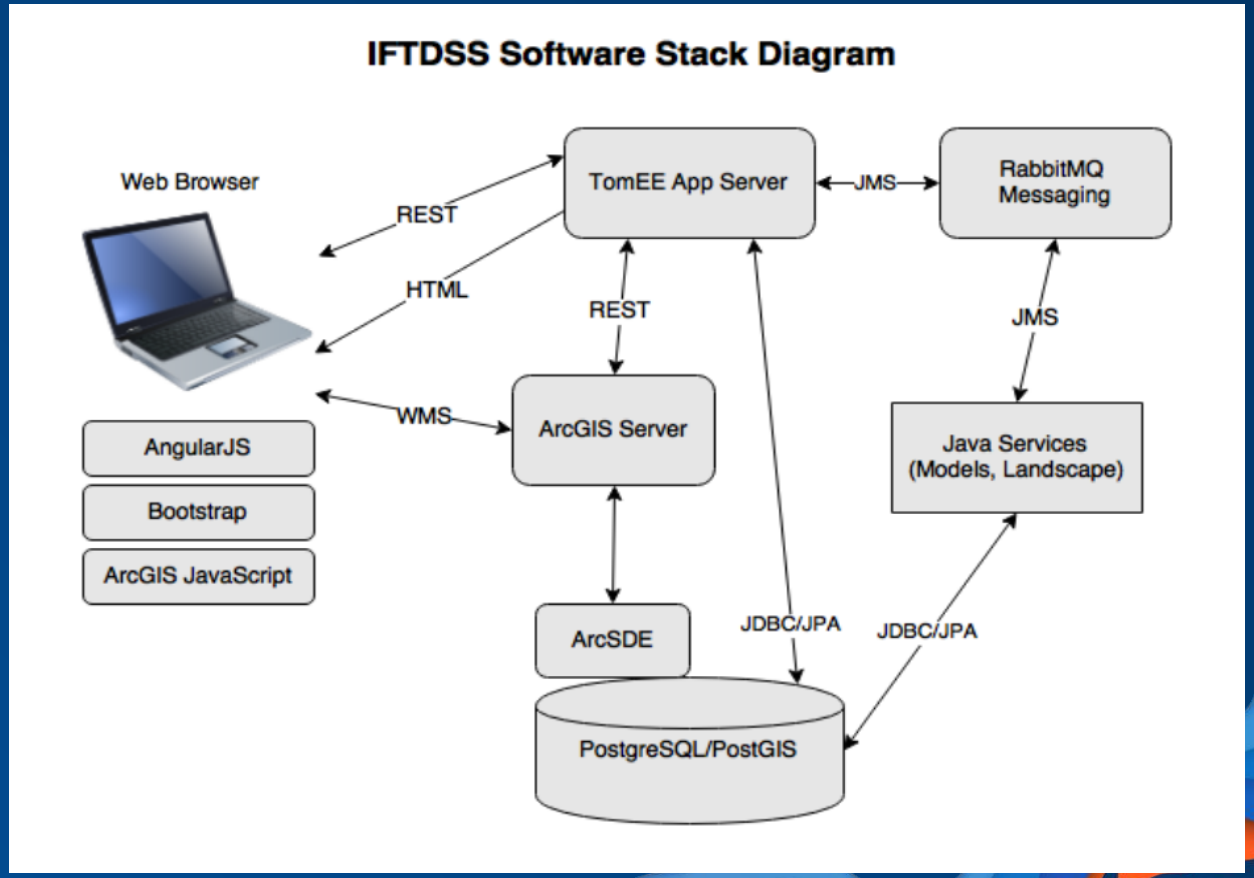
- IFTDSS
  - Interagency Fuels Treatment Decision Support System
  - Web app to plan mechanical treatments and prescribed burns
- FTEM
  - Fuels Treatment Effectiveness Monitoring
  - Mandatory app to report whether fuels treatment affected fire behavior
- MapStudio
  - GIS Mapping Application integrated in both IFTDSS and FTEM

IBM Value-Add

Firenet Platform

MapStudio | IFTDSS | FTEM | Model REST Services

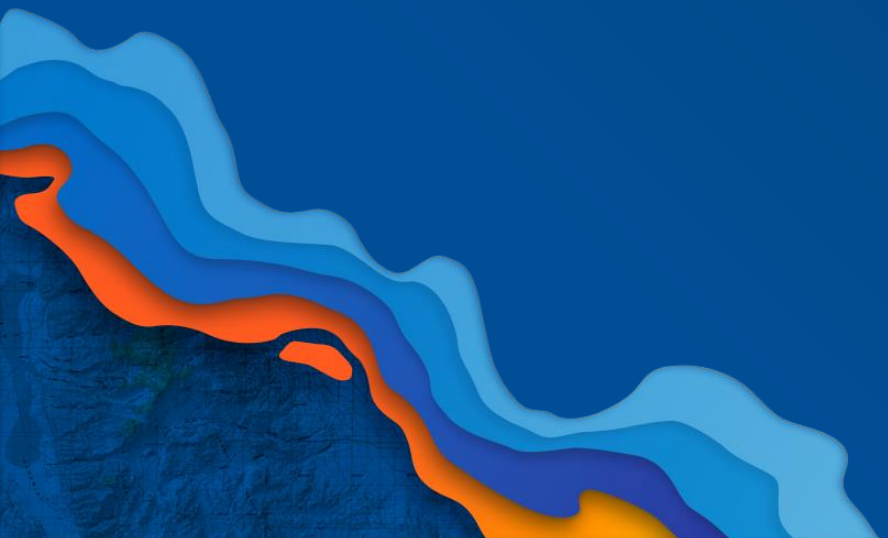
- Split-Map
- Managing Landscapes
- Fire Behavior Modeling
- Distributed Async Services
- Reports with rich content
- Experienced fire app team
- GeoChatBot integrating Watson



MapStudio

Why Web App Builder?

