



NORAD supported project in MRRD covering
Capacity Building and Institutional Cooperation in the
field of Hydrogeology for Faryab Province
Afghanistan

Data Management, Paper & Online Map Production: Results from Faryab Province

by Andreas de Jong & Prof. Shuaib Zarinkhail
11th October 2015

Data Management, Paper & Online Map Production: Results from Faryab Province

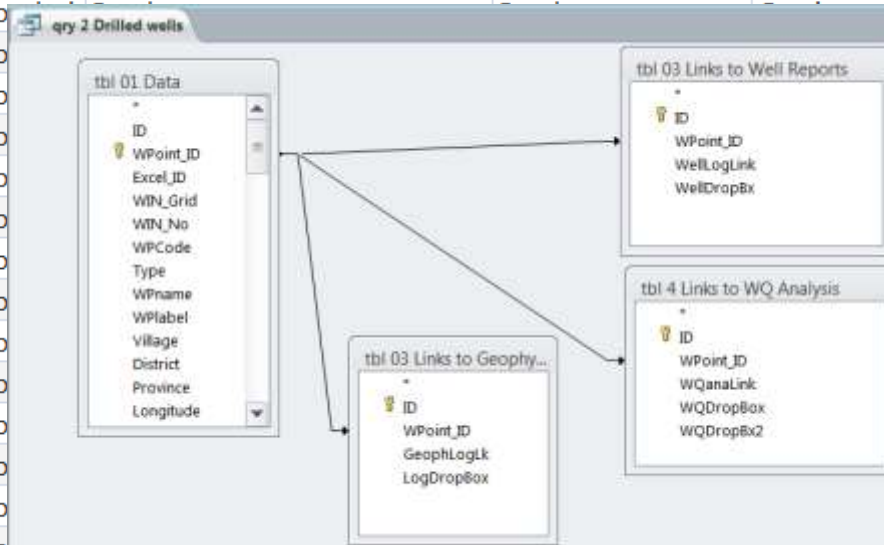
1. Data management
2. Paper Maps
3. Online Maps
4. Conclusions & Recommendations

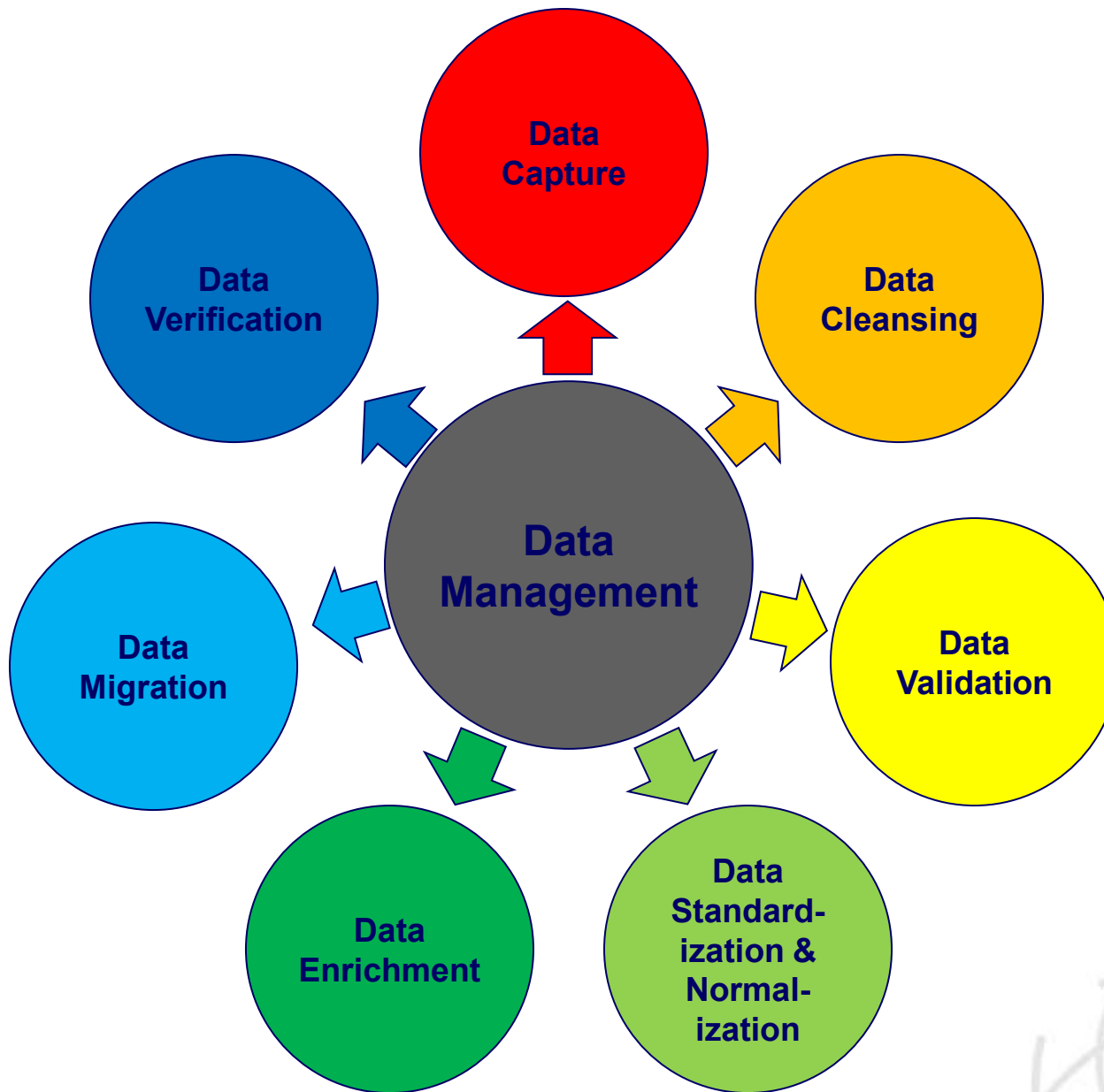
Why do we need Data Management?



Database of hydrogeological information

qry 2 Drilled wells					
Water Point	Water Point Code	Type	Name of feature	Village	District
2038	353702065131501	Drilled borehole	Dar e Shakh Kalakan	Dar e Shakh Kalakar	Gurziwan
2056	353705065134801	Drilled borehole	Dara e Shakh	Dara e Shakh	Gurziwan
2099	353711065032801	Drilled borehole	Kaykawos	Kaykawos	Gurziwan
2055	353712065131502	Drilled borehole	Dara e Shakh	Dara e Shakh	Gurziwan
2035	353719065131302	Drilled borehole	Dara e Shakh	Dara e Shakh	Gurziwan
2133	353731065034701	Drilled borehole	Kikawas	Kikawas	Gurziwan
2104	353742065035801	Drilled borehole	Perech	Perech	Gurziwan
2134	353749065041201	Drilled borehole	Kikawas	Kikawas	Gurziwan
2962	353759065132201	Drilled borehole	Water point code 252, Nowabad	Nowabad Dari Shakh	Gurziwan
2105	353800065044301	Drilled borehole	Perech	Perech	Gurziwan
2098	353801065045501	Drilled borehole			
2059	353803065163801	Drilled borehole			
2011	353814065164101	Drilled borehole			
2045	353815065092901	Drilled borehole			
2023	353817065163902	Drilled borehole			
2132	353820065051301	Drilled borehole			
2129	353822065045901	Drilled borehole			
2034	353822065164301	Drilled borehole			
2091	353824065045601	Drilled borehole			
2049	353826065062601	Drilled borehole			
2077	353830065065801	Drilled borehole			
2032	353834065164602	Drilled borehole			
2033	353834065164601	Drilled borehole			
2100	353836065045801	Drilled borehole			





1. Data Capture – Fieldwork



SCHLUMBERGER ARRAY FIELD SHEET **NORPLAN**

Project: _____ Sounding No.: _____
 Location: _____ Coordinates East: _____
 Date: _____ Coordinates North: _____
 Operator: _____ Azimuth: _____

$\Delta = \frac{AU \cdot AV}{MN}$ $\rho_s = E \frac{\Delta T}{T}$

Stake	Dist. to A (m)	A (m)					B (m)	C (m)	D (m)	E (m)	F (m)	G (m)	H (m)	I (m)	J (m)	K (m)	L (m)	M (m)	N (m)	O (m)	P (m)	Q (m)	R (m)	S (m)	T (m)	U (m)	V (m)	W (m)	X (m)	Y (m)	Z (m)	
		1	2	3	4	5																										
1	1	0.00																														
2	2	11.0																														
3	3	21.0																														
4	4	30.5																														
5	5	37.7																														
6	6	43.2																														
7	7	47.0																														
8	8	49.0																														
9	9	50.0																														
10	10	51.0																														
11	11	51.0	62.0																													
12	12	51.0	110																													
13	13	51.0	150																													
14	14	51.0	180																													
15	15	51.0	210																													
16	16	51.0	240																													
17	17	51.0	270																													
18	18	51.0	300																													
19	19	51.0	330																													
20	20	51.0	360																													
21	21	51.0	390																													
22	22	51.0	420																													
23	23	51.0	450																													
24	24	51.0	480																													
25	25	51.0	510																													
26	26	51.0	540																													
27	27	51.0	570																													
28	28	51.0	600																													
29	29	51.0	630																													
30	30	51.0	660																													
31	31	51.0	690																													
32	32	51.0	720																													
33	33	51.0	750																													
34	34	51.0	780																													
35	35	51.0	810																													
36	36	51.0	840																													
37	37	51.0	870																													
38	38	51.0	900																													
39	39	51.0	930																													
40	40	51.0	960																													
41	41	51.0	990																													
42	42	51.0	1020																													
43	43	51.0	1050																													
44	44	51.0	1080																													
45	45	51.0	1110																													
46	46	51.0	1140																													
47	47	51.0	1170																													
48	48	51.0	1200																													
49	49	51.0	1230																													
50	50	51.0	1260																													
51	51	51.0	1290																													
52	52	51.0	1320																													
53	53	51.0	1350																													
54	54	51.0	1380																													
55	55	51.0	1410																													
56	56	51.0	1440																													
57	57	51.0	1470																													
58	58	51.0	1500																													
59	59	51.0	1530																													
60	60	51.0	1560																													
61	61	51.0	1590																													
62	62	51.0	1620																													
63	63	51.0	1650																													
64	64	51.0	1680																													
65	65	51.0	1710																													
66	66	51.0	1740																													
67	67	51.0	1770																													
68	68	51.0	1800																													
69	69	51.0	1830																													
70	70	51.0	1860																													
71	71	51.0	1890																													
72	72	51.0	1920																													
73	73	51.0	1950																													
74	74	51.0	1980																													
75	75	51.0	2010																													
76	76	51.0	2040																													
77	77	51.0	2070																													
78	78	51.0	210																													

2. Data Capture – Office Work



MS Excel



MS Access

3. Data Cleansing Examples

1. All number fields as numbers, not text.
2. Date fields in YYYY-MM-DD.
3. 'Name' as 'Name', not 'NAME' or 'name'.

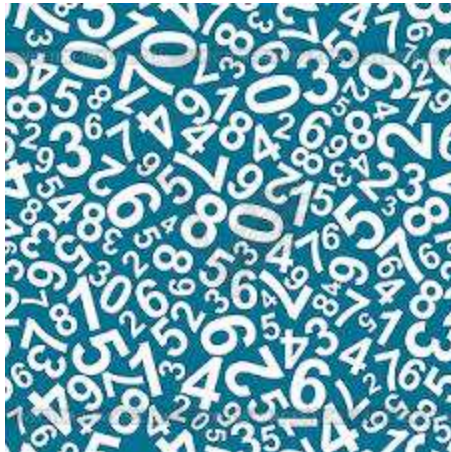


Source: <http://www.japantrendshop.com/rc-sugoi-mop-p-1725.html>

*The Remote Control
Sugoi Mop*

4. Example Data Validation Questions:

1. Are the coordinates within the project area?
2. Are there any duplicates in the data?



Selection
Advanced
Toggle Filter

Refresh All
New
Save
Delete
Totals
Spelling
More

Find
Replace
Go To
Select

Calibri 11
B I U A ab
Text Formatting

zQC Find duplicates for qry 1 Location All

Longitude	Latitude	Water Point ID	Type	Name of feature
63.69164	35.71965	2765	Drilled borehole	Sharshari 2 tubewell
63.69164	35.71965	2766	Drilled borehole	Sharshari 2 tubewell
63.71368	35.76610	886	Dug well	Shar shar (M.Wali)
63.71368	35.76610	916	Dug well	Qalai Wali (1)
64.01599	35.74127	2499	Drilled borehole	Hazar Qala Afghani
64.01599	35.74127	2504	Drilled borehole	Hazar Qala Afghani
64.05947	35.73123	2408	Drilled borehole	Hazara Qala (1)
64.05947	35.73123	2405	Drilled borehole	Hazara Qala (1)
64.65207	36.04302	2320	Drilled borehole	Ag Masjid
64.65207	36.04302	2321	Drilled borehole	Qarg Egale
64.65382	36.05911	522	Dug well	Shah Nazar dug well
64.65382	36.05911	670	Dug well	Qanjegholi dug well
64.66553	36.04999	4185	Dug well	Koh-e Sayad
64.66553	36.04999	4210	Dug well	Qanjegh Ali
64.78000	35.92000	4439	Drilled borehole	Shar Wali (Maimana District): grid reference approximate
64.78000	35.92000	4440	Drilled borehole	Ghund 35 (Maimana District): grid reference approximate
64.78000	35.92000	4438	Drilled borehole	Toshkur Bibi Amina (Maimana District): grid reference approximate
64.86000	36.23000	4442	Drilled borehole	Shirin Tagab Health Centre: grid reference approximate
64.86000	36.23000	4558	Drilled borehole	Shirin Tagab Markaz (Centre) area: grid reference approximate
64.86330	36.24595	2706	Drilled borehole	Tapa Qala
64.86330	36.24595	2712	Drilled borehole	Tash Qala
64.86466	36.26104	2606	Drilled borehole	Kuh-e Sayyad
64.86466	36.26104	2605	Drilled borehole	Kuh-e Sayyad

File

5. Data Standardization & Normalization

you want to do...



