



ArcGIS Platform Implementation at the Caribbean Fisheries Management Council

January – June 2017

Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps - Puerto Rico

Task 5: Technical Support

September 28th, 2018

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1. Introduction

The following document summarizes Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps and Task 5: Technical Support of the CFMC GIS Project: **Development of GIS access to coral and mesophotic reef data from Puerto Rico and the USVI, including commercial landings data.** These tasks were performed between August – October 2016, December 2016 and January – June 2017 and final web maps and web apps quality control in September 2018.

Specific tasks include:

Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps.

Task 3.1 Design and create feature class for Fisheries

Task 3.2 Load fisheries feature class to CFMC geodatabase

Task 3.4 Prepare Landings Register Data.

Task 3.5 Configure ArcGIS Online Web Maps

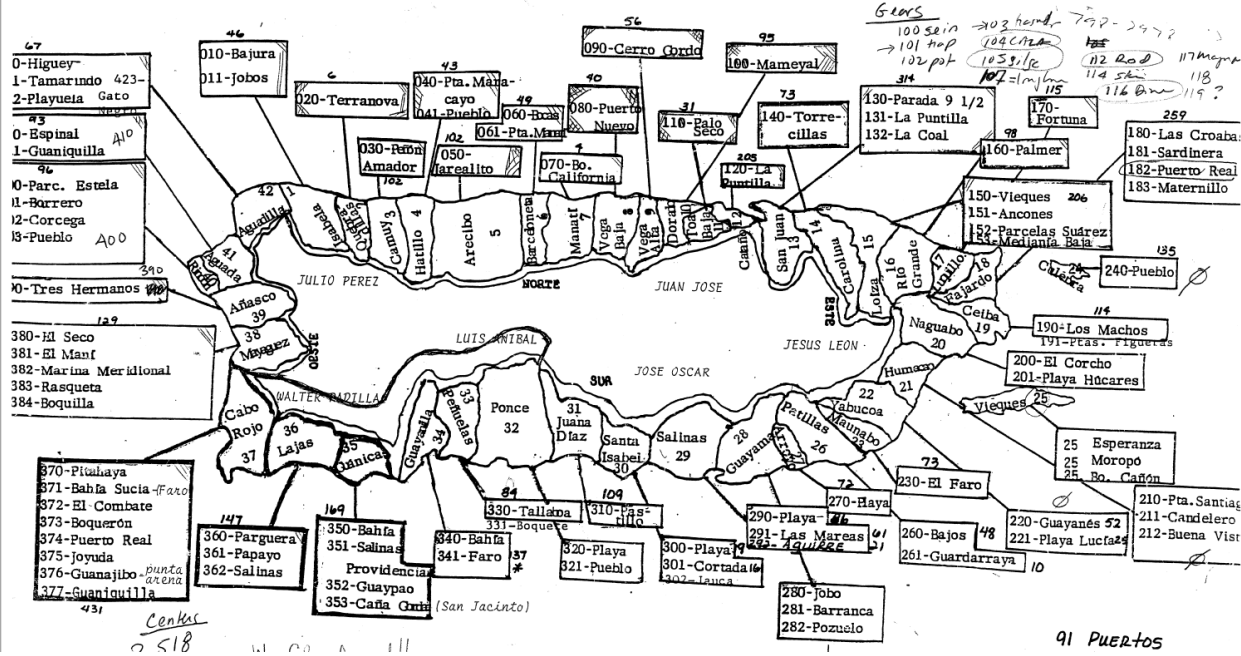
Task 5: Technical Support – (45 hrs)

- Configure Puerto Rico Commercial Landings Statistics Web Apps
- Configure Puerto Rico Commercial Landings Statistics Story Maps

2. Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps.

Task 3.1 Design and create feature class for Fisheries

- The creation and design of the Commercial Fish Landings fish villages was based on the *Historic Fishing Centers Map of Puerto Rico* and the shapefiles of those fishing centers that CFMC delivered.



Historic Fishing Centers Map of Puerto Rico

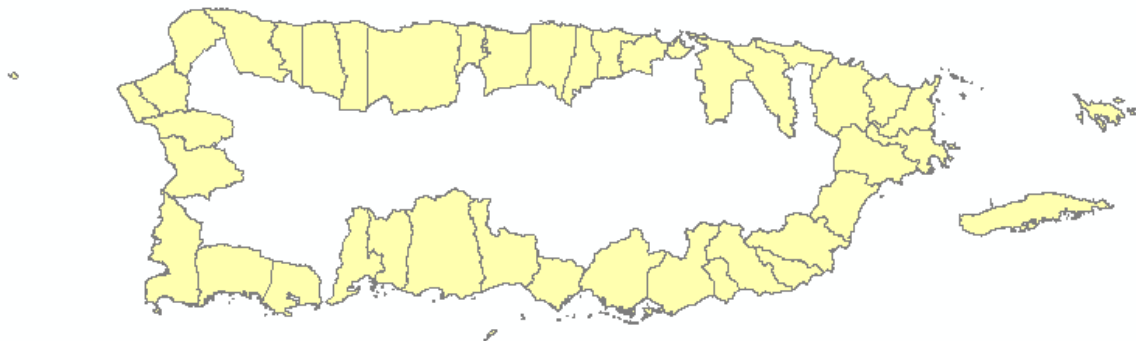
- The location of the fish villages between 1983 and 2014 was validated throughout a series of workshops with CFMC personnel between August and October 2016.
- The final product consists of a fish village feature class per year. Each fish village was identified as active or inactive for the corresponding year. Additional attributes include:
 - Fish Village ID
 - Name
 - Municipio
 - Región
 - Status (Active or Inactive)

Task 3.2 Load fisheries feature class to CFMC geodatabase

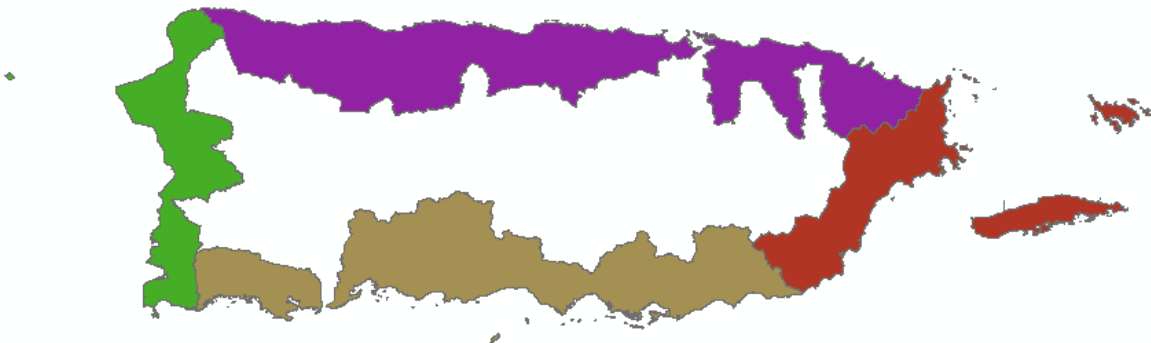
- A fish village feature class per year was loaded into the CFMC geodatabase.
- Two additional feature classes were created:
 - Municipios with fishing villages
 - Regiones – depicting fishing regions.



CFMC File Geodatabase and Feature Classes



Vector Map of the Coastal Municipalities of Puerto Rico


























Vector Map of the Coastal Fishing Regions of Puerto Rico



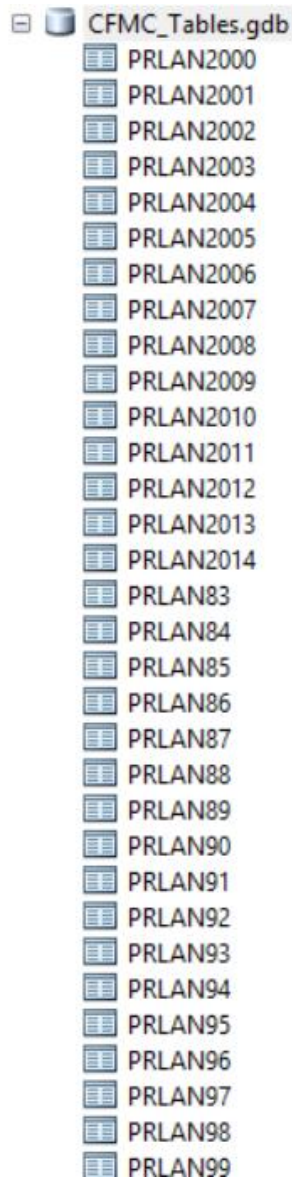
Vector Map of the Fishing Villas of Puerto Rico

Task 3.4 Prepare Landings Register Data.

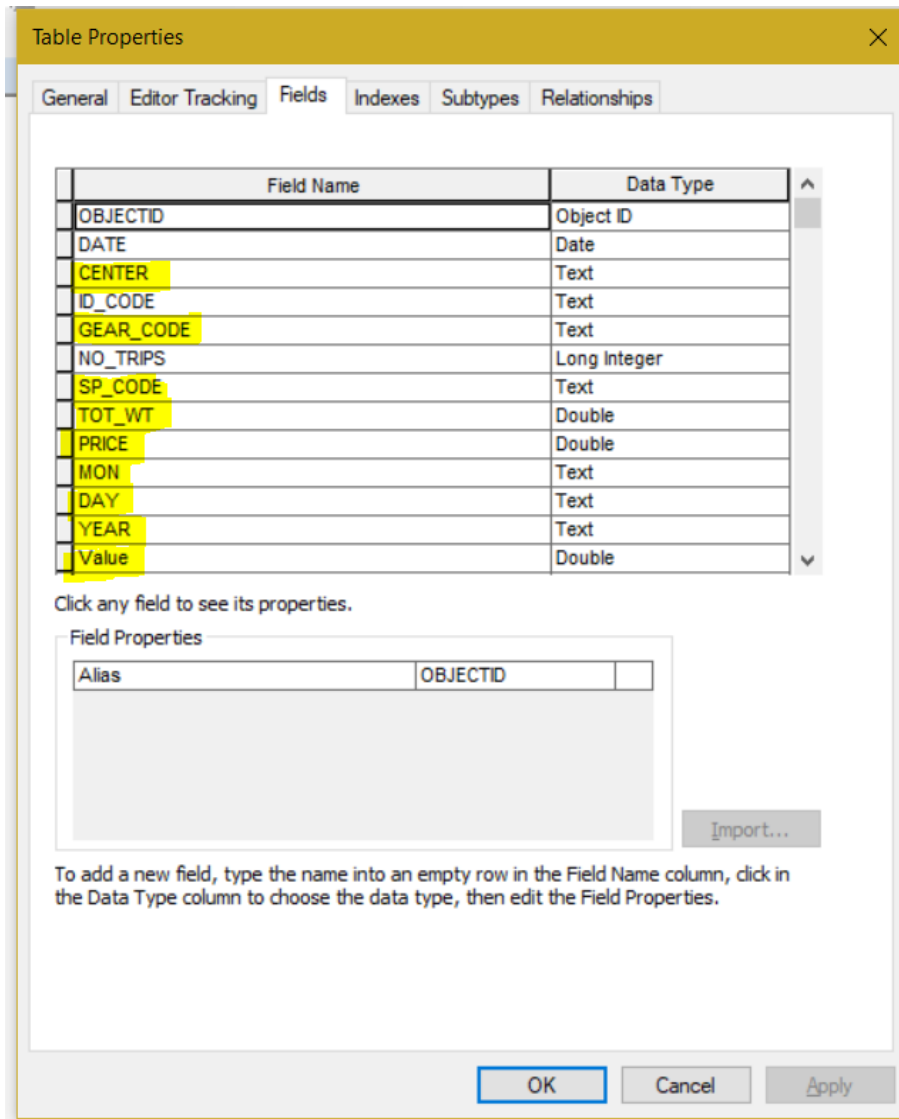
- The preparation, quality control and depuration process of the Puerto Rico commercial fish landings data, including the building of several geoprocessing models to process the data and the development of python scripts was carried out between October – December 2016 and January – June 2017.
- Quality Control and depuration of PRLAN tables and Municipality Reports.
 - The first step consisted in the depuration process of all raw data received by CFMC. The documents consisted of Excel tables that contain the attributes of all fished species in Puerto Rico (PR). The CFMC Staff made a quality control of the information before being delivered to GMT.

 PRLAN01	10/10/2016 3:59 PM	Microsoft Excel W...	6,283 KB
 PRLAN02S	10/10/2016 4:00 PM	Microsoft Excel W...	6,163 KB
 PRLAN03	10/10/2016 4:02 PM	Microsoft Excel W...	6,784 KB
 PRLAN04	10/10/2016 4:03 PM	Microsoft Excel W...	5,163 KB
 PRLAN05A	10/10/2016 4:04 PM	Microsoft Excel W...	4,342 KB
 PRLAN06A	10/10/2016 4:06 PM	Microsoft Excel W...	3,594 KB
 PRLAN07	10/10/2016 4:07 PM	Microsoft Excel W...	3,391 KB
 PRLAN08	10/10/2016 4:08 PM	Microsoft Excel W...	3,252 KB
 PRLAN10	10/10/2016 4:09 PM	Microsoft Excel W...	3,034 KB
 PRLAN88	10/10/2016 3:30 PM	Microsoft Excel W...	2,602 KB
 PRLAN89	10/10/2016 3:32 PM	Microsoft Excel W...	2,959 KB
 PRLAN90	10/10/2016 3:33 PM	Microsoft Excel W...	2,944 KB
 PRLAN91	10/10/2016 3:35 PM	Microsoft Excel W...	3,696 KB
 PRLAN92	10/10/2016 3:36 PM	Microsoft Excel W...	3,081 KB
 PRLAN93	10/10/2016 3:38 PM	Microsoft Excel W...	3,368 KB
 PRLAN94	11/1/2016 2:00 PM	Microsoft Excel W...	3,806 KB
 PRLAN95	10/10/2016 3:42 PM	Microsoft Excel W...	5,923 KB
 PRLAN96	10/10/2016 3:43 PM	Microsoft Excel W...	10,997 KB
 PRLAN97	10/10/2016 3:45 PM	Microsoft Excel W...	6,245 KB
 PRLAN98	10/10/2016 3:50 PM	Microsoft Excel W...	5,237 KB
 PRLAN99	10/10/2016 3:52 PM	Microsoft Excel W...	5,418 KB
 PRLAN2000	10/10/2016 3:56 PM	Microsoft Excel W...	5,906 KB
 PRLAN2011	10/10/2016 4:11 PM	Microsoft Excel W...	3,496 KB

- All the Excel tables delivered by CFMC were imported into a File Geodatabase. GMT performed additional quality control and depuration processes of the PRLAN Tables imported. The image underneath is an excerpt of the GDB containing the standalone tables tables imported to the geodatabase.

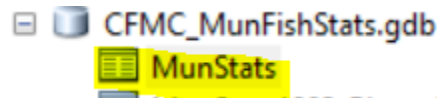


- All The images underneath shows the schema desing and description of the raw tables.The fields that are highlighted in the image, were the fields that were used to make all the analysis.



Field Name	Description
DATE	Date of the Reported Catch
CENTER	Unique ID or code of the Fishing Villa
ID_CODE	N/A
GEAR_CODE	Unique ID or code of the type of gear used to make the catch
NO_TRIPS	Number of trips made
SP CODE	Unique ID or code of the species
TOT_WT	Amount of the weight reported of the catch
PRICE	Price per Pound of that Year
MON	Month of the reported catch
DAY	Day of the reported catch
YEAR	Year of the reported catch
Value	N/A

- Municipalities Commercial Landings Annual Reports
 - GMT revised the annual reports that contained commercial fish landings statistics for coastal municipalities categorized by Total Pounds (TP), Average Price per Pound (Avg PP) and Total Value (TV). A table containing all the information of the municipalities was created to assign those values to the Municipalities feature class.



Table

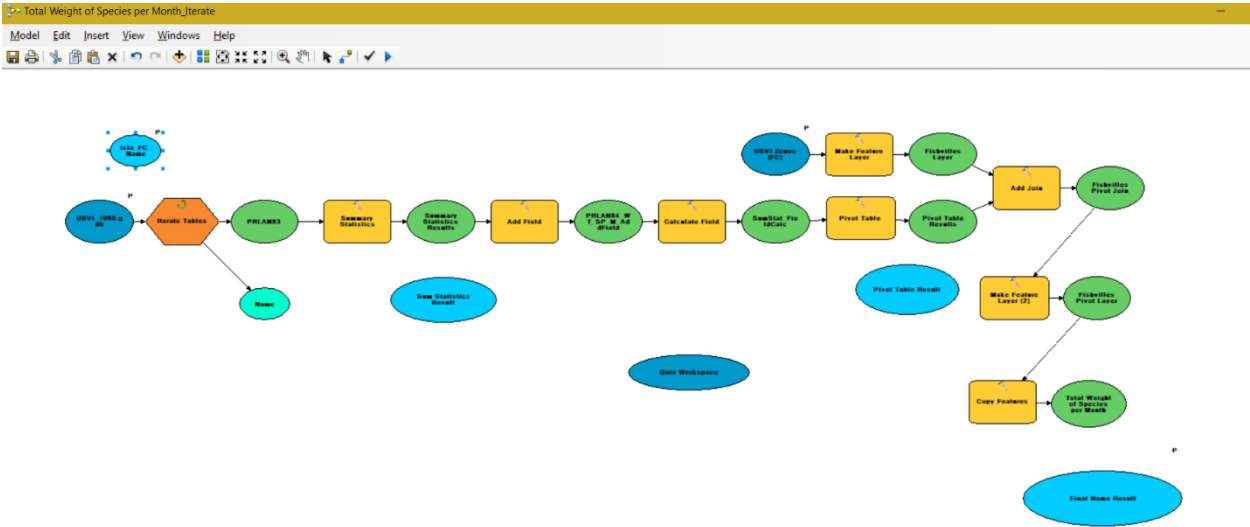
MunStats

Nombre	Region	ID_Municipio	County	Year	Pounds	Value	Average Price	Metadata
Isabela	Region Norte	1 071	1983	10660	20303	1.85	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Quebradillas	Region Norte	2 115	1983	46	82	1.68	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Camuy	Region Norte	3 027	1983	11499	21490	1.87	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Hatillo	Region Norte	4 065	1983	19063	26232	1.52	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Arecibo	Region Norte	5 013	1983	25468	30795	1.27	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Barceloneta	Region Norte	6 017	1983	41002	43891	1.27	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Manati	Region Norte	7 091	1983	1742	3963	2.52	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Vega Baja	Region Norte	8 145	1983	21448	37268	2.11	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Vega Alta	Region Norte	9 143	1983	8084	15546	2.18	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Dorado	Region Norte	10 051	1983	15246	28486	2.12	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Toa Baja	Region Norte	11 137	1983	2681	3583	1.29	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Catano	Region Norte	12 033	1983	51644	44836	0.97	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
San Juan	Region Norte	13 127	1983	91807	162287	1.75	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Carolina	Region Norte	14 031	1983	5148	9049	2.08	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Loiza	Region Norte	15 087	1983	58307	64795	1.34	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Rio Grande	Region Norte	16 119	1983	18455	32126	2	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Luquillo	Region Norte	17 089	1983	34268	54149	1.85	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Fajardo	Region Este	18 053	1983	96019	125311	1.33	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Ceiba	Region Este	19 037	1983	36831	44164	1.14	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Naguabo	Region Este	20 103	1983	77177	95347	1.4	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Humacao	Region Este	21 069	1983	75706	88170	1.27	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Yabucoa	Region Este	22 151	1983	52603	71789	1.62	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Maunabo	Region Este	23 095	1983	31352	28501	1.1	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	
Culebra	Region Este	24 049	1983	22831	30188	1.19	Matos Caraballo and Rivera Alvarez 1994 Overview PR Small-Scale Fish Stats 1983-87	

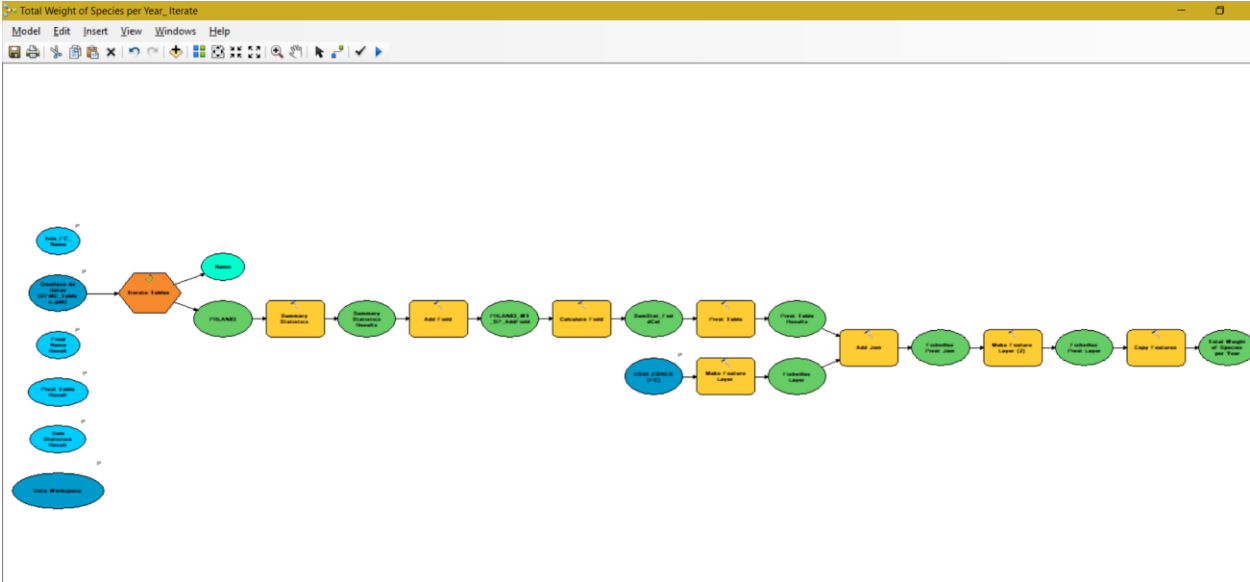
- Geoprocessing models and Scripts
 - GMT performed an analytical process to obtain the statistical results of total weight for species per month, and for year of all the fishing villas. To execute this task, GMT, Corp designed and created a geoprocessing model on ArcGIS for Desktop. This model helped automatize the statistical analysis for all years and generate the different feature classes with the corresponding values.

