# **GIS Wildlife Data Tutorial**

# How to find, Map, & Spatially Analyze Wildlife Data in a GIS System



# This Tutorial was Created by Jennifer Anne Lentz, Ph.D. Education Specialist at the Aquarium of the Pacific

This tutorial, and other teaching-related materials by Dr. Lentz are available online at: http://JenniferALentz.info/Teaching.html

# Part 1: Setting up the GIS Software

### • First you will need to set up and/or log into your <u>ArcGIS Online</u> Account

Many K-12 schools (or School Districts) have accounts through ESRI (the GIS company), so you may want to check to see if there is a log-in you can use (see 1B). Or you can sign-up for a free 30 day trail (see 1A)

1. Go to the following website: <u>http://www.arcgis.com/</u>

Click the "Sign in" link in the upper right hand corner



- **1A**. register for a free 30 day trial
- **1B.** Log in with your personal OR organization's ArcGIS online (AGOL) account *For example here I have logged in with my personal AGOL account log-in*

ArcGIS - Sign In - W	findows Internet Explorer						
GO . O https		e-i				🖉 🔒 [4] 🛪 [ P the bank	( <b>P</b> )-
File Edit View Favor	nters Tools Help						
🚖 Favortes 🛛 🎪 🖻	angendrad Street • 🐮 west Stee	Callery *					
Arrists - Sign In						🔯 • 🖾 · 🖾 🖮 • Paga •	· Safety • Tools • 🕢 • "
			Resource Cent	ter Show: We	b Content Only* 3	ennifer Lentz Notifications Help+ Sign Out	
	ArcGIS	GALLERY	MAP	GROUPS	MY CONTENT	Find maps, applications and moreQ.	
	23	1A		an 72		1B	
	Don't hav	e an accour	it?	Γ	Sign In		
	Sign up for an A An ArcOIS subscr portal for your of 30-Day Free Tri	arcGIS subscription ription allows you to rganization. al	set up an online mapping		Usemame: Password:	zandler	
	Not ready to sul Creace an Arods If you have an E an Arods Public Register your Er Don't have an Er Create a Public	bscribe? 5 Public Account with an Global Account, y Account an Global Account an Global Account to Account	h limits on usage. ou can register it to create register?		ß	Sonia 🔁	

- If you have Access to the 2010 version of Microsoft Office you will want to download and install the free "ESRI Maps" Add-in for Excel from the following website: <u>http://www.esri.com/software/arcgis/arcgisonline/apps/download</u>
- If you do not have this version of excel, you can go straight to "Part 4" of this tutorial

# Part 2: Find and Download Spatial Data

This part of the tutorial provides websites with free spatial wildlife data, and gives step-by-step instructions for how to search within these websites and download the data.

# • Go to the following website: <u>http://iobis.org</u>

• Select the "Search Data" Tab



- Search for your Animal in the iOBIS database
  - 1. Click the **"Taxa"** Window
  - 2. Select "Common Name" (or "Scientific Name") from the pull down menu
    - Start to type the name of the animal you are interested in
    - Then select that animal from the list provided
    - Information on the animal you just searched should appear in the Taxa Search window.
  - 3. Go ahead and close the Taxa Search window by clicking the X in the upper right corner



#### • Navigating the Map of your Animal locations

- You should now have a map showing the locations where your animal has been sighted
- **1.** Click the legend box to see what the colors mean
- 2. Try viewing the data based on their Point Locations



#### • Downloading this Spatial Dataset

- 1. Click the "Show Results" button, a window should appear entitled "Show Results"
- 2. Select the "Download tab"
- 3. Click to download the data as "Points" in "CSV" format



- 4. Click to **Open with** your computer's default un-zipping program
- 5. Select to Extract the file select where on your computer you would like the CSV file saved



Next we are going to locate and download spatial data on the typical geographic range for the animal. The site we are using provides free, publically available data for threatened and endangered animals

# Go to the following website: <u>www.iucnredlist.org</u>

- 1. Enter the **name** (common or scientific) of the animal in the search box and click the **go** button
- 2. Select the animal you're interested in from the list provided



# A Window should appear with information on your animal

- 3. Select the "Geographic Range" link
- 4. Then click the "Range Maps" link provided to open the map viewer & explore the geographic range



5. Click the "Download Spatial Data" link to download the data file for your animal's geographic range



When downloading data for individual as	nimals you must fill out the	e following form to get the data
---	------------------------------	----------------------------------