- Build initial app in a short period of time
- Many templates available out of the box
- Host the app on our own web server
- Extend the app by adding custom widgets and themes
- Configure application and widgets using json files



Integrate with Angular

- MapStudio - created initially using Web App Builder
- IFTDSS Main App - Angular application

app.js

```
.when("/iftdssDataStudio/", {templateUrl: "/pages/mapstudio/mapStudioMain.html",
    resolve: {breadcrumbData:
        function(breadcrumbResource)  {
            breadcrumbResource.removeSubtopic();
            breadcrumbResource.removeGuidance();
            breadcrumbResource.setLeafView("Map Studio", "#");
        }
    }
})
.when("/iftdssDataStudio/:params*",  { templateUrl: "/pages/mapstudio/mapStudioMain.html" })
```

mapStudioController.js

```
mainApp.controller("mapStudioController", ['$rootScope', '$scope', '$location', mapStudioController])

function mapStudioController($rootScope, $scope, $location)
{
```

Integrating with Angular

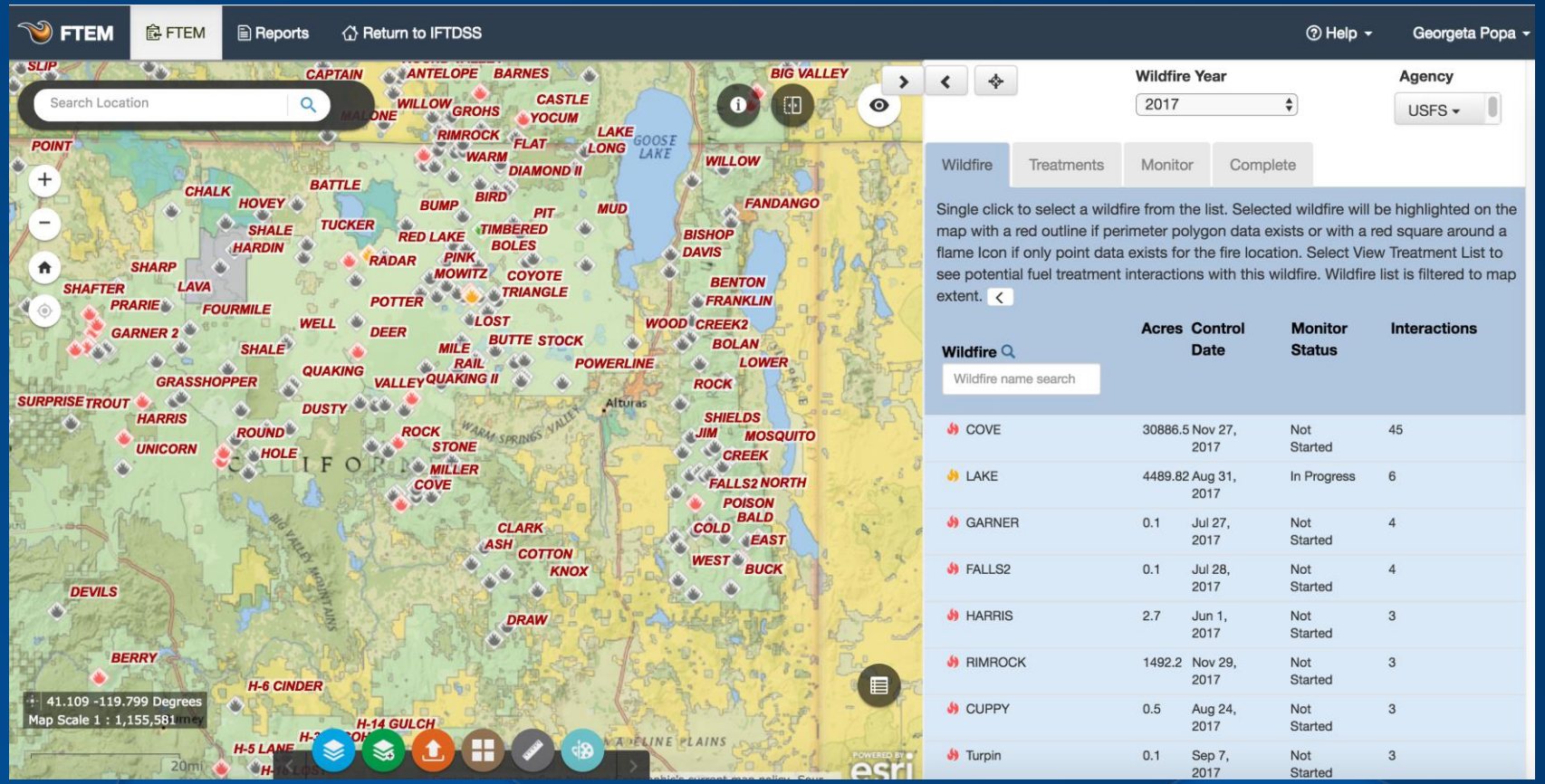
Using a messaging framework

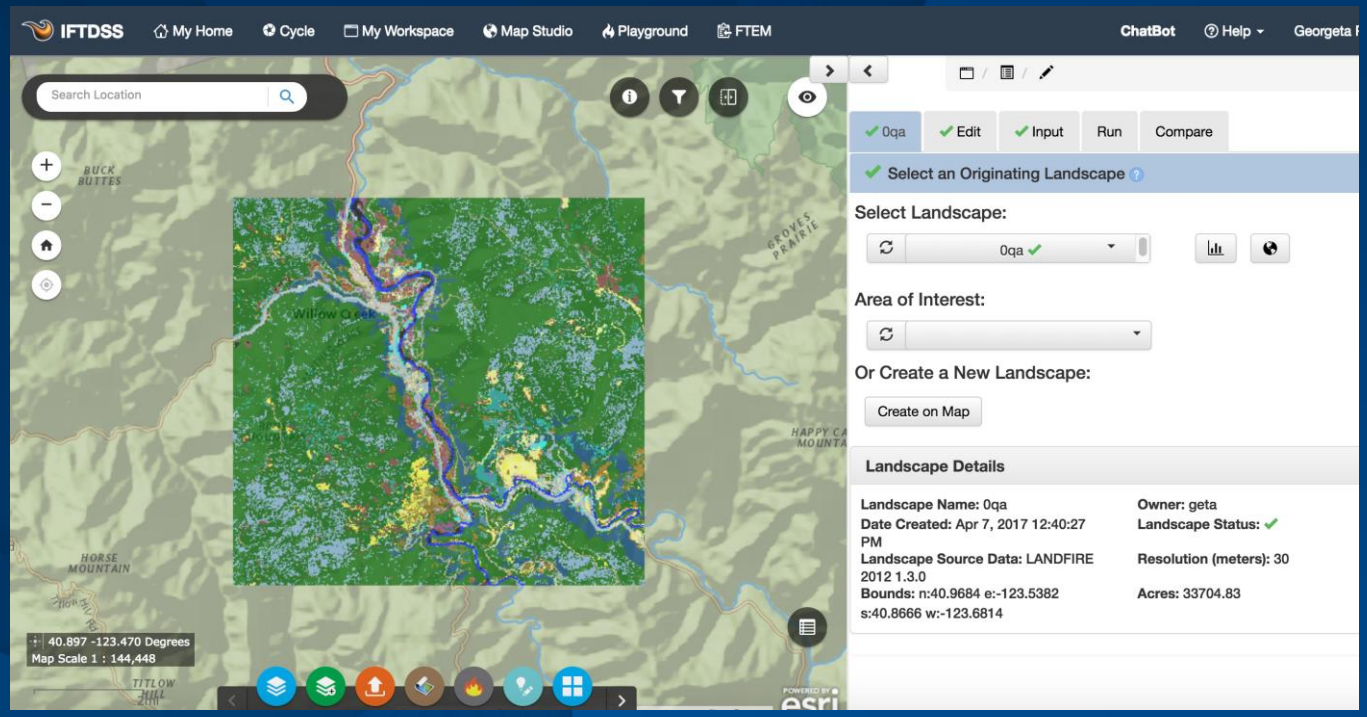
- Listen to messages
- Broadcast messages
- Web sockets

```
ftemApp.factory('mapStudioMessages', function($window, $rootScope, $route) {
    var listenerLoaded = false;
    function subsFunc() {
        if (!listenerLoaded){
            $window.addEventListener('message', function(e) {
                if (e.data && typeof(e.data) == "string") {
                    var extentMsg = e.data;