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
January – June 2017
ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

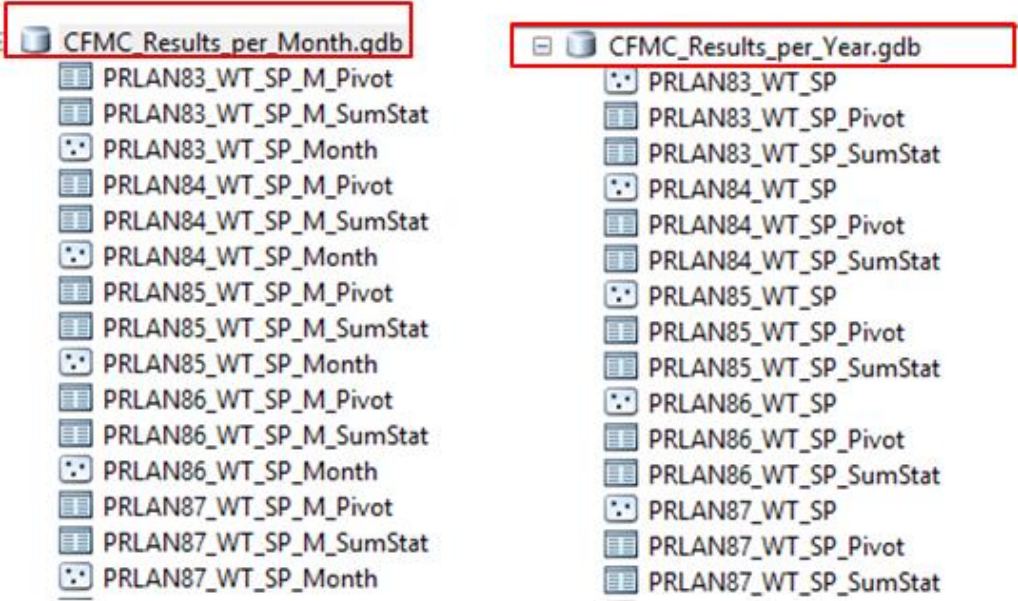
The image below shows the model created in ArcCatalog using ModelBuilder, a programming module for geoprocessing workflows. **This model automates the total weight of fished species per month.**



The image below shows the model created in ArcCatalog using ModelBuilder, a programming module for geoprocessing workflows. **This model automates the total weight of fished species per year.**



The image below shows the feature classes (outputs) generated by the models that automated the total weight of fished species per month and per years.



- An additional script was created to compute species that represent 80% or more of the total landings per villa per year. This script was programmed to automate the process of identifying the significant percentage of species per fishing villas for a particular year. The analyst or end user can enter the percentage number of his/her preference as a parameter for the script.



```
PorcentajeEspecie.py
File Edit Format Run Options Window Help
-----
# Name: PorcentajeEspecie.py
# Purpose:
#
# Author: GMT
#
# Created: 26/10/2016
# Copyright: (c) GMT 2016
# Licence: <your licence>
#
-----
import arcpy
import csv
import os
import re
from decimal import Decimal

#Represents a specie with an id, name, weight and possible percentage
#if it is part of a list of species.
class Specie:
    def __init__(self, id, weight):
        self.id = id
        self.name = ""
        self.weight = weight
        self.percent = 0

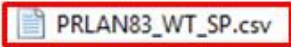
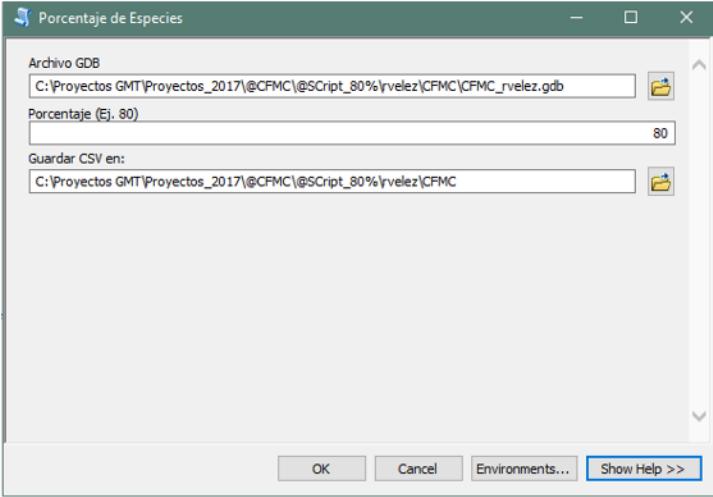
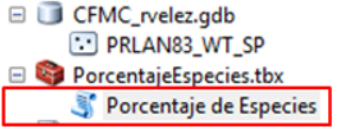
#Represents the names of a specie including its common, english and scientific
#names with its corresponding species id.
class SpeciesName:
    def __init__(self, id, name, englishName, scientificName):
        self.id = id
        self.name = name
        self.englishName = englishName
        self.scientificName = scientificName

#Represents a list of all the species name with its corresponding species id
#extracted from a CSV file.
class SpeciesNameList:
    def __init__(self, speciesNameCSVFile):
        self.lstAllSpeciesName = []
        self.loadSpeciesNameList(speciesNameCSVFile)

#Loads the species names in the given excel file to the lstAllSpeciesName
..
..
```

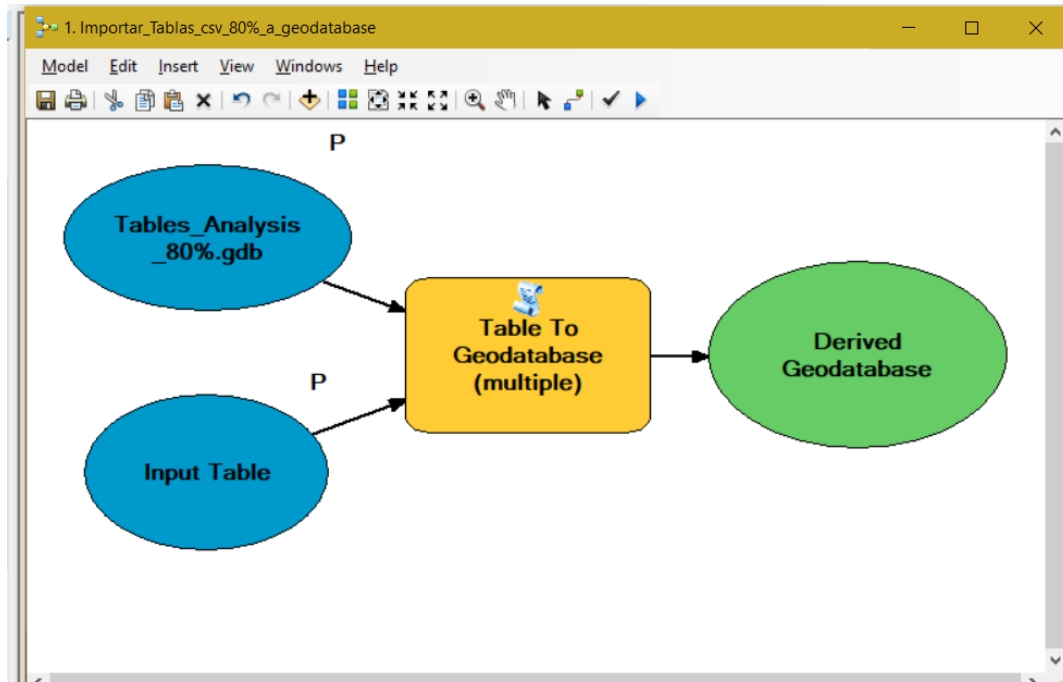
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The image below shows an example of which species represent 80% of the fish landings reported for 1983 by fishing villa. The result of the script is an output table that has the name of each species in Spanish, English and official scientific name. The output table also has the statistics of the total weight per species and the sum of all weights per species and per fishing villa. This result was subsequently published in a web application.

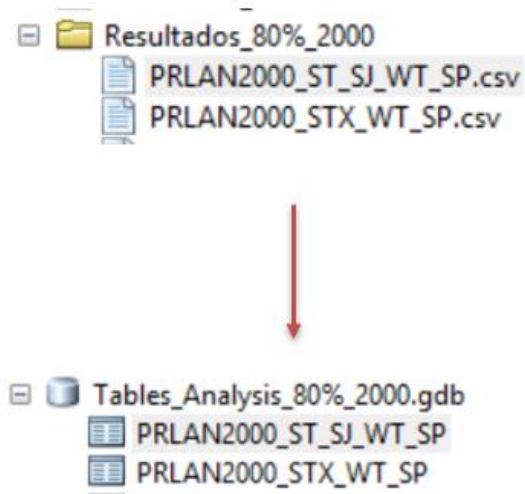


	A	B	C	D	E	F	G	H	I	J	K
1	Porcentaje de Entrada: 80.00%										
2	Municipio	Nombre Villa	ID Villa	ID Especie	Nombre Especie	Nombre Ingles	Nombre Cientifico	Peso	Porcentaje	Total Porcentaje	Total Peso
3	Aguada	Espinar	410 225_1983	Atunes	Mackerels and Tur	Scombridae		22892	44.6	84.4	43317
4	Aguada	Espinar	410 139_1983	Chillo	Silk snapper	Lutjanus vivanus		10370	20.2	84.4	43317
5	Aguada	Espinar	410 202_1983	Picuas	Barracudas	Sphyaenidae		4248	8.3	84.4	43317
6	Aguada	Espinar	410 109_1983	Jureles	Jacks	Carangidae		3330	6.5	84.4	43317
7	Aguada	Espinar	410 233_1983	Carite	King mackerel, Kin	Scomberomorus cavalla		2477	4.8	84.4	43317
8	Aguada	Guaniquilla	411 109_1983	Jureles	Jacks	Carangidae		2686	56.9	99.6	4706
9	Aguada	Guaniquilla	411 225_1983	Atunes	Mackerels and Tur	Scombridae		1080	22.9	99.6	4706
10	Aguada	Guaniquilla	411 795_1983	Otros Peces	Other fishes	N/A		940	19.9	99.6	4706
11	Aguadilla	Higüey	420 225_1983	Atunes	Mackerels and Tur	Scombridae		10609	38.3	84.1	23264
12	Aguadilla	Higüey	420 233_1983	Carite	King mackerel, Kin	Scomberomorus cavalla		5438	19.6	84.1	23264
13	Aguadilla	Higüey	420 139_1983	Chillo	Silk snapper	Lutjanus vivanus		3644	13.2	84.1	23264

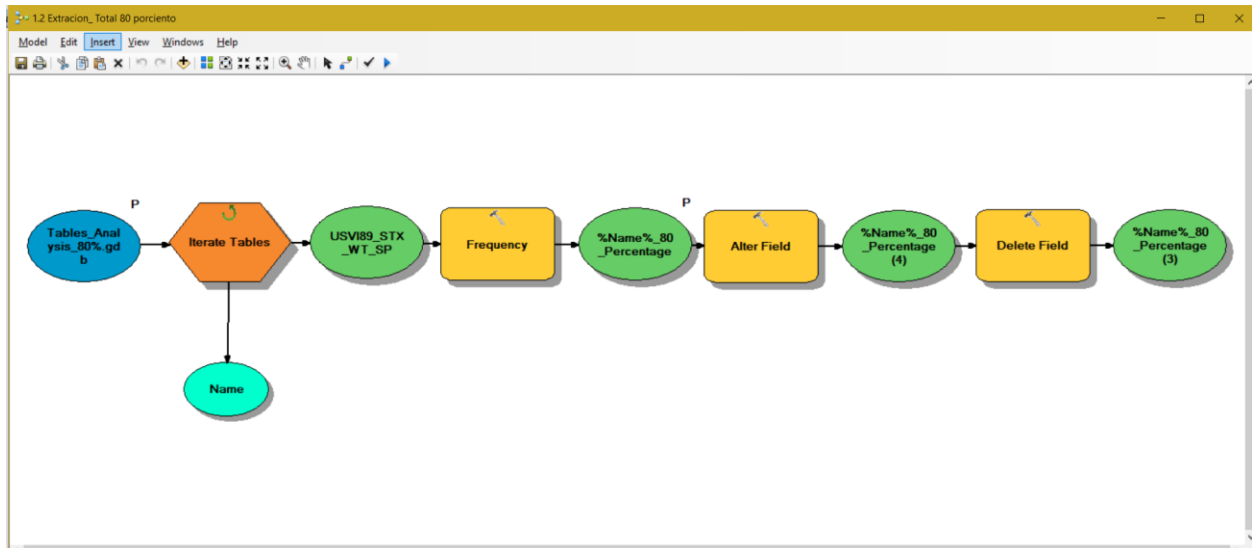
- To manage all the csv tables produced by the python script that computes species that constitute 80% of total landings a geoprocessing model on ArcGIS for Desktop was created. This model imports all the csv tables to a standalone table in a file geodatabase through a batch import process.



The image below shows an example of the result of the batch importation process of the .csv tables to a file geodatabase standalone tables through the geoprocessing model.



- A geoprocessing model was created to extract the total percentage per fishing villa of the 80% of the species catch standalone tables. This result will be appended to the fishing villas feature classes for mapping purposes.



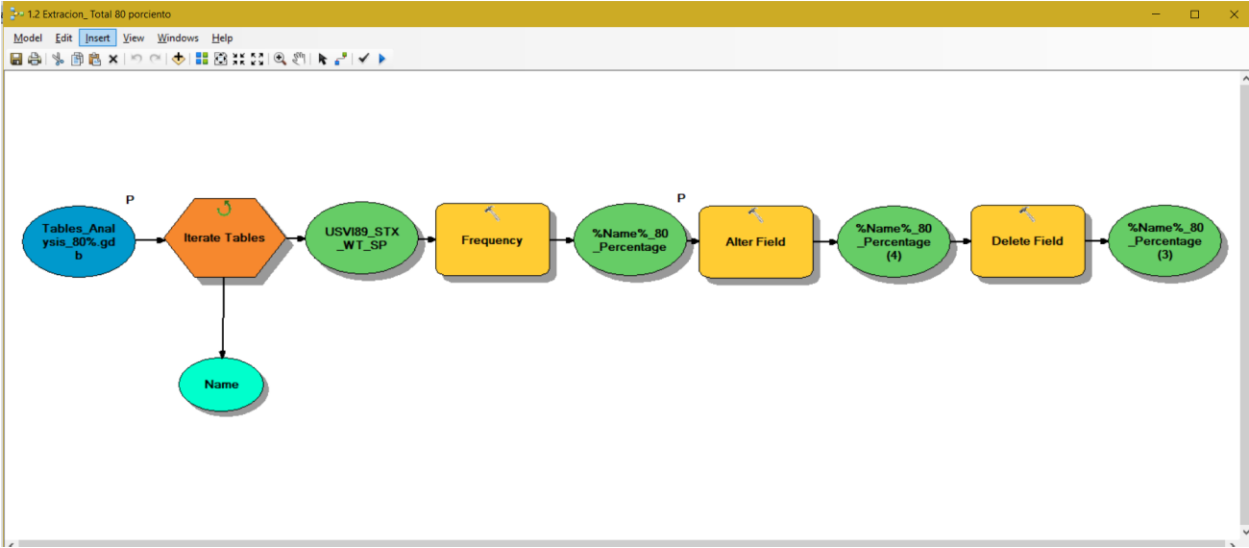
The image below shows an example of the result of the batch extraction process of the 80% total percentage value per fishing villa for all the file geodatabase standalone tables.

Extraer_Porcentaje_x_Zona.gdb
 PRLAN_1990_WT_SP_80_Percentage
 PRLAN_1991_WT_SP_80_Percentage



PRLAN_1990_WT_SP_80_Percentage		
OBJECTID *	CENTER	Total Landing Percentage
1	000	0
2	010	84.5
3	020	0
4	030	90.6
5	040	0

- A geoprocessing model was created to calculate and assign to each fishing villa the total Pounds (TP), Average Price per Pound (Avg PP) and the Total Value (TV). This result was appended to the fishing villas feature classes for mapping purposes.



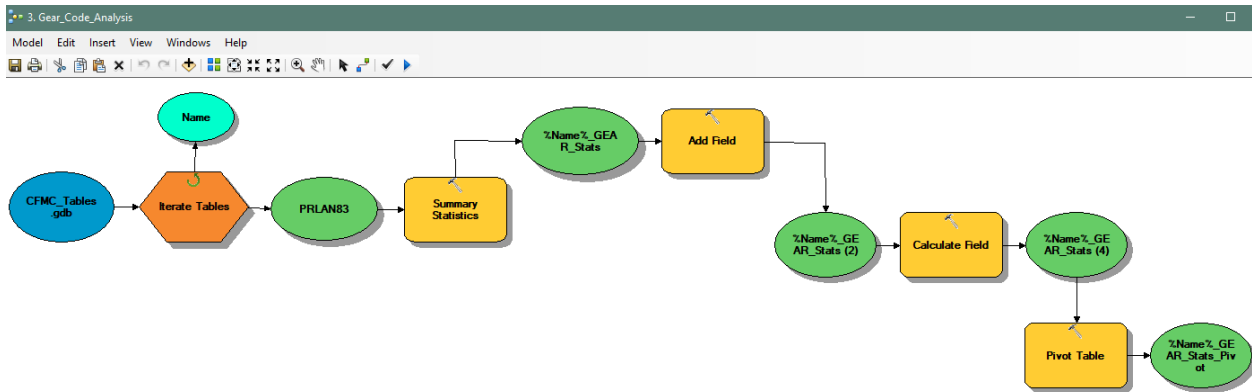
The image below shows an example of the result of the batch calculation process of the total Pounds (TP), Average Price per Pound (Avg PP) and the Total Value (TV) per fishing villa for all the Landings Reported file geodatabase standalone tables.

- Statistics.gdb
 - PRLAN2000_Statistics
 - PRLAN2001_Statistics
 - PRLAN2002_Statistics
 - PRLAN2003_Statistics
 - PRLAN2004_Statistics



CENTER	Total de Libras	Precio Promedio por Libra (USD\$)	Valor Total Reportado de Pesca (USD\$)
010	3045	4.379255	13225.84
011	1401	4.299216	5995.865
030	8339.5	5.006284	40887.34
050	28221	3.665879	99825.535
060	2118	3.084071	5551.87
061	106.5	3.769	428.065
062	217	3.208333	654
063	6100.5	3.006562	17784.245

- Another model was created to automate the process of generating tables for each year per fishing villas with the statistics of Total Weight per Gear Code. The results were appended to the fishing villas feature classes and used for the representation and cartographic purposes.




The image below shows an example of the result of the calculation process of the Total Weight reported by Gear Code

GEAR_CODES.gdb
 GearCodes_1983
 PRLAN83_GearCodePivots

CENTER *	GCODES_ShortInteger100	GCODES_ShortInteger101	GCODES_ShortInteger102
010	0	907	367
020	0	0	0
030	50	35	35
040	0	0	0
041	600	15	0
050	803	4608	134
051	2449	0	0
060	10343	94	0
061	2550	3401	0
070	0	162	0
080	0	0	0

- A Python Script was programmed to automate the assignment of the gear code name, based on the gear code, as an alias to all fields. The objective is to assign to the fish villas feature class the total weight (lbs) per gear code statistics.

 alteralias_FC_GEAR_Codes.py

```
*alteralias_FC_GEAR_Codes.py - C:\GMT\Alberto\USVI\Analysis\GearCode_Analysis\Aliases_GearCode\alteralias_FC_GEAR_C...
File Edit Format Run Options Window Help
-----
# Name:      module1
# Purpose:
#
# Author:    GMT, Corp
#
# Created:   24/10/2016
# Copyright: (c) GMT, Corp 2018
# Licence:   <your licence>
-----

import arcpy, os, csv

#gets the python file directory as a starting directory.
wrkSpace = os.getcwd()

#should use two backslashes in file path
arcpy.env.workspace = r"C:\GMT\Alberto\USVI\Analysis\GearCode_Analysis\Aliases_

# Diccionarios uno para mes y otro para especie
with open(wrkSpace+'GearCode.csv', mode='r') as infile:
    reader = csv.reader(infile)
    with open(wrkSpace+'CFMC_Species_short_new.txt', mode='w') as outfile:
        writer = csv.writer(outfile)
        species = {rows[0]:rows[1] for rows in reader}

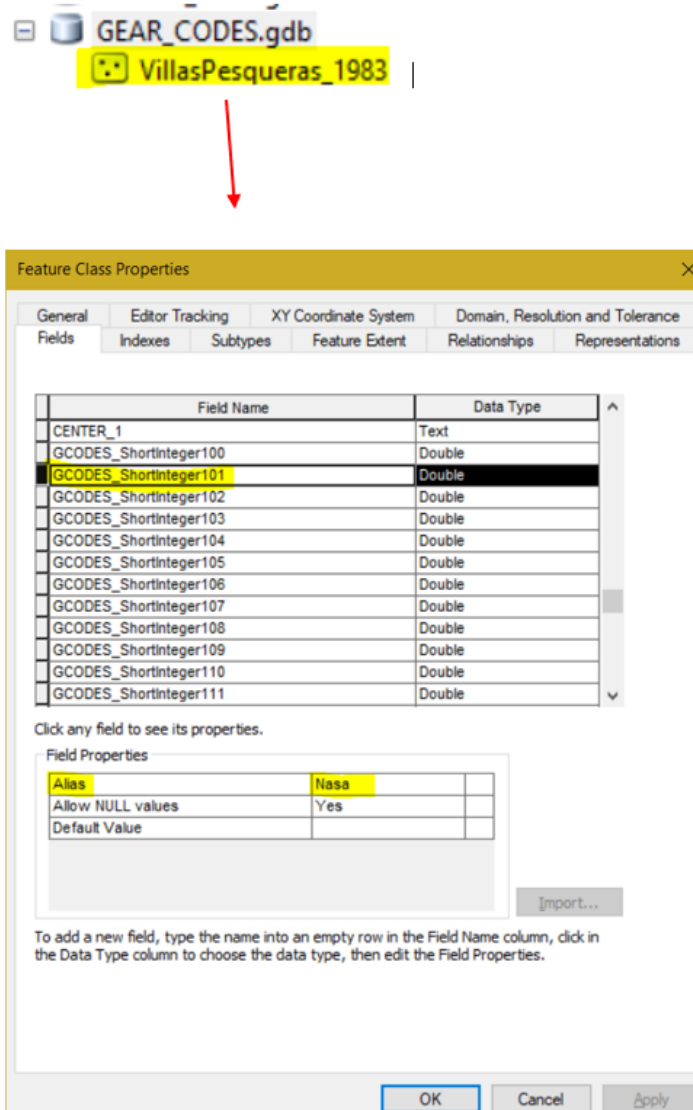
fcs = arcpy.ListFeatureClasses()

for fc in fcs:
    print fc

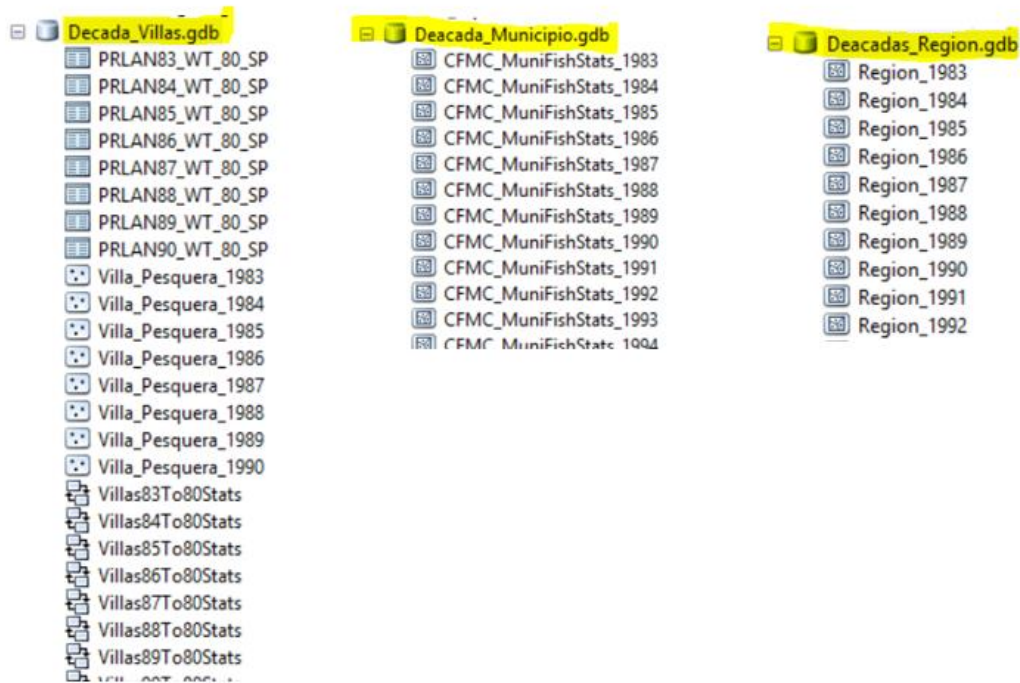
    fieldList = arcpy.ListFields(fc, '*GCODES*', 'Double')

    for fieldFC in fieldList:
        try:
```


The image below shows an example of the result of the assignment of the gear code aliases to the fields through the python script.