	The IUCN Red List of Threatened Species <sup>11</sup> 2013.1	My Downloads   FAQ   Contact   Terms of use   IUCN.org	Will the data requested be used to create a derivative work? $\overset{*}{\ \_}$	O Yes
DED	#About #Initiatives #News #Photos #Partners #Sponso			💿 No
	Enter Red List search term(s) 60 OTHER SEARCH OPTIONS	er more	Is your request for an export of data related to activities within, or	
Home »	Export Data Request Form		conducted on behalf of, or to the benefit of, or to assist the activities of any entity other than a not-for-profit organization?*	O No
	Please answer the following questions related to your reque	st for data:	Please give a comprehensive description of your intended usage of the data re	equested.*
	is the data requested for a one-off reproduction of information for a book, a game, a product, zoo signage, etc.?^ $\!\!\!\!\!\!\!$	○ Yes ⊙ No	This data is being used as part of a workshop designe show teachers how they can access data online to teach their students about the environment using GIS. Specifically, I will be showing them how to download	d to 🔥
	Will the data be redistributed, in its entirety or in part, to a third party? $^{\ast}_{-}$	⊙ Yes ⊛ No	locations of California Sea Lion sightings from JQEIS then download the geographic range from <u>JUCIredist</u> or then bring both <u>datasets</u> into <u>ArGEIS</u> Online so their	and rg, and ⊻
	Will the data be reposted, in its entirety or in part, electronically on a website, pulletin board, blog, FTP site, or other means of posting on the internet?_	© Yes ○ No	Should my request be approved, I agree to the Terms of use, except where above and as expressed in writing by LCN, for the information obtained from t answers above accurately reflect my use of the data I am requesting from the	e otherwise answere dhe IUCN Red List. My IUCN Red List.
	Will the data requested be used to create a derivative work $2^{\rm a}_{\rm p}$	⊙ Yes ⊚ No	For any publications making substantial use of the data, LUCN and its partners w for collaboration and possible co-authorship, and to comment prior to publication clarifications regarding the terms of use or how they may apply to your intende please contact the IUCN Red List Unit at <u>redisticutorn org</u> .	velcome the opportuni n. For queries or d use of the data,
	Is your request for an export of data related to activities within, or conducted on behaif of, or to the benefit of, or to assist the activities of any entity other than a nct-for-profit organization?*		CREATE DATA REQUEST FORM)	

When your request has been approved (3-7 days) you will be notified via email and sent a link to download the data. Download this datafile but leave it in its zipped format.

e www.iucnredlist.	org/search/list 🕎 🗸 sea lion geographic distribution 🔎 🍱 🏫 📴
Certification Contraction Cont	The IUCN Red List of Threatened Species <sup>114</sup> 2013.1       My Downloads   EAQ   Contact   Terms of use   UCN.org         ::About ::Initiatives ::News ::Photos ::Partners ::Sponsors ::Resources       Downloads   EAQ   Contact   Terms of use   UCN.org         Enter Red List search term(s)       (o) OTHER SEARCH OPTIONS       Discover more
Home > Sav	Paved Searches         Saved Searches are permanently stored in your user account. Once a search is saved, you may also export the results for offline use, or provide a link for others to access your saved search.         . You have no saved searches.         Add your current search         Available spatial downloads <u>Pavend Searches</u> <u>Pavend Searches</u> <u>Available spatial downloads</u> <u>Download link</u> Ditailes 20:30:30:UTC         Pending approval by UCN <u>Pending approval by UCN</u> <u>Other Actions</u> Lor Ott
	Hone   Contact   FAQ   Site Map   Donate Now Privacy & Security   Terms of Use © International Union for Conservation of Nature and Natural Resources.

# Part 3: Exploring the Location Data in Excel using the ESRI Maps Add-in

If you do not have access to the 2010 version of Microsoft Excel with the free ESRI Maps Add-in, go to Part 4

- Locate the **point locations dataset** for your animal that you downloaded in step 5 of Part 2(pg. 3)
  - Right-click on the CSV file that you downloaded from iOBIS and extracted from its Zipped format
  - Scroll down to "Open With" and select "Microsoft Excel"



