

BHP

Simplified Prospect Inventory Management Using ESRI Enterprise Platform and FME

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Agenda

- **Business Objectives**
- **Prospect Inventory Management**
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- **Improved Data Entry via Web-based Form**
 - Before & After
 - Simplified data entry web show
- **Solution Architecture**
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 - FME Highlights
 - Enterprise Geodatabase
- **Questions & Answers**

Business Objectives

What are the business drivers to use ESRI's Enterprise Platform?
Easy integration of datasets, and simplified and enhanced data entry

A clean and simple Prospect Inventory serves many purposes:

- Play-based decision making
- Lease Sale Preparation
- High-grading prospects
- Upstream Agreements
- Competitors' Strategic Analysis



Prospect Inventory Management

Problem Statement

First attempt at combining data into a single prospect inventory used software from a third party vendor which included the following challenges:

- Inconsistent support from vendor
- Software incompatible with new computing environment
- Data entry time-consuming
- Tool riddled with bugs

Solution

The data was everywhere! It had to be standardized.

Tabular Data

- Design a clean attribute table and decide on domains.
- Initially Excel worked because it's an amicable format.
- Create a form for geoscientists to complete.

Spatial Data

- Decide on a Windows location for the prospect polygons
- As interpretations are completed, export features from DSG

Join the spatial and attribute data and load into Enterprise GDB

Serve up as an **ESRI Web App**

Result

An intuitive prospect inventory tool that is accessible to the entire team.

Before



AC 192 Hot Potato	2/26/2018 9:48 AM	File folder
AC 195 196 238 239 240 281 282 283 Kor...	12/16/2015 8:57 A...	File folder
AC 195_1 Heaton Hall	4/7/2016 7:33 AM	File folder
AC 200 Bohemia	11/23/2015 2:16 PM	File folder
AC 235 Lassen	10/6/2017 11:18 A...	File folder
AC 239 Red Rover	10/12/2016 3:49 PM	File folder
AC 243 Nuevo Cody	10/12/2016 3:49 PM	File folder
AC 258 Trinity	12/20/2017 12:08 ...	File folder
AC 280 Duck Duck Goose	9/29/2017 10:46 A...	File folder
AC 317 Marianas	3/1/2018 12:52 PM	File folder
AC 323 Double Dutch	9/29/2017 10:52 A...	File folder
AC 326 Shasta	2/6/2018 9:05 AM	File folder
AC 329 King of the Hill	9/28/2017 1:51 PM	File folder

Prospect data kept in directory folders for each Protraction Area

+



GDE, Composite risk segment maps kept in PowerPoint slides

+



Integrated in an MXD. Printed a "War Map" to visualize

Prospect Inventory Management

	BEFORE	NOW	BENEFIT
# of Attributes to Populate	454	47	Easy to use; reduced time to complete from 30+ min to 10min.
Data Entry (Initial Phase)	ArcGIS + Microsoft Access	Internet + Excel	Specialized mapping software no longer needed. Tool accessible to all users with permission.
Software Platform	Leostream	Web browser	Fewer steps & programs needed.

After

BHP GoM and Mexico Prospects

Application Guide and Support

(1 of 1) [Clear](#)

Search Prospects / Leases

BHP LEADS & PROSPECTS Colored by Play: Candy Bars

Internal Prospect Info

Label Name: Candy Bars
 BHP prospect name: Candy Bars
 Internal alt prospect name: Milky Way
 Populated by: M. Cahoj
 Population Date: February 25, 2018
 Interpreter: n/a
 Year of data creation: 2,013
 BHP prospect status: Drilled
 Prospect Origin: External
 \\\americas.ent.bhpbilliton.net\pfs\Ass Exploration\Prospects\GC\GC 36 Candy Bars - Statoil
 O drive location (full file path):
 In-house seismic coverage: Yes
 Seismic comments: Good seismic data quality

GENERAL INFO

Country: USA
 Protection Area: Green Canyon
 Operation Environment: Deep Water
 Drilled: Yes
 Prospect_Results: Dry

BHP PROPRIETARY SCOUT INTEL

External prospect name 1: OUTLAW - BHPB
 External prospect name 1 company: STATOIL

PROSPECT DETAILS:

Play: Miocene
 Reservoir Age: Middle Miocene
 Trap Type: 3-way
 Hydrocarbon Type: Oil
 Water depth (m): 579.10
 Water depth (ft): 1,900.00
 Depth of Crest (mTVD): 5,181.60
 Depth of Crest (ftTVD): 17,000.00
 Spill Point (mTVD): 6,553.20
 Spill Point (ftTVD): 21,500.00
 Relief (m): 1,371.60
 Relief (ft): 4,500.00
 Area of Closure (km2): 56.28
 Area of Closure (mi2): 21.73
 Prospect Comments: Prospect was drilled by Statoil (OP). Ecopetrol and Samson. It was a 3 way middle and early Miocene prospect. The well T'd'd in the Oligocene and only saw thin wet sands.