Conditional Formatting
Format as Table
Cell Styles

Paste

Format Painter

B*I*U

Font

A

Alignment

Merge & Center

\$

%

Number

Conditional Formatting

Format as Table

Cell Styles

G11

X

✓

fx

End cap

	A	B	C	D	E	F	G	H	I	J
1	Hole ID	From	To	Outer Diameter	Inner Diameter	Offset	Item			
2	KMU-1	0	18	8	8	0	Casing			
3	KMU-1	18	30	8	8	0	Screen			
4	KMU-1	30	38	8	8	0	Casing			
5	KMU-1	38	46	8	8	0	Screen			
6	KMU-1	46	54	8	8	0	Casing			
7	KMU-1	54	58	8	8	0	Screen			
8	KMU-1	58	62	8	8	0	Casing			
9	KMU-1	1	62	14	8	0	Gravel pack			
10	KMU-1	0	1	14	8	0	Bentonite seal			
11	KMU-1	61.8	62	8	8	0	End cap			
12							Gravel pack			
13							End cap			
14							Soil			
15							Cap			
16							Outside grout			
17							Outside bentonite seal			
18							Slough			
19							Outside casing			
20										
21										
22										
23										

Be consistent

Options

Project Settings

Location

Well Construction

Well Construction Details

Lithology ...

+

:

◀



	PROJECT: Kabul Medical University Well	BOREHOLE ID: KMU-1	
	LOCATION: PD3	WELL ID: KMU-1	
	DRILLING CONTRACTOR: MRRD	NORTHING: 34 30' 58.8"	EASTING: 69 07' 54.9"
	DRILLING EQUIPMENT: Chinese Rig	GROUND SURFACE ELEV.: 1821 m	TOC ELEVATION: not measured
	DRILLING METHOD: Percussion	TOTAL DEPTH: 62 m	DEPTH TO WATER: 12 m
LOGGED BY: Eng Poya & Jalil	SAMPLING METHOD: Every layer	DATE STARTED: 05/02/2015	DATE COMPLETED: 21/02/2015

Depth (m)	Lithology	Description	Well Construction	
0		Organic soil		
2				
4				
6				
8		Conglomerate containing schist pebbles		
10				
12		Sandy clay with gravel		
14				
16				
18				
20				
22				

6 – Data Migration

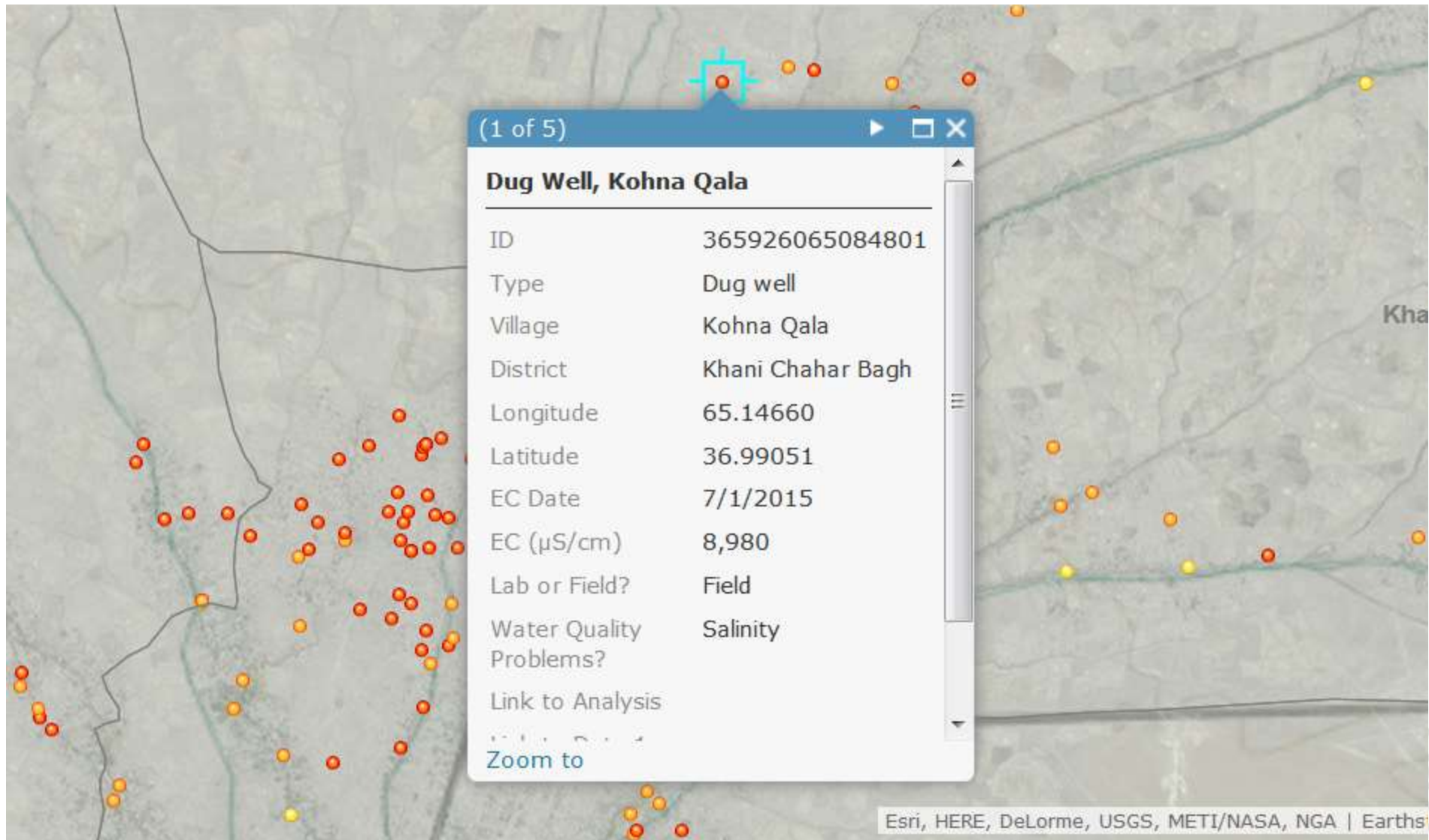


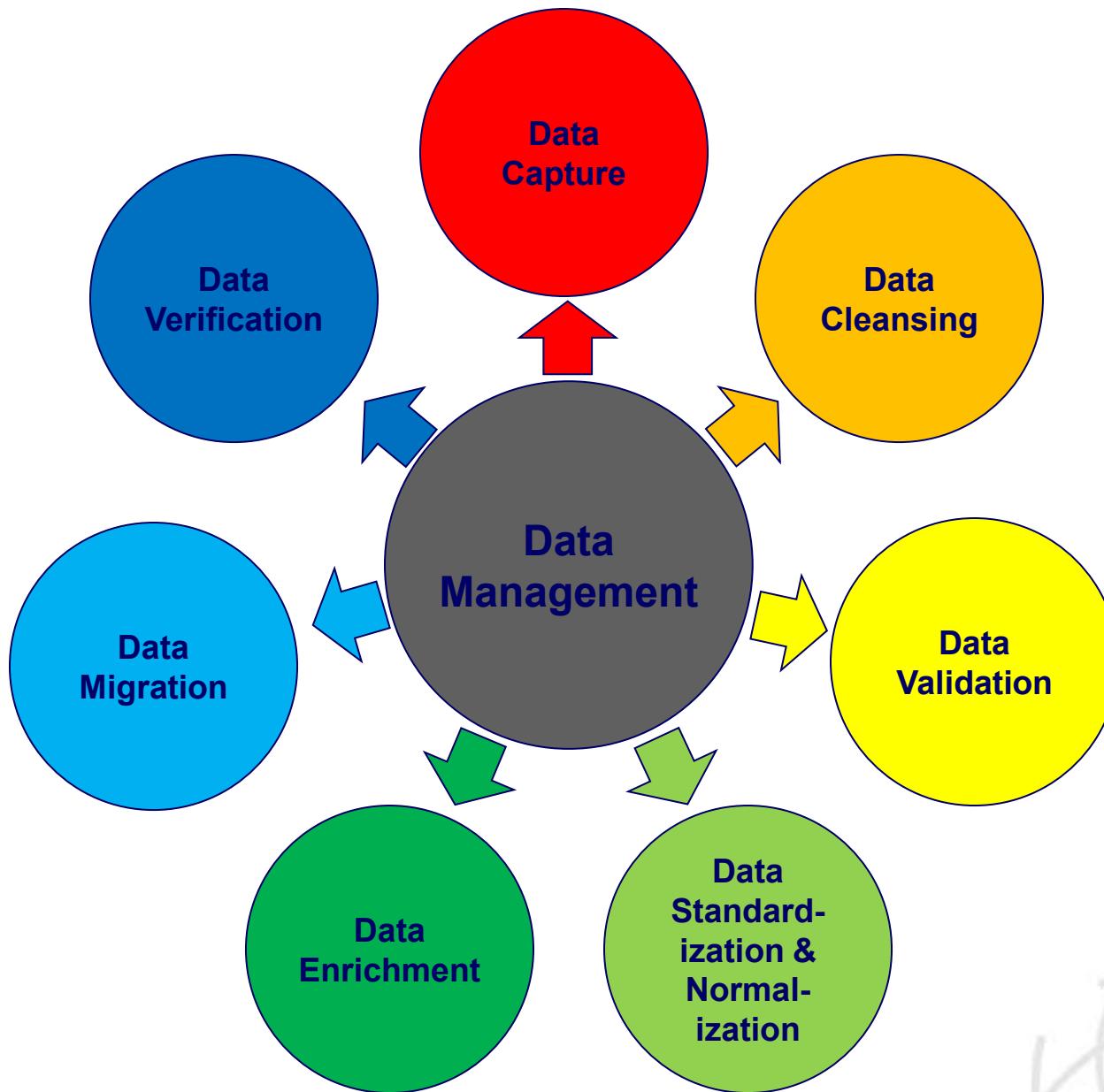
MS Access



<http://www.arcgis.com/home/group.html?owner=AfghanMaps&title=Faryab%20Maps>

7 – Data Verification Example (Back to the Future)





Data Management, Paper & Online Map Production: Results from Faryab Province

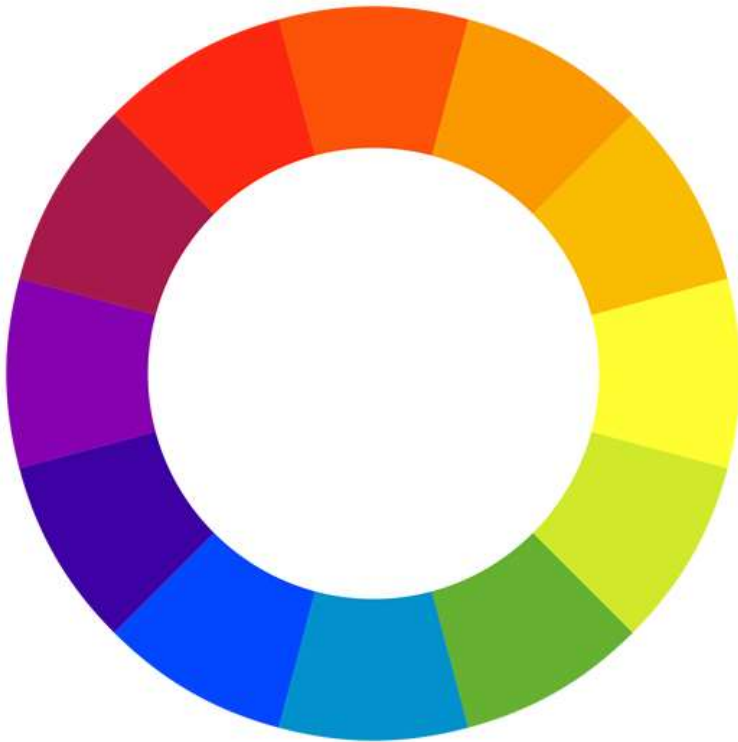
1. Data management
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A picture is worth a thousand words

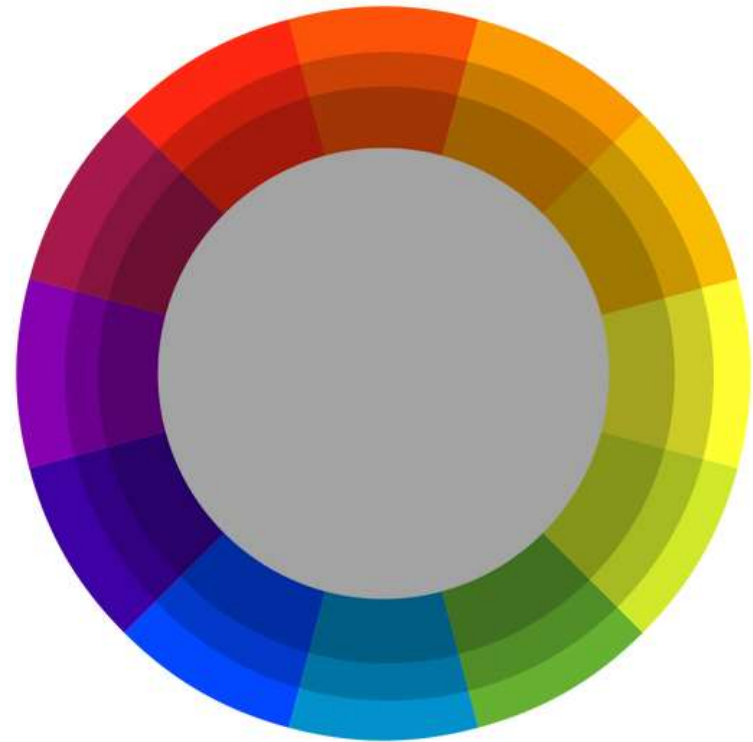


....but what is the message?