- Final Products:
 - Commercial Landings for Puerto Rico was organized in three different file geodatabases: (1) per Villa, (3) per Municipio, and (3) per Region. This schema is reproduced for each decade between 1983 – 2014.










- All this information was published to the CFMC ArcGIS Online Organizational site (<https://cfmc.maps.arcgis.com>) in order to build the web maps.

Task 3.5 Configure ArcGIS Online Web Maps

Web Maps













Each year of Reported Fish Landing Statistics has a web map configured. All these web maps were configured in the CFMC ArcGIS Online Organizational Account (<https://cfmc.maps.arcgis.com>).

- **1983-1989 Decade**

<input type="checkbox"/>	Title	
<input type="checkbox"/>	 Desembarcos 1984	Web Map
<input type="checkbox"/>	 Desembarcos 1983	Web Map
<input type="checkbox"/>	 Desembarcos 1986	Web Map
<input type="checkbox"/>	 Desembarcos 1985	Web Map
<input type="checkbox"/>	 Desembarcos 1989	Web Map
<input type="checkbox"/>	 Desembarcos 1988	Web Map
<input type="checkbox"/>	 Desembarcos 1987	Web Map











Web Maps for the 1983-1989 decade.

- **1990-1999 Decade**

<input type="checkbox"/>	Title	
<input type="checkbox"/>	 Desembarco 1997	Web Map
<input type="checkbox"/>	 Desembarcos 1996	Web Map
<input type="checkbox"/>	 Desembarco 1995	Web Map
<input type="checkbox"/>	 Desembarcos 1994	Web Map
<input type="checkbox"/>	 Desembarcos 1993	Web Map
<input type="checkbox"/>	 Desembarcos 1992	Web Map
<input type="checkbox"/>	 Desembarcos 1991	Web Map
<input type="checkbox"/>	 Desembarcos 1990	Web Map
<input type="checkbox"/>	 Desembarcos_1999	Web Map
<input type="checkbox"/>	 Desembarcos 1999	Web Map
<input type="checkbox"/>	 Desembarcos_1998	Web Map
<input type="checkbox"/>	 Desembarcos 1998	Web Map






Web Maps for the 1990-1999 decade.

○ **2000-2009 Decade**

<input type="checkbox"/>	Title	
<input type="checkbox"/>	 Desembarcos 2009	Web Map
<input type="checkbox"/>	 Desembarcos 2008	Web Map
<input type="checkbox"/>	 Desembarcos 2007	Web Map
<input type="checkbox"/>	 Desembarco 2006	Web Map
<input type="checkbox"/>	 Desembarcos 2004	Web Map
<input type="checkbox"/>	 Desembarcos 2005	Web Map
<input type="checkbox"/>	 Desembarcos 2003	Web Map
<input type="checkbox"/>	 Desembarcos 2002	Web Map
<input type="checkbox"/>	 Desembarcos 2001	Web Map
<input type="checkbox"/>	 Desembarcos 2000	Web Map

Web Maps for the 2000-2009 decade.

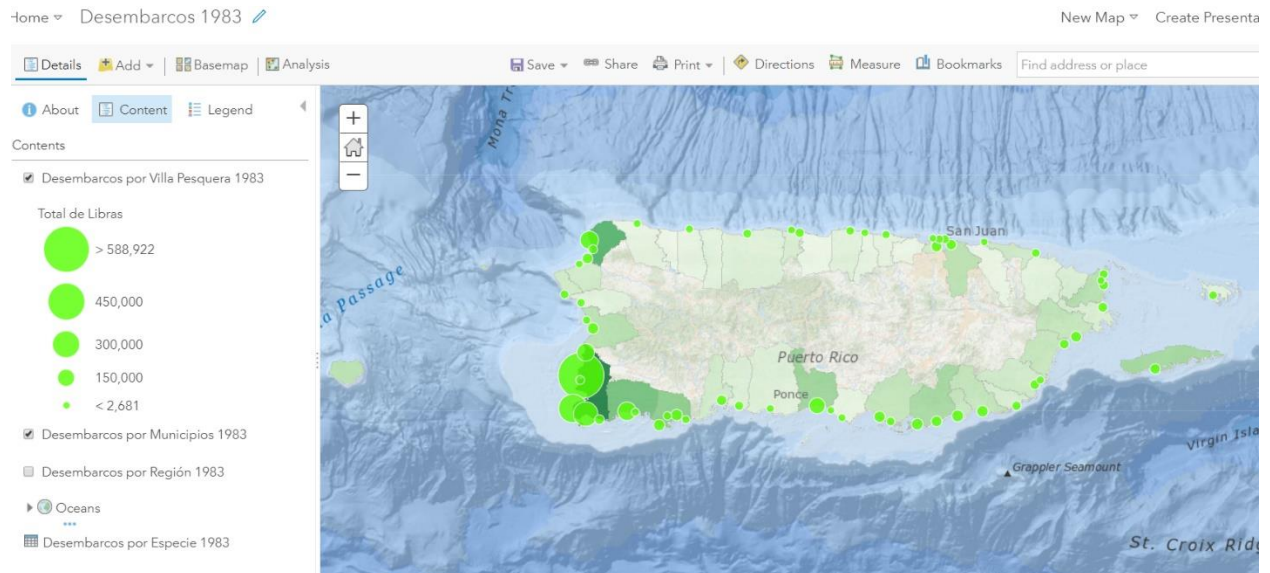
- **2010-2014 Decade**

<input type="checkbox"/>	Title	
<input type="checkbox"/>	 Desembarcos 2010	Web Map
<input type="checkbox"/>	 Desembarcos_2011	Web Map
<input type="checkbox"/>	 Desembarcos_2012	Web Map
<input type="checkbox"/>	 Desembarcos_2013	Web Map
<input type="checkbox"/>	 Desembarcos_2014	Web Map

Web Maps for the 2010-2014 decade.

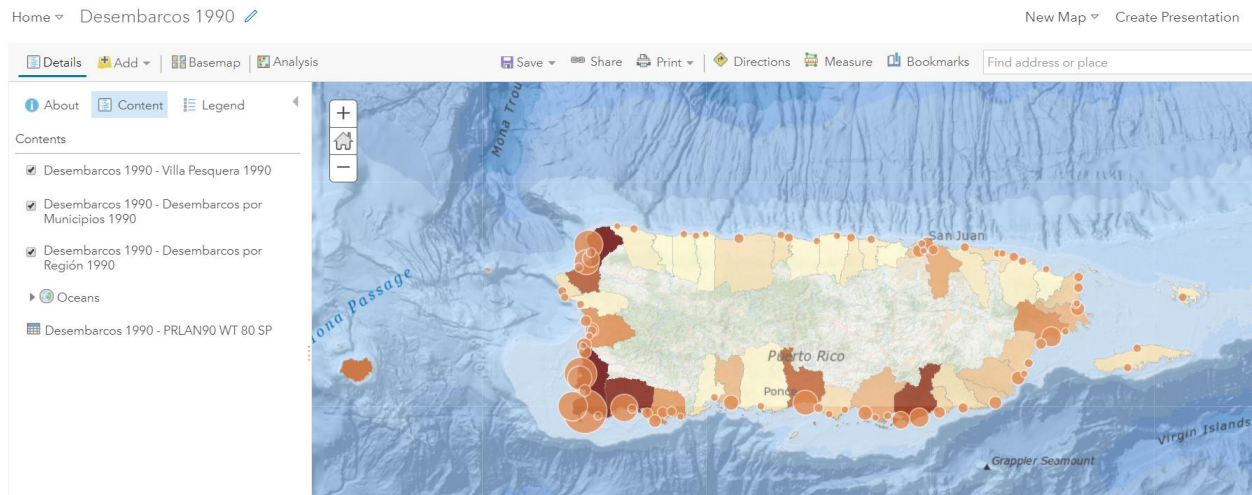
Each web map is composed of four main layers: (1) fishing village commercial landings statistics layer (2) coastal municipalities commercial landings reported statistics layer and (3) coastal regions statistics layer (4) Standalone table with the species that represent the 80% of the total weight of species reported for each fishing villa.

1983 Commercial Landings Reported Statistics Web Map



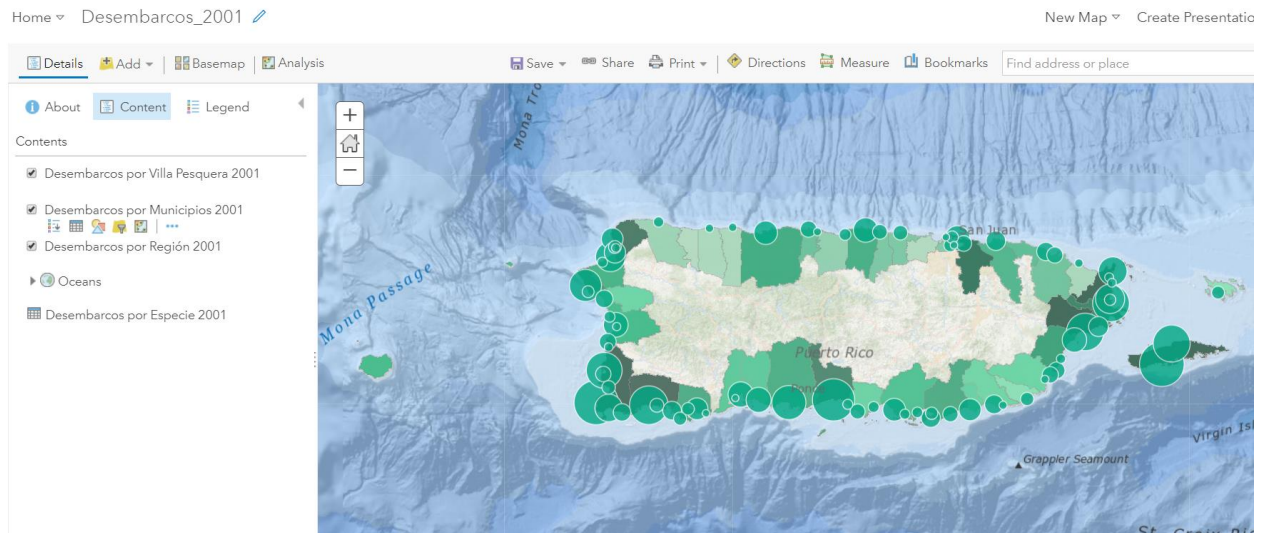
Example of web map configuration for the 1983-1989 decade

1990 Commercial Landings Reported Statistics Web Map



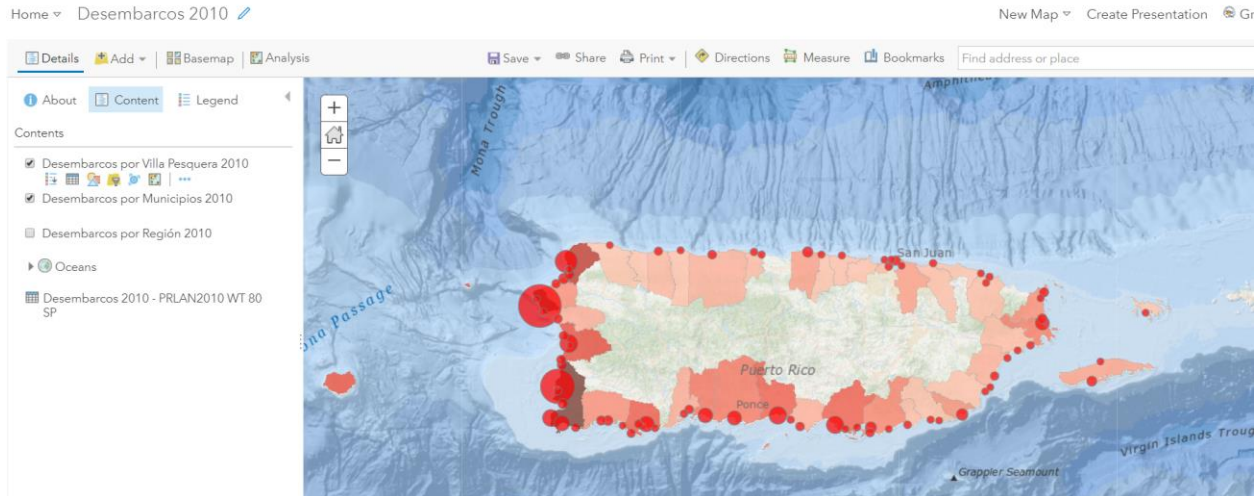
Example of web map configuration for the 1990-1999 decade

2001 Commercial Landings Reported Statistics Web Map



Example of web map configuration for the 2000-2009 decade

2010 Commercial Landings Reported Statistics Web Map

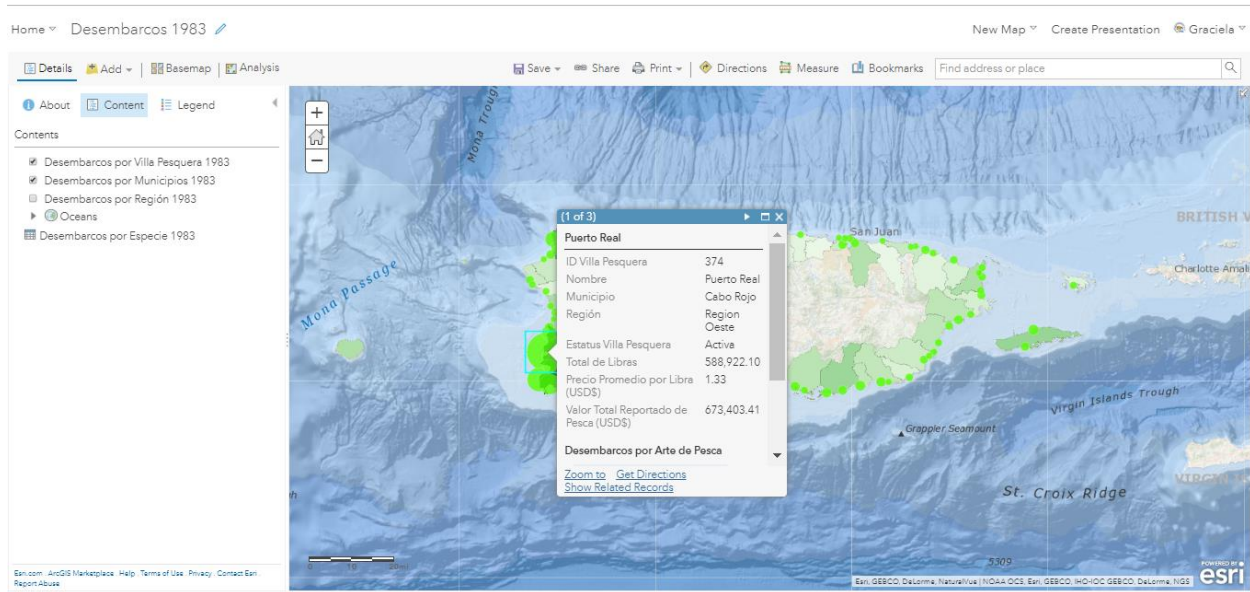


Example of web map configuration for the 2010-2014 decade

ArcGIS Platform Implementation
Caribbean Fisheries Management Council
January – June 2017
ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico

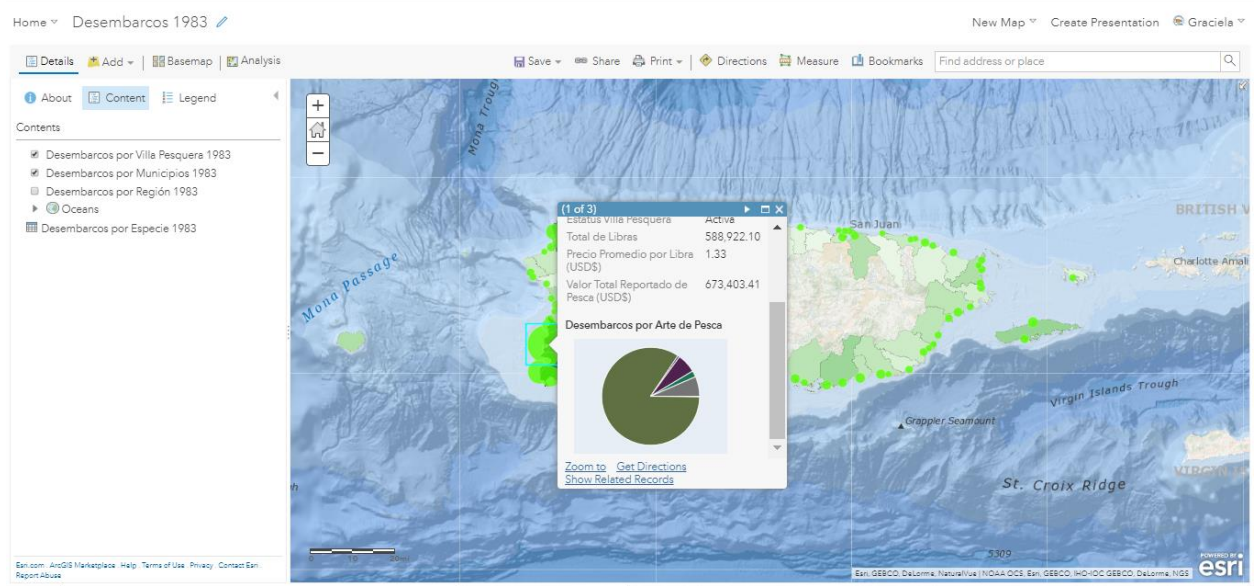
For each web map, the following elements were configured:

- Transparency
- Visibility Range
- Symbology
- Pop-Up (Villas, Municipios and Regiones feature layers)
- Pie Graph in Pop-Up representing Gear Codes (Villas feature layer)

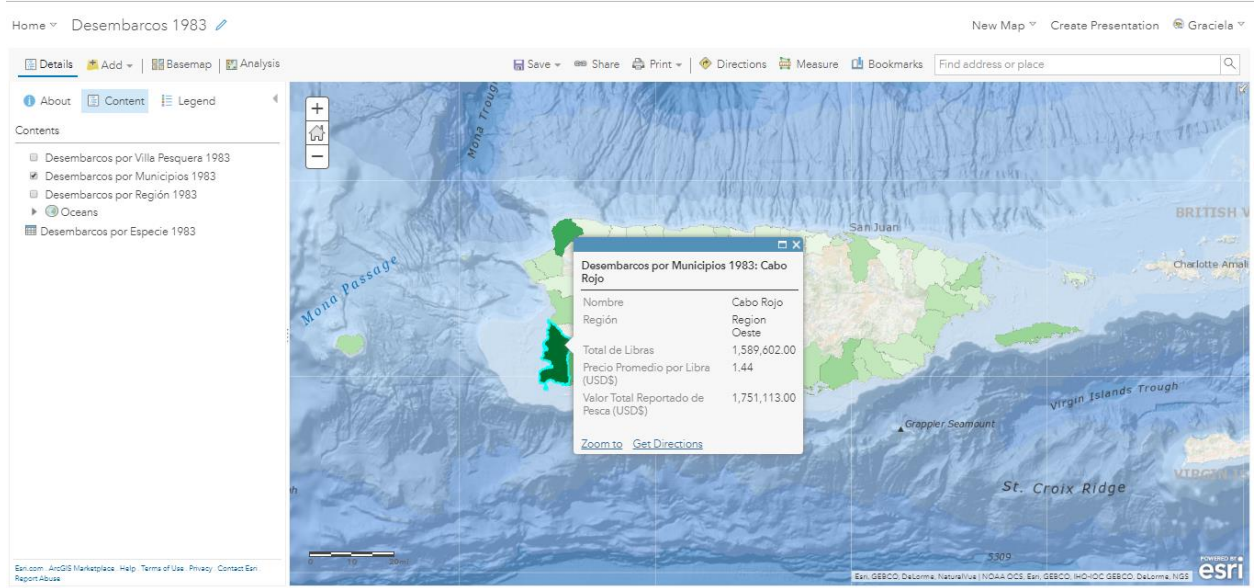


Villas Pop-Up Configuration

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
January – June 2017
ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