VOLUME & RISK:

BHP VRV7:

LABEL_NAME	PROSPECT_NAME	ALT_INTERNAL_N	BHP_PROSPECT	PROSPECT_ORIG_PATH	ANALOGS	BHP_SEISMIC_CC	SEISMIC_VOLUMI	BHP_PROPRIETAF	SEI
Candy Bars	Candy Bars	Milky Way	Drilled	External	\\americas.ent.bhpbilliton.net\pfs\Ass Exploration\Prospect 36 Candy Bars - Statoil	Yes	TGS Constitution	No	Good data
Katmai	Handles Peak		Drilled	External	\\americas.ent.bhpbilliton.net\pfs\Ass Exploration\Prospect 40 Katmai - Noble	Yes	TGS Constitution	No	Fair in TGS c spec
Hurricane	Handles Peak		Drilled	External	\\americas.ent.bhpbilliton.net\pfs\Ass Exploration\Prospect 1010 Handles Peak	Yes	TGS Constitution	No	Fair in TGS c spec

5 features 1 selected

Improved Data Entry via Web-based Form

Problem Statement

Data Entry to the prospect inventory database was cumbersome & prone to errors:

- Have to find latest template on network drive
- Had to combine Excel templates from different Interpreters
- Polygon selection prone to errors
- Pivot & format data until it matched SDE schema
- Hard to trace when and whom
- Time-consuming, so inputs were loaded once a week
- Load data into SDE feature class

Solution

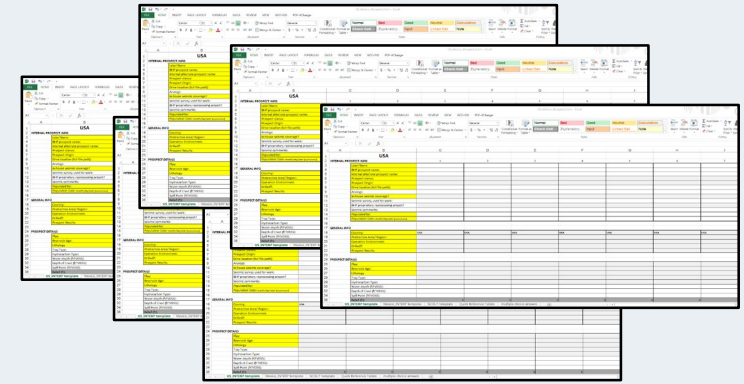
A web-map-centric data entry tool:

- Interpreters see their polygon within minutes / Ability for immediate spatial QC
- Uses the same fields and domains from the Excel template
- More flexibility in the timing of data entry
- User Guide is embedded in the tool