                    var extentMsgStart = "extent-changed=";
                    if (extentMsg.startsWith(extentMsgStart)) {
                        var extentJsonStr = extentMsg.substr(extentMsgStart.length);
                        var extentObj = JSON.parse(extentJsonStr);
                        $rootScope.$broadcast('map-extent-changed', extentObj);
                    }
                    var removeInteractionStart = "remove-interaction=";
                    if (extentMsg.startsWith(removeInteractionStart)) {
                        var treatmentId = extentMsg.substr(removeInteractionStart.length);
                        $rootScope.$broadcast('map-remove-interaction', treatmentId);
                    }
                    var addInteractionStart = "add-interaction=";
                    if (extentMsg.startsWith(addInteractionStart)) {
                        var treatmentId = extentMsg.substr(addInteractionStart.length);
                        $rootScope.$broadcast('map-add-interaction', treatmentId);
                    }
                    var highlightInteractionStart = "highlight-interaction=";
                    if (extentMsg.startsWith(highlightInteractionStart)) {
                        var treatmentId = extentMsg.substr(highlightInteractionStart.length);
                        $rootScope.$broadcast('map-highlight-interaction', treatmentId);
                    }
                    if (extentMsg.startsWith("mouse-clicked-on-map")) {
                        $rootScope.$broadcast('user-mouse-clicked');
```