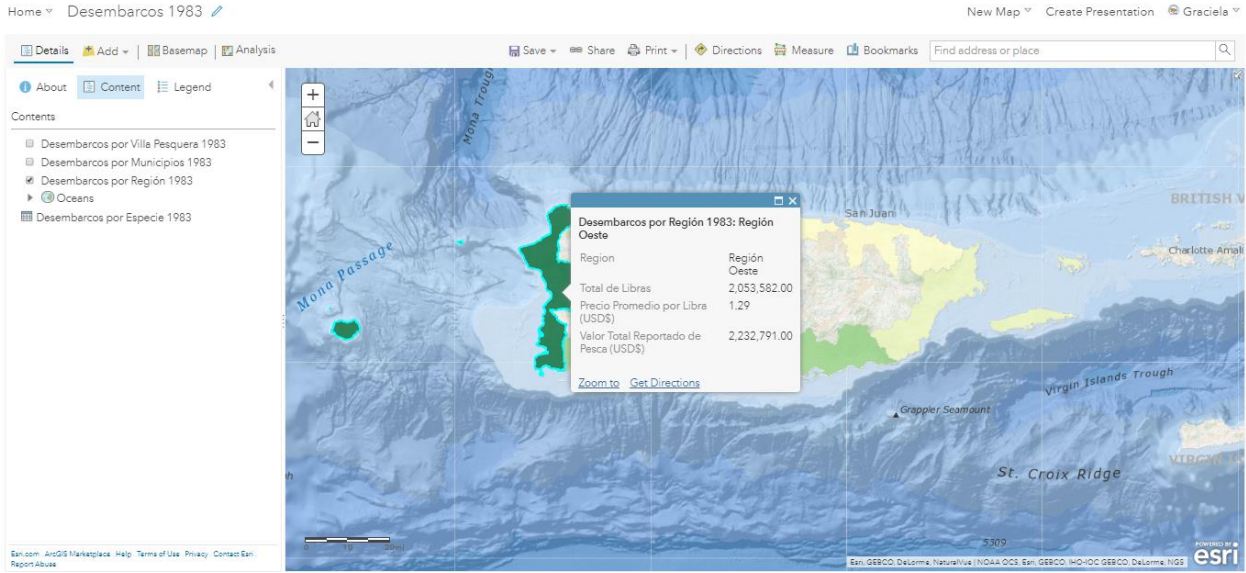


Villas Pie Graph Configuration



Municipios Pop-Up Configuration

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January – June 2017
ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**



Regiones Pop-Up Configuration

**ArcGIS Platform Implementation
 Caribbean Fisheries Management Council
 January – June 2017
 ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

- Metadata, Credits and Tags were configured for each of the web maps and feature layers.

Desembarcos 1983 Edit

Overview Usage Settings

Edit Thumbnail Web Map que muestra las estadísticas de desembarcos comerciales por Villa Pesquera, por Municipio y por Región para el año 1983 en Puerto Rico. Edit
 Web Map by cfm_c_pr
 Created: Apr 27, 2017 Updated: Sep 28, 2018 View Count: 455
 Add to Favorites

Description Edit

Este web map muestra las estadísticas de total de libras, peso promedio por libra y valor total reportado de pesca para los desembarcos comerciales por Villa Pesquera, por Municipio y por Región para el año 1983 en Puerto Rico. Los datos de estadísticas de pesca comercial los proveen los pescadores al Laboratorio de Investigaciones Pesqueras del Departamento de Recursos Naturales y Ambientales de Puerto Rico o a la División de Pesca y Vida Silvestre del Departamento de Planificación y Recursos Naturales de las Islas Vírgenes Estadounidenses. Los datos se transfieren oficialmente a la NOAA- Southeast Fisheries Science Center (SEFSC). El CFMC obtuvo los datos del SEFSC para este proyecto.

El Caribbean Fishery Management Council (CFMC) es uno de 8 consejos de pesca en los Estados Unidos, establecido bajo el PL 94-265 (aprobado el 13 de abril de 1976), mejor conocido como el Magnuson-Stevens Act o el Sustainable Fisheries Act según enmendado en 1996 y 2007 para la conservación y utilización ordenada de los recursos pesqueros de los Estados Unidos de América.

El CFMC es responsable de la creación de planes de manejo de recursos pesqueros en la Zona Exclusiva Económica del Caribe (EEZ, por sus siglas en inglés) en Puerto Rico e Islas Vírgenes Americanas. A través de esta iniciativa el CFMC persigue incorporar los sistemas de información geográfica (GIS) para visualizar y analizar los patrones y tendencias de las actividades pesqueras en Puerto Rico y proveer acceso a información valiosa a científicos, estudiantes, educadores, pescadores y público en general.

Layers

- Desembarcos por Villa Pesquera 1983
- Desembarcos por Municipios 1983
- Desembarcos por Región 1983
- Oceana
 - World Ocean Base
 - World Ocean Reference

Tables

- Desembarcos por Especie 1983

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Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content.

Comments (0) +

Leave a comment.

Item Information Learn more

Low High
 Top Improvement: Add terms of use

Details

Size: 18 kb
 Shared with: Everyone (public), Caribbean Fishery Management Council
 Facebook Twitter LinkedIn

Owner Change Owner

cfm_c_pr

Folder Move

Decade_1983_1989

Categories Edit

This item has not been categorized.

Tags Edit

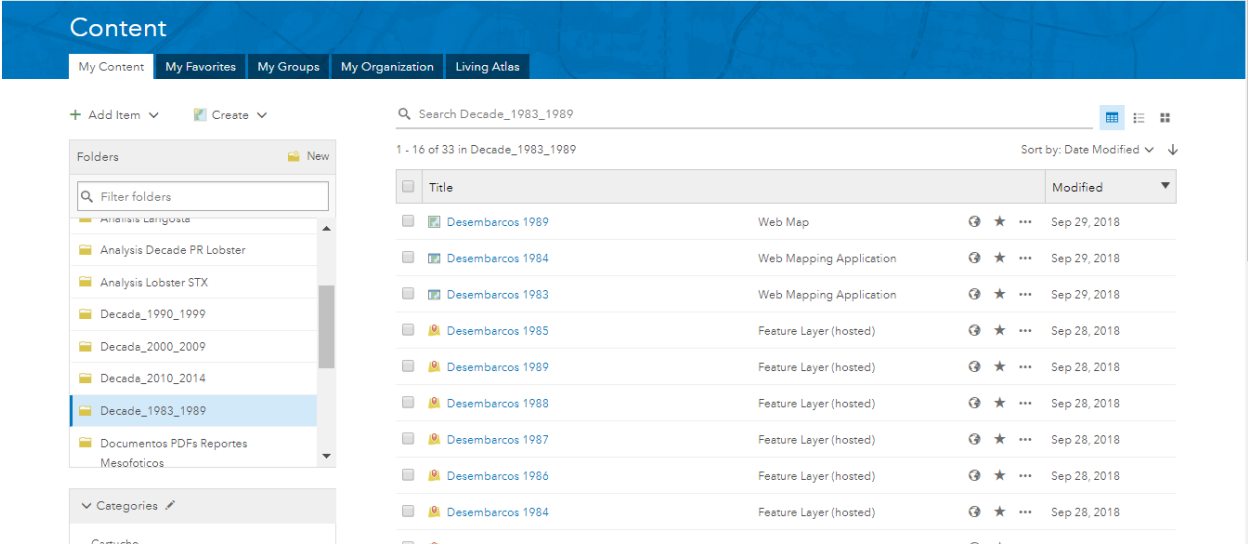
CFMC, Desembarcos, Landings, Puerto Rico, PR, 1983, Commercial Fish Landings, Fisheries, Villas Pesqueras

Credits (Attribution) Edit

Caribbean Fisheries, Management Council (CFMC) NOAA- Southeast Fisheries Science Center (SEFSC) Laboratorio de Investigaciones Pesqueras del Departamento de Recursos Naturales y Ambientales de Puerto Rico Web Map Creation: Angélica Robles - Intern Geographic Mapping Technologies, Corp.

**ArcGIS Platform Implementation
 Caribbean Fisheries Management Council
 January – June 2017
 ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

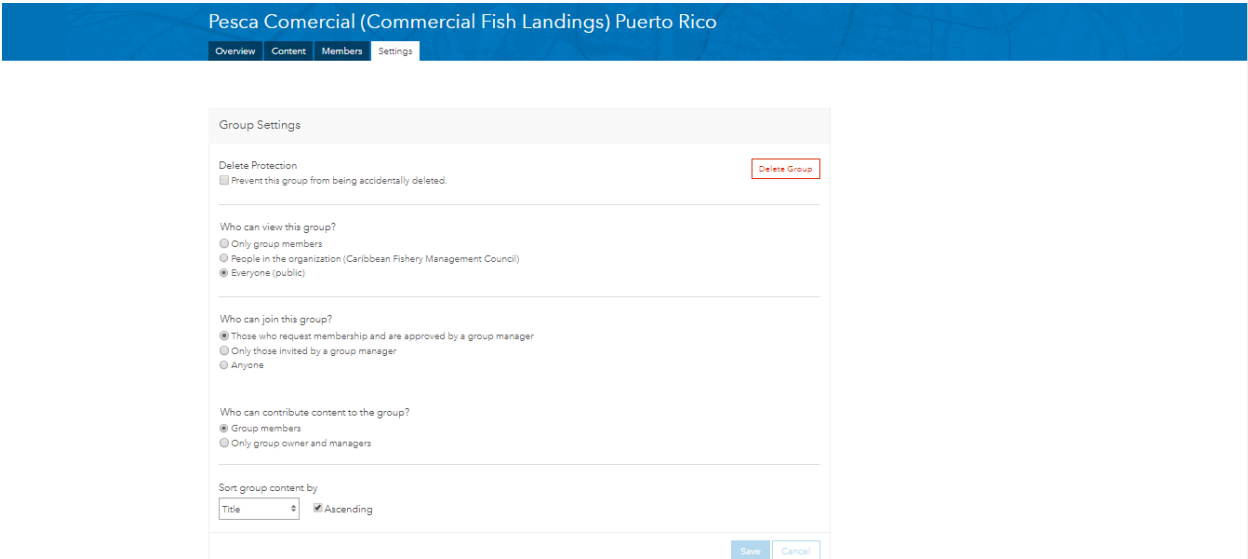
All feature layers are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named after the corresponding decade.



Commercial fish landings content for Puerto Rico (webmaps, web apps and feature layers) is shared within the Pesca Comercial (Commercial Fish Landings) Puerto Rico Group.



The Group has been set up as public for everyone to be able to view its contents.



**ArcGIS Platform Implementation
 Caribbean Fisheries Management Council
 January – June 2017
 ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

A second group for data download was created. This group is named Descarga de Datos Pesca Comercial en Puerto Rico



Descarga de Datos Pesca Comercial en Puert Rico

Owner: [cfmc_pr](#)

Created: Sep 28, 2018 Last Updated: Sep 28, 2018 Viewable by: Everyone (public)

 Delete Group

This group contains the fish landings data for download.

Descarga de Datos Pesca Comercial en Puert Rico

Overview **Content** Members Settings

Refine Content

Group Categories

No Group Categories Yet

Categories allow group members to organize items consistently and provide a simple way to browse content in the group.

Set up group categories

Item Type

- Maps
- Layers
- Scenes
- Apps
- Tools
- Files

Date Modified

Search group content








1 - 8 of 8 Sort by: Title ▾ ↑

	Title		Modified	Owner	View Count
<input type="checkbox"/>	Desembarcos 1983		Sep 28, 2018	cfmc_pr	71
<input type="checkbox"/>	Desembarcos 1984		Sep 28, 2018	cfmc_pr	446
<input type="checkbox"/>	Desembarcos 1985		Sep 28, 2018	cfmc_pr	210
<input type="checkbox"/>	Desembarcos 1986		Sep 28, 2018	cfmc_pr	146
<input type="checkbox"/>	Desembarcos 1987		Sep 28, 2018	cfmc_pr	182
<input type="checkbox"/>	Desembarcos 1988		Sep 28, 2018	cfmc_pr	171
<input type="checkbox"/>	Desembarcos 1989		Sep 28, 2018	cfmc_pr	177
<input type="checkbox"/>	Desembarcos_1983_1989		May 3, 2017	cfmc_pr	114

3. Task 5: Technical Support

- **Configure Puerto Rico Commercial Landings Statistics Web Apps**

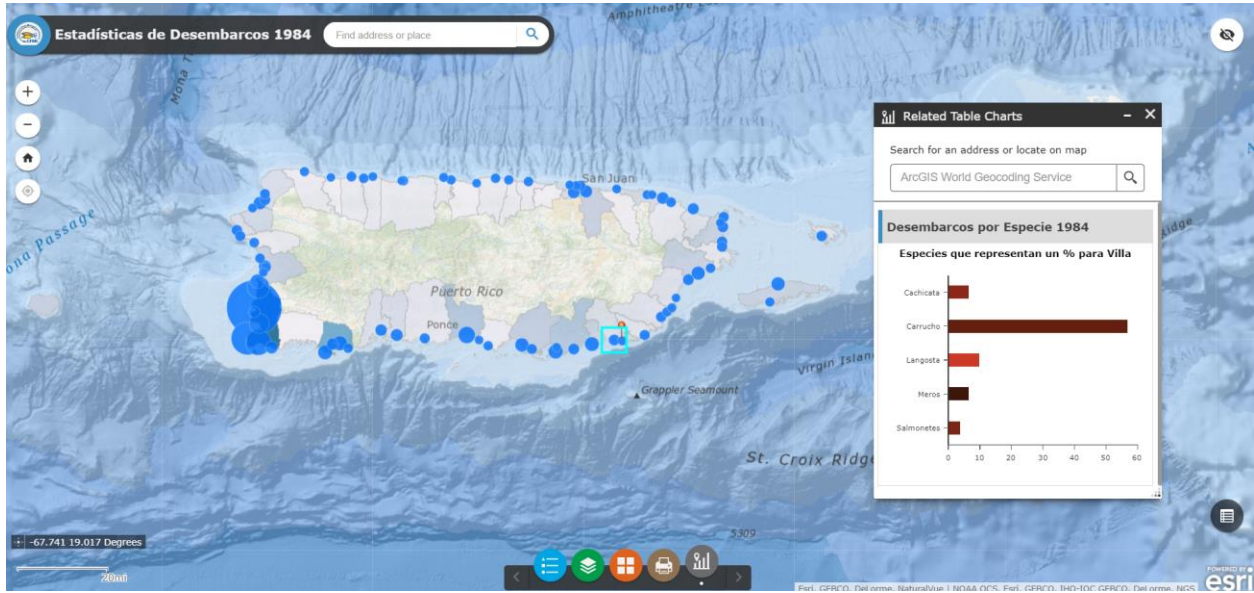
Web Maps configured in Task 3 were used as baseline to build web applications using ArcGIS Web App Builder.

<input type="checkbox"/>	 Desembarcos 1983	Web Mapping Application
<input type="checkbox"/>	 Desembarcos 1984	Web Mapping Application
<input type="checkbox"/>	 Desembarcos 1985	Web Mapping Application
<input type="checkbox"/>	 Desembarcos 1986	Web Mapping Application
<input type="checkbox"/>	 Desembarcos 1987	Web Mapping Application
<input type="checkbox"/>	 Desembarcos 1988	Web Mapping Application
<input type="checkbox"/>	 Desembarcos 1989	Web Mapping Application

Each web application contains basic navigation tools and four configured widgets for visualizing map legend, selecting layers, changing base map and the related table widget that shows the 80% of the total weight (lbs) per species for each fishing villa.

Individual web applications were configured for each year between 1983 and 2014. Below is an example of the 2010 web application.

2010 Commercial Landings Reported Statistics Web App



**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
January – June 2017
ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

- Metadata, Credits and Tags were configured for each of the web applications.

Desembarcos 1984 Edit

Overview Usage Settings

Edit Thumbnail Aplicación web que muestra las estadísticas de desembarcos comerciales por Villa Pesquera, por Municipio y por Región para el año 1984 en Puerto Rico. Edit
Web Mapping Application by cfm_pr
Created: May 2, 2017 Updated: Sep 29, 2018 View Count: 173
Add to Favorites

Description Edit

Este aplicación web muestra las estadísticas de total de libras, peso promedio por libra y valor total reportado de pesca para los desembarcos comerciales por Villa Pesquera, por Municipio y por Región para el año 1984 en Puerto Rico. Los datos de estadísticas de pesca comercial los proveen los pescadores al Laboratorio de Investigaciones Pesqueras del Departamento de Recursos Naturales y Ambientales de Puerto Rico o a la División de Pesca y Vida Silvestre del Departamento de Planificación y Recursos Naturales de las Islas Vírgenes Estadounidenses. Los datos se transfieren oficialmente a la NOAA- Southeast Fisheries Science Center (SEFSC). El CFMC obtuvo los datos del SEFSC para este proyecto.

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Terms of Use Edit

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Comments (0)

Leave a comment.

Leave a comment. Comment

View Application

Edit Application
Download
Share

Item Information Learn more

Low High
Top Improvement: [Add terms of use](#)

Details

Size: 68 KB
Shared with: Everyone (public), Pesca Comercial (Commercial Fish Landings) Puerto Rico, Caribbean Fishery Management Council
API: JavaScript
Purpose: Ready To Use

[f](#) [t](#) [g+](#)

Owner Change Owner
cfm_pr

Folder Move
Decade_1983_1989

Categories Edit
This item has not been categorized.

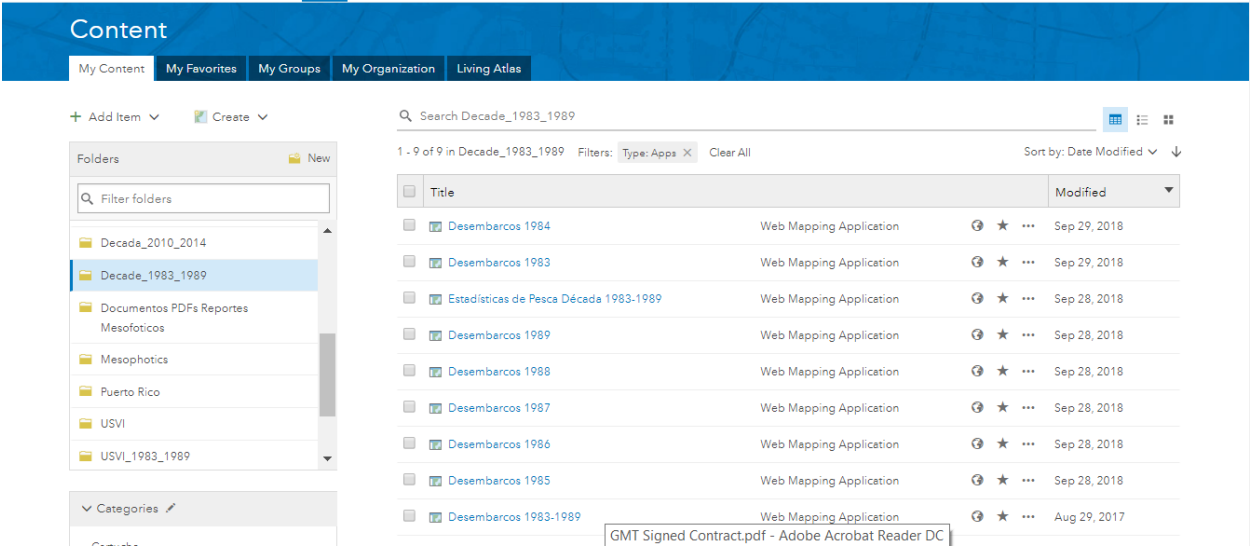
Tags Edit
CFMC Landings, Desembarcos, PR, Puerto Rico, 1984, Commercial Fish Landings, Fisheries, Villas Pesqueras

Credits (Attribution) Edit
Caribbean Fisheries, Management Council (CFMC) NOAA- Southeast Fisheries Science Center (SEFSC) Laboratorio de Investigaciones Pesqueras del Departamento de Recursos Naturales y Ambientales de Puerto Rico
Caribbean Fisheries, Management Council (CFMC) Web Map Creation: Angelica Robles - Intern Geographic Mapping Technologies, Corp.

URL View
<http://cfmc.maps.arcgis.com/apps/web>

**ArcGIS Platform Implementation
 Caribbean Fisheries Management Council
 January – June 2017
 ArcGIS Online Commercial Fish Landings and Census Data Web Maps – Puerto Rico**

All web applications are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named after the corresponding decade.



Commercial fish landings content for Puerto Rico (webmaps, web apps and feature layers) is shared within the Pesca Comercial (Commercial Fish Landings) Puerto Rico Group.

P

Pesca Comercial (Commercial Fish Landings) Puerto Rico

Owner: cfmc_pr

Created: Sep 29, 2018 Last Updated: Sep 29, 2018 Viewable by: Everyone (public)

Delete Group

- **Configure Puerto Rico Commercial Landings Statistics Story Maps**

Story Maps combine authoritative maps with narrative text, images, and multimedia content. They are a medium for harnessing the power of maps and geography to tell a story.