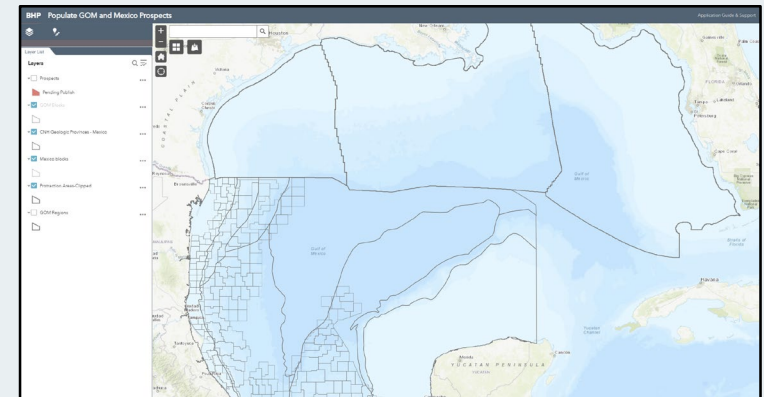
Result

An easy-to-find, simplified, and enhanced data entry process

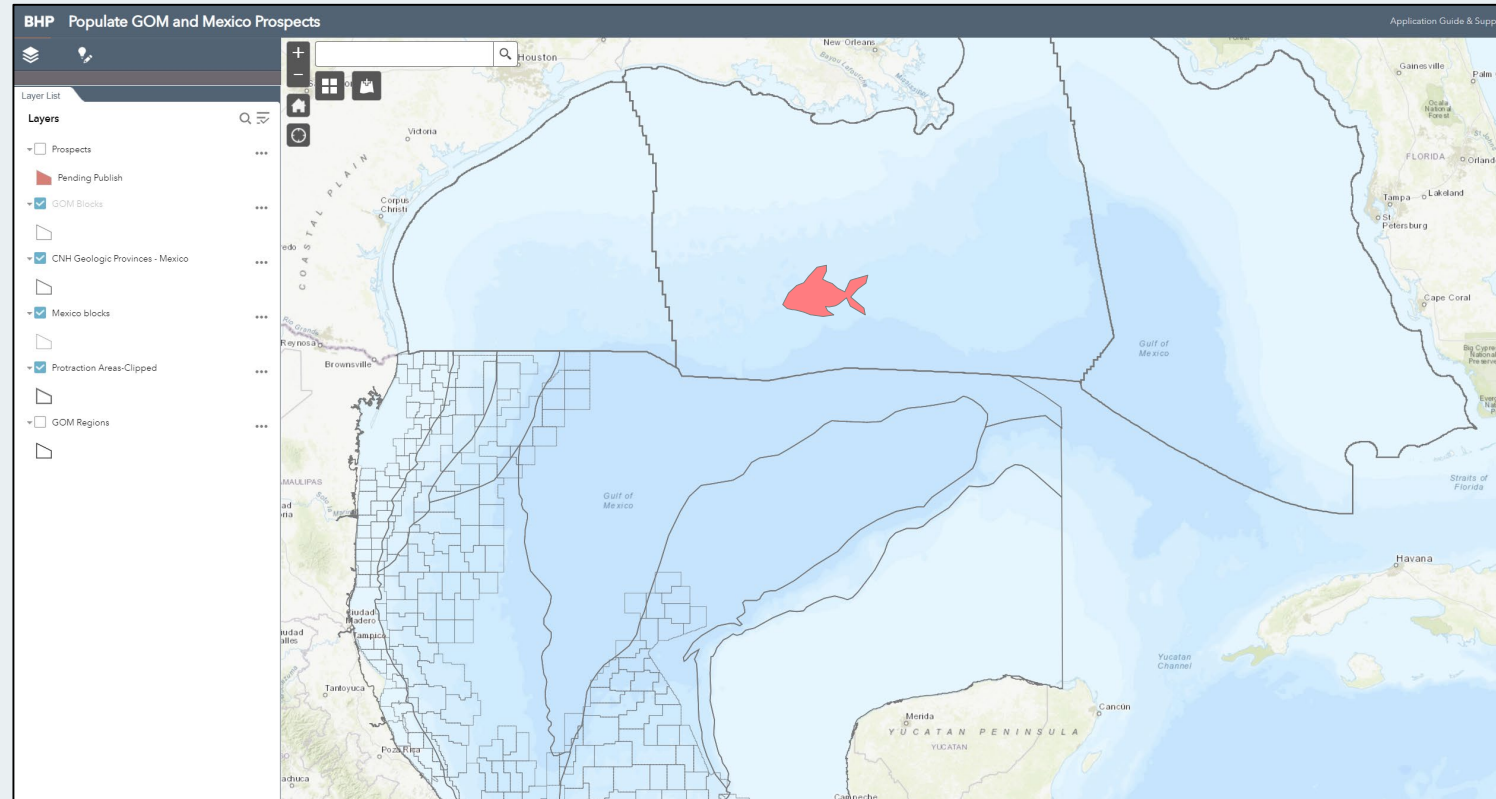
Before



After



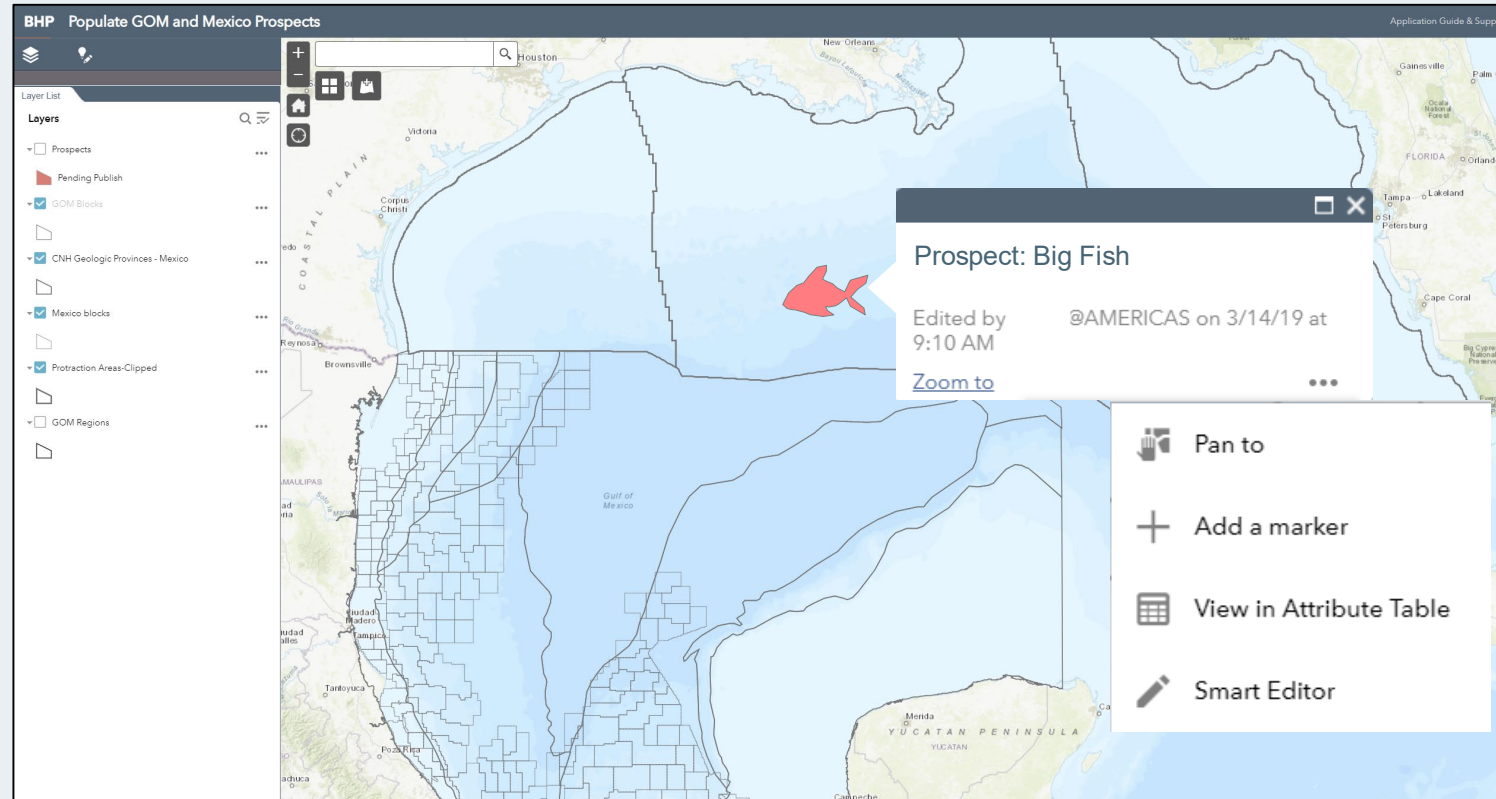
Improved Data Entry via Web-based Form



POPULATE TOOL : Allows Simplified & Enhanced Data Entry