Value Added - Split Mode

- two ways communication
- configurable
- responsive



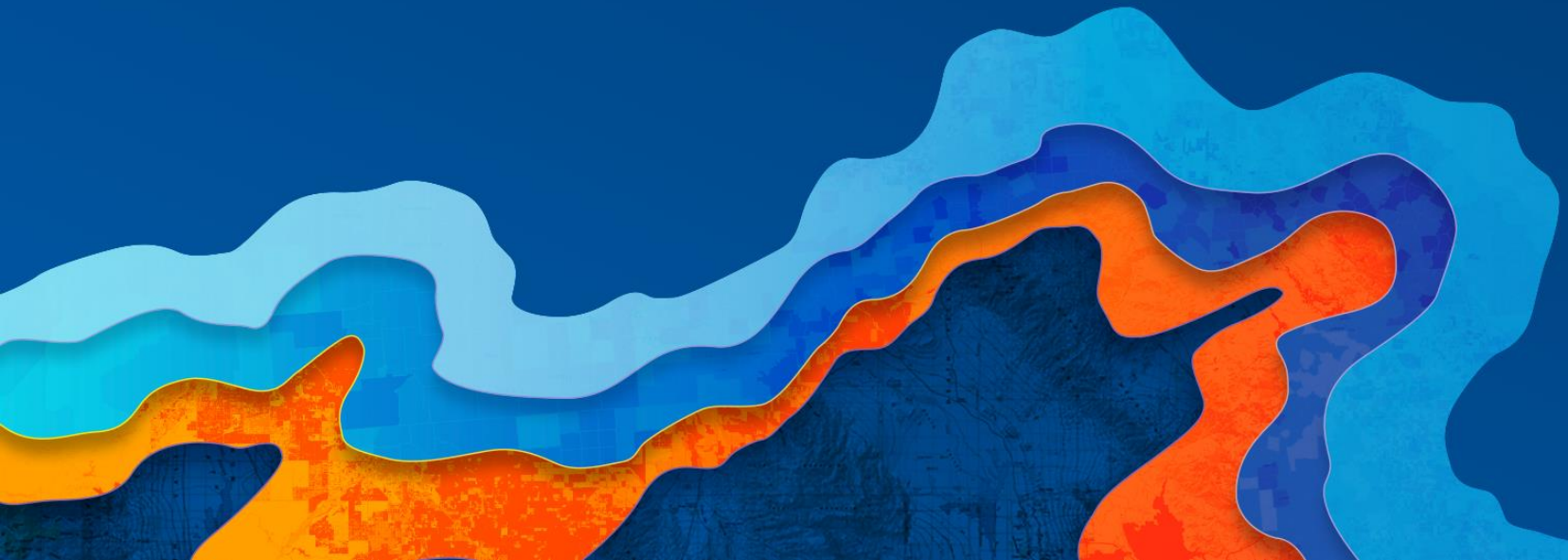


DEMO
Map Studio

Integration with Angular/Split mode

Custom Widgets

IFTDSS/FTEM

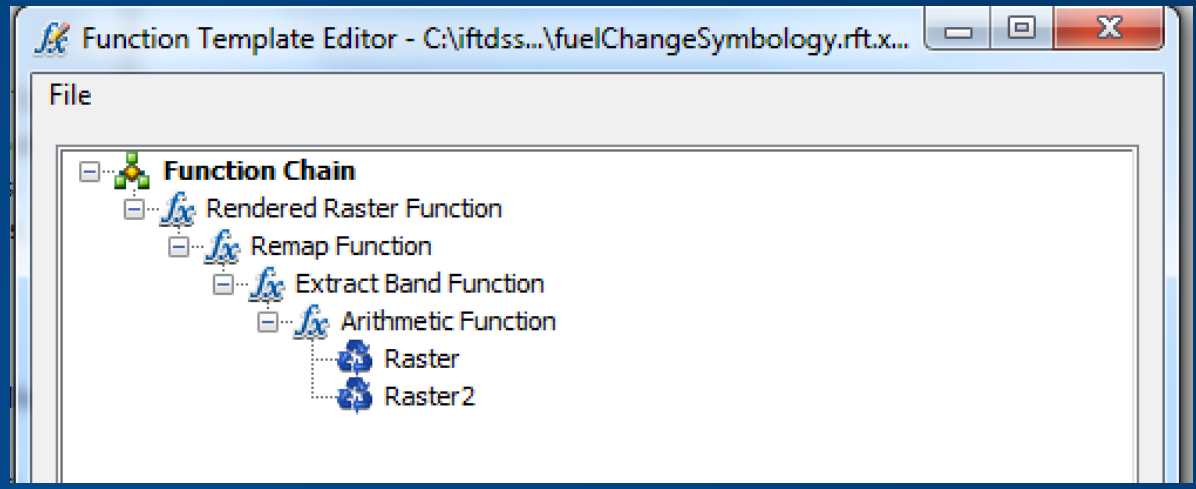


Widgets Working with Rasters

Using Image Service

- Data Used
  - Mosaic Raster Dataset
- Services Used
  - ArcGIS Server Image Services
    - live data turned on
  - Geoprocessing Services
    - adding raster to mosaic dataset
    - getting raster id from mosaic dataset
- Rendering
  - Using Raster Function Templates

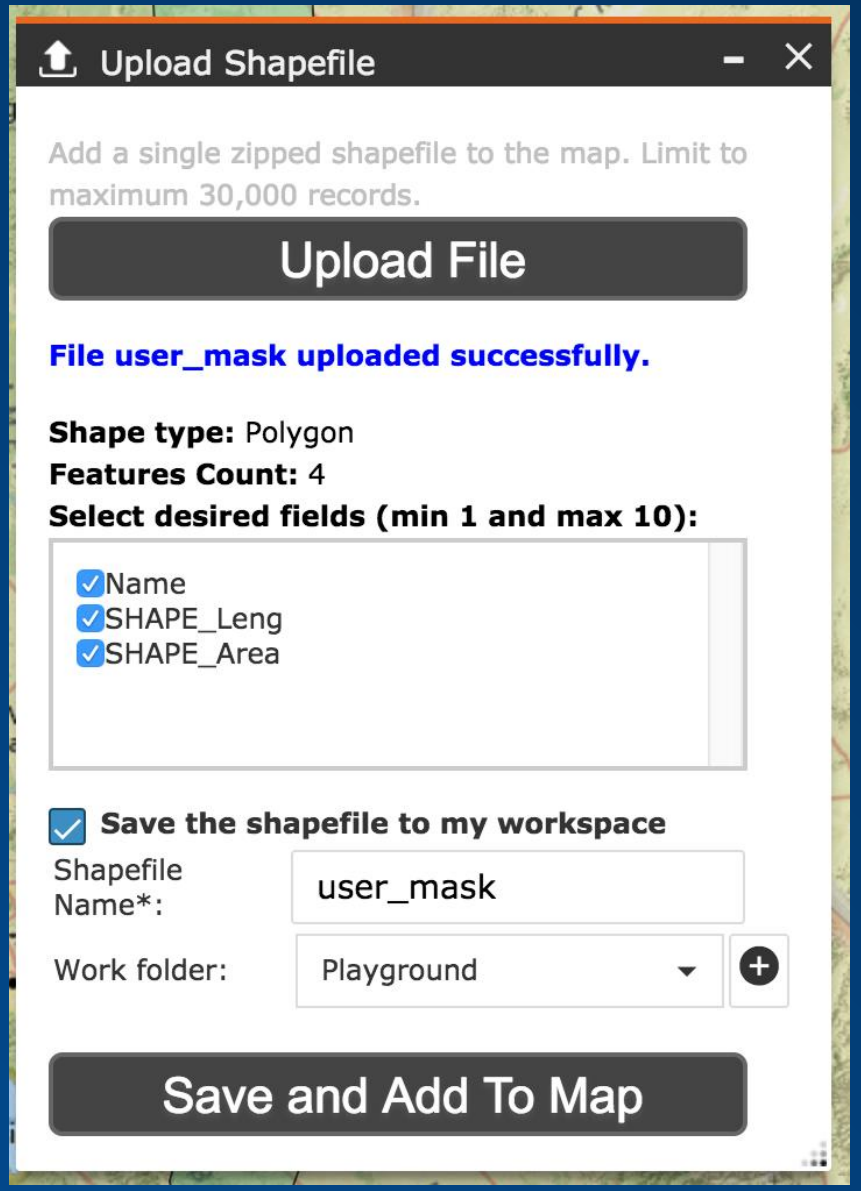
```
var mr = new esri.layers.MosaicRule();
mr.method = esri.layers.MosaicRule.METHOD_LOCKRASTER;
mr.lockRasterIds = [rasterId];

var params1 = new ImageServiceParameters();
params1.noData = -9999;
var rasterFunction1 = new esri.layers.RasterFunction();
rasterFunction1.functionName = "elevationSymbologyComposite";
params1.renderingRule = rasterFunction1;
params1.mosaicRule = mr;
var imageServiceLayer1 = new ArcGISImageServiceLayer(imageService, {
  imageServiceParameters: params1,
  opacity: 0.7,
  visible: false
});
imageServiceLayer1.title = "Elevation (feet)";
```