• Once your data file opens click the "ESRI Maps" tab

	19 -	(°" - 🖄 - I	Ŧ				525	5483955f319	9_20131009	_02652 - 1	vicrosoft E	xcel						- 0	23
F	ile H	ome Inse	ert Page	Layout	Formulas	Data I	Review	/iew Esr	i Maps								\$	🕜 — é	ja 23
Pa	×	Calibri	* 11	· A A	· = =	<b>=</b> »»-	Wra	p Text	General		* Cond	itional Fo	rmat Cell	insert	Delete Form	Σ Auto	Sum * A		
	- I I I I I I I I I I I I I I I I I I I	16 I U	•   # •	2 · A	* = =		E Mer	ge & Center		• • .00	Forma	atting * as T	able + Styles	* *	* *	Clear	* Filte	r * Select *	
Clip	board 🗔		Font		54	Aligr	nment		Ξ Nι	umber	5	Style	15		Cells		Editing		_
	A1		0	J <sub>x</sub> id	1								1	1	1				~
	А	В	C	D	E	F	G	Н	I	J	K	L	M	N	0	Р	Q	R	
1	id	valid_id	sname	sauthor	tname	tauthor	resource_	resname	datecolled	latitude	longitude	lifestage	basisofree	datelastca	datepreci	datelastm	depth	depthpre	ete≡
2	1036223	6 /01396	Zalophus	californian	Zalophus	(Lesson, 1	130	IZIKO SOUT	******	34.0333	-120.367			*****	12:00:00	2/6/2006			
3	19/134	8 /01390 1 701296	Zalophus	californian	Zalophus	(Lesson, 1	130	IZIKO SOUL	2/2/1069	33.25	-119.5			******	15 days	2/6/2006			
5	2225185	5 701396	Zalophus	californian	Zalophus	(Lesson 1	1507	Video Anr	#########	36 76403	-120.307		м	*****	0:00:00	8/7/2009	25.07	0	1
6	1266563	9 701396	Zalophus	californian	Zalophus	(Lesson, 1	1507	Video Anr	*****	36,75374	-121.973		M	*****	0:00:00	8/7/2009	9.42	0	,
7	2059363	6 701396	Zalophus	californian	Zalophus	(Lesson, 1	1507	Video Anr	*****	36.75674	-121.971		M	*****	0:00:00	8/7/2009	9.56	0	5
8	1949582	3 701396	Zalophus	californian	Zalophus	(Lesson, 1	1507	Video Anr	****	36.72002	-122.053		M	****	0:00:00	8/7/2009	139.2	0	5
9	1843035	7 701396	Zalophus	californian	Zalophus	(Lesson, 1	1507	Video Anr	*****	36.7199	-122.052		M	*****	0:00:00	8/7/2009	117.79	0	)
10	1871068	6 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	26.51178	-94.6645		D	****		****			
11	2144947	7 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	27.47028	-82.6907		D	****		****			
12	2147400	3 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	28.1369	-92.045		D	*****		****			
13	21934340	0 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	27.6921	-91.756		D	****		****			
14	22348114	4 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	29.47259	-87.1689		D	****		****			
15	2246812	3 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	29.74851	-93.0899		D	*****		*****			
16	1956759	3 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	27.30174	-83.2079		D	*****		*****			
17	1253557	8 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	27.7368	-88.2854		D	*****		****			
18	1783454	1 701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	26.79914	-84.7157		D	*****		*****			
19	1958202	2 /01396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	30.41911	-86.5596		D			*****			
20	193/011	701396	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	20./2112	-84.9392		D			******			
21	19957110	701390	Zalophus	Lesson	Zalophus	(Lesson, 1	1545	Biodiversi	ty of the G	20.7039	-90.4001		D	******		******			-
14	I → N 5	25483955f	319_2013	1009_026	52 2	(Lesson, 1	1545	biouversi	ty of the G	23.01955	-52.0141		U					1	
Rea	dy															100%	0	0(	÷ .;;

# How to Find, Map, & Analyze Wildlife Data in a GIS System

- 1. Sign In to your "Arc GIS Online" Account"
- 2. Then click "Insert Map"
  - A map should appear on top of your spreadsheet (like the one shown below)
- 3. Click the "Add Excel Data" button