Colour Harmony



The Colour Wheel

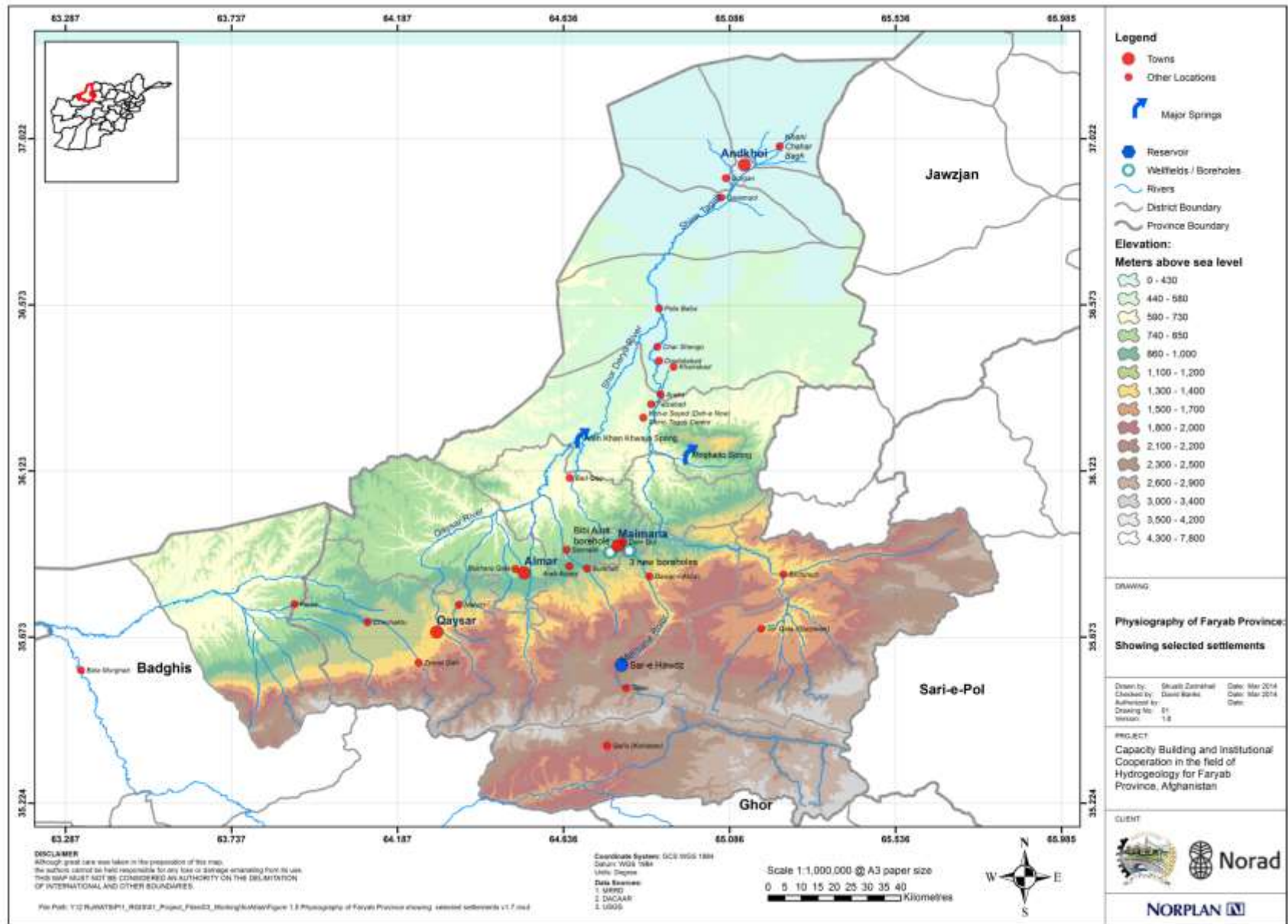


Monochromatic
Different shades of a single colour.

Balanced Layout



Map 5: Faryab Physiography



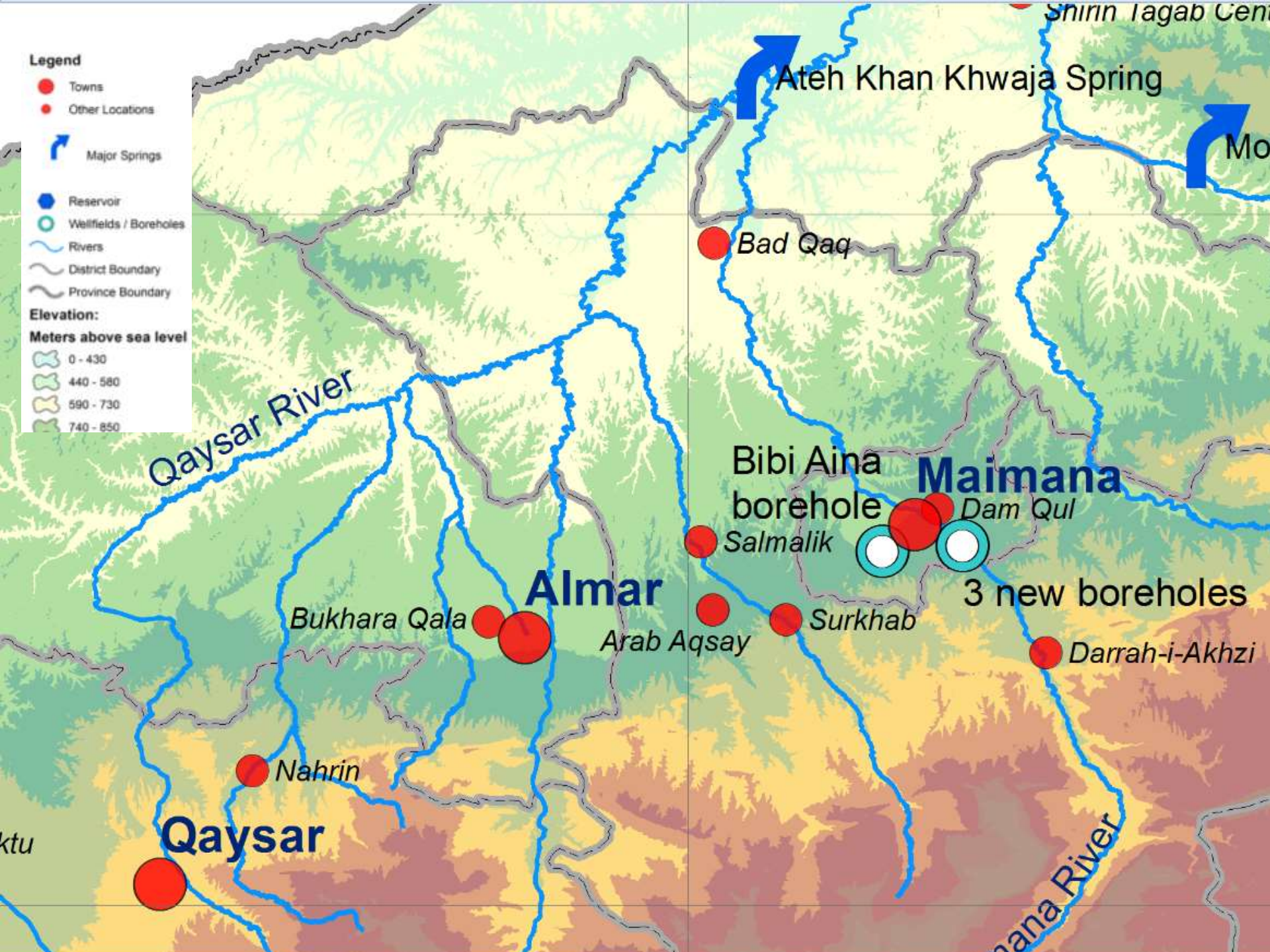
Legend

- Towns
- Other Locations
- Major Springs
- Reservoir
- Wellfields / Boreholes
- Rivers
- District Boundary
- Province Boundary

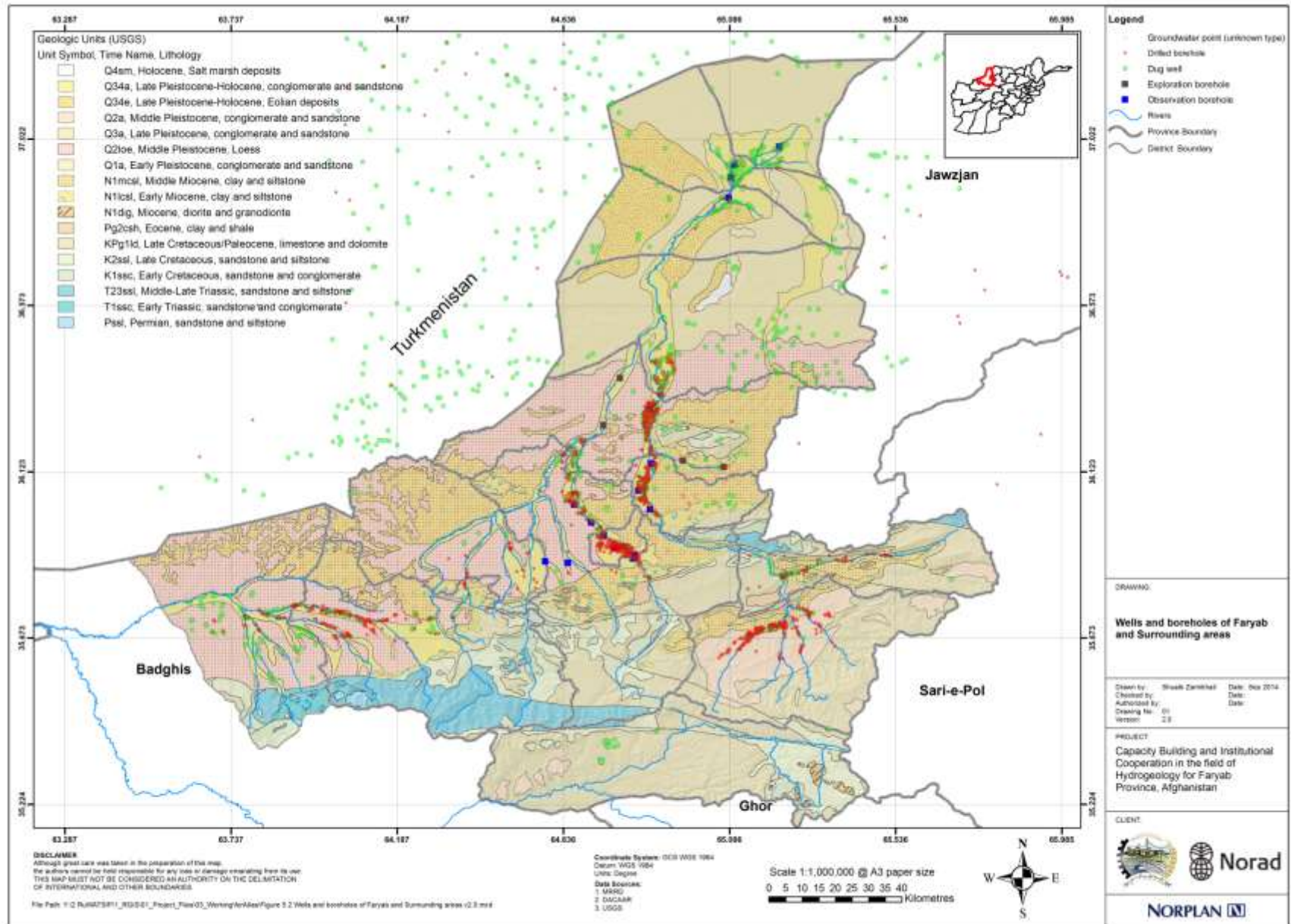
Elevation:

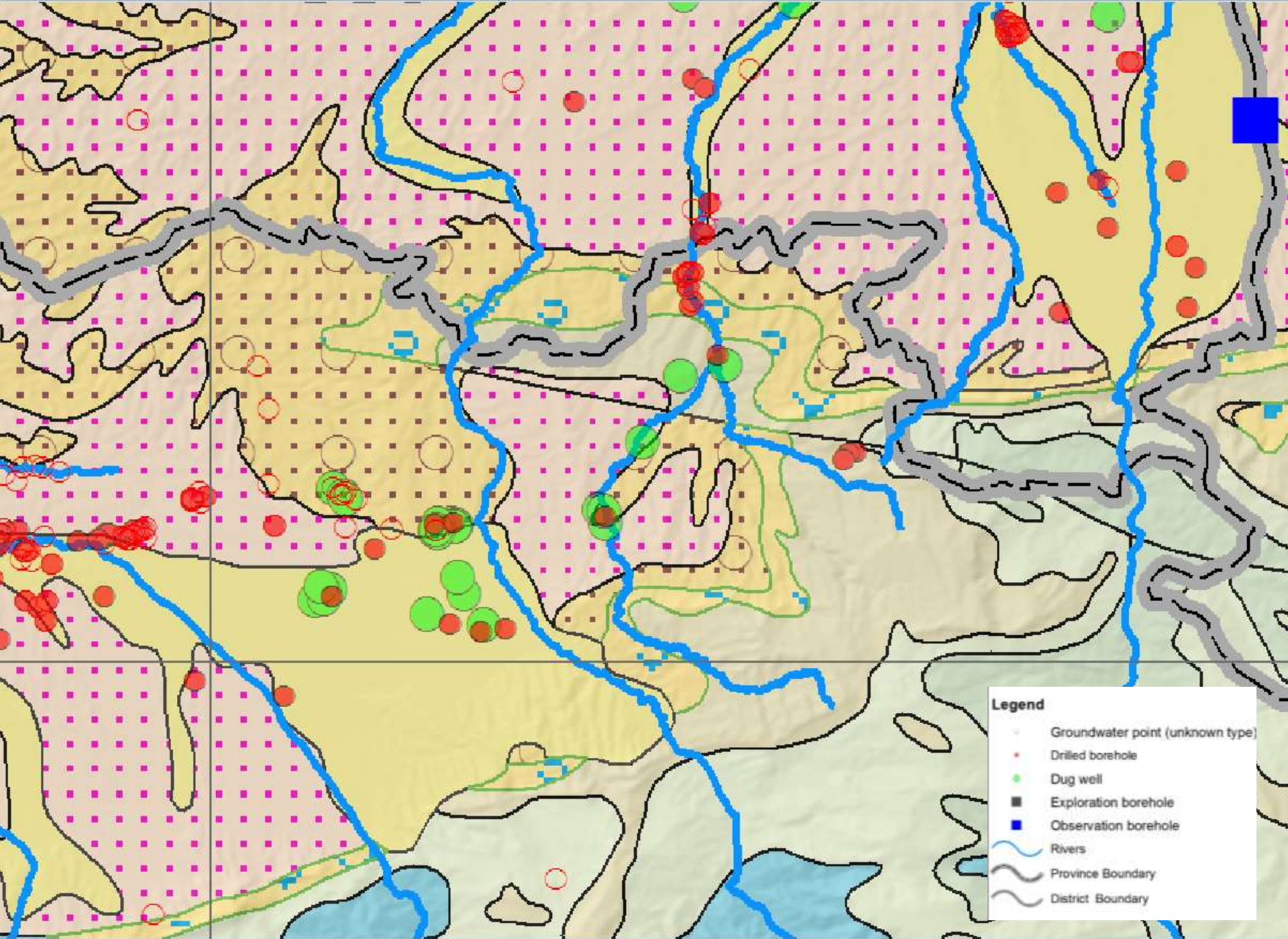
Meters above sea level

- 0 - 430
- 440 - 580
- 590 - 730
- 740 - 850

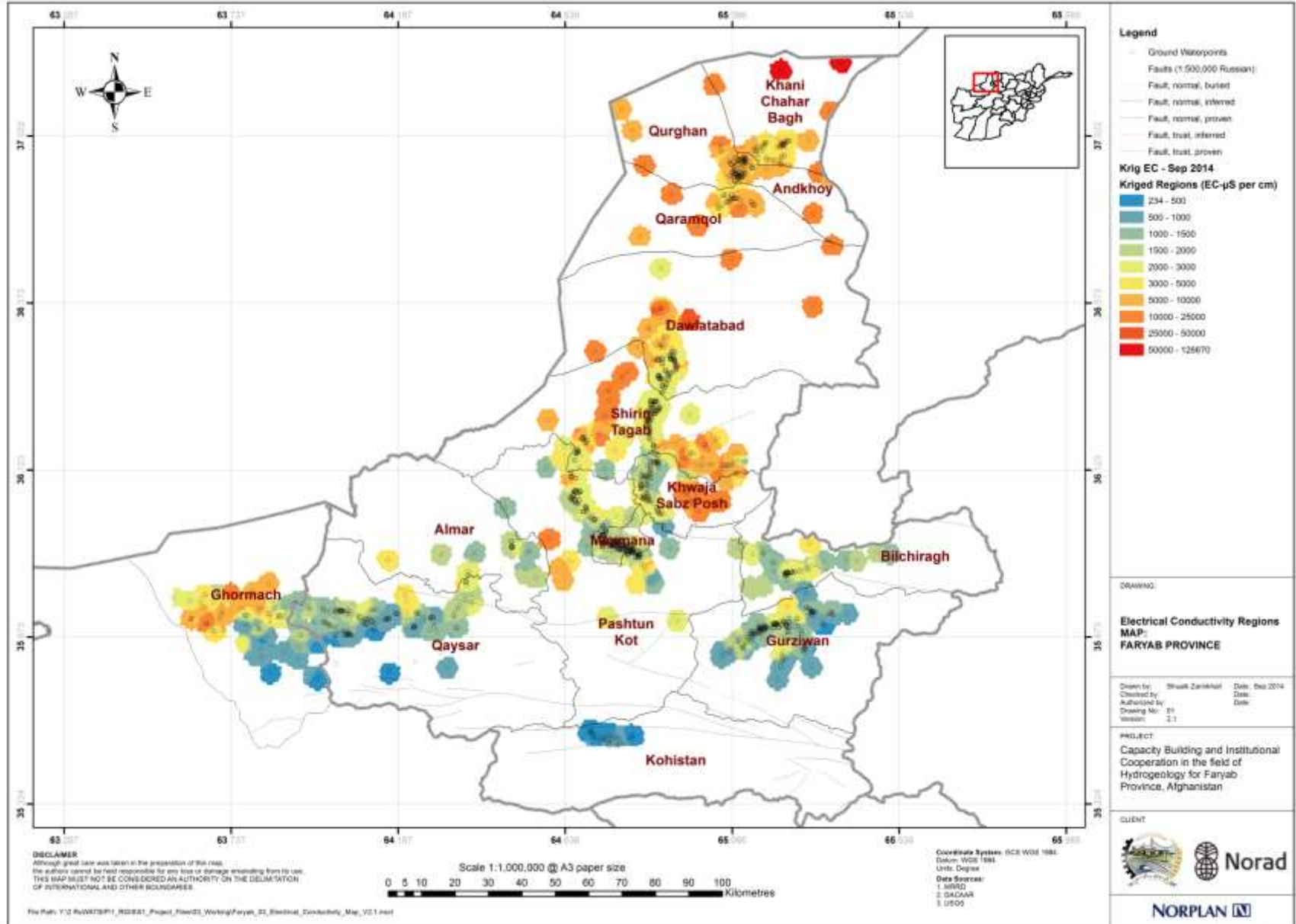


Map 6: Faryab Geology & Water Points

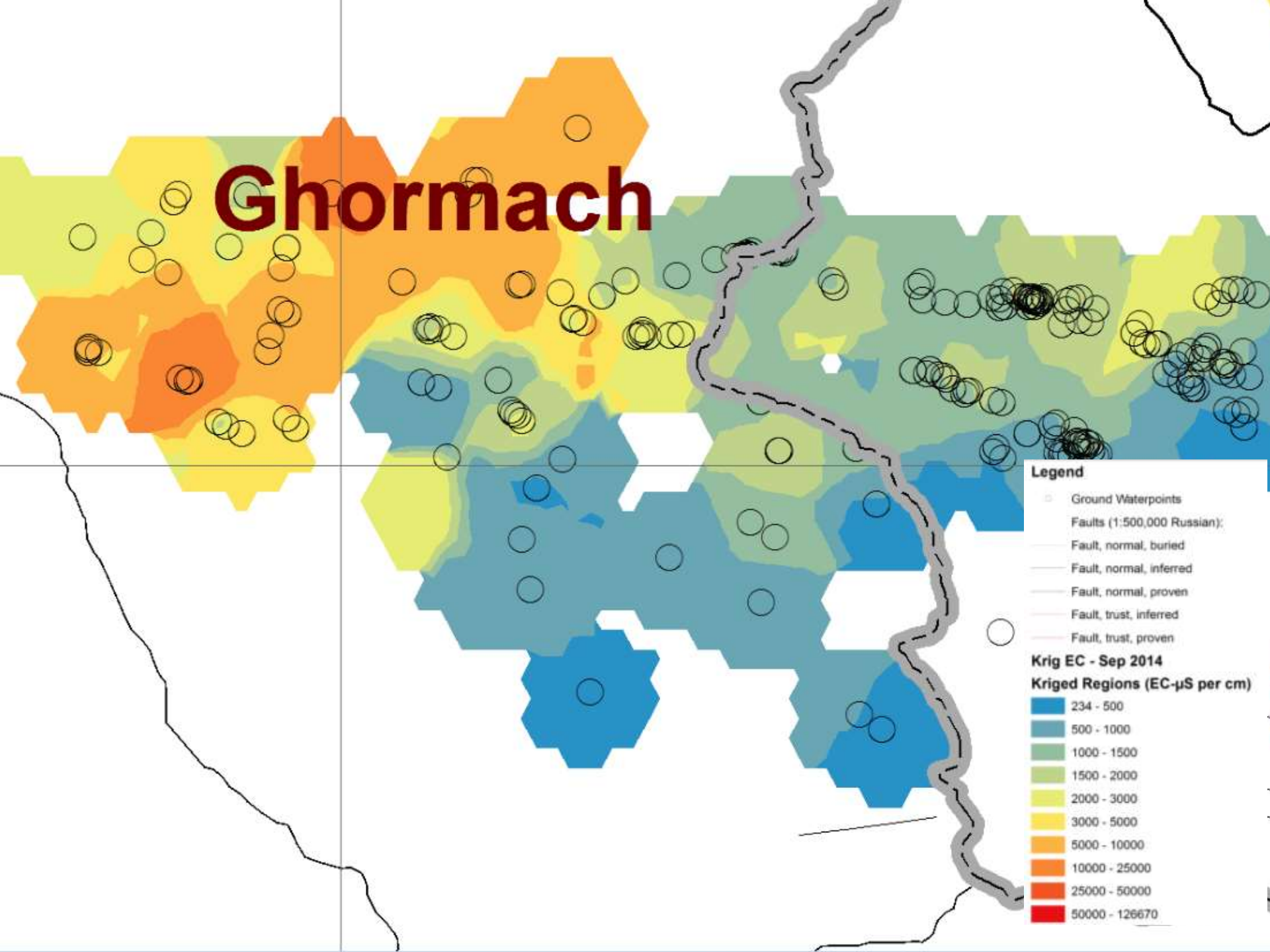




Map 7: Faryab Water Salinity



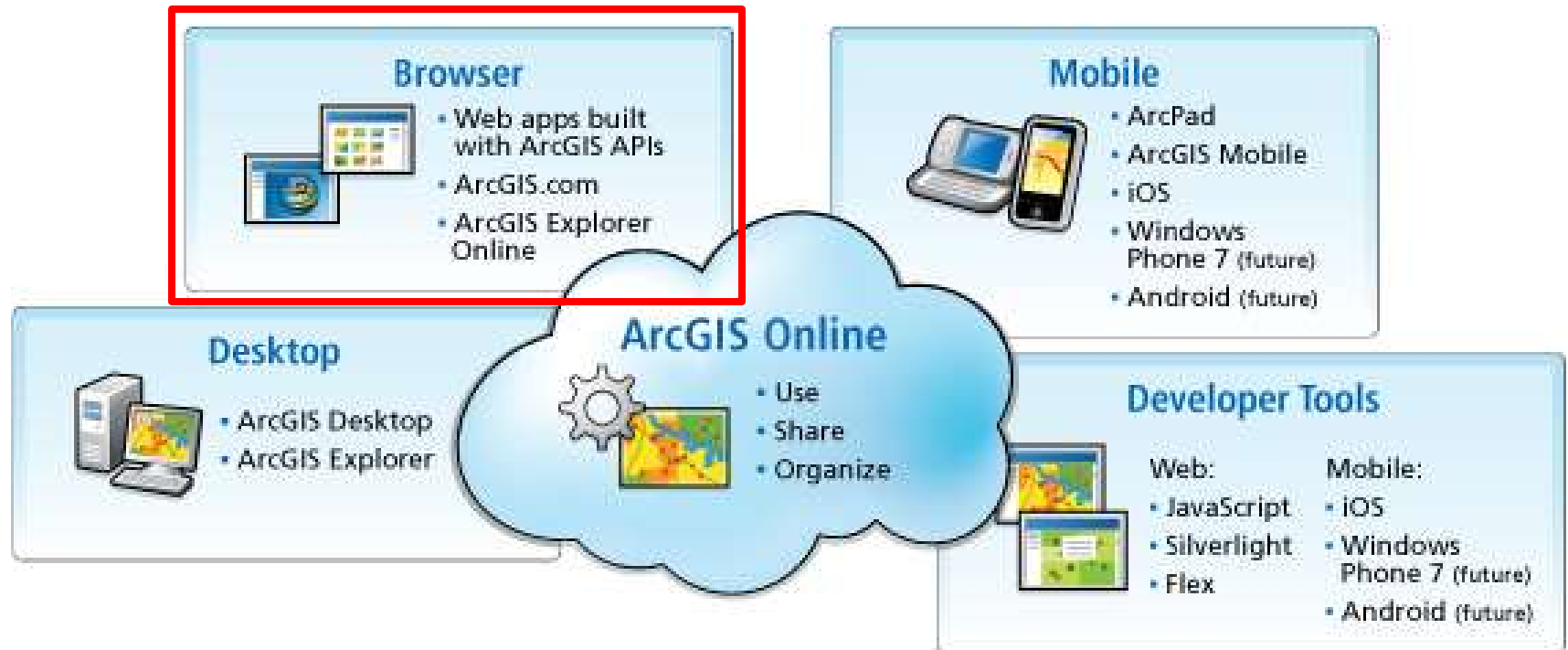
Ghormach



Data Management, Paper & Online Map Production: Results from Faryab Province

1. Data management
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Online Maps - ArcGIS Online



What you need for ArcGIS Online



Internet (Fast!)

Internet Browser

MS Access

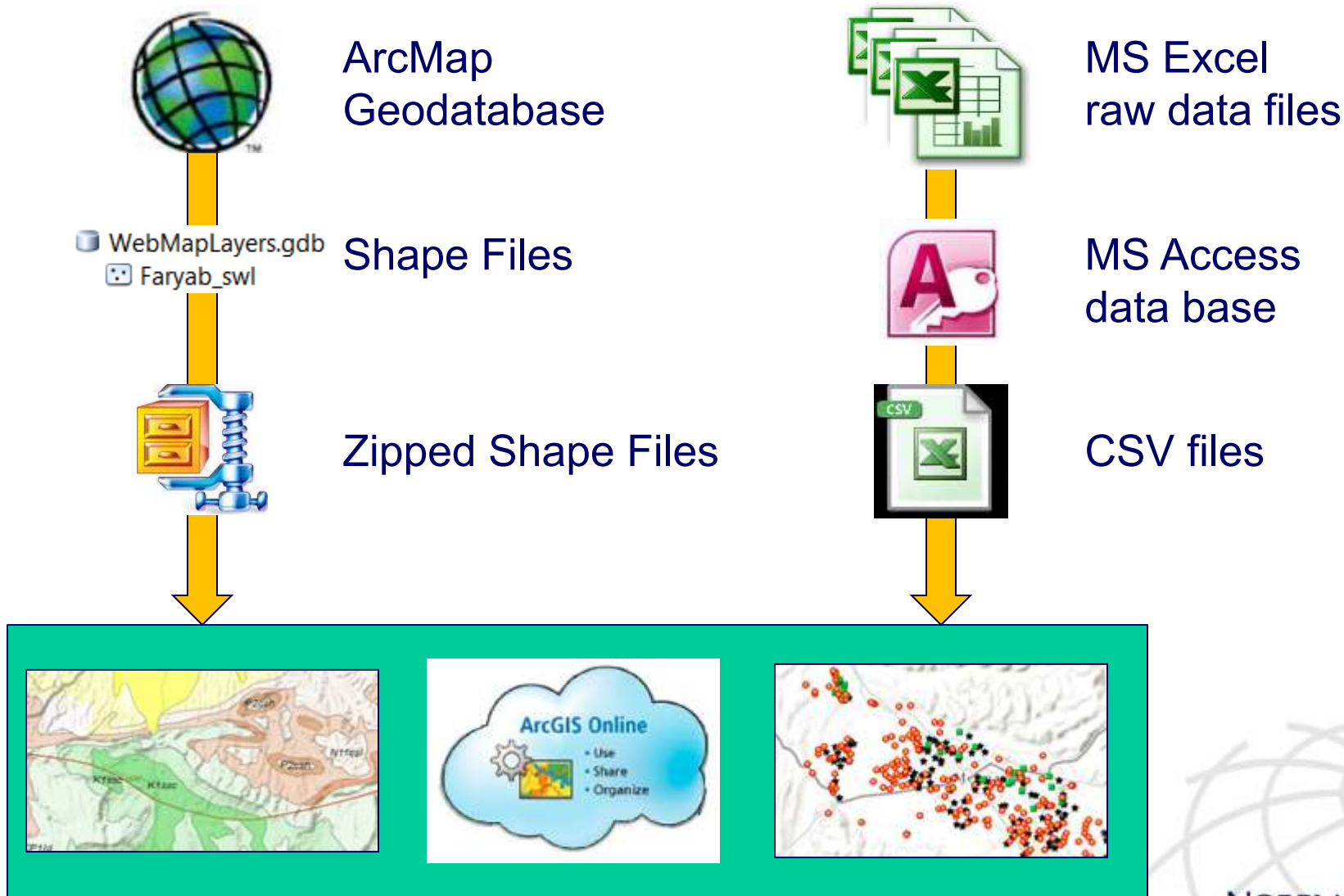
MS Excel

ArcGIS 10.x

	A	B	C	D	E	F	G
1	WPoint_IC	WPCode	Type	WPname	Village	District	Longitude
2	2038	353702065131501	Drilled bor	Dar e Shak	Dar e Shak	Gurziwan	65.22075
3	2056	353705065134801	Drilled bor	Dara e Sha	Dara e Sha	Gurziwan	65.23009
4	2099	353711065032801	Drilled bor	Kaykawos	Kaykawos	Gurziwan	65.05764
5	2055	353712065131502	Drilled bor	Dara e Sha	Dara e Sha	Gurziwan	65.22075
6	2035	353719065131302	Drilled bor	Dara e Sha	Dara e Sha	Gurziwan	65.22025
7	2133	353731065034701	Drilled bor	Kikawas	Kikawas	Gurziwan	65.06296
8	2104	353742065035801	Drilled bor	Perech	Perech	Gurziwan	65.06614
9	2134	353749065041201	Drilled bor	Kikawas	Kikawas	Gurziwan	65.06985