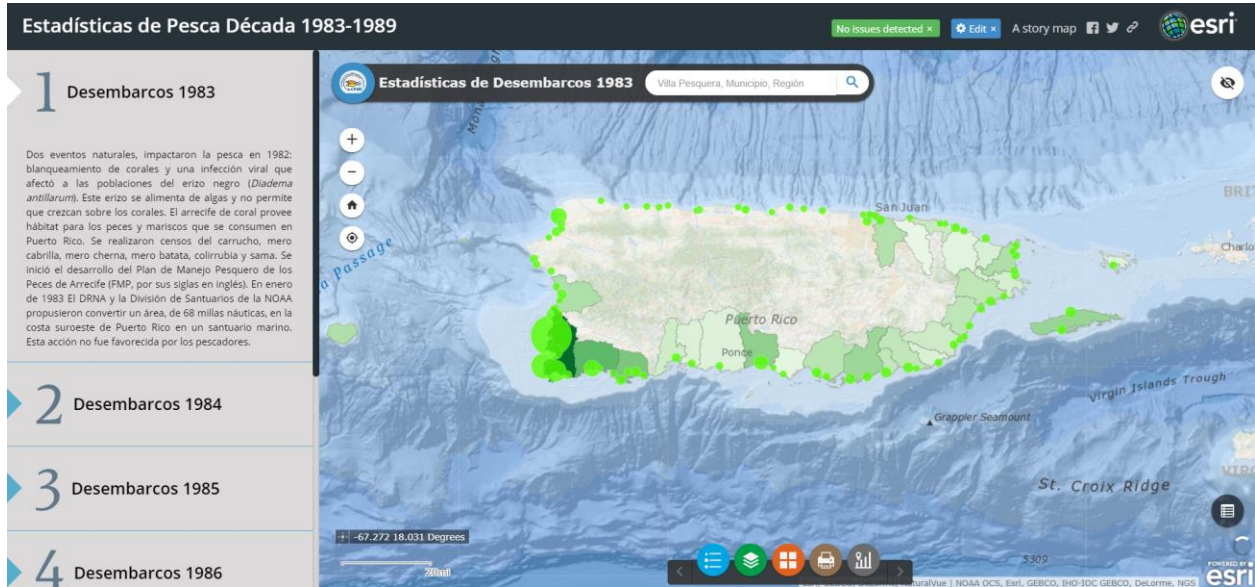
As a culmination of the Puerto Rico Commercial Landings Statistics Project, a story map per decade was created to share with the public the data and analysis results of the historic commercial landings reported data between 1983 and 2014.



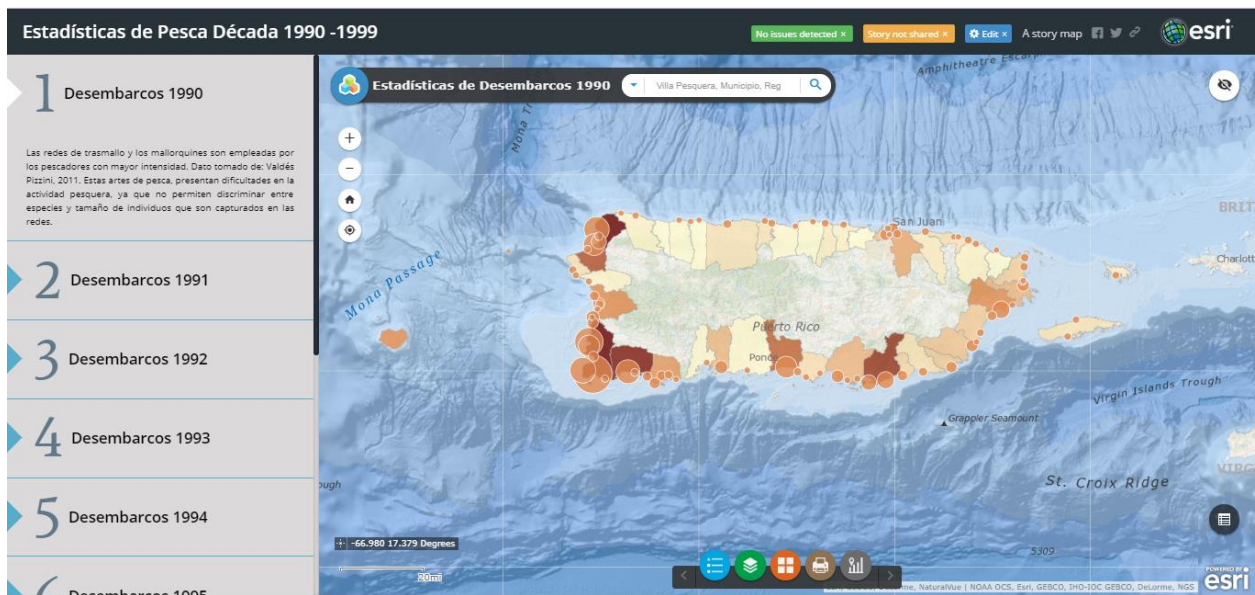
The story maps index the configured web applications described in the "*Configure Puerto Rico Commercial Landings Statistics Web Apps*" section. The story map also incorporates text which summarized the most important facts for that year.

Through these story maps, the history of commercial fishing in Puerto Rico can be recreated, studied and analyzed. With the use of Web GIS this historical data, originally in table format, is brought to life in an interactive medium, bringing new insights to scientists, researchers, educators, fishermen and the general public.

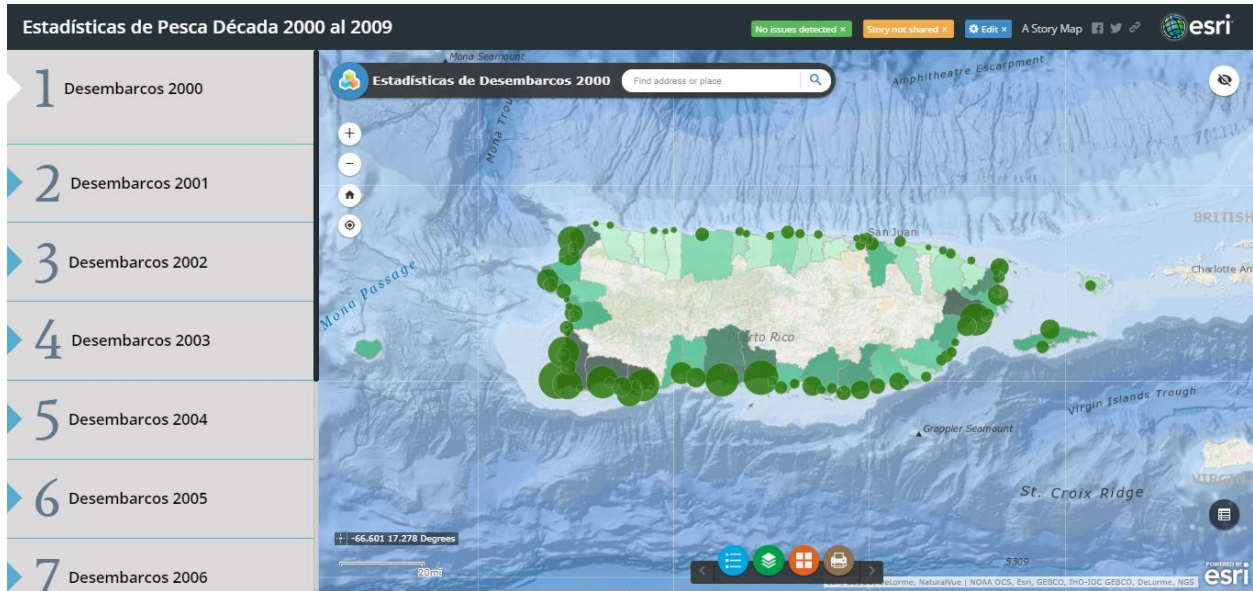
1983 -1989 Commercial Landings Reported Statistics Story Map



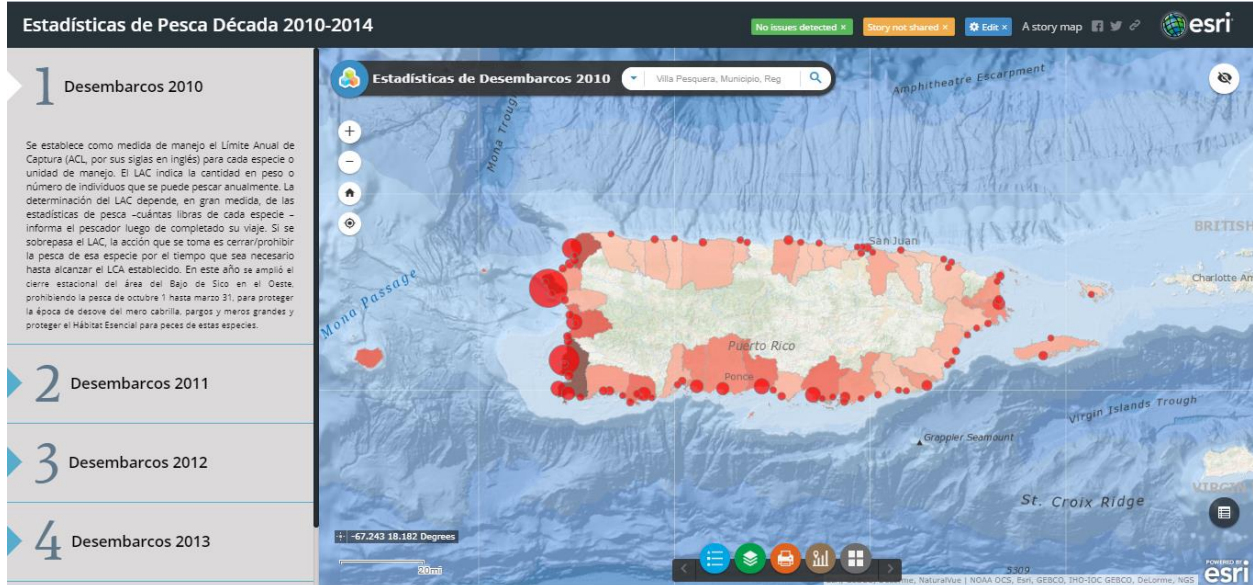
1990-1999 Commercial Landings Reported Statistics Story Map



2000-2009 Commercial Landings Reported Statistics Story Map



2010-2014 Commercial Landings Reported Statistics Story Map





ArcGIS Platform Implementation at the Caribbean Fisheries Management Council

July – September 2018

Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps - USVI

Task 5: Technical Support

September 28th, 2018

Prepared for:
Graciela García Moliner
FMP and Habitat Specialist
Caribbean Fisheries and Management Council

Prepared by:
Geographic Mapping Technologies, Corp.
54 Calle Mayagüez
San Juan, Puerto Rico 00917
Teléfonos: 787-250-8182/ 787-250-8185

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4. Task 5: Technical Support.....	40

1. DOCUMENT CONTROL

<i>VERSION</i>	<i>DATE</i>	<i>DESCRIPTION</i>
2.0	10/25/2018	<ul style="list-style-type: none">• Changing images on pages 19,20,21

2. Introduction

The following document summarizes Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps and Task 5: Technical Support of the CFMC GIS Project: **Development of GIS access to coral and mesophotic reef data from Puerto Rico and the USVI, including commercial landings data.** These tasks were performed between May – September 2018.

Specific tasks include:

Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps.

Task 3.1 Design and create feature class for Fisheries

Task 3.2 Load fisheries feature class to CFMC geodatabase

Task 3.4 Prepare Landings Register Data.

Task 3.5 Configure ArcGIS Online Web Maps

Task 5: Technical Support – (48 hrs)

- Configure USVI Commercial Landings Statistics Web Apps
- Configure USVI Commercial Landings Statistics Story Maps

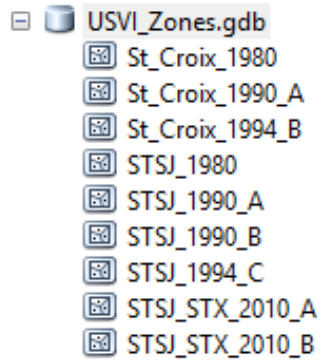
3. Task 3: ArcGIS Online Commercial Landings and Census Data Web Maps.

Task 3.1 Design and create feature class for Fisheries

- The creation and design of the Commercial Fish Landings fishing zone historic maps was based on historic maps and the shapefiles of the fishing zones that CFMC delivered.
- The fishing zones areas between 1983 and 2016 was validated throughout a series of workshops with CFMC personnel between May and June 2018. Many scenarios were created based on historic maps (1980 and 1990 decade).
- The final product consists of a fishing zones feature classes per decade and within each decade several additional scenarios. The attribute that was created in the Fishing Zone Feature Classes was:
 - **Zone Names** – Zone Unique Identifier

Task 3.2 Load fisheries feature class to CFMC geodatabase

- The Fishing Zones feature classes were loaded into the USVI_Zones geodatabase.



CFMC File Geodatabase and Feature Classes



Vector Map of the St. Thomas/ St.John of USVI (1980 Decade)



Zone Names

- 003
- C1
- C2
- C3
- C4
- C5
- C6

St.Croix of USVI (1980 Decade)

Zone Names

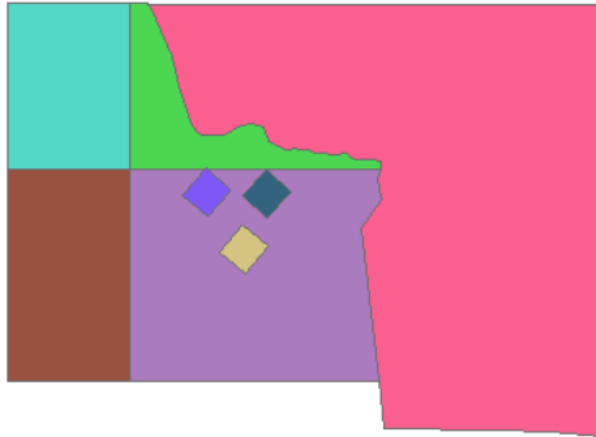
- 000
- 001
- 002
- BBB
- JN
- JS
- TNE
- TNW
- TSE
- TSW



Vector Map of the St. Thomas/ St. John of USVI (1990 Decade) Scenario A

Zone_Names

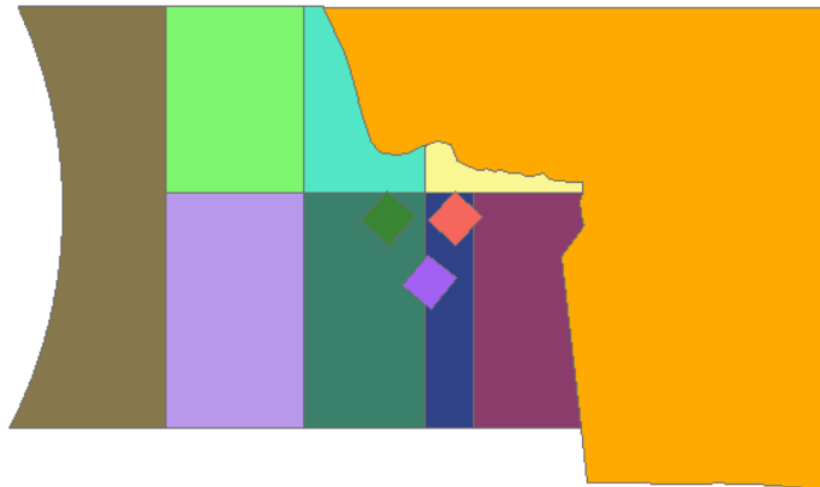
- 000
- 001
- 002
- BBB
- TNE
- TNW
- TSE
- TSW



Vector Map of the St. Thomas/ St.John of USVI (1990 Decade) Scenario B

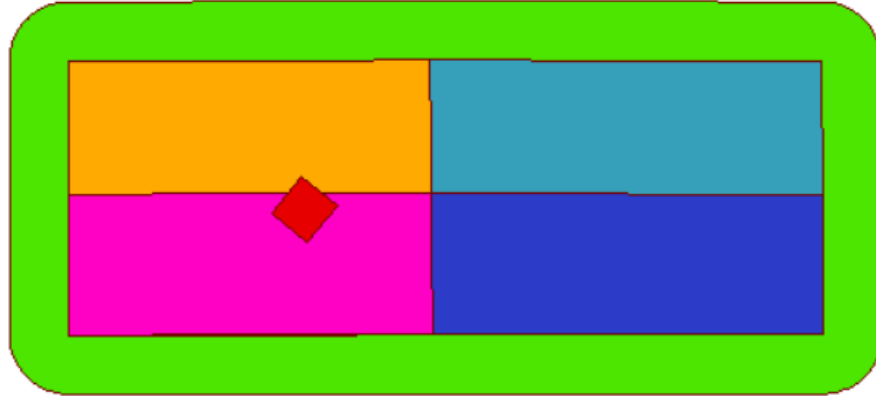
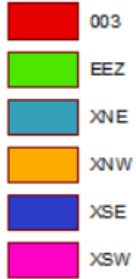
Zone Names

- 000
- 001
- 002
- BBB
- JN
- JSE
- JSW
- PR
- TNE
- TNW
- TSE
- TSW



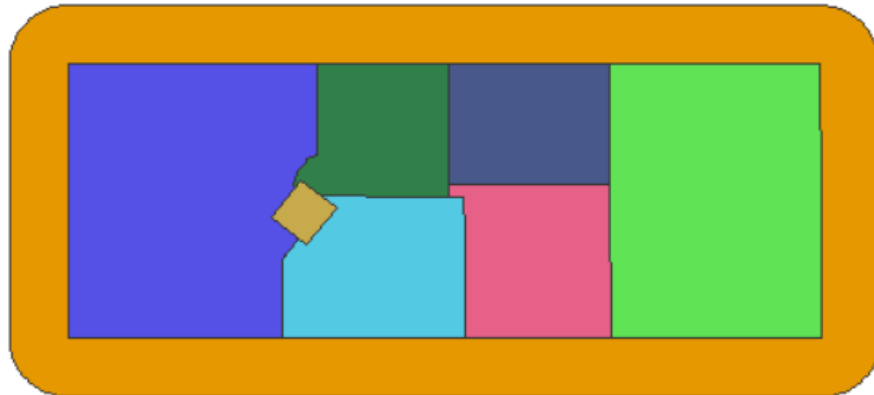
Vector Map of the St. Thomas/ St.John of USVI (1990 Decade) Scenario B

Zone_Names

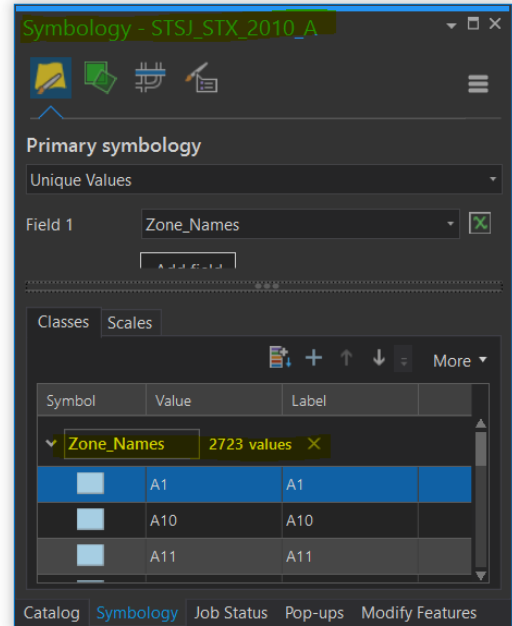
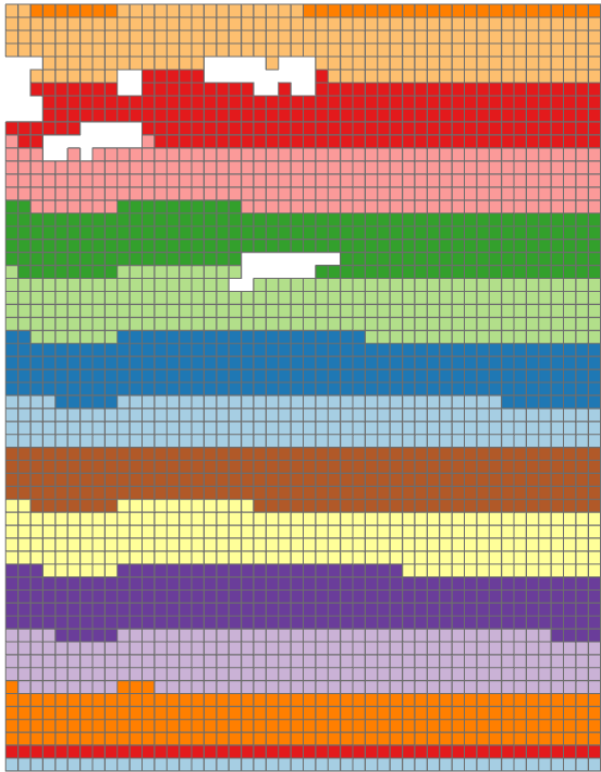


St.Croix of USVI (1990 Decade) Scenario A

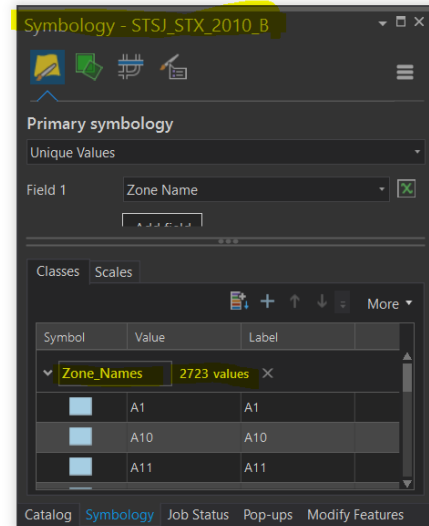
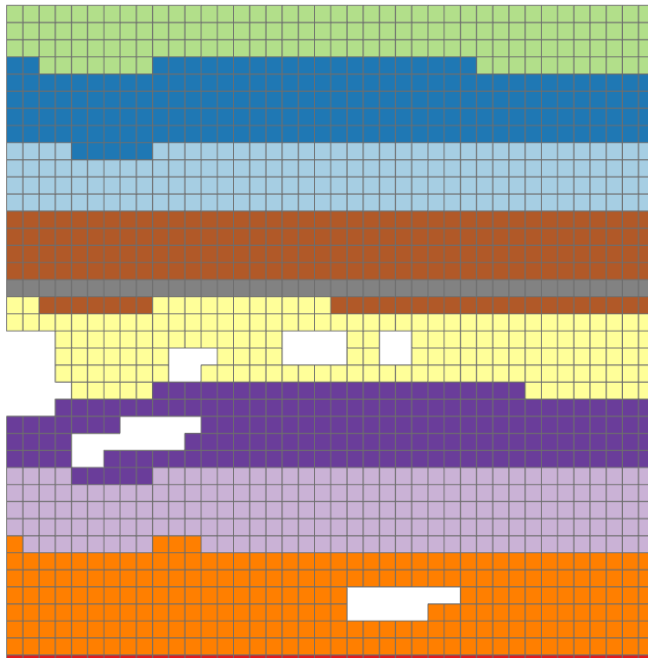
Zone Names