then click the "Next" button

4. Click "Cell Range"

X	ile Hom	• 💁 • 🖙 e Insert Pag	pe Layout J	Formulas	Data I	525 Review V	1483955f31 New Es	9_20131009 ri Maps	_02652 - 1	Microsoft E	xcel			• • • • •	E3 1
In: M	ert Map Gontents Map	Add Excel Search Data Add Data	Basemap Organ	Bring Forw Send Backv Remove Lay Ize Layers	ard vard er Spo	Hot Add ts Heatmap Analysis	Select	Style Group	oing Cluster Layer	Ing Visible Range	La 1	Sign In ArcGIS	Share Create Copy Map Slide Image Share	(2) Help Help	
	A1	• (*	∫x id								SI	gn in to ArcGIS Onlin			
1	A	B C	D	E	F	G	н	Ι.	J	K	L				
1	id v	valid_id sname	sauthor	tname	tauthor	resource_	resname	datecolled	latitude	longitude	lifestag				
2	10362236	701396 Zalophu	s californian	Zalophus	(Lesson, 1	130	iziko Sout		34.0333	-120.367					
3	1971348	701396 Zalophu	s californian	Zalophus	(Lesson, 1	130	iziko Sout	******	33.25	-119.5					
4	4392081	701396 Zalophu	s californian	Zalophus	(Lesson, 1	130	iziko Sout	3/3/1968	34.0333	-120.367		-			
5	22251855	701396 Zalophu	s californian	Zalophus	(Lesson, 1	1507	Video An		36.76403	-122.048		Esn Maps for (	Office wants to a	ccess your account i	nformation
6	12665639	701396 Zalophu	s californian	Zalophus	(Lesson, 1	1507	Video An	*******	36.75374	-121.973					
7	20593636	701396 Zalophu	s californian	Zalophus	(Lesson, 1	1507	Video An	******	36.75674	-121.971		Sign in to	ArcGIS O	nline	
8	19495823	701396 Zalophu	s californian	Zalophus	(Lesson, 1	1507	Video An		36.72002	-122.053		Sign in t	AICOIDO	innie	
9	18430357	701396 Zalophu	s californian	Zalophus	(Lesson, 1	1507	Video An	*******	36.7199	-122.052					
10	18710686	701396 Zalophu	Lesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	26.51178	-94,6645					
11	21449477	701396 Zalophu	s (Lesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	27,47028	-82.6907		Username:	jlentz_AOP2		
12	21474003	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	28,1369	-92.045					
13	21934340	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	27.6921	-91.756		Password:			
14	22348114	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	29,47259	-87.1689					
15	22468123	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	29.74851	-93.0899					
16	19567593	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	27.30174	-83.2079					
17	12535578	701396 Zalophu	Lesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	27.7368	-88.2854			Sign In Car	icel	
18	17834541	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	26,79914	-84,7157					
19	19582022	701396 Zalophu	silesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	30.41911	-86.5596					
20	19376117	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	26.72112	-84,9392		Forgot Userna	ame or Password	2	esr
21	19360901	701396 Zalophu	siLesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	25.7039	-90,4661					
22	19957119	701396 Zalophu	s Lesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	29.01935	-92.6141	_				

0		17-0	9 - <u>(</u>					52	5483955f3:	19_20131009	9_02652 - 1	Micros	rosoft Excel 😐 🖬	23
	File	Но	me Ins	ert Pag	e Layout	Formulas	Data	Review	View Es	sri Maps			n 🕤 🖓 🗅	X
	Insert Map	3 Map	Add Exc Data	el Search	Basemap Orga	Bring Forv Send Back Remove La Inize Layers	ward ward yer Spo	Hot Add ots Heatmag Analysis	Select	Style Grou	ping Cluster Layer	ing Vi Ra	Visible Layer Enrich Range Details Layer Arred D	
			2	• (*	∫x id									
	4	А	В	С	D	E	F	G	н	1	J		Add Excel Data for Map 1	×
3	1 id		valid_id	sname	sauthor	tname	tauthor	resource	resname	datecolle	latitude	long	Bata Source	
	2 10	0362236	701396	5 Zalophu	s california	n Zalophus	(Lesson, 1	1 130	iziko Sou	t ########	34.0333	-12	How is the data you want to man stored?	
	3 1	1971348	701396	5 Zalophu	s california	n Zalophus	(Lesson, 1	1 130	iziko Sou	t #########	33.25	-	now is the data you want to map stored.	
2	4 4	4392081	Map 1							\$ 3/1968	34.0333	-12	2	
	5 22	2231833	1	laska	all a	10.00	1.12.12	12. L.	1		36 75274	-12	2	
	7 20	1593636									36,75674	-12		
3	8 19	9495823	- Sector			N	ORTH	101			36,72002	-12	Table or Named Range	
	9 18	8430357	1000			AM	ERI	CA		******	36.7199	-12		
	10 18	8710686								of the G	26.51178	-94	Get map data from a table or named cell range	
	1 21	1449477			8238				12	of the G	27.47028	-82	12	
1	12 21	1474003	11							of the G	28.1369	.9		
1	13 21	1934340				1 3				of the G	27.6921		A Cell Pange	
4	14 22	2348114				100				of the G	29.47259	4		
1	15 22	2468123	N	ORTH	1				- 1	of the G	29.74851		Get map data from an unnamed range of cells	
	10 19	9567593	PA	CIFI	C	29		Conto		of the G	27.30174			
	10 17	7024541	38 0	CEAN	V		53	Mex	icon	of the G	27.7308	-00		
-	19 19	9582022					and the	S 10.5	POWERED	of the G	30 41911	-86	26	
	0 19	9376117	G		6327		and the	-	es	of the G	26.72112	-84		
	1 19	9360901	701396	5 Zalophu	Lesson	Zalophus	(Lesson, 1	1 1545	Biodivers	sity of the G	25.7039	-90	Next	
1	2 19	9957119	701396	5 Zalophu	Lesson	Zalophus	(Lesson, 1	1 1545	Biodivers	sity of the G	29.01935	-92	2.0141	
ł		H 52	5483955f	319_201	31009_026	52 2				14		111.	>)	
	keady													