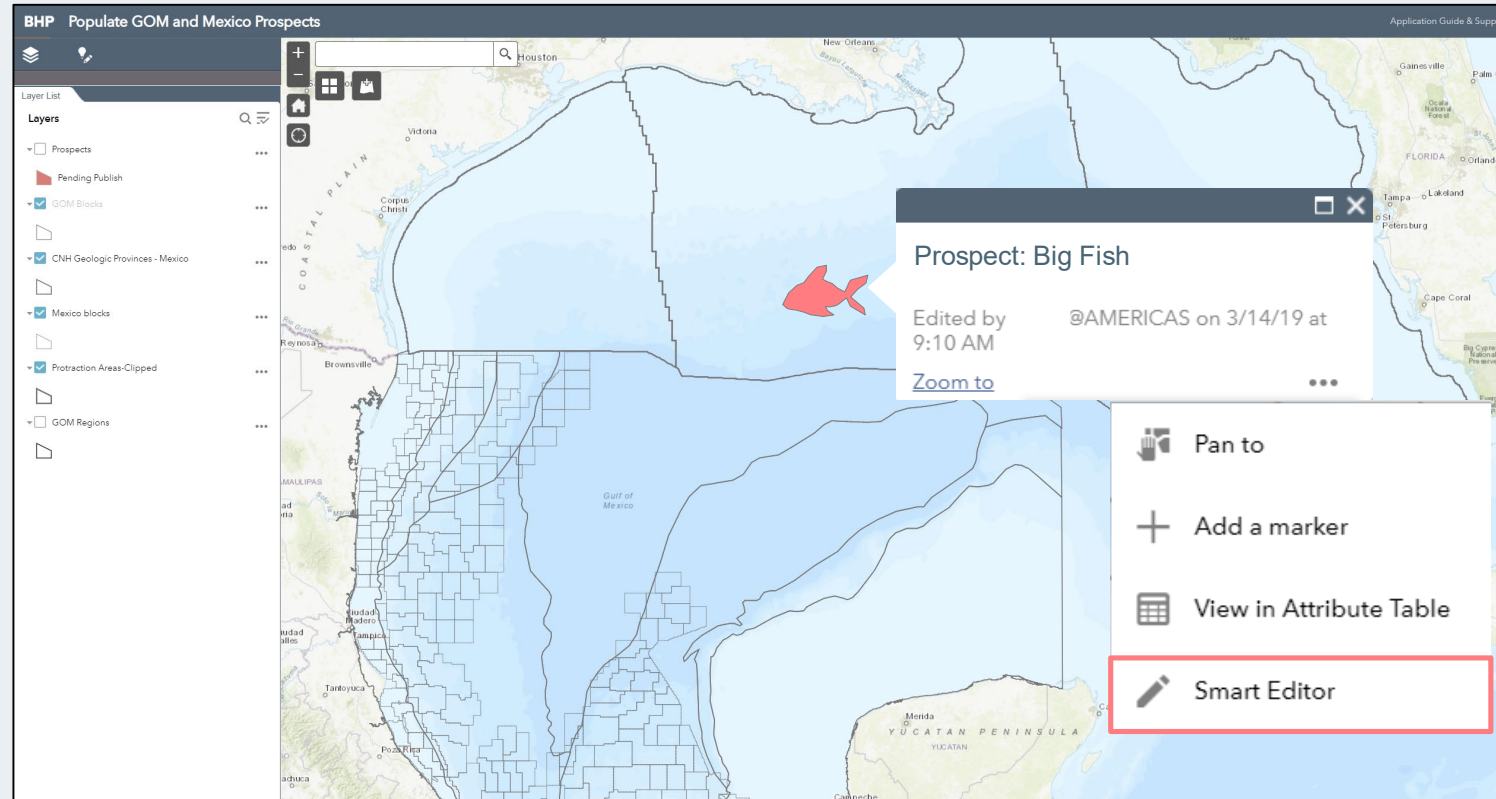
- Once polygon is dropped in a specified folder which scans for new polygons, it automatically gets uploaded to this Populate Tool in a matter of minutes
- Interpreters can spatially QC their prospect before entering associated data