St.Croix of USVI (1990 Decade) Scenario B



Vector Map of the St. Thomas/ St.John & St.Croix of USVI (2010) Scenario A

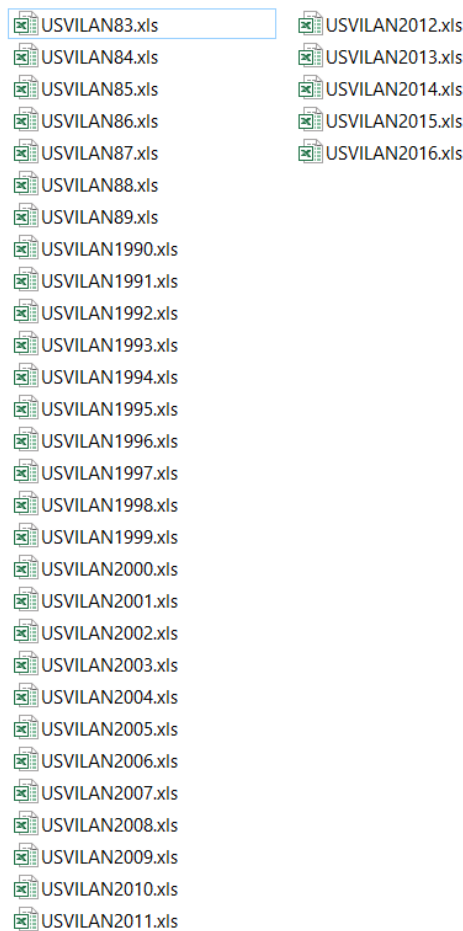


Vector Map of the St. Thomas/ St.John & St.Croix of USVI (2010) Scenario B

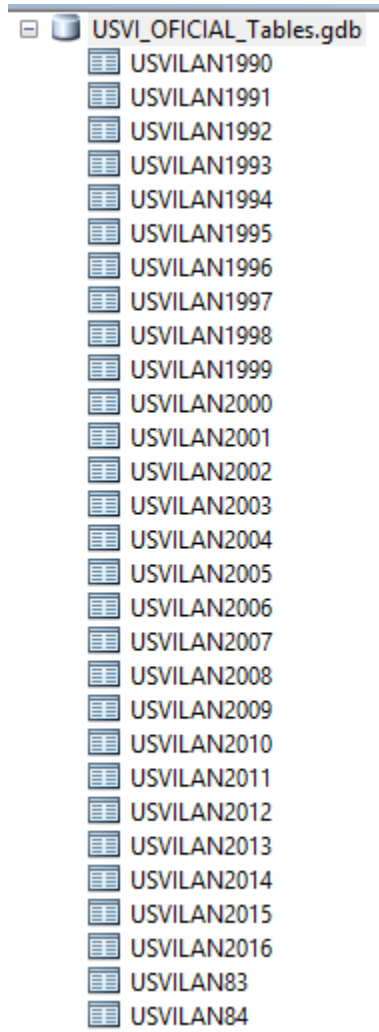
Task 3.4 Prepare Landings Register Data.

- The preparation, quality control and depuration process of the USVI commercial fish landings data, including the building of several geoprocessing models to process the data and the development of python scripts was carried out between October May-July 2018.

- Quality Control and depuration of USVILAN tables
 - The first step consisted in the depuration process of all raw data received by CFMC. The documents consisted of Excel tables that contained the attributes of all fished species in United States Virgin Islands (USVI). The CFMC Staff made a quality control of the information before delivering it to GMT.



- All the Excel tables delivered by CFMC were imported into a File Geodatabase. GMT performed additional quality control and depuration processes of the USVI Tables imported. The image underneath is an excerpt of the GDB containing the standalone tables imported to the geodatabase.



- All The images underneath show the schema design and description of the raw tables. The fields that are highlighted in the image, were the fields that were used to make all the analysis.

Table Properties ✕

General Editor Tracking **Fields** Indexes Subtypes Relationships

Field Name	Data Type
OBJECTID	Object ID
DATE	Date
CENTER	Text
ID_CODE	Text
GEAR_CODE	Text
NO_TRIPS	Long Integer
SP_CODE	Text
TOT_WT	Double
	Double
MON	Text
DAY	Text
YEAR	Text
	Double

Click any field to see its properties.

Field Properties

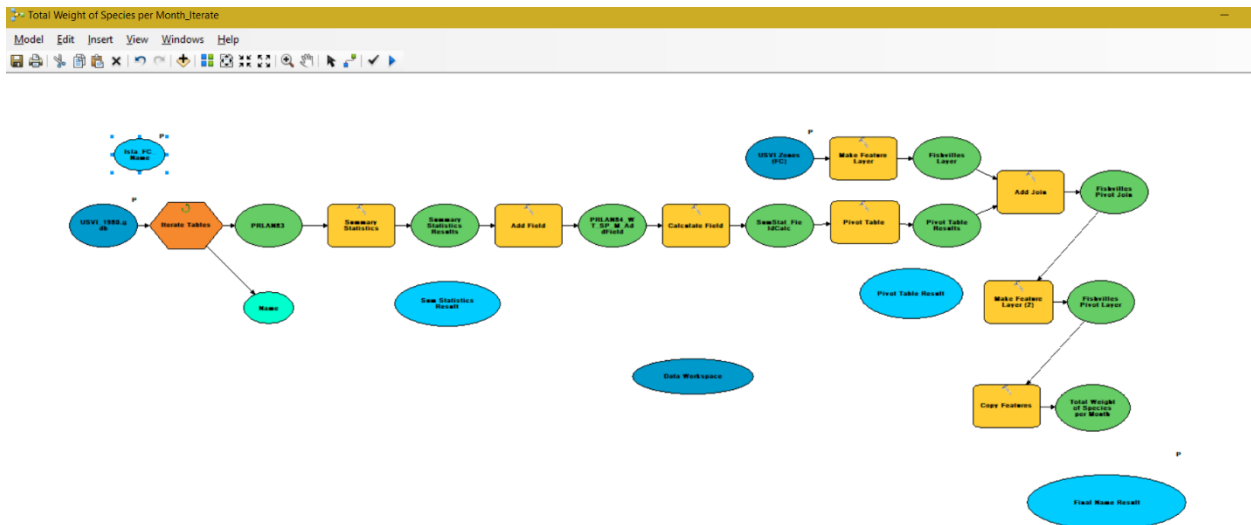
Alias	OBJECTID	
-------	----------	--

To add a new field, type the name into an empty row in the Field Name column, click in the Data Type column to choose the data type, then edit the Field Properties.

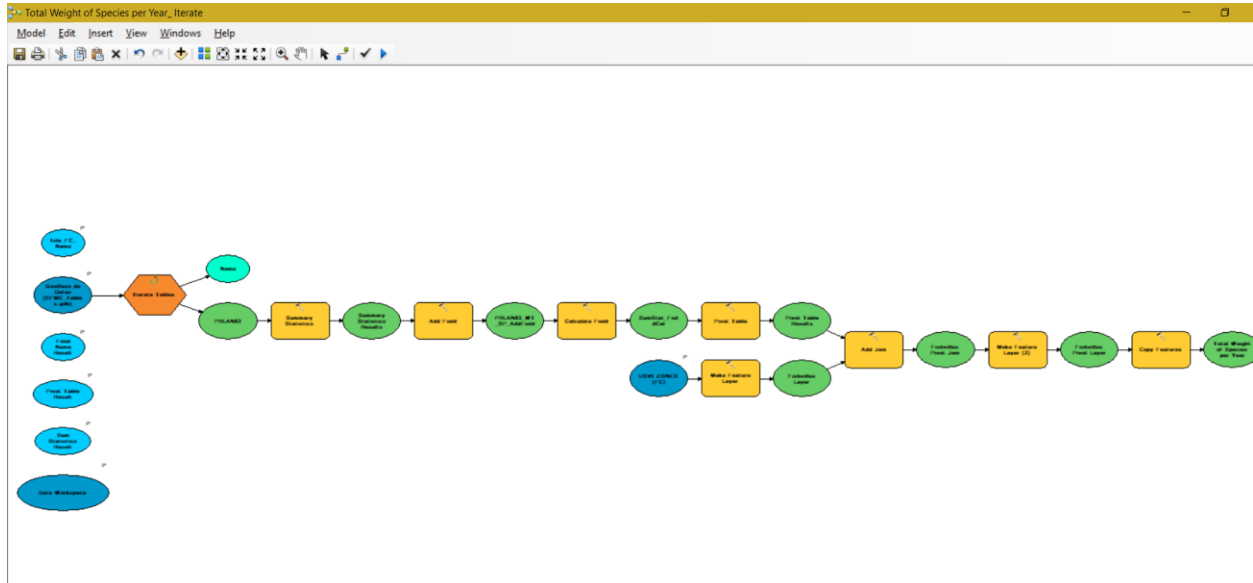
Field Name	Description
DATE	Date of the Reported Catch
CENTER	Unique ID or code of the Fishing zone
ID_CODE	N/A
GEAR_CODE	Unique ID or code of the type of gear used to make the catch
NO_TRIPS	Number of trips made
SP_CODE	Unique ID or code of the species
TOT_WT	Amount of the weight reported of the catch
MON	Month of the reported catch
DAY	Day of the reported catch
YEAR	Year of the reported catch
Value	N/A

- Geoprocessing models and Scripts
 - GMT performed an analytical process to obtain the statistical results of total weight for species per month per year for all USVI fishing zones. To execute this task, GMT, Corp designed and created a geoprocessing model on ArcGIS for Desktop. This model helped automatize the statistical analysis for all years and generate the different feature classes with the corresponding values.

The image below shows the model created in ArcCatalog using ModelBuilder, a programming module for geoprocessing workflows. **This model automates the total weight of fished species per month.**



The image below shows the model created in ArcCatalog using ModelBuilder, a programming module for geoprocessing workflows. **This model automates the total weight of fished species per year.**



The image below shows the feature classes (outputs) generated by the models that automated the total weight of fished species per month and per year.

- CFMC_Results_per_Month.gdb
 - USVILAN1990_STSJ_A_WT_SP_M_Pivot
 - USVILAN1990_STSJ_A_WT_SP_M_SumStat
 - USVILAN1990_STSJ_A_WT_SP_Month
 - USVILAN1990_STX_A_WT_SP_M_Pivot
 - USVILAN1990_STX_A_WT_SP_M_SumStat
 - USVILAN1990_STX_A_WT_SP_Month
 - USVILAN1991_STSJ_A_WT_SP_M_Pivot
 - USVILAN1991_STSJ_A_WT_SP_M_SumStat
 - USVILAN1991_STSJ_A_WT_SP_Month
 - USVILAN1991_STSJ_B_WT_SP_M_Pivot
 - USVILAN1991_STSJ_B_WT_SP_M_SumStat
 - USVILAN1991_STSJ_B_WT_SP_Month
 - USVILAN1991_STSJ_C_WT_SP_M_Pivot

- CFMC_Results_per_Year.gdb
 - USVI86_ST_SJ_WT_SP
 - USVI86_ST_SJ_WT_SP_Pivot
 - USVI86_ST_SJ_WT_SP_SumStat
 - USVI86_STX_WT_SP
 - USVI86_STX_WT_SP_Pivot
 - USVI86_STX_WT_SP_SumStat
 - USVILAN1990_STSJ_A_WT_SP
 - USVILAN1990_STSJ_A_WT_SP_Pivot
 - USVILAN1990_STSJ_A_WT_SP_SumStat
 - USVILAN1990_STX_A_WT_SP
 - USVILAN1990_STX_A_WT_SP_Pivot
 - USVILAN1990_STX_A_WT_SP_SumStat
 - USVILAN1991_STSJ_A_WT_SP
 - USVILAN1991_STSJ_A_WT_SP_Pivot

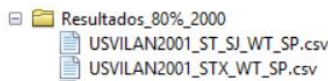
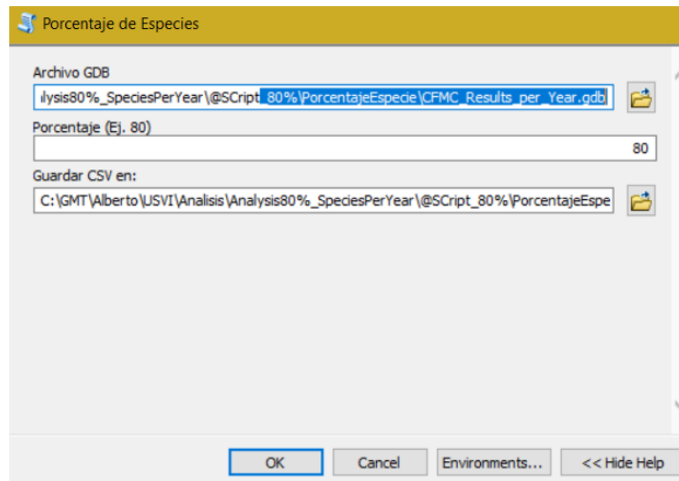
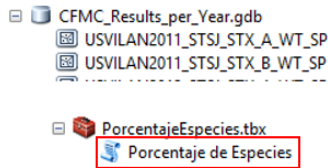
- The PorcentajeEspecie script created for Puerto Rico Fish Landings Data and used to compute species that represent 80% or more of the total landings per villa per year was modified and used to compute the statistic for USVI fishing zones.



```
-----  
# Name:      PorcentajeEspecie.py  
# Purpose:  
#  
# Author:    GMT  
#  
# Created:   26/10/2016  
# Copyright: (c) GMT 2016  
# Licence:   <your licence>  
#-----  
import arcpy  
import csv  
import os  
import re  
from decimal import Decimal  
  
#Represents a specie with an id, name, weight and possible percentage  
#if it is part of a list of species.  
class Species:  
    def __init__(self, id, weight):  
        self.id = id  
        self.name = ""  
        self.weight = weight  
        self.percent = 0  
  
#Represents the names of a specie including its common, english and scientific  
#names with its corresponding species id.  
class SpeciesName:  
    def __init__(self, id, name, englishName, scientificName):  
        self.id = id  
        self.name = name  
        self.englishName = englishName  
        self.scientificName = scientificName  
  
#Represents a list of all the species name with its corresponding species id  
#extracted from a CSV file.  
class SpeciesNameList:  
    def __init__(self, speciesNameCSVFile):  
        self.lstAllSpeciesName = []  
        self.loadSpeciesNameList(speciesNameCSVFile)  
  
    #Loads the species names in the given excel file to the lstAllSpeciesName  
    .  
    .  
    .
```

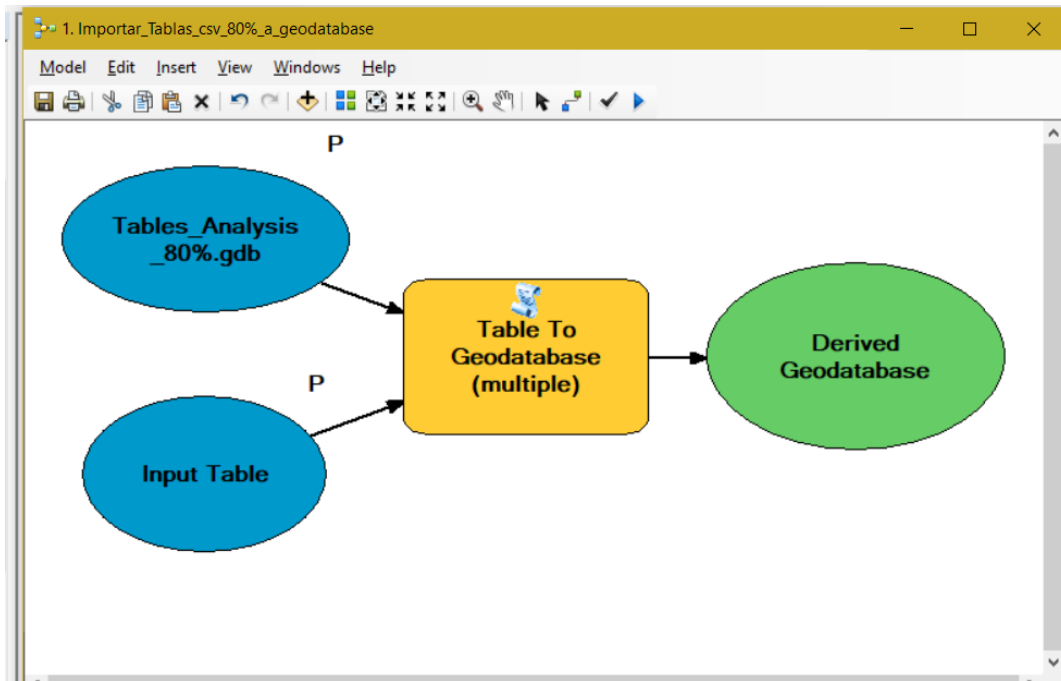

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The image below shows an example of which species represent 80% of the fish landings reported for 1983 by fishing zone. The result of the script is an output table that has the name of each species in English and official scientific name. The output table also has the statistics of the total weight per species and the sum of all weights per species and per fishing zone. This result was subsequently published in a series of web maps and web applications.

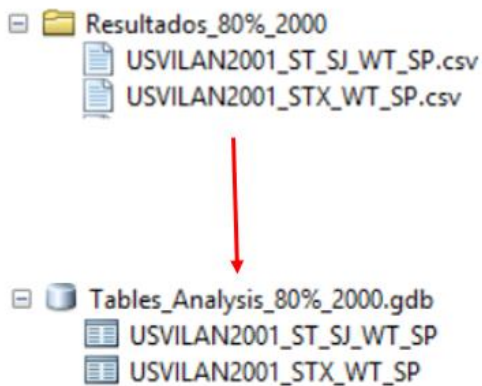


Zone_Name	Species_Code	Common_Name	Scientific_Name	Weight	Percentage	Total_Percentage	Total_Weight	Input_Percent
C4	170809	Parrotfish	Epinepheelus adscen	60225	25.2	81.2	193912.25	80.00%
C4	97648	Spiny lobster	Coryphaena equiset	46684.25	19.6	81.2	193912.25	
C4	168845	Snappers - unspecif	Antennariidae	38161.75	16	81.2	193912.25	
C4	72558	Conch, queen	Trachinotus falcatu	31573	13.2	81.2	193912.25	
C4	172250	Surgeonfish unspec	Priacanthidae	9739	4.1	81.2	193912.25	

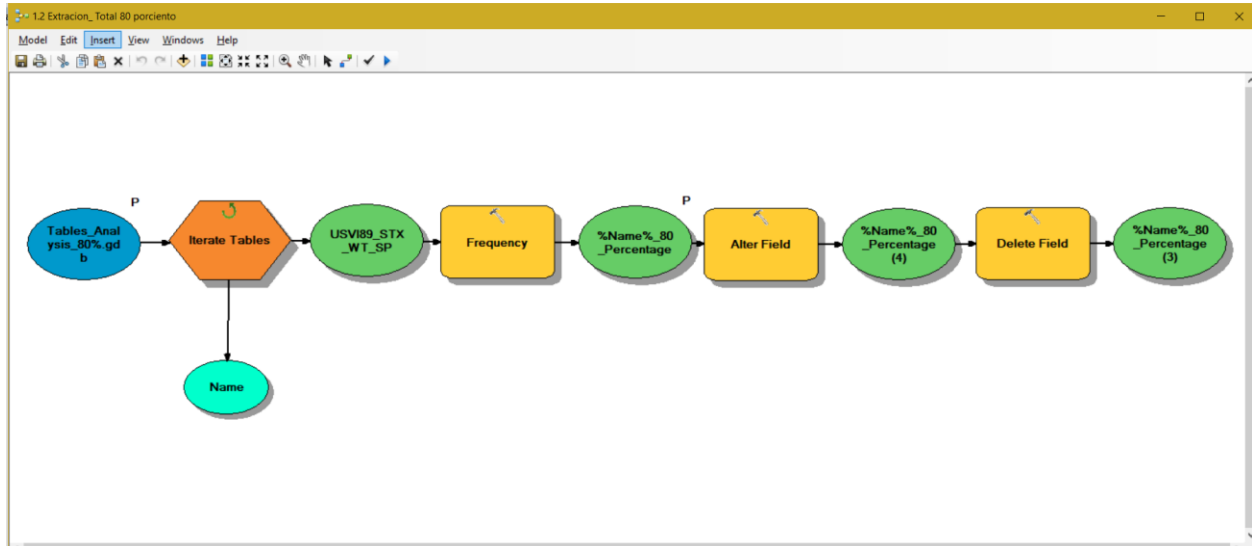
- To manage all the csv tables produced by the python script that computes species that constitute 80% of total landings the geoprocessing model created for Puerto Rico Fish Landing data was modified and used for USVI data. This model imports all the csv tables to a standalone table in a file geodatabase through a batch import process.



The image below shows an example of the result of the batch importation process of the .csv tables to a file geodatabase standalone tables through the geoprocessing model.



- The geoprocessing model created to extract the total percentage per fishing zone of the 80% of the species catch standalone tables for Puerto Rico Fish Landings Data was reutilized for USVI data. The results were appended to the fishing zones feature classes for mapping purposes.