#### 5. Select all the data columns (with data in them) in the spread sheet and click "OK"

XII	19 · (*	- @ -	Ŧ				525	483955f3	19_2013	31009_0	2652 - 1	vicrosoft E	Excel									• 23
File	Home	Inse	rt Pag	ge Layout	Formulas	Data R	teview V	iew E	sri Maps												۵ 🕜 🗆	<u>م</u>
Insel Map	Map Map	Add Exce Data Add	el Search Data	Basemap	Bring Forwa Send Backw Remove Lay nize Layers	rd ard Find H Spot	lot Add s Heatmap	Select	Style	Groupin	ig Cluster Layer	ing Visible Range	Layer I Details	Enrich Layer	Sign Out ArcGIS	Share Layer	Share Map Sh	Create Slide	Copy Image	(?) Help		
	A1		( n	f <sub>x</sub> id																		
	ĸ	L	м	N	0	р	Q	R	S		Т	U	V		W	X		Y	Z	Esri Map	s	- ×
1	ongitude li	festage	basisofr	ec datelastc	a datepreci:	datelastm	depth	depthpr	ectemp	eratisa	linity	nitrate	oxygen	n pho	osphate	silicate				[	Search	
2	-120.367			*****	12:00:00	2/6/2006											1			-	Map Contents	
3	-119.5			*****	15 days	2/6/2006																
4	-120.367			*****	12:00:00	2/6/2006						Select the	e range t	o olot	on the r	nan 🔽						
5	-122.048		м	*****	0:00:00	8/7/2009	25.07		0 12	.263	22 268						-					
6	-121.973		м	******	0:00:00	8/7/2009	9.42		0	_	- 11	Select Rang	le									
7	-121.971		M	******	0:00:00	8/7/2009	9.56		0	_	51	\$4:\$2	_		_							
8	-122.053		м	*****	0:00:00	8/7/2009	139.2		0 8	.622			1	OK		Cancel						
9	-122.052		M	*****	0:00:00	8/7/2009	117.79		0 8	.794	89	-	-				-					
10	-94.6645		D	*****		*****											1					
11	-82.6907		D	*****		*****											1					
12	-92.045		D	*****		*****											1					
13	-91.756		D			*****				700	26 100	1.000		-	0.074							
14	-87.1089		0						20	.701	30.199	1.002	4.3	575	0.074	2.5	-					
16	-93.0899		D			********											1					
17	-03.2075		D	*****		******											1					
18	-84 7157		D			********											1					
19	-86.5596		D	******		******			15	.729	34,003	2.322	5.9	946	0.361	2.07	4					
20	-84,9392		D	******		********			1.5		34.003	2.324	5.5		21201	2.07	1					
21	-90,4661		D	******		******											1					
22	-92.6141		D	*****													1		Ŧ			
14 4	H 5254	83955f	319_201	31009_026	52 2											.111			•			
Point																			1009	6 <del>0</del> -		

- 6. Select "Latitude, Longitude" from the pop-up window, and then click the "Next" button
- 7. Make sure the names of the data columns match the label, and then click the "Add" button