Improved Data Entry via Web-based Form



- Click on the prospect & navigate to the Smart Editor

Improved Data Entry via Web-based Form



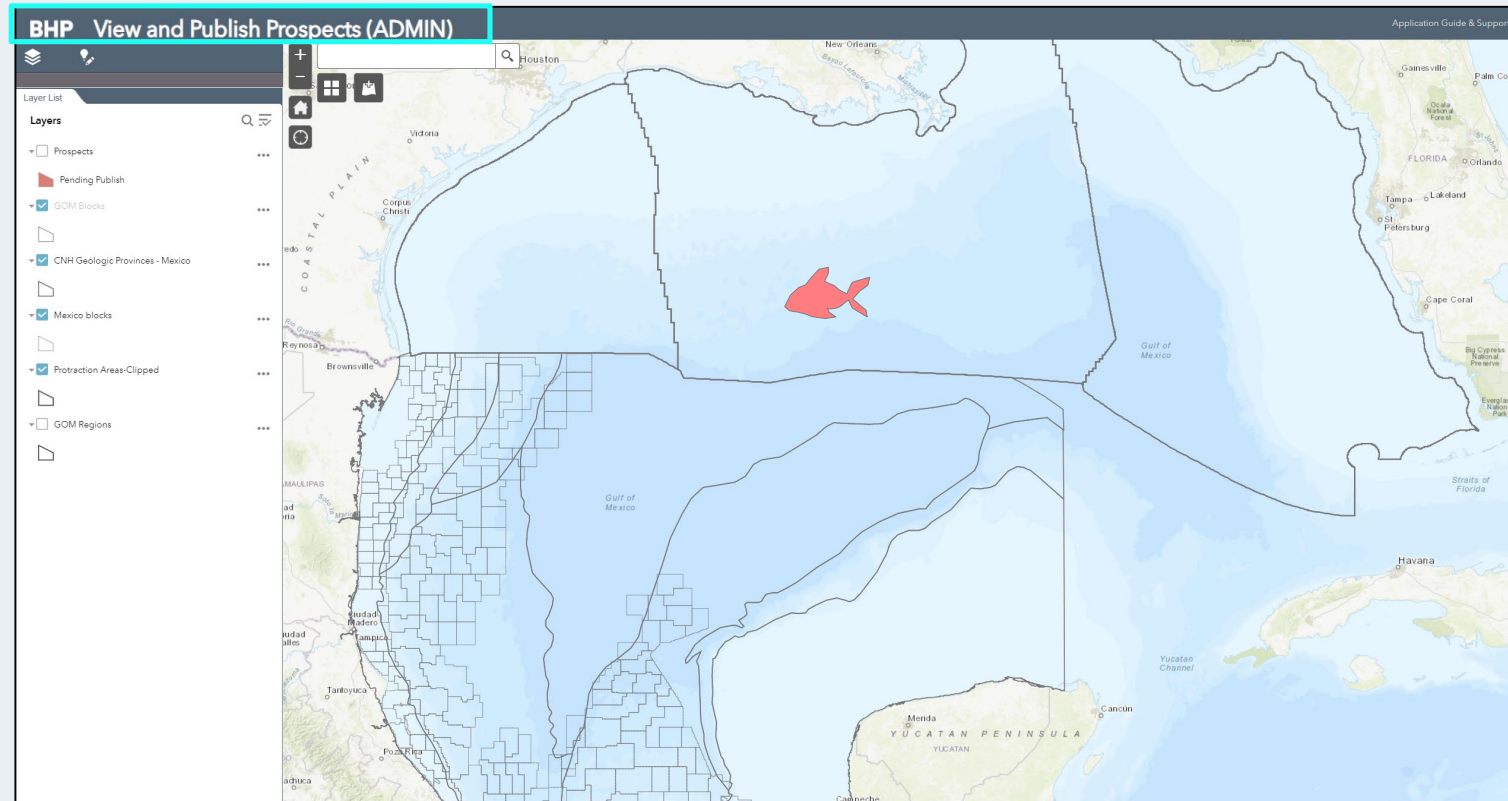
- Click on the prospect & navigate to the Smart Editor