Widget to Upload Shapefiles

Using Dynamic Feature Service

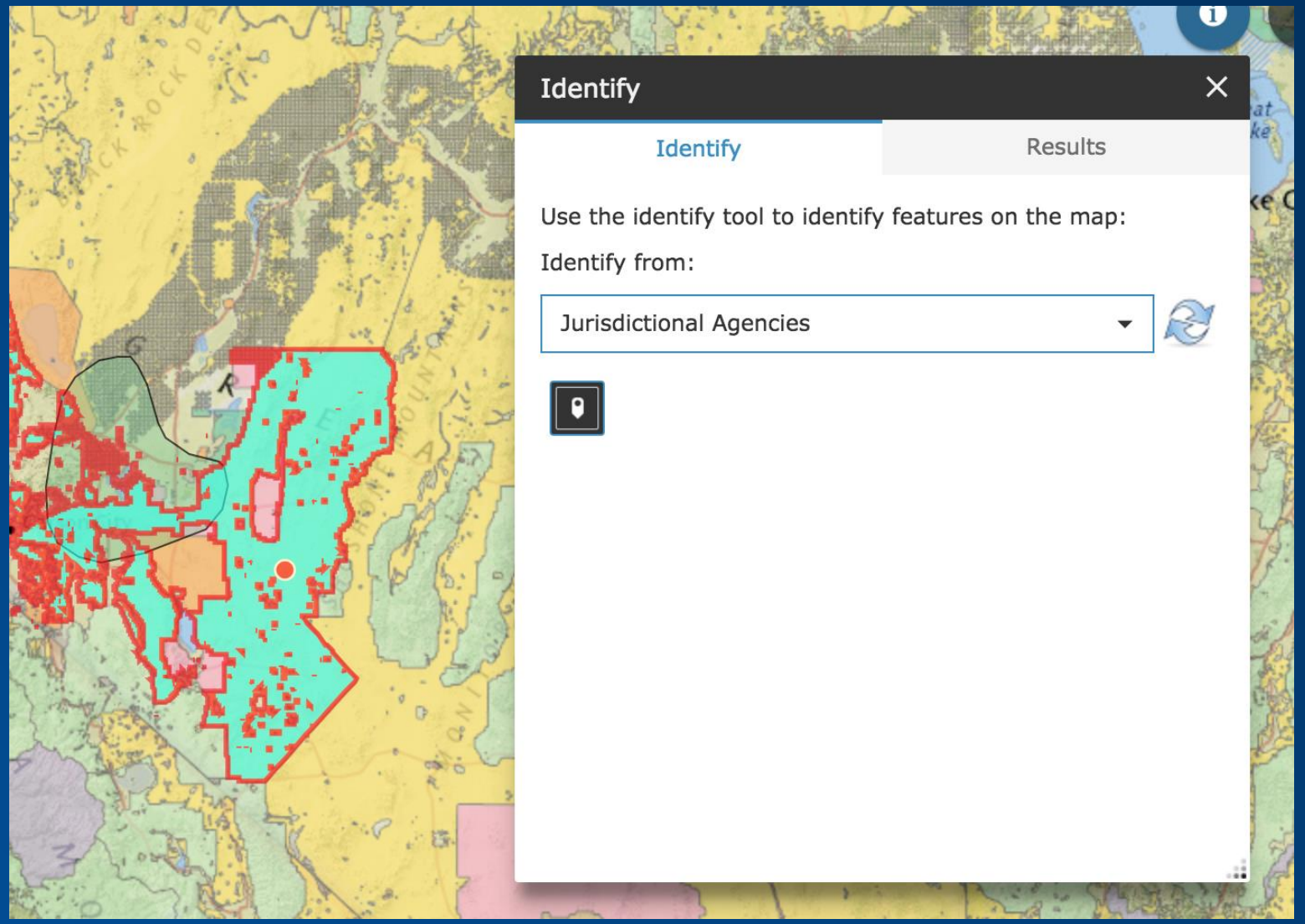
- Data Used
  - Dynamic Feature Service
- Services Used
  - Dynamic Feature Service
    - using dynamic workspaces
  - Geoprocessing Services
    - custom geoprocessing services

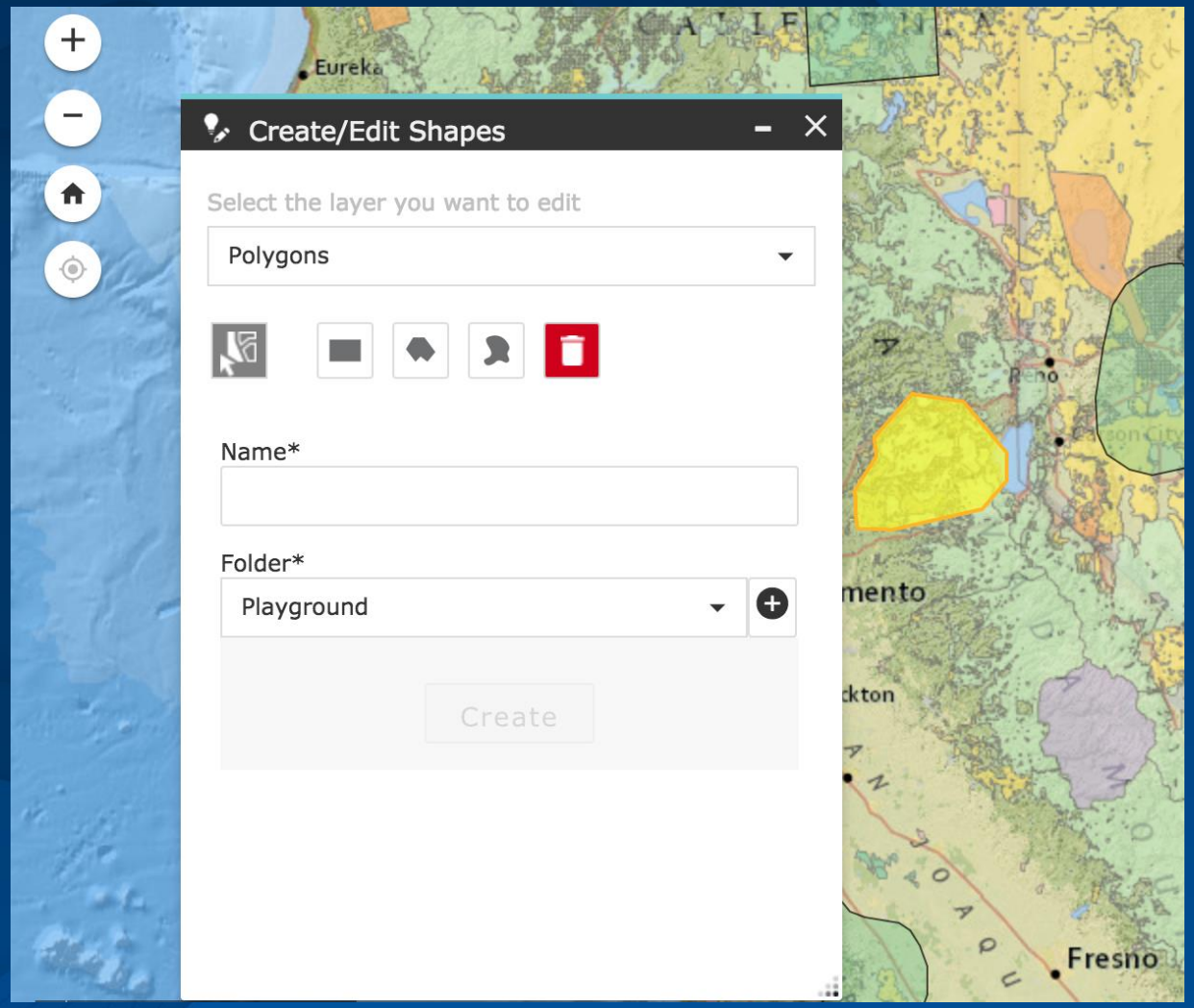


Identify Widget

Identify various type of data

- Data supported
  - Feature Layers
  - Tiled Layers
  - Image Services
  - Map Services