• Your map should now show "Clusters" of animal sighting locations

	<b>9</b> - C		Ŧ				525	483955f31	9_20131009	_02652 - 1	vicrosoft E	xcel							23
F	ile Hon	ne Inse	rt Pag	e Layout	Formulas	Data I	Review V	liew Es	ri Maps								c	s 🕜 🗆 🖻	1 23
Ins Mi	ert Map Contents Map	Add Exc Data Add	I Search	Basemap d Orga	Bring Forwa Send Backw Remove Lay- nize Layers	ard Find I er Spo	Hot Add ts Heatmap Analysis	Select	Style Group	oing Cluster	ing Visible Range	Layer Enr Details Lay	ich Sign out ArcGIS	Share Layer	Share Creat Map Slide Share	te Copy e Image	(?) Help		
			. (=	<i>f</i> ∗ id															•
1	Α	в	С	D	E	F	G	н	1	J	к	L	M	N	0	P 🛓	Esri Maps		, ×
1	id .	valid_id	sname	sauthor	tname	tauthor	resource_	resname	datecollec	latitude	longitude	lifestage	basisofre	datelastc	a datepreci	datela =		Search	
2	10362236	701396	Zalophu	s california	Zalophus	(Lesson, 1	130	iziko Sout	. ******	34.0333	-120.367			*****	12:00:00	2/6/2	Ma	p Contents	
3	1971348	701396	Zalophus	s california	Zalophus	(Lesson, 1	130	iziko Sout	*****	33.25	-119.5			*****	15 days	2/6/2	_		
4	4392081	Mon 1							3/1968	34.0333	-120.367			*****	12:00:00	2/6/2		el Layer	
5	22251855	imap 1	-						·*****	36.76403	-122.048		M	*****	0:00:00	8/7/2	l ľ		
6	12665639	100							*****	36.75374	-121.973		M	*****	0:00:00	8/7/2	6		
7	20593636	the second							******	36.75674	-121.971		M	*****	0:00:00	8/7/2			
8	19495823	0			N	DRTH			·····	36.72002	-122.053		M	*****	0:00:00	8/7/2			
9	18430357				AM	ERIC	A		******	36.7199	-122.052		М	*****	0:00:00	8/7/2			
10	18710686			11					of the G	26.51178	-94.6645		D	*****		*****			
11	21449477			8238				12	of the G	27.47028	-82.6907		D	*****		*****			
12	21474003	11							of the G	28.1369	-92.045		D	*****	1	******			
13	21934340			183	2 1 2				of the G	27.6921	-91.756		D	*****	1	*****			
14	22348114				6330				of the G	29.47259	-87.1689		D	*****	1	*****			
15	22468123	N	DRTH				1. 186		of the G	29.74851	-93.0899		D	*****		*****			
16	19567593	PA	CIFI	C <sup>33</sup>	-	1000	21	58	of the G	27.30174	-83.2079		D	*****		*****			
17	12535578	38 0	CEAN				Mexi	of cor	of the G	27.7368	-88.2854		D	*****		*****			
18	1/834541	a the					1.5	POWERED	of the G	26./9914	-84.7157		D	*****		*****			
19	19582022	all in		6377			-	es	f the G	30.41911	-80.5596		0			*****			
20	193/611/	701200	Zelesku		Teleshus		1545	Diadi	the G	20.72112	-84.9392		0			*****			
21	19300901	701396	Zalophus	s (Lesson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the G	25.7039	-90.4661		D	******		*******			
14 4	► N 525	6483955f	319_2013	31009_026	52	riesson, 1	1545	bioulvers	ity of the G	4	-52.0141		U			▶ []			
Rea	dy		_												<b></b>	100	% <del>-</del>	0 (	Ð

• Use the **zoom controls** (or scroll with your mouse) to explore these clusters at different spatial scales



• To show the Individual Point Locations <u>un-select</u> the "Clustering" button