Data with coordinates

Faryab Maps - Data Flow Paths



Access ArcGIS Online in your browser

Browser address bar: [www.arcgis.com/home/group.html?owner=AfghanMaps&title=Faryab Maps](http://www.arcgis.com/home/group.html?owner=AfghanMaps&title=Faryab%20Maps) DuckDuckGo

Navigation: Most Visited Getting Started Latest Headlines Google




ArcGIS FEATURES PLANS GALLERY MAP HELP Sign In

Faryab Maps

JOIN THIS GROUP SHARE

Maps of Faryab Province, Afghanistan

Group Content

	Title	Owner	Rating	Views	Date
All Results Maps Layers Apps Tools Files <input type="checkbox"/> Show ArcGIS Desktop Content		Faryab Geology Map			
	Geological Map of Faryab, Afghanistan Web Map by AfghanMaps Last Modified: 11 July 2014 ★★★★★ (0 ratings, 0 comments, 116 views)				
	Open	Details			
		Faryab Groundwater Quality (EC)			
	Electrical Conductivity Map of Faryab Province, Afghanistan. Web Map by AfghanMaps Last Modified: 10 September 2014 ★★★★★ (0 ratings, 0 comments, 82 views)				
	Open	Details			
		Faryab Monitoring Wells			
	Monitoring Wells in Faryab Province, Afghanistan Web Map by AfghanMaps Last Modified: 11 September 2014				
	Open	Details			

Facebook Twitter

Group Details

AfghanMaps

Status: public

Contributors: All members

Tags:

Faryab, Afghanistan

1 Member

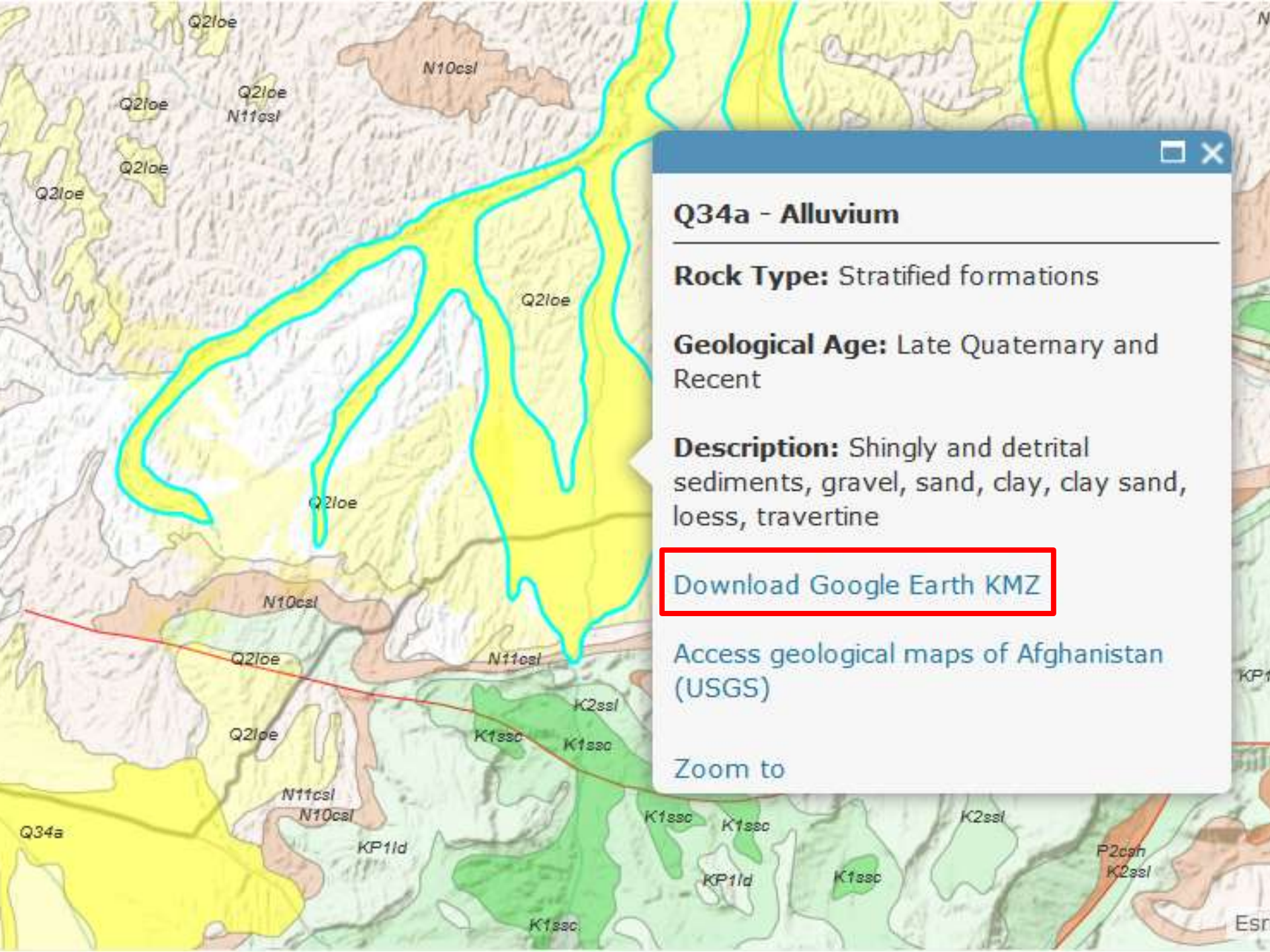
AfghanMaps

Access ArcGIS Online in your browser

The screenshot shows a web browser window displaying the ArcGIS Faryab Geology Map. The browser's address bar shows the URL: www.arcgis.com/home/webmap/viewer.html?webmap=7bc2743c68054f2a9c45b966511fae45. The page title is "ArcGIS - Faryab Geology Map". The map interface includes a "Details" tab, a "Basemap" button, and a search bar with the placeholder text "Find address or place". A legend on the left side, titled "Faryab_Geology", lists several geological units with their descriptions:

- Q4a: Shingly and detrital sediments, gravel, sand, clay, clay sand, loess, travertine
- Q34a: Shingly and detrital sediments, gravel, sand, clay, clay sand, loess, travertine
- Q3a: Shingly and detrital sediments, gravel, sand, clay, clay sand, loam, loess, travertine
- Q2loe: Shingly and detrital sediments, gravel, sand, clay, clay sand, loam, loess, travertine; trachybasalt, leucite basanite (Sarlog Group); andesitic basalt, olivine basalt (Asparan Group)

The map itself shows a complex geological landscape with various colored regions (yellow, orange, green, brown) representing different geological units. A red rectangle highlights a specific area of the map. The bottom of the page features the Esri logo and a list of links: "Esri.com", "Help", "Terms of Use", "Privacy", "Contact", and "Report Abuse".



Q34a - Alluvium

Rock Type: Stratified formations

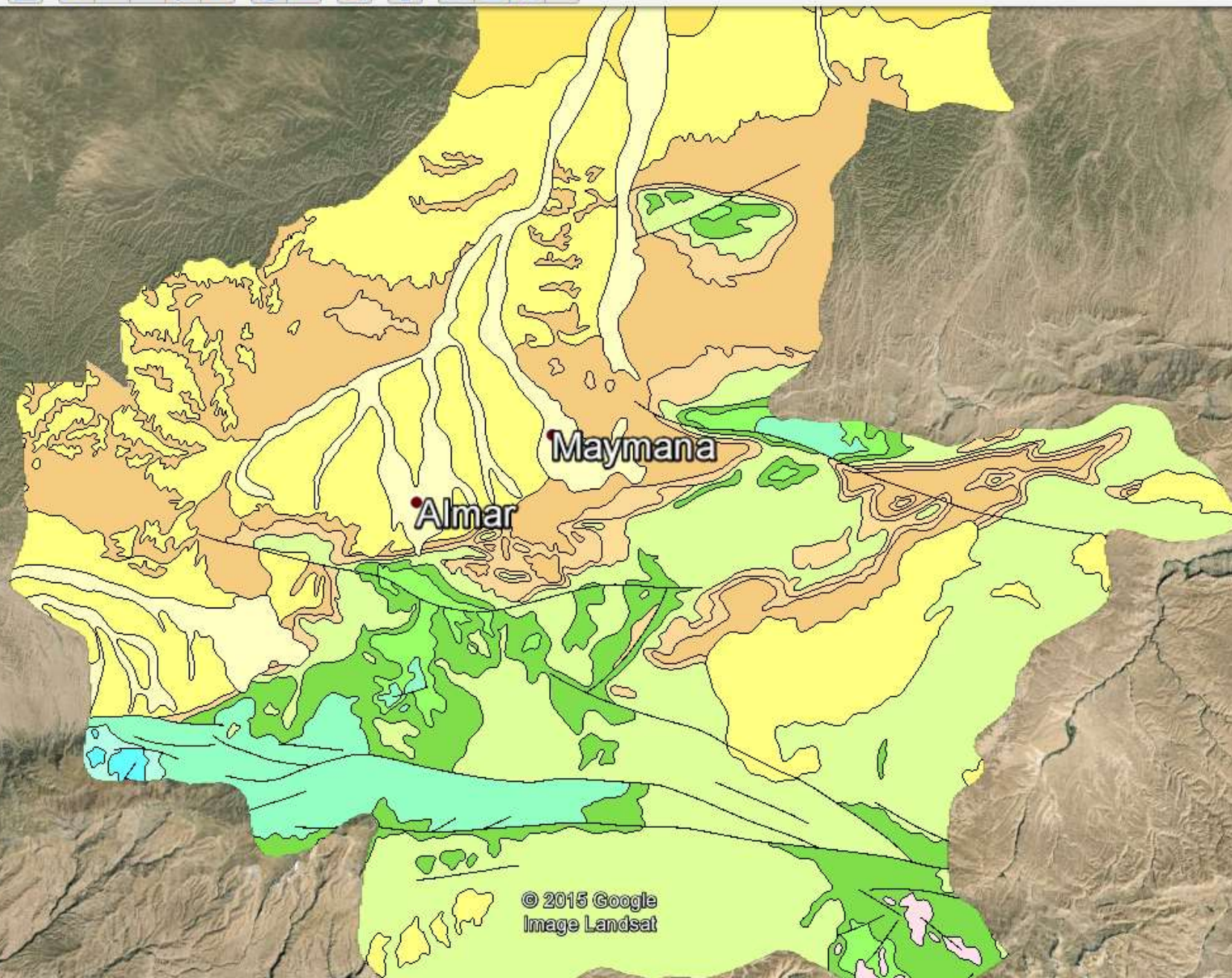
Geological Age: Late Quaternary and Recent

Description: Shingly and detrital sediments, gravel, sand, clay, clay sand, loess, travertine

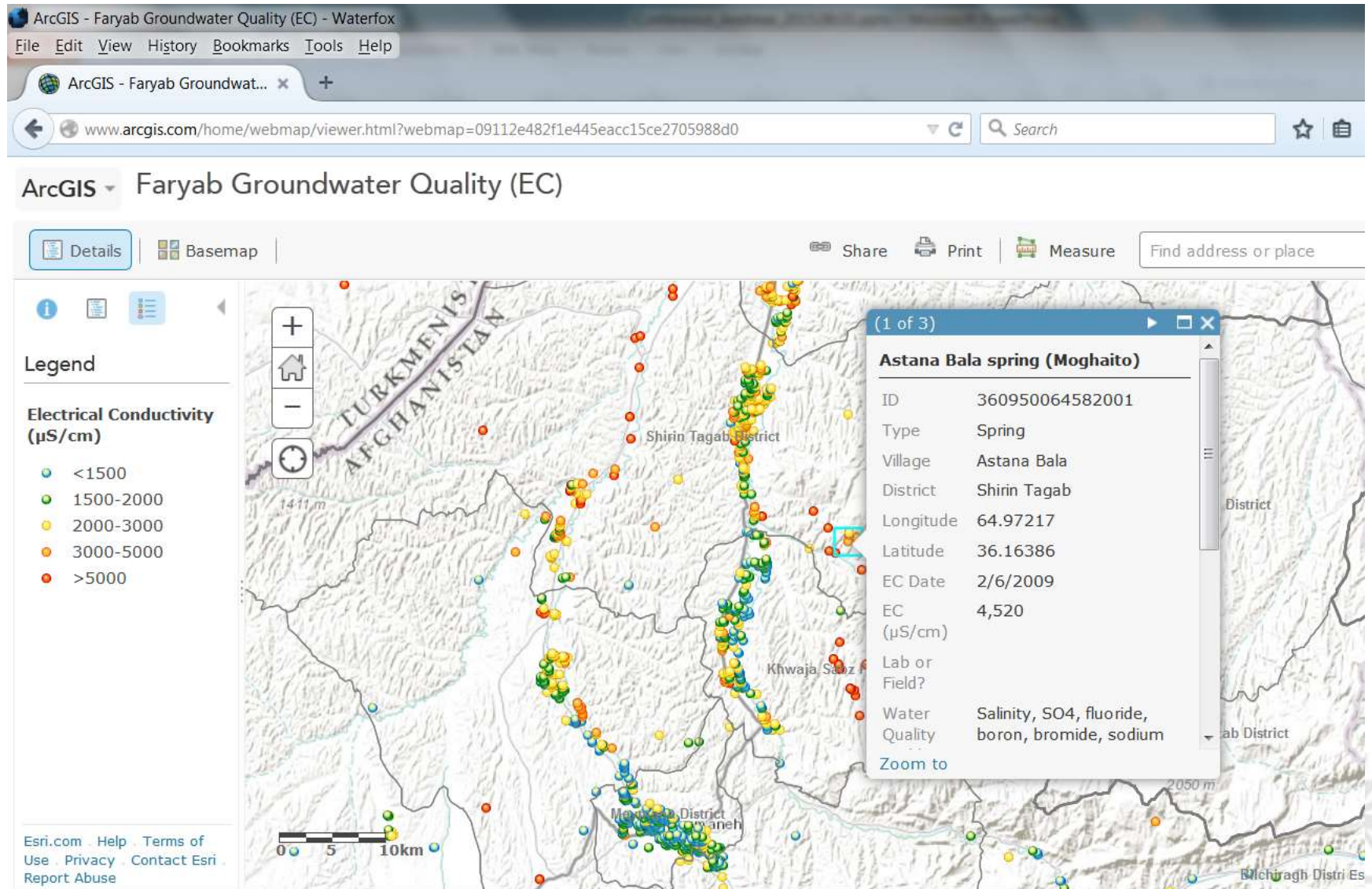
[Download Google Earth KMZ](#)