Improved Data Entry via Web-based Form

The screenshot displays a web-based interface for managing prospect data. On the left, a sidebar titled 'Layer List' contains a search bar and a list of attributes for data entry, including 'Prospect status', 'Prospect Origin', 'Drive location (full file path)', 'Analog', 'In-house seismic coverage?', 'Seismic survey used for work', 'BHP proprietary reprocessing project?', 'Seismic comments', 'Country *', and 'Protraction Area/ Region'. The main area shows a map of the Gulf of Mexico with a red fish icon marking a prospect. A pop-up window for 'Prospect: Big Fish' displays 'Edited by @AMERICAS on 3/14/19 at 9:10 AM' and a 'Zoom to' link. A context menu is open over the map, offering options: 'Pan to', 'Add a marker', 'View in Attribute Table', and 'Smart Editor'.

- Same set of attributes and drop-downs as in the Excel template form
- Interpreters can input data at their convenience; can save and pick up where they left off
- If their prospect is “pending”, they will receive an email notification

Improved Data Entry via Web-based Form



PUBLISH TOOL

- A geotech can simply add or “publish” new prospects with a push of a button, instead of going through a number of formatting steps to bring it into the SDE feature class

Solution Architecture

The Business Objectives drove the architecture for a Prospect Inventory management solution that could:

- Automate as much as possible.
- Simplify browsing and managing tools for end users, editors, and publishers.
- Integrate AD access control.
- Have the ability to review changes - when and by whom.
- Provide data editing notifications

Solution Architecture

How did we do this?

- **ArcGIS Web Platform**

- ArcGIS 2016.1 Server/Portal – map and feature services, web maps, WAB with in-house widgets, access control.
- Developed three lookalike web map apps for browsing/search, editing, and QC/Publishing leads and prospects, completely eliminates the attribute spreadsheets, personal and file databases, and the ArcMap plugin.