K 🖬 49 - (	(H + 🙆 + 14	r -				525483955	5f319_2013	1009_026	52 - Mi	crosoft	Excel							• 23
File Ho	me Inser	t Page Laj	yout	Formulas	Data	Review V	iew Est	i Maps								G	0 -	er 2
Insert Map Map Conten Map	Add Excel Data	Search Bas	semap Orga	Bring Forw Send Backv Remove Lay	ward ward yer Spo	Hot Add ts Heatmap	Select	Style Gro	ouping C	<b>O</b> lustering	(isible Range	Layer Enr Details Lay	ich Sign out ArcGIS	Share Layer	Share Map Sha	Create Copy Slide Image	Help	þ
118		(- )	fx															
Δ Δ	B	C .	D	F	F	G	н	1	1		K	T.	м	N	-	Erri Mane		
1 id	valid id	sname sa	author	tname	tauthor	resource	resname	datecol	erlatitu	de la	ngitude	lifestage	basisofre	datelastca	dat	CSIT-Tops	earch.	
10362236	701396	Zalophus ca	lifornia	n Zalophus	(Lesson, 1	130	iziko Sout		# 34	0333	120.367				12	Map	Contents	_
1971348	701396	Zalonhus ca	lifornia	n Zalonhus	(Lesson 1	130	iziko Sout			3 25	-119.5			*****	15 (			
4 4392 M	ap 1										20.367			******	12	🔺 🔽 Exo	el Layer	
5 22251	0	1 december 1	-			Contribute	Russa Des	10	1.12	123	22.048		M	*****	c	9-		
12665		Redond	to Bead	h/		Cernicos	buena Par				21.973		M	*****	c			
20593	do Canyo	Тогга	nce	Carson							21.971		M	*****	c			
19495	Pop Tit						Anaheir	n 7			22.053		м	******	c			
18430	0. 0%	17							range		22.052		M	******	c			
0 18710	IS	a series of	L	ong Beach	3	estminster	San	ta Ana			1.6645		D	*****				
1 21449	"Pe	1 a a	F				Jul	a ring			2.6907		D	*****				
2 21474	9.9	PIT									92.045		D	******				
3 21934	-	0 SC2	-	9 San P	edro						91.756		D	*****				
4 22348	1	PI	20 Th	9 TopBa	y .	Hu	ntington	Beach	Irvin	ie	7.1689		D	*****				
5 22468	ann		24	2	Y-						3.0899		D	*****				
5 19567	ed.			1			Newp	ort Beach		he For	3.2079		D	*****				
7 12535	9	°Ch.		Te		0.9	9				3.2854		D	*****				
8 17834	9.	ann	-		- 81	994	-				4.7157		D	*****				
9 19582		.6	1		8.	0 %	· •	9			5.5596		D	*****				
0 19376 9	San Pe	dro			STI	11-	0	9			1.9392		D	*****				
1 19360	Basi	n		000	NY S		101	1		-DII	0.4661		D	*****				
2 19957119	701396	Zalophus	esson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the	G 29.0	1935	92.6141		D	*****				
3 12178081	701396	Zalophus	esson	Zalophus	(Lesson, 1	1545	Biodiversi	ity of the	G 27.1	2929	96.6004		D	*****				
4 18243222	701396	Zalophus	esson	Zalophus	(Lesson, 1	1545	Biodivers	ity of the	G 30.2	5043	86.6694		D	*****				
4 + H 52	5483955f3	19_201310	09_020	652 2				4			01				•			
eady		-													100	% ( <del>-</del> )	0	+

- Select the "Share Layer" button to bring this dataset into ArcGIS Online
  - fill in the layer name and click "OK"



# Part 4: Exploring all the Spatial Data in ArcGIS Online

• Go to the following website: <u>http://www.arcgis.com/</u>

Click the "Sign in" link in the upper right hand corner & log-into your ArcGIS online account



• Displaying your data in ArcGIS Online

Option A. Display the data layer you exported from Excel using the "Share Layer" function (on page 10)Option B. Make a map and add the downloaded data to the map (use this option if you skipped Part 3)

# **Option A**

- 1. Click the "My Content" tab at the top of the screen and select the "Features" layer from Excel
- 2. Click the "Open" button and select the "Add to New Map" Option



# **Option B**

1. Click the "Map" Tab at the top of the screen



- A window like the one below should appear when you click the "Map" tab
- 2. Click the "Basemap" button and Select a base map (don't worry you can play around with this latter)
  For this example I have selected the "Oceans" base map shown in
- 3. Click the "Add" button and select the "Add Layer from File" option



- Next add the Geographic Range data file you downloaded in Part 2 from the IUCN Redlist site
  - Click the "Add" button and select the "Add Layer from File" option
  - Click the "Browse" button, Navigate to the zipped IUCN Redlist file , Click "Import Layer"







- Changing the Order of the Displayed Layers
  - Click the **down arrow** to the right of the geographic range layer
  - Select the "Move Down" option
  - Now the geographic range layer should be shown <u>underneath</u> the sighting locations



- Changing the color of the geographic range layer
  - 1. Click the down arrow to the right of the geographic range layer, & select the "Change Symbols" option
  - 2. Since we are looking at the habitat of a marine mammal we should select a color that won't be confused with ocean depth, once you've selected a good color combination, click "Apply" & "Done"
     a. The selected a good color combination, click "Apply" & "Done"
  - 3. Then click "Done Changing Symbols"



• If you're interested in learning more about any of the sighting locations simply click on the point



# • Looking for Spatial Trends using Spatial Analysis

- 1. Click the **down arrow** to the right of the sightings layer, & select the "**Perform Analysis**" option
- 2. Click "Analyze Patterns"
- 3. Select the "Find Hot Spots" button