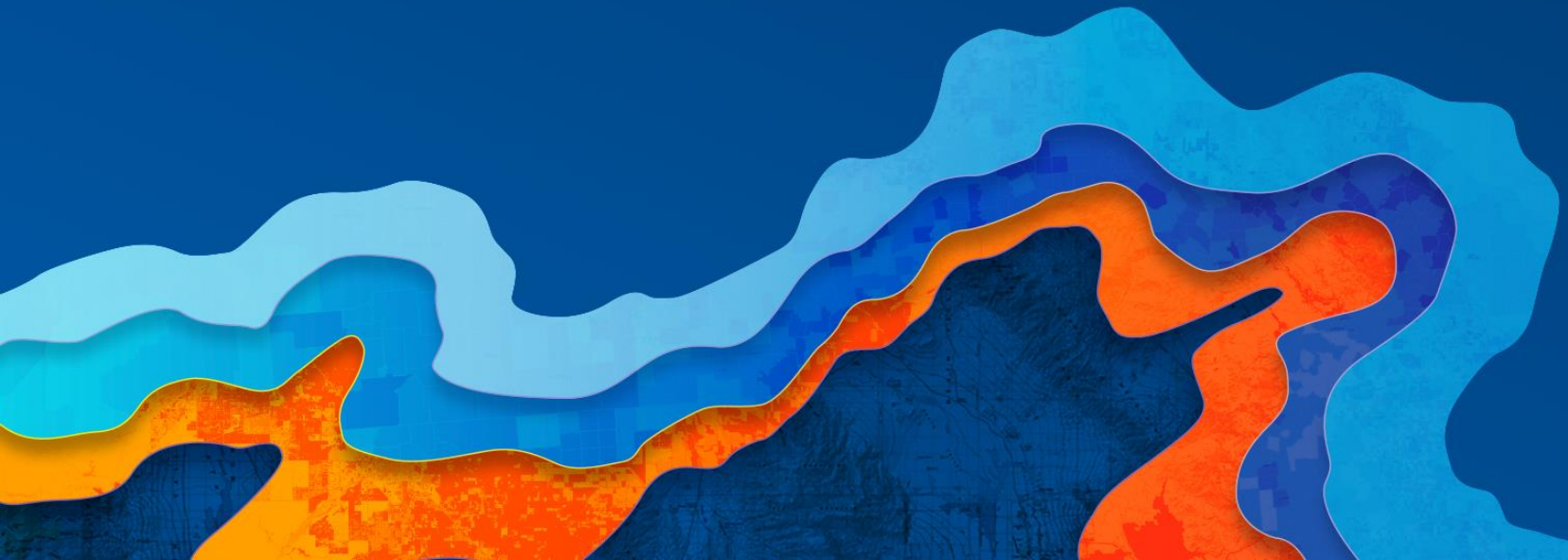




DEMO
Custom Widgets

Watson Geospatial Chat Bot

IBM Watson natural language processing services



IBM

IBM Watson

Build cognitive apps that help enhance, scale, and accelerate human expertise.

Discovery

Add a cognitive search and content analytics engine to applications.

Lite IBM

Knowledge Catalog

Discover, catalog, and securely share enterprise data.

Lite IBM

Knowledge Studio

Build custom models to teach Watson the language of your domain.

IBM

Language Translator

Translate text from one language to another for specific domains.

Lite IBM

Machine Learning

IBM Watson Machine Learning - make smarter decisions, solve tough problem

Lite IBM

Natural Language Classifier

Natural Language Classifier performs natural language classification on ques

IBM

Natural Language Understanding

Analyze text to extract meta-data from content such as concepts, entities,

Lite IBM

Personality Insights

The Watson Personality Insights derives insights from transactional and social

Lite IBM

Speech to Text

Low-latency, streaming transcription

Lite IBM

Text to Speech

Synthesizes natural-sounding speech from text.

Lite IBM

Tone Analyzer

Tone Analyzer uses linguistic analysis to detect three types of tones from

Lite IBM

Visual Recognition

Find meaning in visual content! Analyze images for scenes, objects, faces, and

Lite IBM

Watson Assistant (formerly Conversation)

Add a natural language interface to your application to automate interactions wi

Lite IBM

Watson Studio

Embed AI and machine learning into your business. Create custom models using y

Lite IBM

What is Watson Assistant?

- *IBM Watson Assistant is a fully hosted SaaS application running in IBM Cloud that enables organizations to quickly build bots that can incorporate both short and long tail questions (through Discovery).*

- *With a focus on Customer Care, Watson Assistant makes it easy to get started with prebuilt domain content, out the box channel connectors (e.g. Facebook, Slack) and simple easy to use tooling. Moreover, Watson Assistant comes with built-in integration with github, versioning, and deployment management for enterprise-level DevOps.*

- *Once you're bot is live and you're receiving a sea of conversational interactions, Watson Assistant, leveraging unsupervised machine learning approaches, provides helpful recommendations and assistance on how to improve your bot. Finally, Watson Assistant can also help alleviate time pressures on your Live Agents. Watson can listen to agent interactions with users, provide suggestions, and allow Live Agents to hand off interactions to Bots.*

Watson Assistant

Core New Features

Unified tooling experience

Single experience between WVA and Conversation leveraging prebuilt and custom content. Ability to incorporate buttons, images, videos, pauses etc.