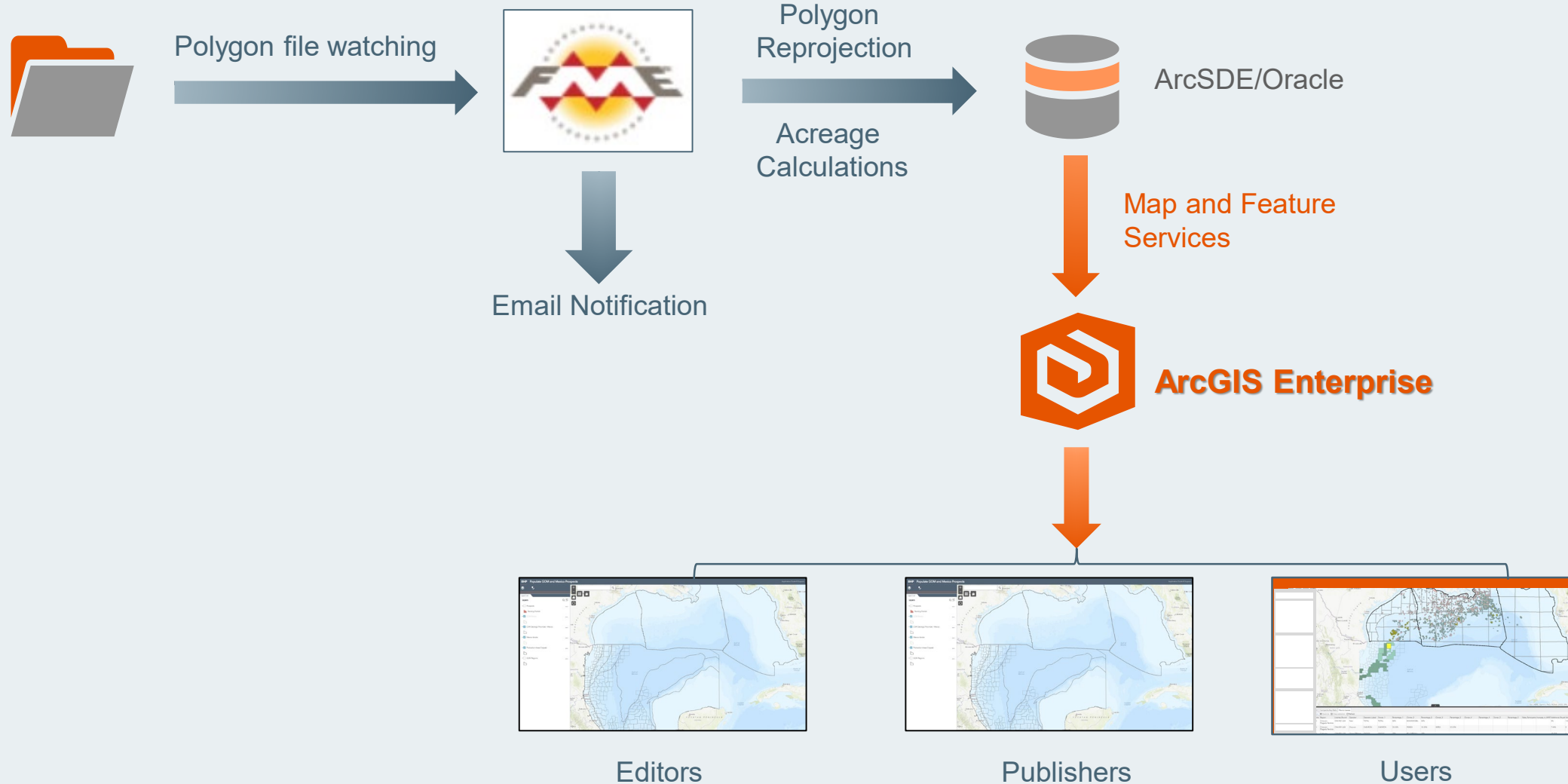
- **FME 2018.1 server**

- Data transformation – auto polygon processing with ArcSDE, including re-projection and acreage calculations.
- Email notification of edited polygons pending publishing

- **Enterprise Geodatabase Capabilities**

- IWA/OAS Authentication and access control throughout this enterprise solution
- ArcGIS data domains used whenever applicable
- Oracle Triggers for auto calculations and feature publishing from edits.
- ArcGIS feature class editor tracking and archiving

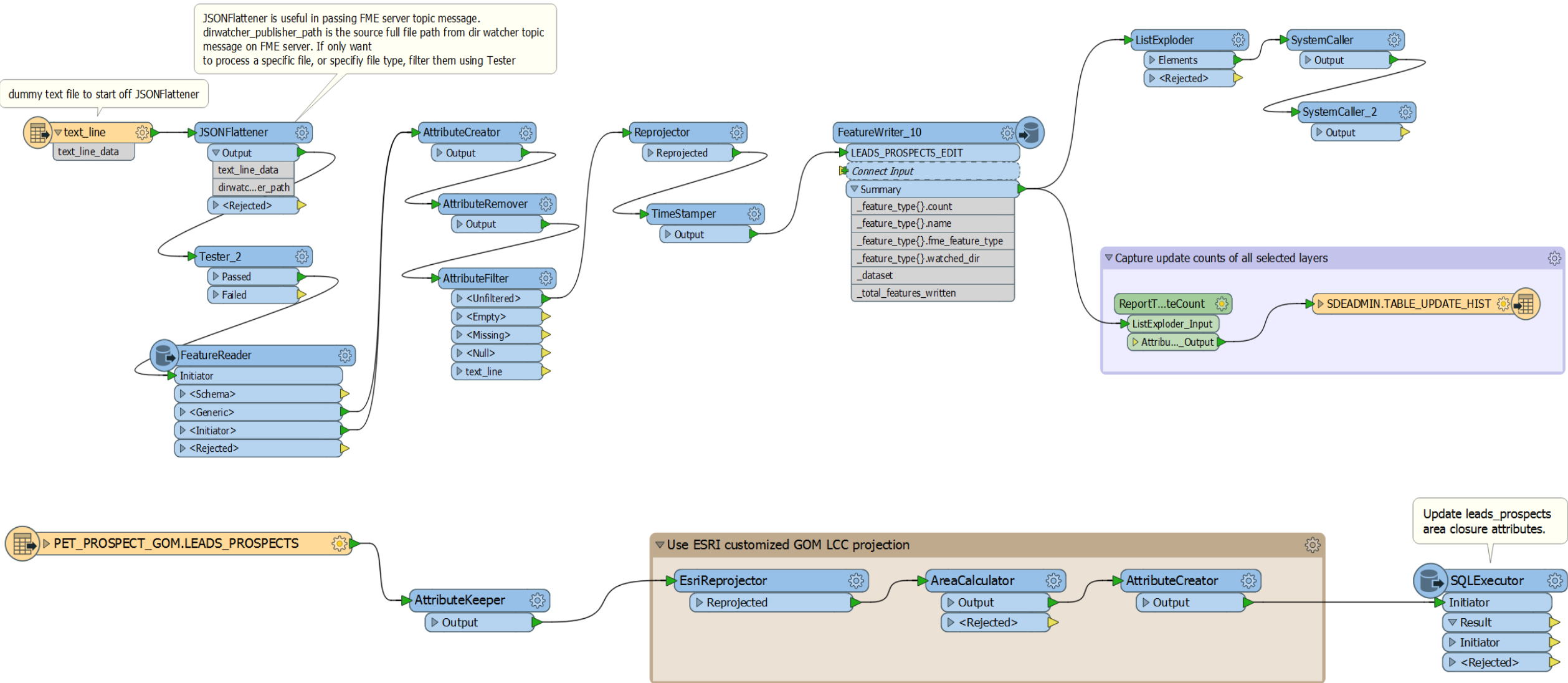
Solution Architecture – ArcGIS Enterprise