**3B**. To find out more information about the type of analysis click the "**blue information**" button



- 4. Select the **data field** to be analyzed
  - here we're going to see whether we find spatial clusters of sea lions at different temperatures
  - so we've selected the "temperature" field



# 5. Click the "Run Analysis" button

### The results of the "Find Hot Spots" Analysis



# **The Finished Product**



#### **Online Tutorials & Training Modules**

- Teaching with GIS: Introduction to Using GIS in the Classroom (http://training.esri.com/gateway/index.cfm?fa=catalog.webCourseDetail&courseid=2198)
- "Mapping with ArcGIS Online" Tutorial & "ArcGIS Online: Using Subscription Accounts with Statewide/District wide Licenses for K-12 Schools" (<u>http://esriurl.com/mappingwithago</u>)
- ArcGIS info for Maryland K-12 Public Schools (http://www.washcoll.edu/centers/ces/gis/esri-k-12-software.php)

# Links to Free K-12 GIS Lesson Plans

#### For <u>Geography</u> Teachers

- Geography Lesson Plans & Worksheets by Lesson Planet <a href="http://www.lessonplanet.com/lesson-plans/geography">http://www.lessonplanet.com/lesson-plans/geography</a>
- GIS day Activities for different Age Groups <u>http://www.gisday.com/activities.html</u>
- "Why Geography Education Matters" High School
   <u>http://edcommunity.esri.com/software-and-data/Lessons/W/Why Geography Education Matter</u>
- "Geocaching: Geography Meets Environmental Ed" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/G/Geocaching Geography Meets E</u>

#### For <u>History</u> Teachers

- "A New Look at Lewis & Clark with Online GIS" High School http://edcommunity.esri.com/software-and-data/Lessons/A/A\_New\_Look\_at\_Lewis\_Clark\_wi
- "Lewis and Clark Elevation Lesson" High School http://edcommunity.esri.com/software-and-data/Lessons/L/Lewis and Clark Elevation Less
- "Underground Railroad Lesson Plan" 3-5 grades
   <u>http://edcommunity.esri.com/software-and-data/Lessons/U/Underground Railroad Lesson Pl</u>
- "War of 1812 (Web lesson)" Middle School http://edcommunity.esri.com/software-and-data/Lessons/W/War of 1812 Web lesson

#### > For <u>Earth Science</u> Teachers

- "Coral Reefs" K-12 <u>http://edcommunity.esri.com/software-and-data/Lessons/C/Coral Reefs</u>
- "Examining World Temperature Extremes" High School http://edcommunity.esri.com/software-and-data/Lessons/E/Examining World Temperature Ex
- "Geocaching:Geography Meets Environmental Ed" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/G/Geocaching Geography Meets E</u>
- "Investigating Historical and 1 Modern Tornado" *High School* <u>http://edcommunity.esri.com/software-and-data/Lessons/I/Investigating Historical and 1</u>
- "Investigating Temperature Extremes in the USA " 5-12 grades
   <u>http://edcommunity.esri.com/software-and-data/Lessons/I/Investigating Temperature Extr</u>
- "Learning about <u>Dams-Reservoirs</u> Using ArcGIS Online" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning about Dams Reservoirs</u>
- "Learning about <u>Flood Zones</u> Using ArcGIS Online" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning about Flood Zones Usi</u>
- "Learning About Local Water Quality w/ArcGIS Online" 5-12 grades <a href="http://edcommunity.esri.com/software-and-data/Lessons/L/Learning\_About\_Local\_Water\_Qua">http://edcommunity.esri.com/software-and-data/Lessons/L/Learning\_About\_Local\_Water\_Qua</a>
- "Learning about <u>Oceans</u> Using ArcGIS Online " 5-12 grades
   <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning about Oceans Using Ar</u>
- "Learning about <u>Rivers</u> Using ArcGIS Online" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning about Rivers Using Ar</u>
- "Learning about <u>Watersheds</u> Using ArcGIS Online" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning about Watersheds Usin</u>
- "Learning About <u>Weather & Streamflow</u>: ArcGIS Online " 5-12 grades
   <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning About Weather Strea</u>
- "Learning about <u>Wetlands</u> Using ArcGIS Online" 5-12 grades <u>http://edcommunity.esri.com/software-and-data/Lessons/L/Learning about Wetlands Using</u>
- "USGS Education Resources" K-12 <u>http://education.usgs.gov/</u>
- "World Temperature Extreme Analysis" High School http://edcommunity.esri.com/software-and-data/Lessons/W/World\_Temperature\_Extreme\_Anal