Hosted Application

Built-in session state to track conversational history, out of the box connectors, and leverage serverless IBM Cloud Functions for application logic & 3rd party systems

Discovery Connector

Leverage Connector to easily assemble Knowledge to address both short and long tail questions

Manage Bot Lifecycle

Built-in integration with Github, versioning, and deployment management for enterprise-level DevOps

Improve & Recommendations

Enhanced analytics and recommended insights based on large user activity

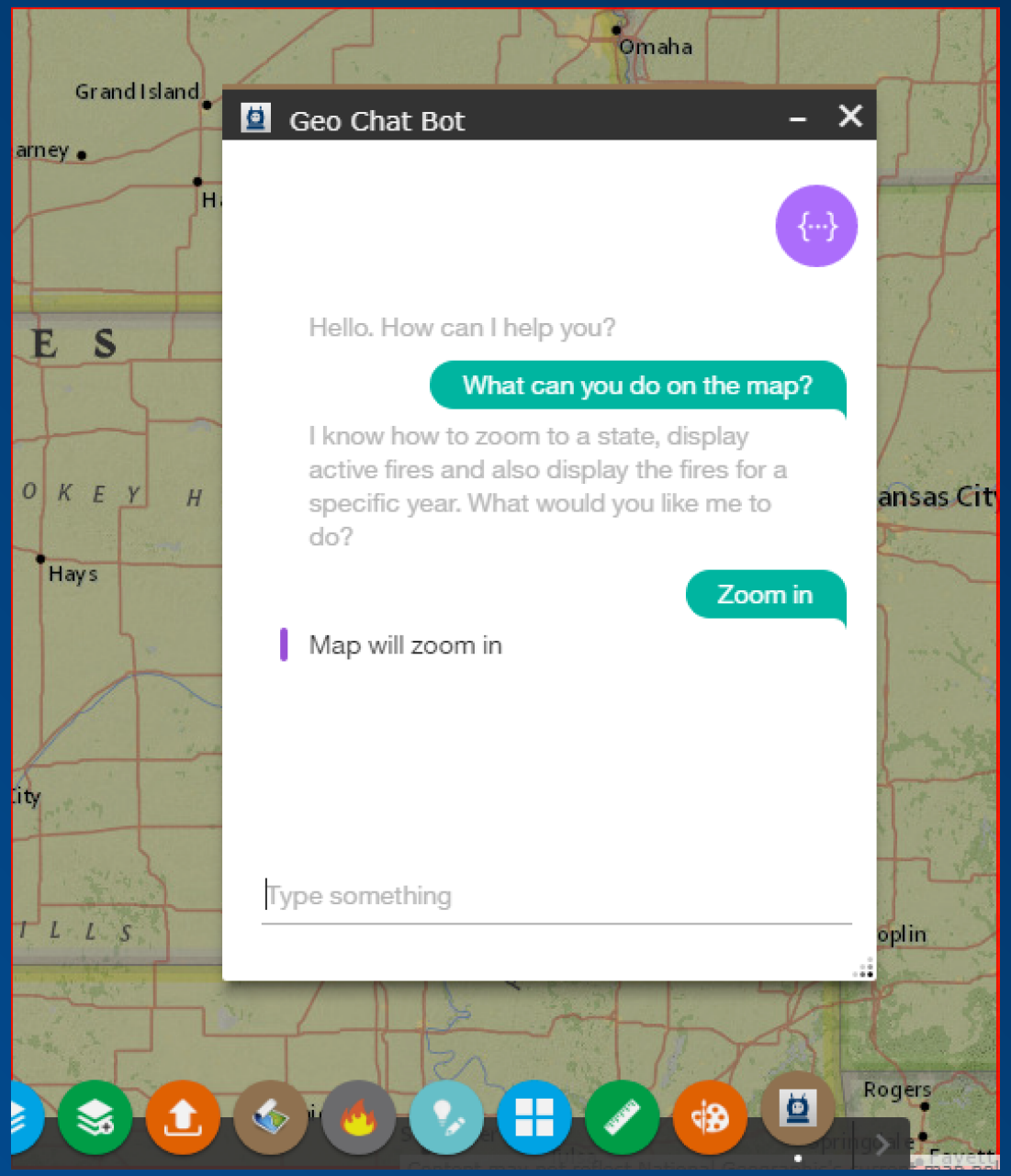
Human Agent Interaction & Learning

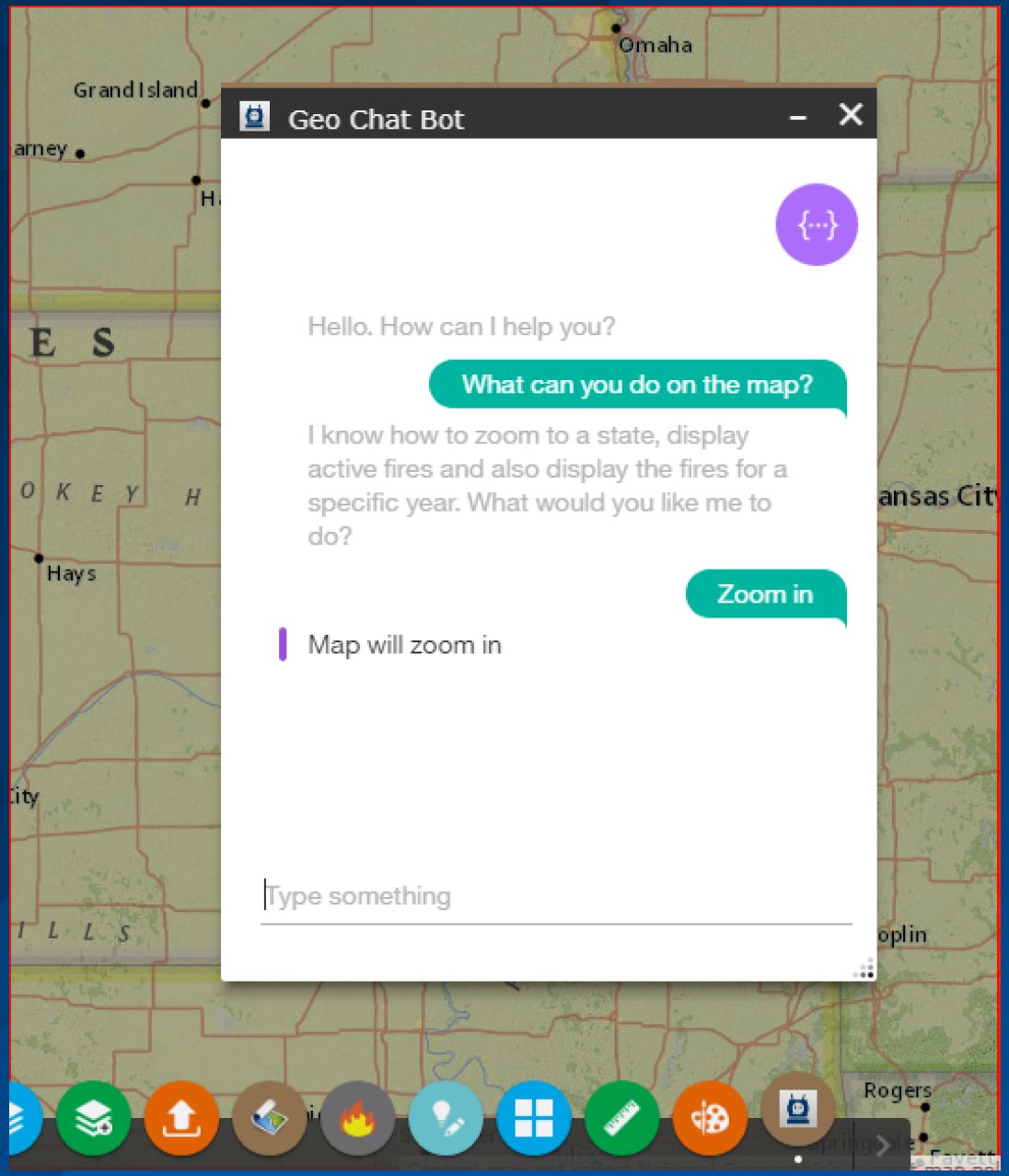
Improve the performance of the system by leveraging Agent activity (e.g. clicks through)