[Access geological maps of Afghanistan \(USGS\)](#)

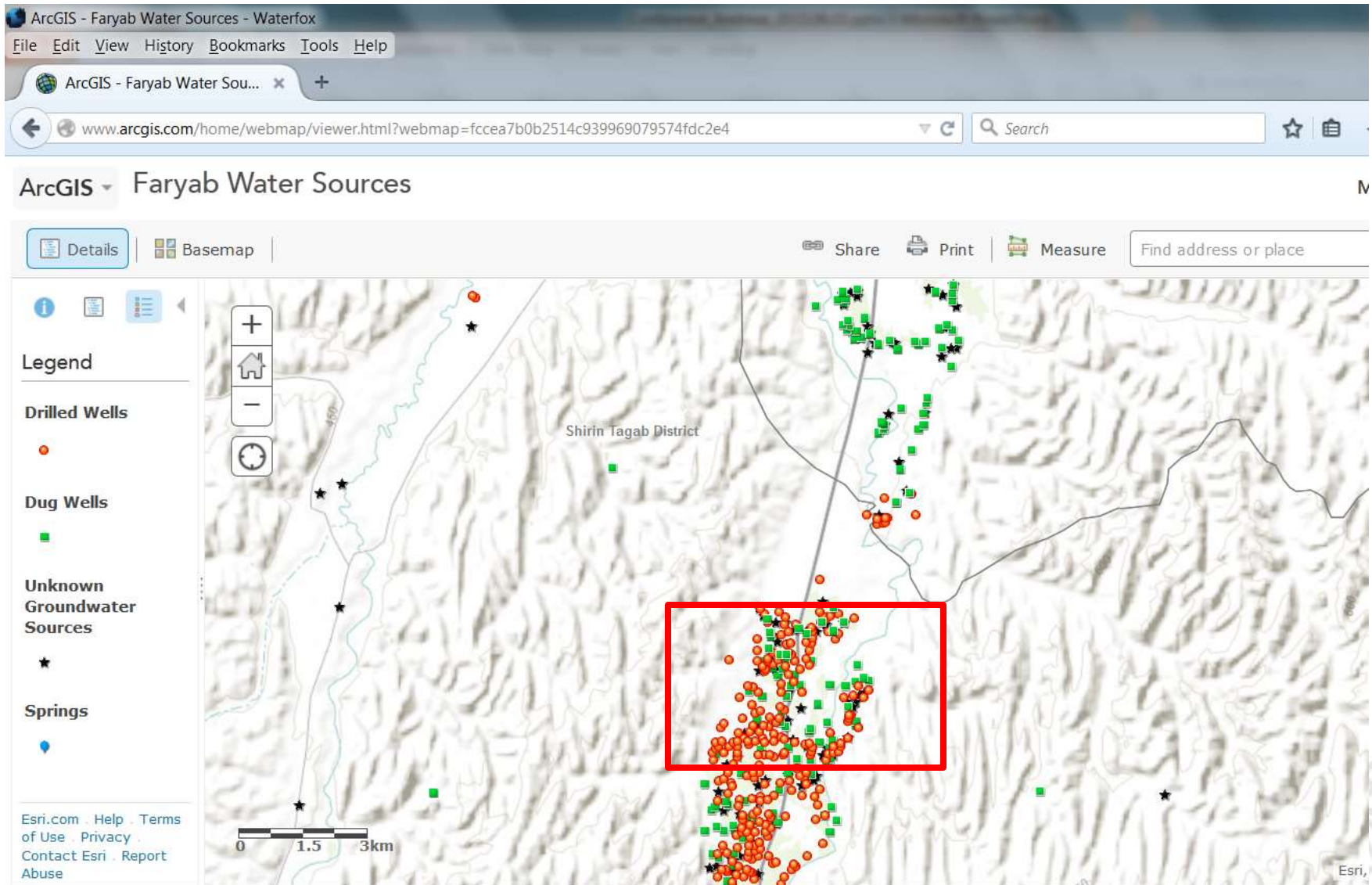
Zoom to



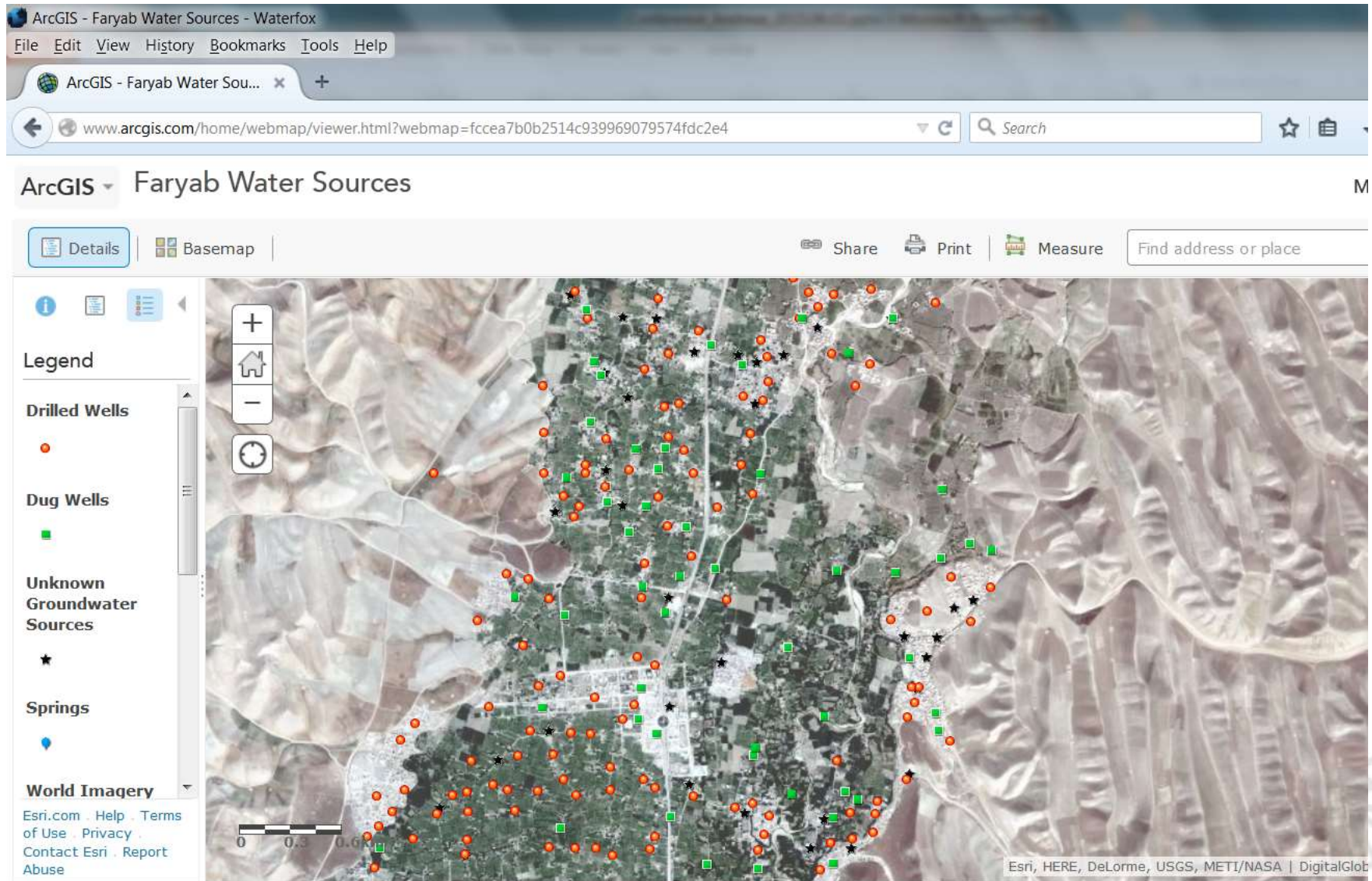
EC map of Faryab



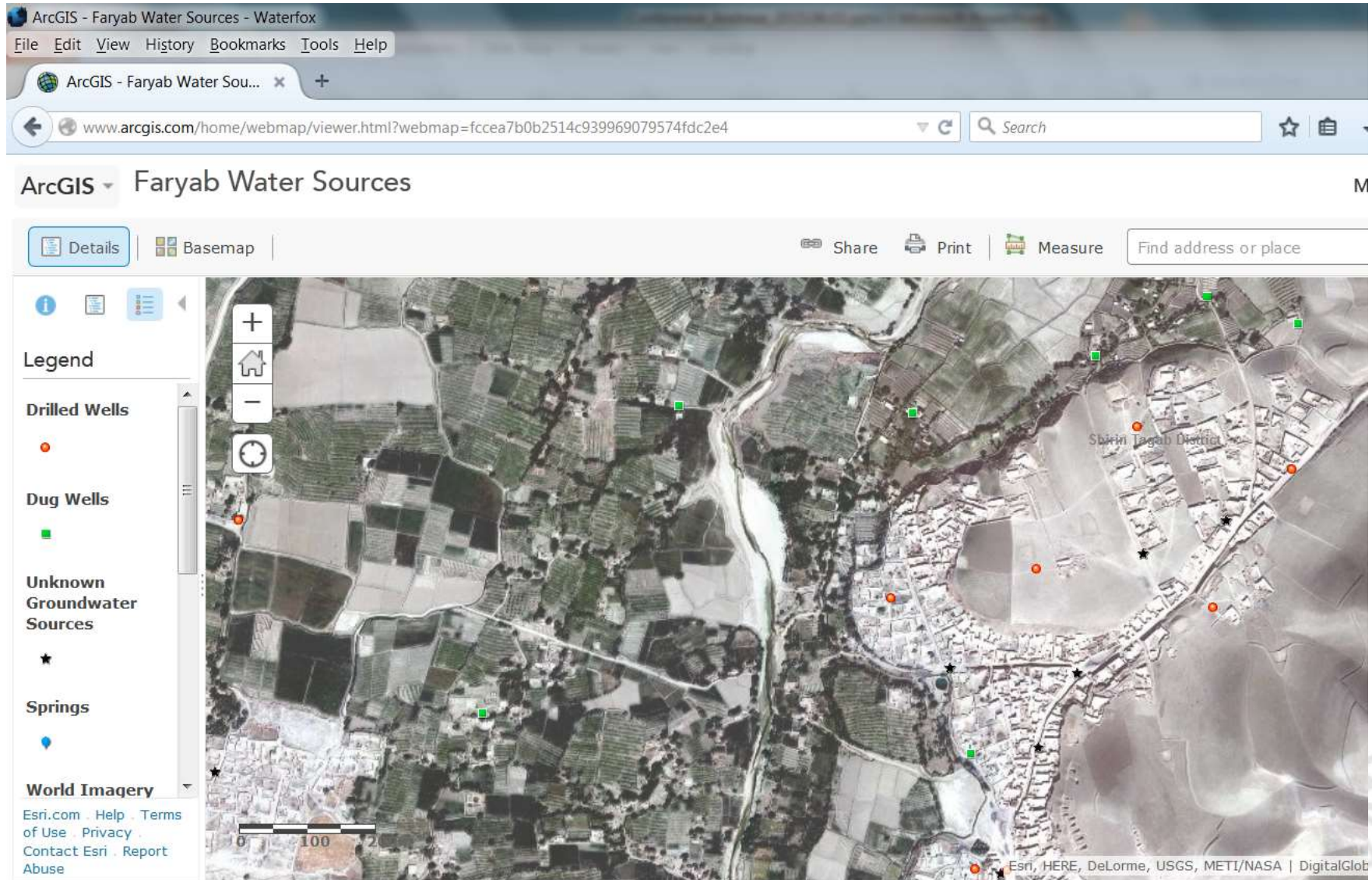
Water sources map of Faryab



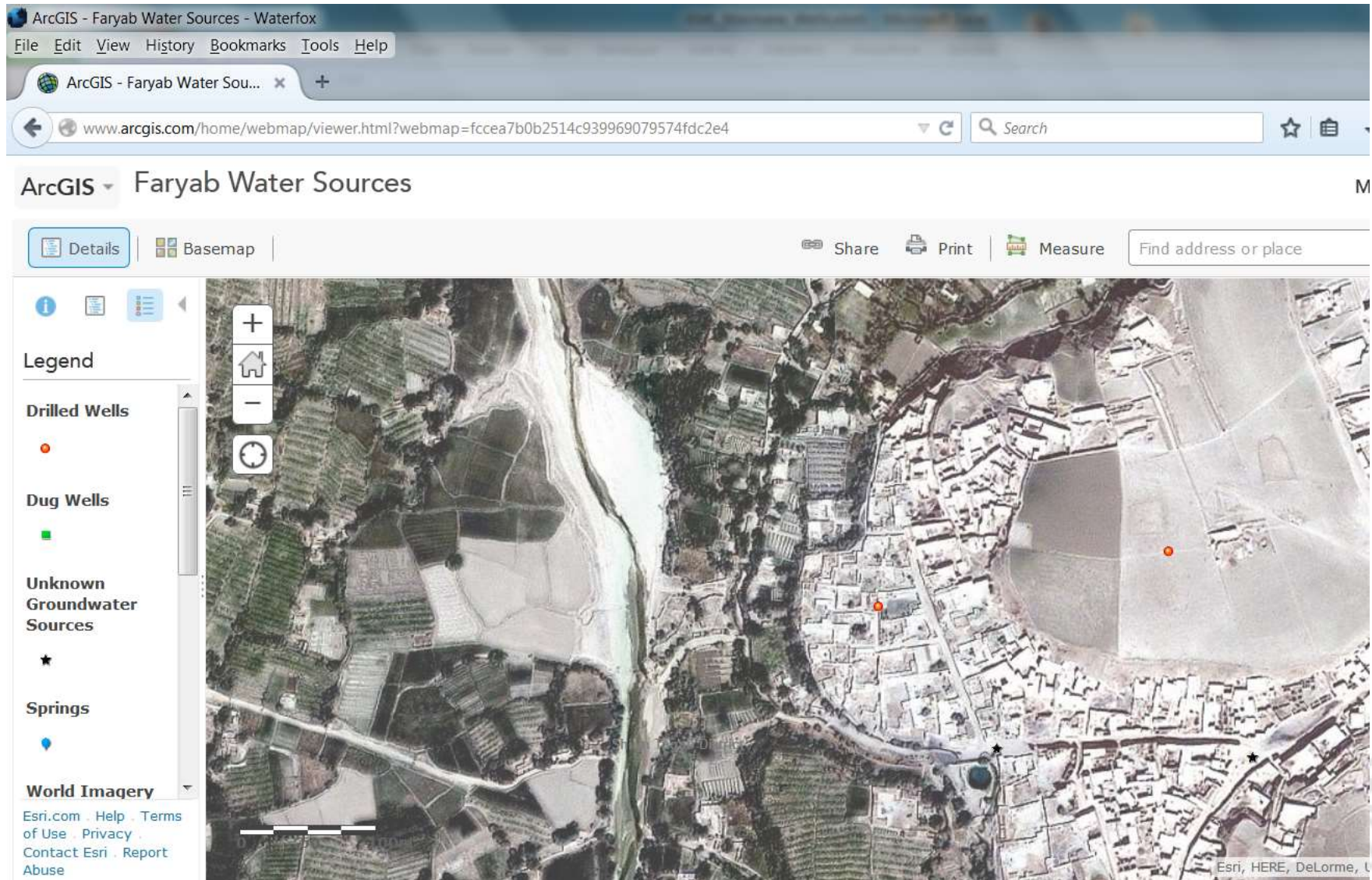
Water sources map of Faryab



Water sources map of Faryab



Water sources map of Faryab



Water sources map of Faryab

ArcGIS - Faryab Water Sources - Waterfox

File Edit View History Bookmarks Tools Help

ArcGIS - Faryab Water Sou... x +

www.arcgis.com/home/webmap/viewer.html?webmap=fccea7b0b2514c939969079574fdc2e4

ArcGIS Faryab Water Sources

Details Basemap Share Print Measure Find address or place

Legend

- Drilled Wells
- Dug Wells
- Unknown Groundwater Sources
- Springs
- World Imagery

Esri.com Help Terms of Use Privacy Contact Esri Report Abuse

Baloch

ID	361731064531301
Type	Drilled borehole
Name	Baloch
Village	Baloch
District	Shirin Tagab
Longitude	64.88689
Latitude	36.29182
Elevation (m)	485
Year constructed	2013
Implementing agency	DACAAR
Donor	Norwegian

Zoom to

Water sources map of Faryab

ArcGIS - Faryab Water Sources - Waterfox

File Edit View History Bookmarks Tools Help

ArcGIS - Faryab Water Sou... x +

www.arcgis.com/home/webmap/viewer.html?webmap=fccea7b0b2514c939969079574fdc2e4

ArcGIS Faryab Water Sources

Details Basemap

Share Print Measure Find address or place

Legend

- Drilled Wells
- Dug Wells
- Unknown Groundwater Sources
- Springs
- World Imagery