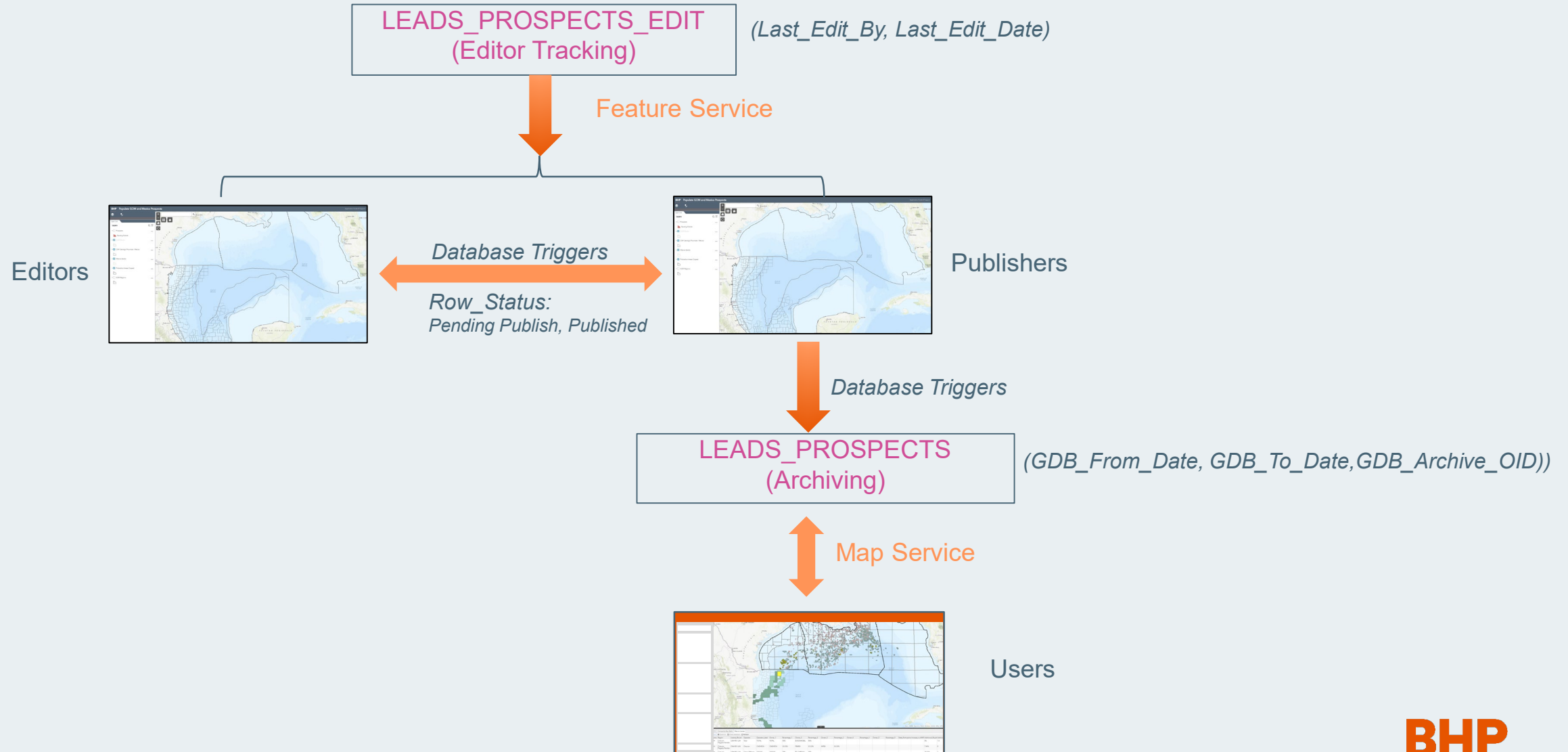
Solution Architecture – FME Highlights

JSONFlattener is useful in passing FME server topic message. dirwatcher_publisher_path is the source full file path from dir watcher topic message on FME server. If only want to process a specific file, or specify file type, filter them using Tester

dummy text file to start off JSONFlattener



Solution Architecture – Enterprise GDB



Conclusions

- **The simplified and highly automated process significantly increases productivity in managing prospect data, from the authors to the consumers.**
- **A better and intuitive Quality Assurance Web Map-centric solution throughout the process.**
- **Traceability: the ability to check data change history, which is important in prospect data management.**
- **Scalability: the entire solution can be easily replicated to, or integrated with, other regions' opportunity data management.**
- **Mobile-ready: the solution can be easily extended to mobile devices.**

Questions?