Watson Geospatial Chat Bot

As a Map Studio Widget

- Integrated through a custom widget
- Using Watson Assistant Services
- Hosted on IBM Cloud



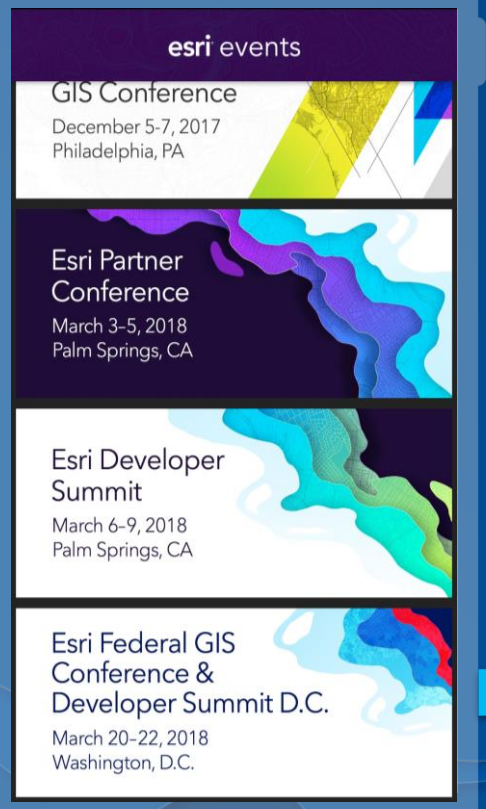


DEMO
Geospatial Chat Bot

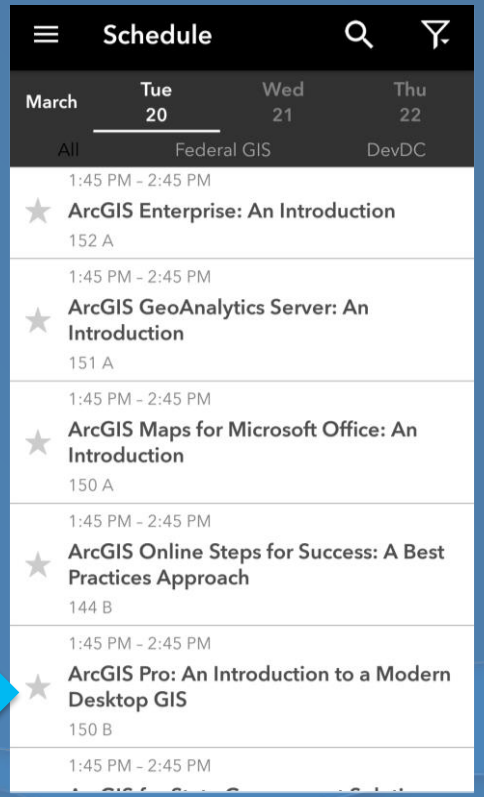
Using Watson

Please Take Our Survey in the Esri Events App

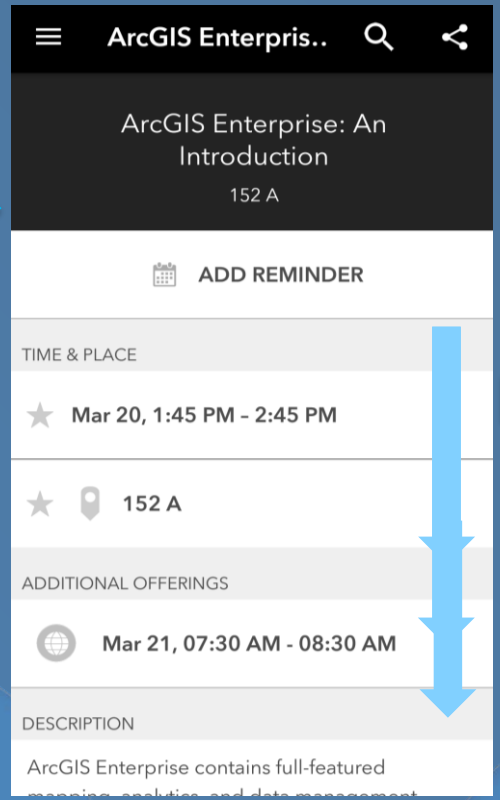
Download the Esri Events app and find your event



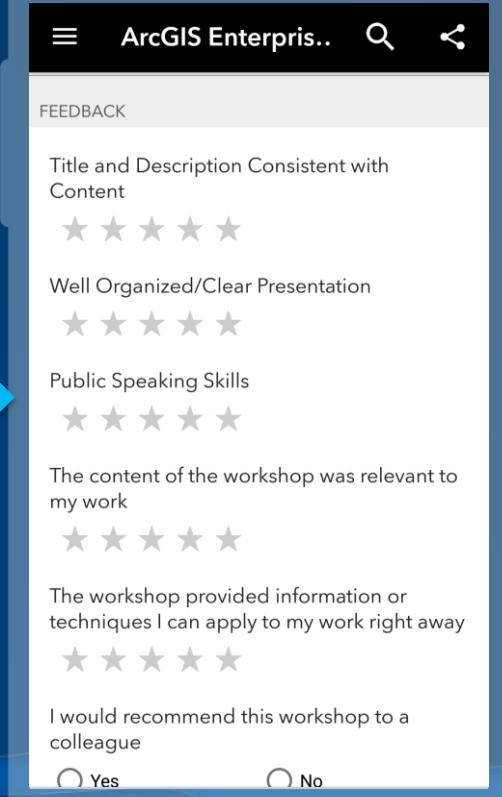
Select the session you attended



Scroll down to find the feedback section



Complete answers and select "Submit"



esri
THE SCIENCE OF WHERE