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Maymana District

0 20 40m

(4 of 4)

Imagery provider: DigitalGlobe

DATE (YYYYMMDD)	20110718
RESOLUTION (M)	0.50
ACCURACY (M)	10.20
DATA SOURCE	WV02

Zoom to

Access ArcGIS Online via a web site

Untitled Document - Waterfox

File Edit View History Bookmarks Tools Help

Untitled Document x ArcGIS x +

norplan.af/Page_GIS_Web_maps.html

Search

Different maps covers:

Water points showing:-

- Type of water point
- Water quality (EC)
- Dept to static water level
- Wells and drilling reports/logs

Also

- Geology
- Satellite images

Source of data:

- DACAAR water points
- MRRD data
- USGS
- Russian hydrogeological maps

Different layers of information will be added continuously as dynamic on-line maps

Hydrogeological Map of Faryab

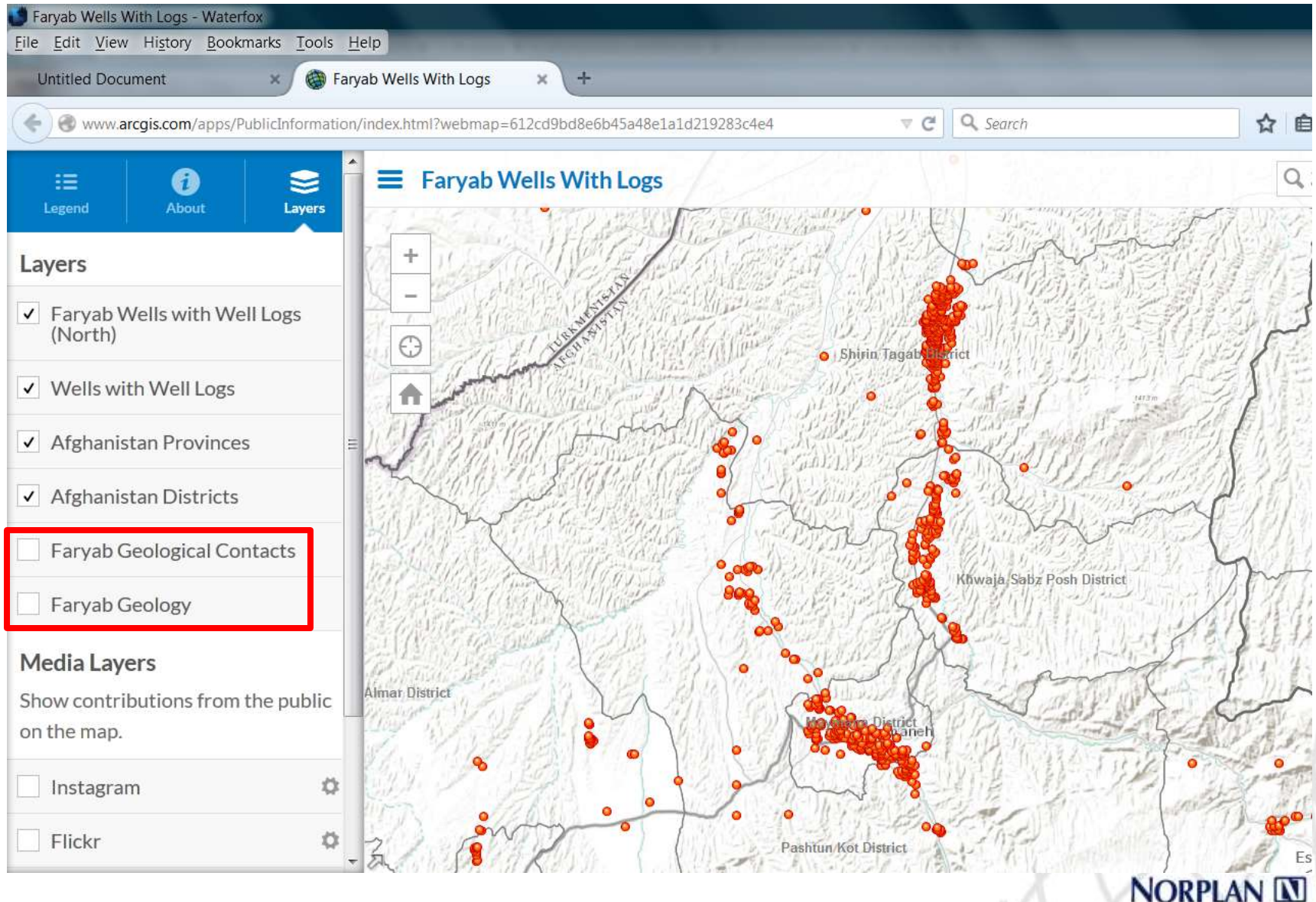
Map of Water Points Functionality in Faryab Province, Afghanistan

View Map

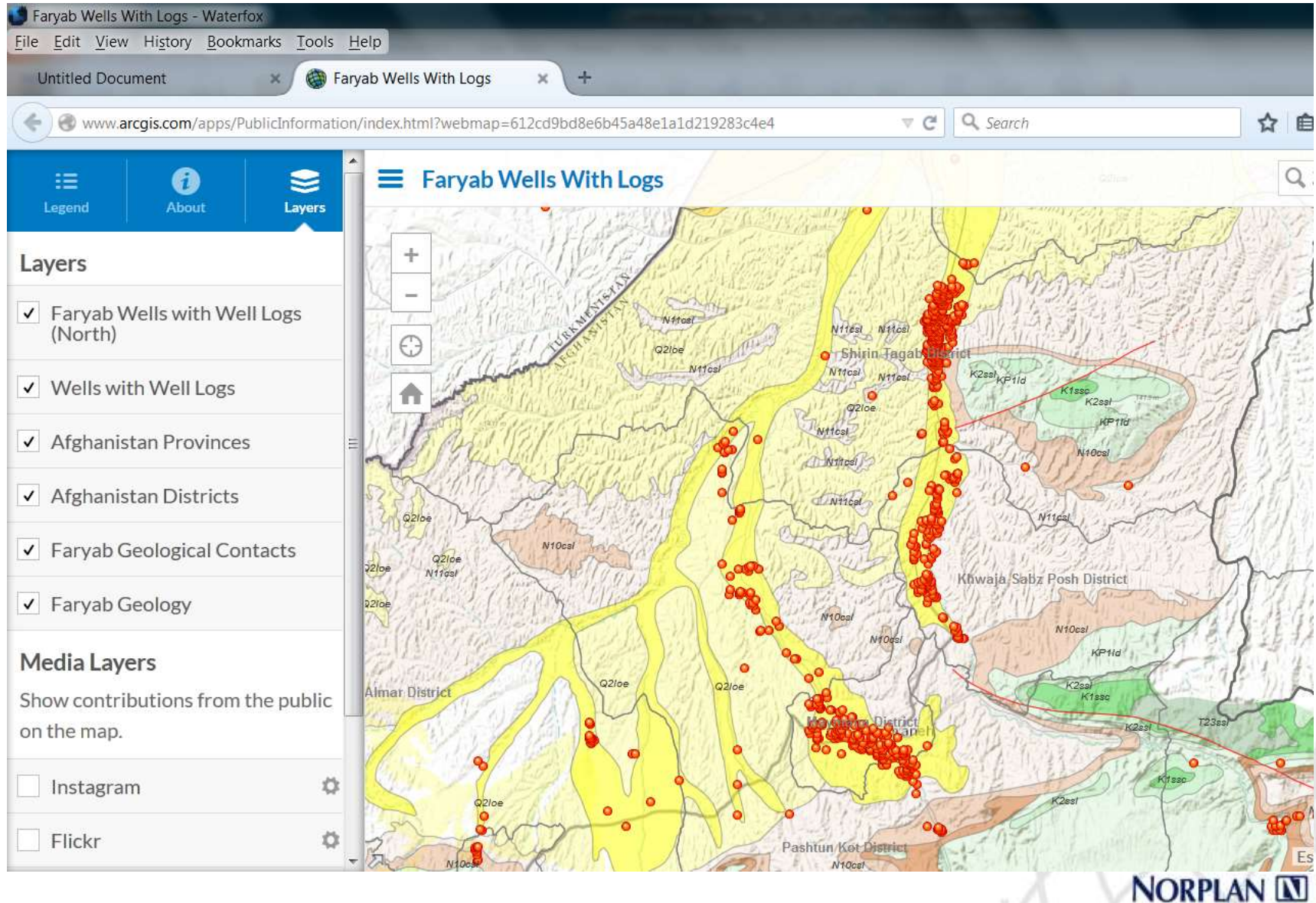
Faryab Wells With Logs

Faryab Rest Water Levels

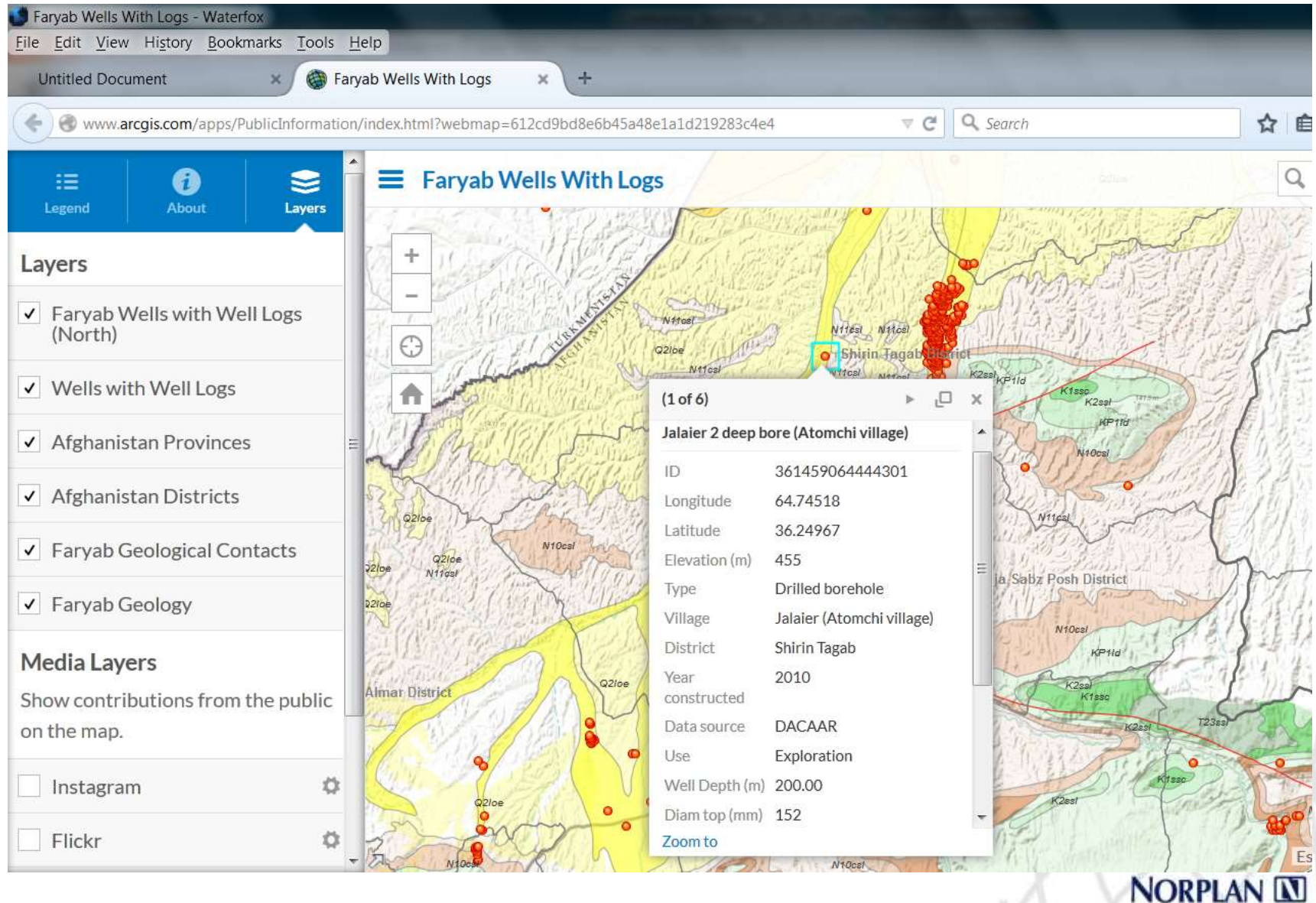
Access ArcGIS Online via a web site



Access ArcGIS Online via a web site



Access ArcGIS Online via a web site



The screenshot shows the ArcGIS Online web interface for the 'Faryab Wells With Logs' map. The browser address bar displays the URL: www.arcgis.com/apps/PublicInformation/index.html?webmap=612cd9bd8e6b45a48e1a1d219283c4e4. The map shows a geographical area with various layers and wells. A pop-up window displays the following information for the selected well:

Jalaier 2 deep bore (Atomchi village)	
ID	361459064444301
Longitude	64.74518
Latitude	36.24967
Elevation (m)	455
Type	Drilled borehole
Village	Jalaier (Atomchi village)
District	Shirin Tagab
Year constructed	2010
Data source	DACAAR
Use	Exploration
Well Depth (m)	200.00
Diam top (mm)	152

The map interface includes a left sidebar with the following sections:

- Layers**
 - ☒ Faryab Wells with Well Logs (North)
 - ☒ Wells with Well Logs
 - ☒ Afghanistan Provinces
 - ☒ Afghanistan Districts
 - ☒ Faryab Geological Contacts
 - ☒ Faryab Geology
- Media Layers**

Show contributions from the public on the map.

 - ☐ Instagram
 - ☐ Flickr

The map itself shows a topographic view of the Faryab region, with various districts labeled, including Shirin Tagab District and Jala Sabz Posh District. The map is titled 'Faryab Wells With Logs'.

NORPLAN

Access ArcGIS Online via a web site

The screenshot shows the ArcGIS Online web interface. The browser address bar displays the URL: www.arcgis.com/apps/PublicInformation/index.html?webmap=612cd9bd8e6b45a48e1a1d219283c4e4. The page title is "Faryab Wells With Logs". The left sidebar contains a "Layers" panel with the following layers checked: "Faryab Wells with Well Logs (North)", "Wells with Well Logs", "Afghanistan Provinces", "Afghanistan Districts", "Faryab Geological Contacts", and "Faryab Geology". Below the "Layers" panel is a "Media Layers" section with the text "Show contributions from the public on the map." and two unchecked options: "Instagram" and "Flickr". The main map area shows a topographic map of the Faryab region in Afghanistan. A red dot on the map represents a well. A pop-up window titled "(1 of 6)" is open over this well, displaying the following information:

Village	Jalaier (Atomchi village)
District	Shirin Tagab
Year constructed	2010
Data source	DACAAR
Use	Exploration
Well Depth (m)	200.00
Diam top (mm)	152
SWL (m)	16.70
SWL date	July 2, 2010
Well report	DACAAR\Jalaier 2 Atomchi.pdf
Download data	More info

The "More info" link is highlighted with a red box. The map also shows various geographical features, including the "Turkmenistan-Afghanistan" border, "Aimar District", and "Shirin Tagab District". The "NORPLAN" logo is visible in the bottom right corner.

Access ArcGIS Online via a web site

Dropbox - Jalaier 2 Atomchi.pdf - Waterfox

File Edit View History Bookmarks Tools Help

Untitled Document x Faryab Wells With Logs x Dropbox - Jalaier 2 Atomchi... x

https://www.dropbox.com/s/9nvuoieX0qm5gf2/Jalaier_2_Atomchi.pdf?dl=0

Jalaier 2 Atomchi.pdf

Download Sign in

Exploration well No-2 Log design (Atonchi village, Jalaier)

Select Station	X [m]	Y [m]	Elevation [m]	TQC [m]
Jalaier 2	64.75	36.25	455.000	456.00

Depth (m)	Lithology	Well Completion details	Drilling protocol
0	Clay		
	Sand		
50	Clay		
	Sandy Clay		
100	Clay		
	Sandy Clay		

Major ion plot by Pie diagram 01/02/2010 (Atonchi village, Jalaier)

Legend

- Na
- Ca
- Mg
- Cl
- HCO3
- SO4
- as eq/L

7880 µs/cm

Rotary Reverse

Comments Options

Post a comment to start a discussion.
@Mention someone to notify them.

Write a comment

Comments will notify 2 people. Anyone who can view this file can comment.

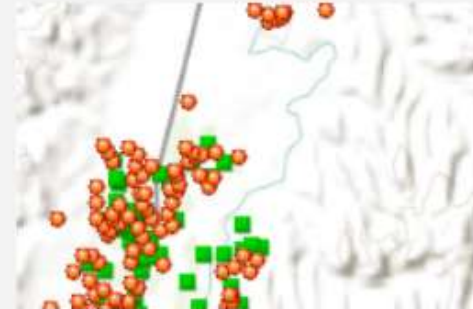
All online Faryab maps use a free Public Account



Faryab Monitoring Wells



Faryab Groundwater Quality ...



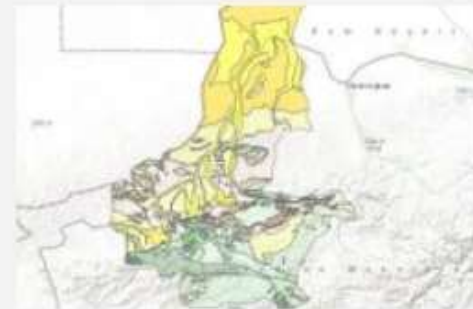
Faryab Water Sources



Faryab Rest Water Levels



Faryab Wells With Logs



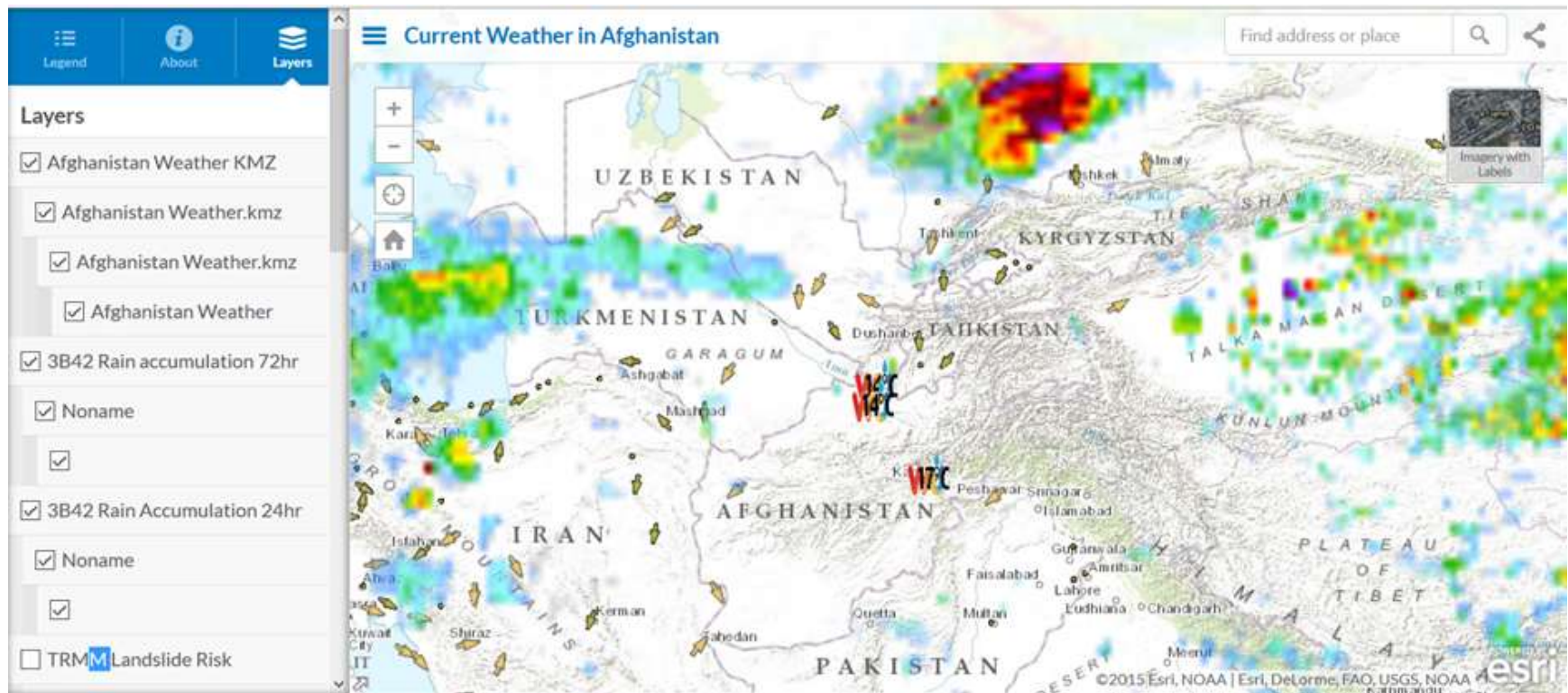
Faryab Geology Map

Find them in the **Faryab Maps** group



<http://www.arcgis.com/home/group.html?owner=AfghanMaps&title=Faryab%20Maps>

Live Weather Map of Afghanistan



Live Internet Data – Earthquakes from USGS

Earthquakes in Afghanistan - Waterfox

File Edit View History Bookmarks Tools Help

ArcGIS - Farya... file:///C:...0Site.htm Paghman Dist... Faryab Water ... Mahigir Canal Earthquak...

www.arcgis.com/apps/PublicInformation/in Search

Earthquakes in Afghanistan

Find address or place

Layers

- ☒ Earth's Tectonic Plates
- ☒ Tectonic_Plates
- ☒ Fault Lines
- ☒ Labels
- ☒ Past 30 Days, M2.5+ Earthquakes
- ☒ Earthquakes
- ☒ Earthquakes

Media Layers

Show contributions from the public on the map.

- ☐ Instagram
- ☐ Flickr
- ☐ Twitter

(1 of 3)

M 7.5 - 45km N of 'Alaqahdari-ye Kiran wa Munjan, Afghanistan

USGS
science for a changing world

M 7.5 - 45km N of 'Alaqahdari-ye Kiran wa Munjan, Afghanistan

PAGER - ORANGE ShakeMap - VII
DYFI - VII

Time
2015-10-26 09:09:32 UTC
2015-10-26 13:39:32 +04:30 at epicenter

Zoom to

Esri, DeLorme, FAO, USGS, NOAA | United States Geologic Service (USGS)

49

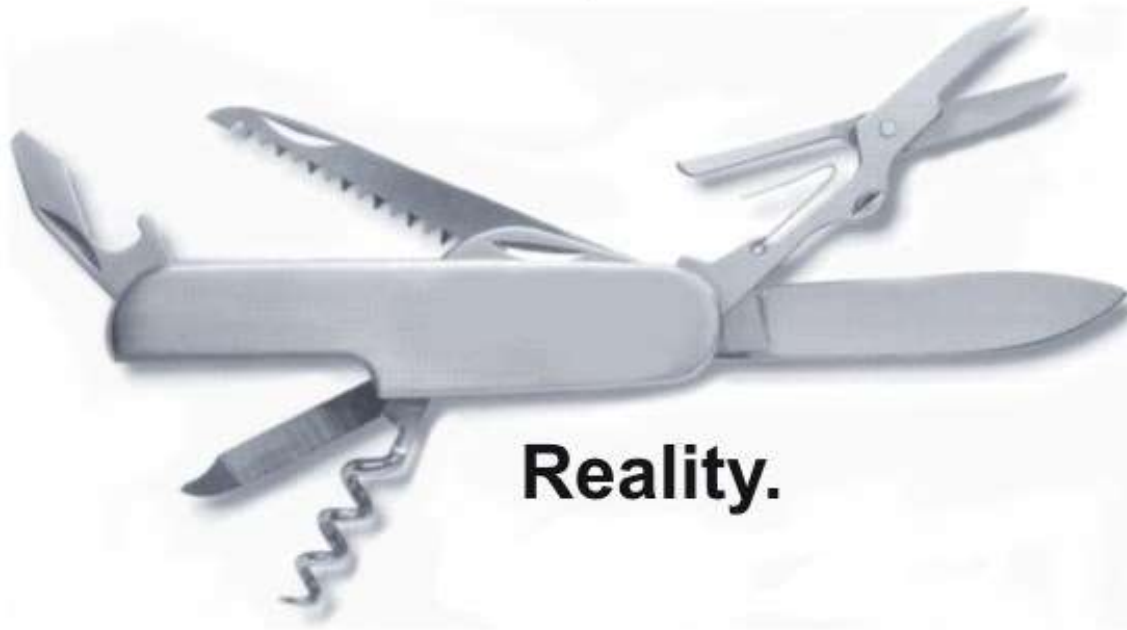
Data Management, Paper & Online Map Production: Results from Faryab Province

1. Data management
2. Paper Maps
3. Online Maps
4. Conclusions & Recommendations

Conclusions & Recommendations



Perception.



Reality.

**Data
management
& GIS is far
more
complicated
than you
think!**

Conclusions & Recommendations



Regular training & capacity building needs to be integrated in Ministerial workplans & budgets.

+/- 800 Participants trained by NORPLAN

Conclusions & Recommendations



GIS & IT are constantly evolving.

Keep studying or you will be left behind.

+/- 800 Participants trained by NORPLAN

Thank you for your attention!