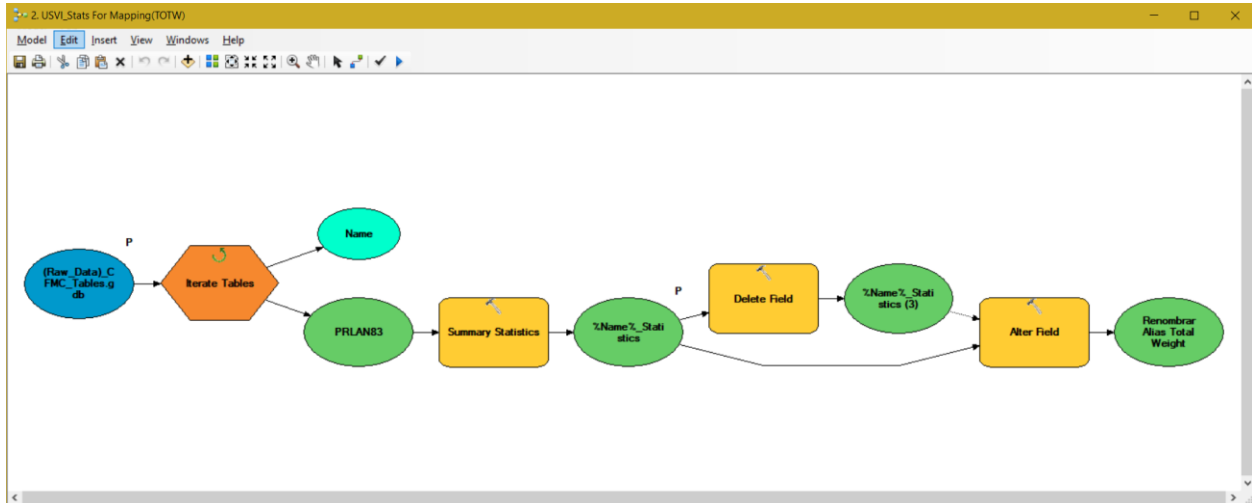
The image below shows an example of the result of the batch extraction process of the 80% total percentage value per fishing zone for all the file geodatabase standalone tables.

Extraer_Porcentaje_x_Zona.gdb
 USVILAN1986_ST_SJ_WT_SP_80_Percentage
 USVILAN1986_STX_WT_SP_80_Percentage



OBJECTID *	Zone_Name	Total_Percentage
1	003	84.4
2	C1	92.8
3	C2	89
4	C3	92.4
5	C4	90.3
6	C5	90.3
7	C6	94.2
8	EEZ	85.7

- A geoprocessing model was created to calculate an assign to each fishing zone the total Weight in Pounds (TP). The result was appended to the fishing zones feature classes for mapping purposes.



The image below shows an example of the result of the batch calculation process of the total weight in Pounds (TW) per fishing zone for all the Landings Reported file geodatabase standalone tables.

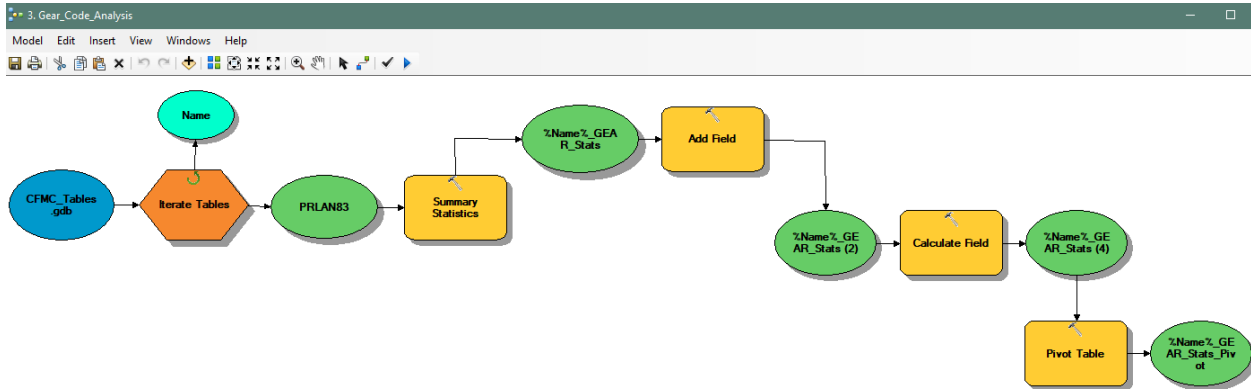
Results_GEAR_CODE_Analisis.gdb
 USVILAN1990_GEAR_Stats_Pivot
 USVILAN1990_Statistics

↓

USVILAN1991_Statistics		
OBJECTID *	Zone Name (CENTER)	Total Weight (lbs)
1	001	362543.65
2	003	268972
3	BBB	27542
4	C1	46572
5	C2	62335.5
6	C3	23250
7	C4	31928
8	C5	18289.75
9	C6	721
10	TNE	44204.5
11	TNW	11657.5

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- o Another model was created to automate the process of generating tables for each year per fishing zones with the statistics of Total Weight per Gear Code. The results were appended to the fishing zones feature classes and used for representation and cartographic purposes.



The image below shows an example of the result of the calculation process of the Total Weight reported by Gear Code

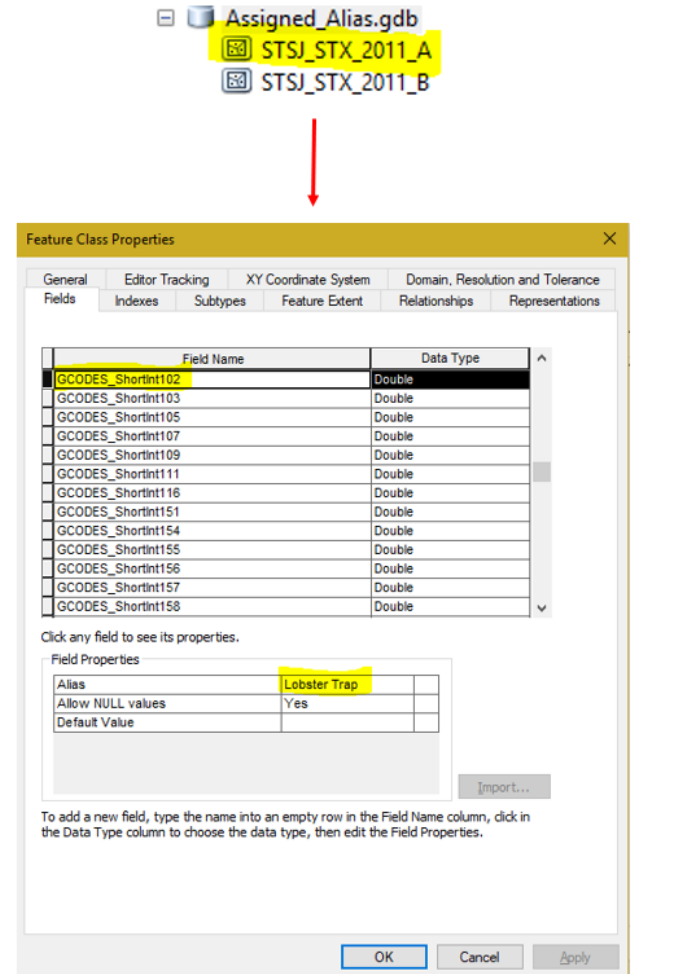
Results_GEAR_CODE_Analysis.gdb
 USVILAN1990_GEAR_Stats_Pivot

↓

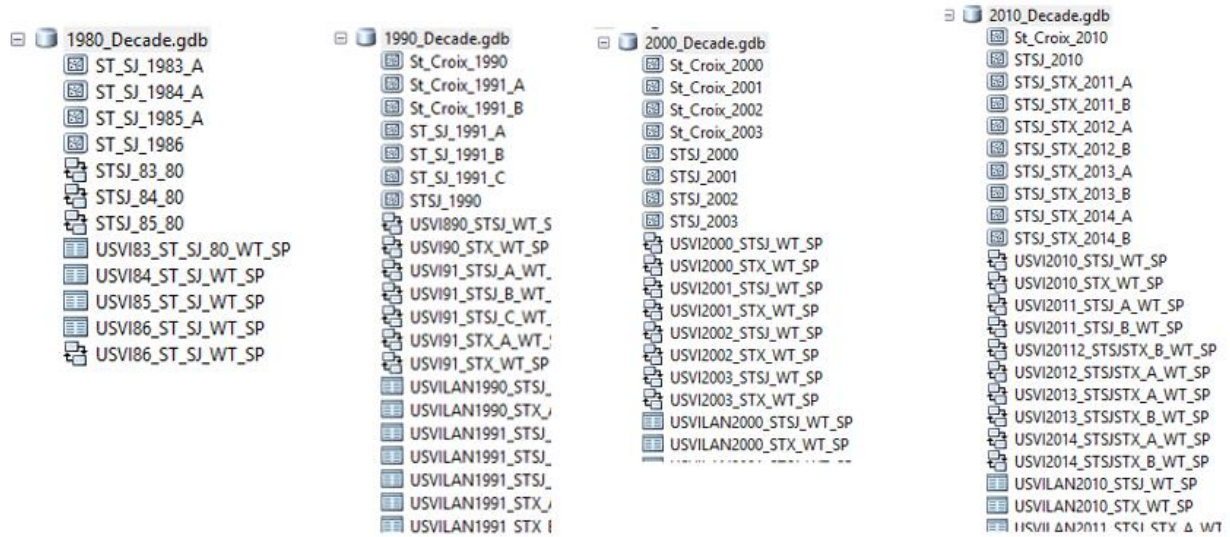
USVILAN1990_GEAR_Stats_Pivot								
OBJECTID*	Zone Name (CENTER)	GCODES_ShortInt0	GCODES_ShortInt01	GCODES_ShortInt02	GCODES_ShortInt04	GCODES_ShortInt10	GCODES_ShortInt31	GCODES_ShortInt50
1	001	0	243997.08	51127.5	64955.25	883.25	18055	49514
2	003	327	95474.5	1345	41153	7253	8217	18884
3	BBB	0	3354	479	4417	0	12	0
4	C1	13	19861	333	19845	1422	2297	3610
5	C2	0	53012	125	5256	3504	5676	3426
6	C3	0	20729	27	1088	702	1650	3234
7	C4	0	16401	1029	17796	1916	7972	2285
8	C5	3	6701	0	21310.5	2046	5077	646
9	C6	0	591	0	6	0	0	0
10	TNE	0	12822	2782	1540.5	0	1489	3600
11	TNW	0	637	0	771	0	0	0

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The image below shows an example of the result of the assignment of the gear code aliases to the fields through the python script.



- Final Products:
 - Commercial Landings for USVI was organized in four different file geodatabases: (1) per 1980 decade data, (3) per 1990 decade data, (3) per 2000 decade data and (4) 2010 decade data. This schema is reproduced for each decade between 1983 – 2016.





























- All this information was published to the CFMC ArcGIS Online Organizational site (<https://cfmc.maps.arcgis.com>) in order to build the web maps.

Task 3.5 Configure ArcGIS Online Web Maps

Web Maps

Each year of Reported Fish Landing Statistics has a web map configured. All these web maps were configured in the CFMC ArcGIS Online Organizational Account (<https://cfmc.maps.arcgis.com>).










- o **1983-1989 Decade**

<input type="checkbox"/>	Title		
<input type="checkbox"/>	 ST - SJ 1983 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 ST - SJ 1984 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 ST - SJ 1985 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 ST - SJ 1986 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 ST - SJ 1987 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 ST - SJ 1988 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 ST - SJ 1989 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 STX 1983 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 STX 1984 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 STX 1985 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 STX 1986 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 STX 1987 Commercial Fish Landings	Web Map	
<input type="checkbox"/>	 STX 1988 Commercial Fish Landings	Web Map	

Web Maps for the 1983-1989 decade.

○ **1990-1999 Decade**

1 - 16 of 34 in USVI_1990_1999 Filters: Type: Maps X Clear All














<input type="checkbox"/>	Title	
<input type="checkbox"/>	 St_Croix_1990_Commercial Landings	Web Map
<input type="checkbox"/>	 STSJ_1990_Commercial_Landings	Web Map
<input type="checkbox"/>	 STSJ_1991_A_Commercial_Landings	Web Map
<input type="checkbox"/>	 STSJ_1991_B_Map	Web Map
<input type="checkbox"/>	 STSJ_1991_C_Commercial_Landings_Map	Web Map
<input type="checkbox"/>	 STSJ_1992_A_Map	Web Map
<input type="checkbox"/>	 STSJ_1992_B_Map	Web Map
<input type="checkbox"/>	 STSJ_1992_C_Map	Web Map
<input type="checkbox"/>	 STSJ_1993_A_Map	Web Map

Web Maps for the 1990-1999 decade.

○ **2000-2009 Decade**















Search USVI_2000_2009

1 - 16 of 20 in USVI_2000_2009 Filters: Type: Maps X [Clear All](#)

<input type="checkbox"/>	Title	
<input type="checkbox"/>	 ST_SJ_Landings_2000	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2001	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2002	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2003	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2004	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2005	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2006	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2007	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2008	Web Map
<input type="checkbox"/>	 ST_SJ_Landings_2009	Web Map
<input type="checkbox"/>	 STX 2000 Commercial Fish Landings	Web Map
<input type="checkbox"/>	 STX 2001 Commercial Fish Landings	Web Map
<input type="checkbox"/>	 STX 2002 Commercial Fish Landings	Web Map

Web Maps for the 2000-2009 decade.

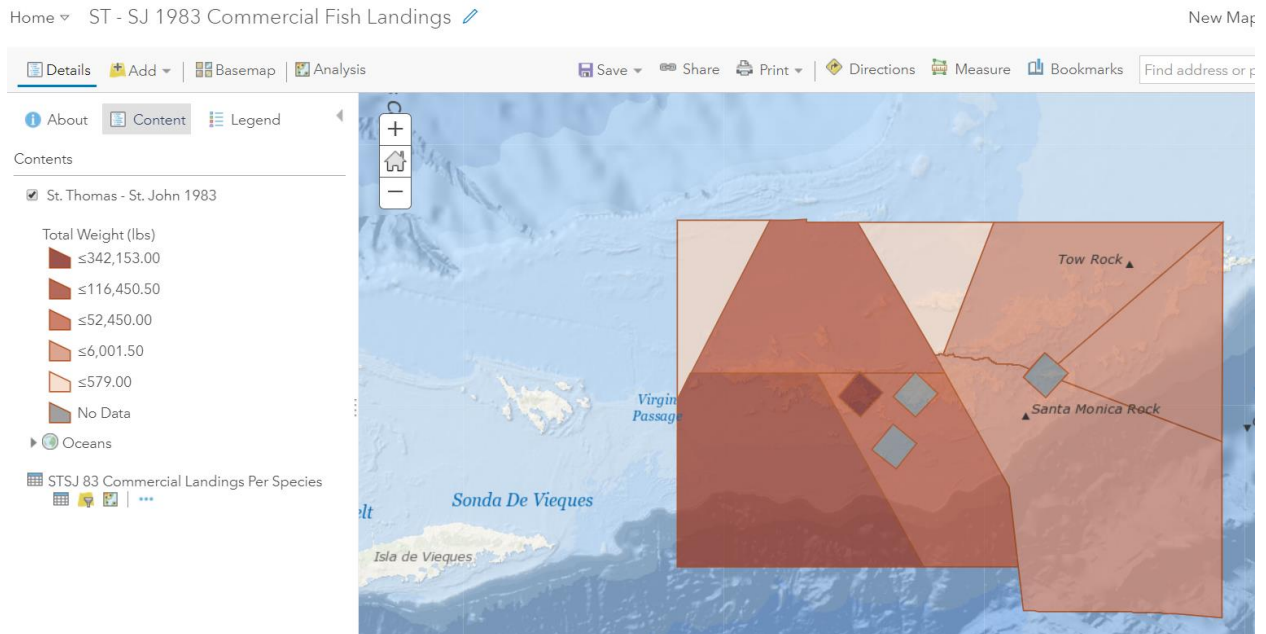
○ **2010-2016 Decade**

<input type="checkbox"/>	Title	
<input type="checkbox"/>	 STSJ_2010_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2012_B_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2013_A_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2013_B_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2014_A_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2014_B_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2015_A_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2015_B_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2016_A_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_2016_B_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_A_2011_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_A_2012_MAP	Web Map
<input type="checkbox"/>	 STSJ_STX_B_2011_MAP	Web Map
<input type="checkbox"/>	 STX_2010_MAP	Web Map

Web Maps for the 2010-2016 decade.

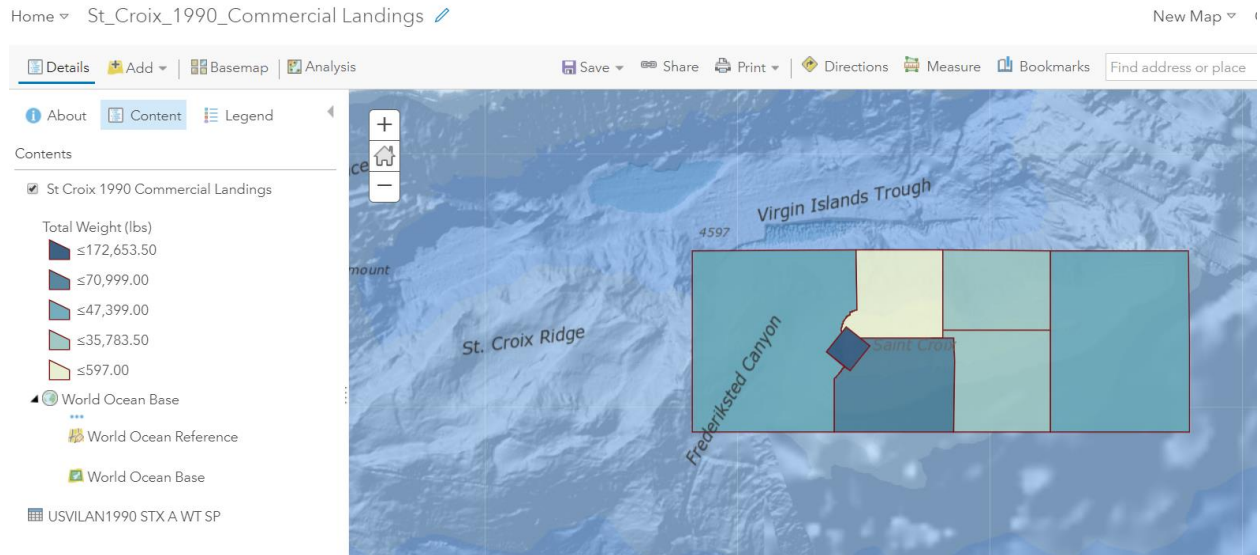
Each web map is composed of two main layers: (1) fishing zone commercial landings statistics layer (2) Standalone table with the species that represent the 80% of the total weight of species reported for each fishing zone.

1983 Commercial Landings Reported Statistics Web Map



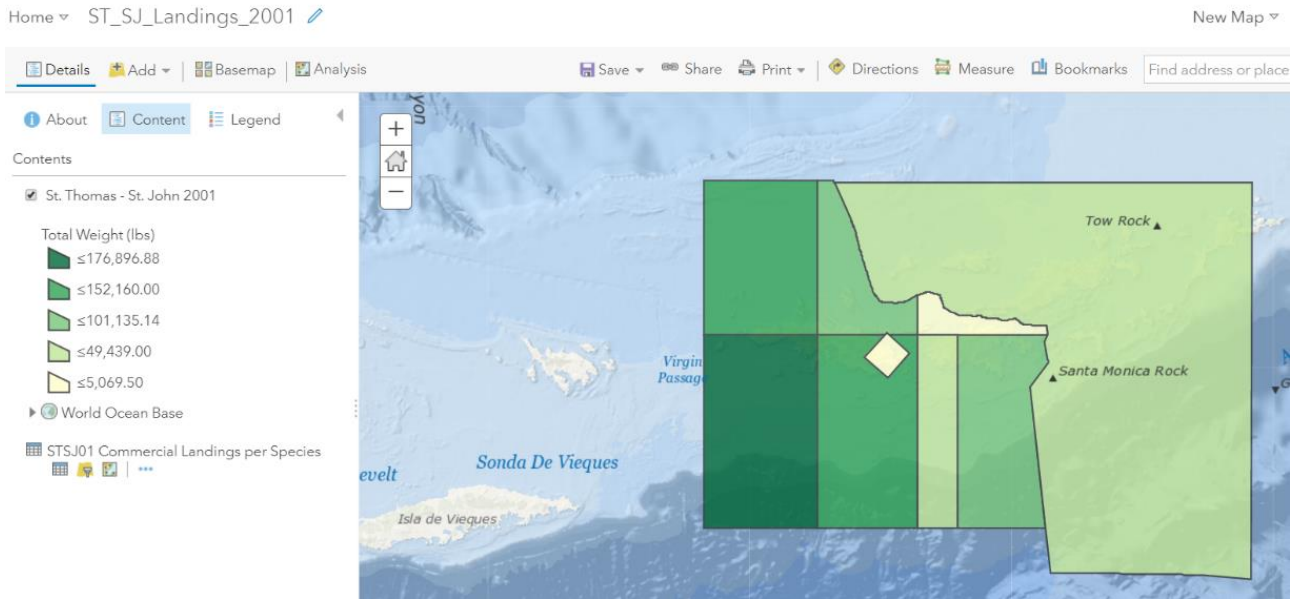
Example of web map configuration for the 1983-1989 decade

1990 Commercial Landings Reported Statistics Web Map



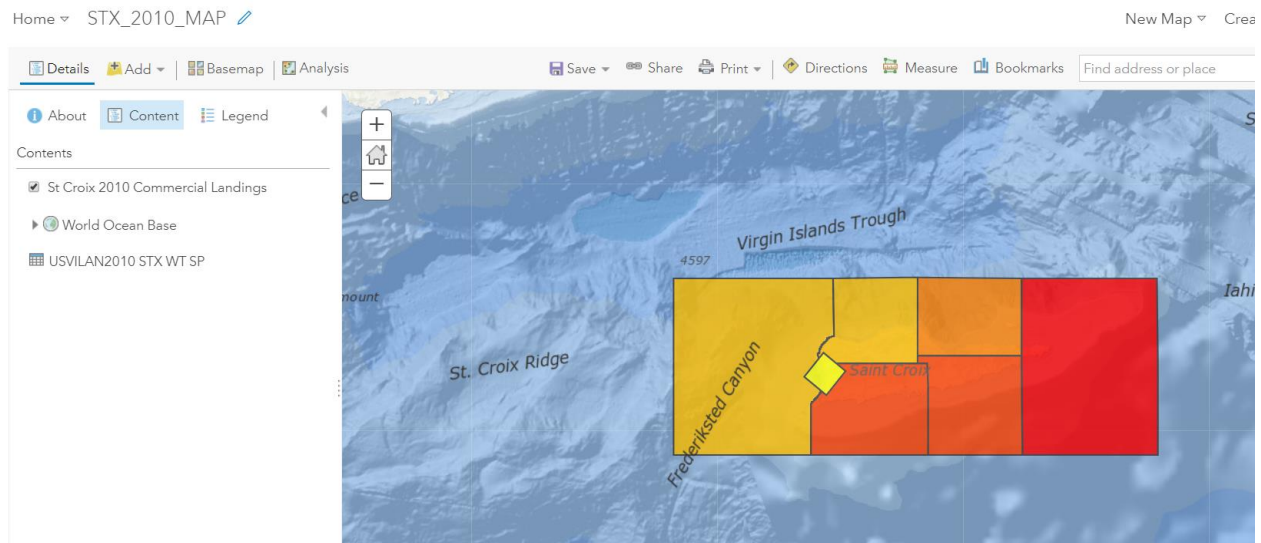
Example of web map configuration for the 1990-1999 decade

2001 Commercial Landings Reported Statistics Web Map



Example of web map configuration for the 2000-2009 decade

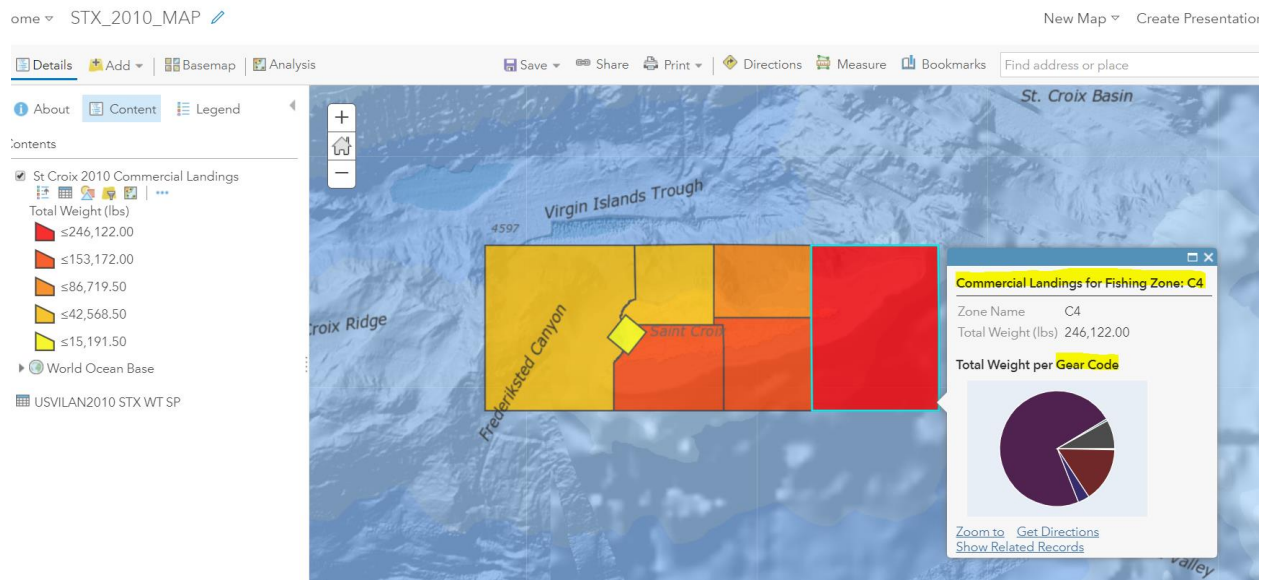
2010 Commercial Landings Reported Statistics Web Map



Example of web map configuration for the 2010-2016 decade

For each web map, the following elements were configured:

- Transparency
- Visibility Range
- Symbology
- Pop-Up (Fishing Zones feature layers)
- Pie Graph in Pop-Up representing Gear Codes (Fishing Zones feature layer)



Zones Pop-Up and Pie Graph Configuration

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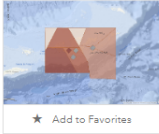
- Metadata, Credits and Tags were configured for each of the web maps and feature layers.

Home Gallery Map Scene Groups Content Organization Graciela ▾

ST - SJ 1983 Commercial Fish Landings ✎ Edit

Overview
Usage
Settings

✎ Edit Thumbnail



★ Add to Favorites

This Web Map shows commercial fish landings statistics for 1983 per fishing zones for St. Thomas and St. John, US Virgin Islands. ✎ Edit

Web Map by [cfmc_pr](#)

Created: Aug 28, 2018 Updated: Sep 30, 2018 View Count: 108

Description ✎ Edit

This web map shows commercial fish landings statistics for 1983 per fishing zones for St. Thomas and St. John, US Virgin Islands. Data on commercial fish landings are provided by fishermen to Division of Fish and Wildlife of the USVI Department of Planning and Natural Resources. Data is officially transferred to the NOAA- Southeast Fisheries Science Center (SEFSC). The Caribbean Fisheries Management Council (CFMC) obtained the data from the SEFSC to execute this project.

The Caribbean Fishery Management Council (CFMC) is one of eight regional fishery management councils, established under PL 94-265 (approved on April 13, 1976), now known as the Magnuson-Stevens Act (the Act) as amended in 1996 and 2007 also called [Sustainable Fisheries Act](#), for the conservation and orderly utilization of the fishery resources of the United States of America. The Caribbean Fishery Management Council is responsible for the creation of management plans for fishery resources (FMPs) in the US Caribbean Exclusive Economic Zone (EEZ) off PR and the USVI. This initiative seeks to incorporate geographic information systems to visualize and analyze patterns and tendencies in commercial fish activities in USVI. It also seeks to provide access to this valuable information to scientists, students, educators, fishermen and the general public.

Layers

St. Thomas - St. John 1983

Oceans

Layers

St. Thomas - St. John 1983

Oceans

- [World Ocean Base](#)
- [World Ocean Reference](#)

Tables

[STSJ_83_Commercial_Landings_Per_Species](#)

Terms of Use ✎ Edit

Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content.

Comments (0) ✎

Leave a comment.

Comment

Open in Map Viewer

Open in ArcGIS Desktop

Create Presentation

Create Web App ▾

Share

Item Information Learn more

Low High

Top Improvement: [Add terms of use](#)

Details

Size: 8 KB

Shared with: Everyone (public), [Commercial Fish Landings \(Pesca Comercial\) USVI](#), [Caribbean Fishery Management Council](#)

★★★★★

Owner Change Owner

★★★★★

Owner Change Owner

cfmc_pr

Folder Move

USVI_1983_1989

Categories ✎ Edit

This item has not been categorized.

Tags ✎ Edit

CFMC, USVI, 1983, St. Thomas, St. John, Commercial Fish Landings, Fisheries, Landings

Credits (Attribution) ✎ Edit

Caribbean Fisheries, Management Council (CFMC) NOAA- Southeast Fisheries Science Center (SEFSC) Division of Fish and Wildlife of the USVI Department of Planning and Natural Resources. David Peña & Alberto Millán - GIS Analyst Geographic Mapping Technologies, Corp.

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All feature layers are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named after the corresponding decade.

The screenshot shows the ArcGIS Online 'Content' interface. On the left, a sidebar lists folders under 'USVI', with 'USVI_1983_1989' selected. The main area shows a search for 'USVI_1983_1989' resulting in 17 items. The items are listed in a table with columns for Title, Type, and Modified date.

Title	Type	Modified
ST_SJ_1983_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
ST_SJ_1984_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
ST_SJ_1989_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
ST_SJ_1988_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
ST_SJ_1987_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
ST_SJ_1985_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
STT_SJ_1986_Commercial_Fish_Landings	Feature Layer (hosted)	Sep 30, 2018
ST - SJ 1983 Commercial Fish Landings	Web Map	Sep 30, 2018
ST - SJ 1984 Commercial Fish Landings	Web Map	Sep 30, 2018
ST - SJ 1985 Commercial Fish Landings	Web Map	Sep 30, 2018
ST - SJ 1986 Commercial Fish Landings	Web Map	Sep 30, 2018
ST - SJ 1987 Commercial Fish Landings	Web Map	Sep 30, 2018

Commercial fish landings content for USVI (webmaps, web apps and feature layers) is shared within the Commercial Fish Landings (Pesca Comercial) USVI Group.

The screenshot shows the details for the 'Commercial Fish Landings (Pesca Comercial) USVI' group. The group is owned by 'cfmc_pr' and was created and last updated on Sep 30, 2018. It is set to be 'Viewable by: Everyone (public)'. There is a 'Delete Group' button in the top right corner.

The Group has been set up as public for everyone to be able to view its contents.

The screenshot shows the 'Group Settings' page for the group 'Commercial Fish Landings (Pesca Comercial) USVI'. The page has a blue header with the group name and navigation tabs for Overview, Content, Members, and Settings. The main content area is titled 'Group Settings' and contains several sections:

- Delete Protection:** A checkbox labeled 'Prevent this group from being accidentally deleted.' is unchecked. A red 'Delete Group' button is visible in the top right corner of this section.
- Who can view this group?:** Three radio button options are shown: 'Only group members' (unchecked), 'People in the organization (Caribbean Fishery Management Council)' (unchecked), and 'Everyone (public)' (checked).
- Who can join this group?:** Three radio button options are shown: 'Those who request membership and are approved by a group manager' (checked), 'Only those invited by a group manager' (unchecked), and 'Anyone' (unchecked).
- Who can contribute content to the group?:** Two radio button options are shown: 'Group members' (checked) and 'Only group owner and managers' (unchecked).
- Sort group content by:** A dropdown menu is set to 'Title' and a checkbox for 'Ascending' is checked.

At the bottom right of the settings area, there are 'Save' and 'Cancel' buttons.

A second group for data download was created. This group is named Data Download Commercial Fish Landings (Pesca Comercial) USVI

The screenshot shows a group card for 'Data Download Commercial Fish Landings (Pesca Comercial) USVI'. The card features a square icon with the letter 'D' on the left. To the right of the icon, the group name is displayed in blue text. Below the name, the owner is listed as 'cfmc_pr'. Further down, the creation and update dates are shown as 'Created: Sep 30, 2018' and 'Last Updated: Sep 30, 2018'. The visibility is set to 'Viewable by: Everyone (public)'. In the top right corner of the card, there is a 'Delete Group' button with a trash can icon.

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This group contains the fish landings data for download.

Data Download Commercial Fish Landings (Pesca Comercial) USVI

Overview Content Members Settings

Refine Content

Group Categories

No Group Categories Yet

Categories allow group members to organize items consistently and provide a simple way to browse content in the group.

Set up group categories

Item Type

- Meps
- Layers
- Scenes
- Apps
- Tools
- Files

> Date Modified

> Tags

Search group content

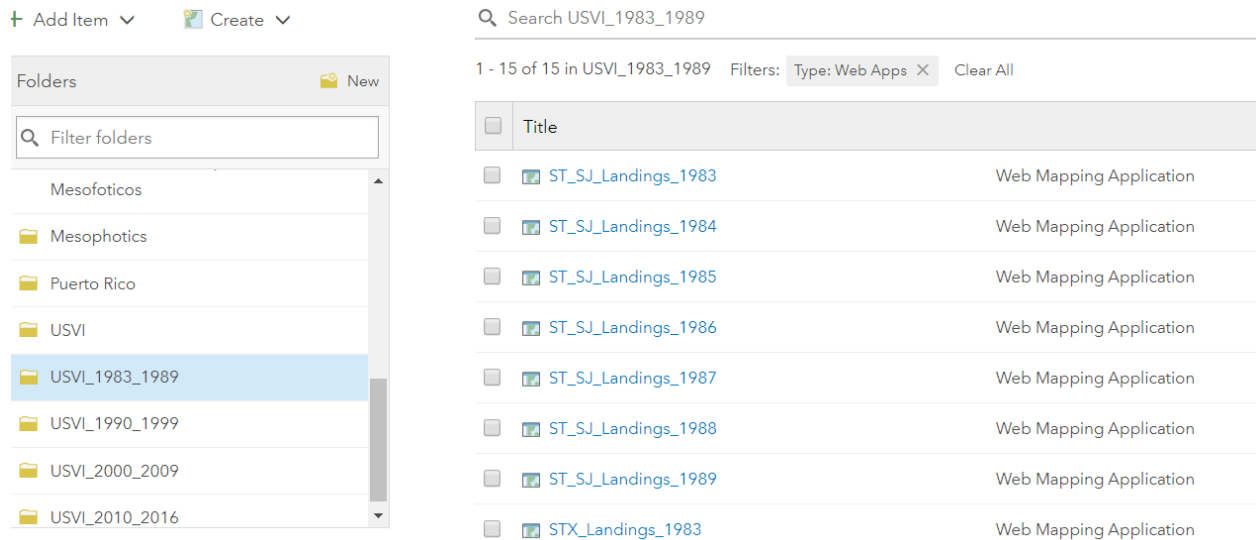
1 - 16 of 34 Sort by: Title v ^

	Title		Modified	Owner	View Count
<input type="checkbox"/>	ST_SJ_1983_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	84
<input type="checkbox"/>	ST_SJ_1984_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	41
<input type="checkbox"/>	ST_SJ_1985_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	26
<input type="checkbox"/>	ST_SJ_1987_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	23
<input type="checkbox"/>	ST_SJ_1988_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	25
<input type="checkbox"/>	ST_SJ_1989_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	26
<input type="checkbox"/>	ST_SJ_2000_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	17
<input type="checkbox"/>	ST_SJ_2001_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	11
<input type="checkbox"/>	ST_SJ_2002_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	10
<input type="checkbox"/>	ST_SJ_2003_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	10
<input type="checkbox"/>	ST_SJ_2004_Commercial_Fish_Landings		Sep 30, 2018	cfmc_pr	11

4. Task 5: Technical Support

- **Configure USVI Commercial Landings Statistics Web Apps**

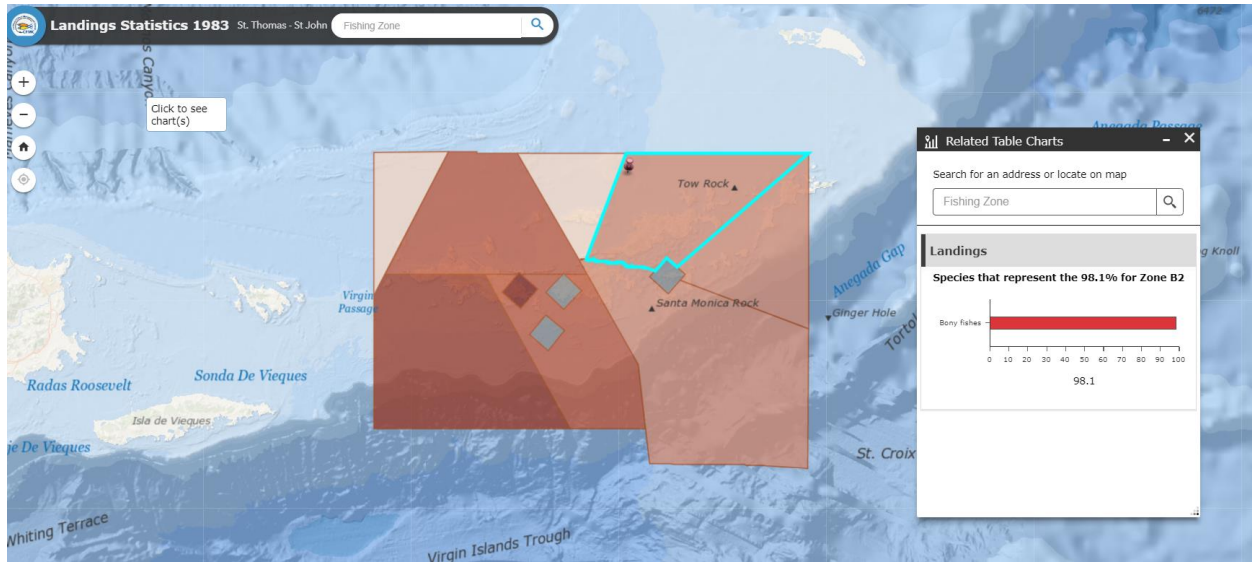
Web Maps configured in Task 3 were used as baseline to build web applications using ArcGIS Web App Builder.



Each web application contains basic navigation tools and four configured widgets for visualizing map legend, selecting layers, changing base map and the related table widget that shows the 80% of the total weight (lbs) per species for each fishing zone.

Individual web applications were configured for each year between 1983 and 2016. Below is an example of the 1983 web application.

1983 St. Thomas /St.John Commercial Landings Reported Statistics Web App




**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
July – September 2018
ArcGIS Online Commercial Fish Landings and Census Data Web Maps – USVI**

- Metadata, Credits and Tags were configured for each of the web applications.

ST_SJ_Landings_1983 ✎ Edit

Overview
Usage
Settings

✎ Edit Thumbnail

★ Add to Favorites

This Web App shows commercial fish landings statistics for 1983 per fishing zones for St. Thomas and St. John, US Virgin Islands. ✎ Edit

Web Mapping Application by [cfmc_pr](#)

Created: Sep 12, 2018 Updated: Sep 30, 2018 View Count: 145

Description ✎ Edit

This web app shows commercial fish landings statistics for 1983 per fishing zones for St. Thomas and St. John, US Virgin Islands. Data on commercial fish landings are provided by fishermen to Division of Fish and Wildlife of the USVI Department of Planning and Natural Resources. Data is officially transferred to the NOAA- Southeast Fisheries Science Center (SEFSC). The Caribbean Fisheries Management Council (CFMC) obtained the data from the SEFSC to execute this project.


The Caribbean Fishery Management Council (CFMC) is one of eight regional fishery management councils, established under PL 94-265 (approved on April 13, 1976), now known as the Magnuson-Stevens Act (the Act) as amended in 1996 and 2007 also called [Sustainable Fisheries Act](#), for the conservation and orderly utilization of the fishery resources of the United States of America. The Caribbean Fishery Management Council is responsible for the creation of management plans for fishery resources (FMPs) in the US Caribbean Exclusive Economic Zone (EEZ) off PR and the USVI. This initiative seeks to incorporate geographic information systems to visualize and analyze patterns and tendencies in commercial fish activities in USVI. It also seeks to provide access to this valuable information to scientists, students, educators, fishermen and the general public.

Terms of Use ✎ Edit

Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content.

Comments (0) 🗨

Leave a comment.



Comment

View Application

Edit Application

Download

Share

Item Information 🔍 Learn more

Low High

🔗 Top Improvement: [Add terms of use](#)

Details

Size: 60 KB

Shared with: Everyone (public), [Commercial Fish Landings \(Pesca Comercial\) USVI](#), [Caribbean Fishery Management Council](#)

API: JavaScript

Purpose: Ready To Use

★ ★ ★ ★ ★

f
t
s

Owner 👤 Change Owner

Owner 👤 Change Owner

👤 cfmc_pr

Folder 📁 Move

📁 USVI_1983_1989

Categories ✎ Edit

This item has not been categorized.

Tags ✎ Edit

USVI, Landings, 1983, St. Thomas, St. John, CFMC, Fisheries, Commercial Fish Landings

Credits (Attribution) ✎ Edit

Caribbean Fisheries, Management Council (CFMC) NOAA- Southeast Fisheries Science Center (SEFSC) Division of Fish and Wildlife of the USVI Department of Planning and Natural Resources. David Peña & Alberto Millán - GIS Analyst Geographic Mapping Technologies, Corp.

URL 🔗 View

🔗

**ArcGIS Platform Implementation
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 ArcGIS Online Commercial Fish Landings and Census Data Web Maps – USVI**

All web applications are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named after the corresponding decade.

The screenshot shows the ArcGIS Online interface. On the left, a 'Folders' panel lists various folders, with 'USVI_1983_1989' selected. Below it, a 'Categories' panel shows 'Cartucho', 'Story Maps PR', 'Mesophotic Reefs', and 'Desembarcos 1990 (Puerto Rico)'. The main content area displays a search for 'USVI_1983_1989' with 15 results, all of which are 'Web Mapping Application' items. The results are sorted by 'Title' and show a list of items from 'ST_SJ_Landings_1983' to 'STX_Landings_1988', all dated 'Sep 30, 2018'.

Title	Type	Modified
ST_SJ_Landings_1983	Web Mapping Application	Sep 30, 2018
ST_SJ_Landings_1984	Web Mapping Application	Sep 30, 2018
ST_SJ_Landings_1985	Web Mapping Application	Sep 30, 2018
ST_SJ_Landings_1986	Web Mapping Application	Sep 30, 2018
ST_SJ_Landings_1987	Web Mapping Application	Sep 30, 2018
ST_SJ_Landings_1988	Web Mapping Application	Sep 30, 2018
ST_SJ_Landings_1989	Web Mapping Application	Sep 30, 2018
STX_Landings_1983	Web Mapping Application	Sep 30, 2018
STX_Landings_1984	Web Mapping Application	Sep 30, 2018
STX_Landings_1985	Web Mapping Application	Sep 30, 2018
STX_Landings_1986	Web Mapping Application	Sep 30, 2018
STX_Landings_1987	Web Mapping Application	Sep 30, 2018
STX_Landings_1988	Web Mapping Application	Sep 30, 2018

Commercial fish landings content for USVI (webmaps, web apps and feature layers) is shared within the Commercial Fish Landings (Pesca Comercial) USVI Group.

The screenshot shows the details for the 'Commercial Fish Landings (Pesca Comercial) USVI' group. The group is owned by 'cfmc_pr' and was created and last updated on 'Sep 30, 2018'. It is set to be 'Viewable by: Everyone (public)'. There is a 'Delete Group' button in the top right corner.

- **Configure USVI Commercial Landings Statistics Story Maps**

Story Maps combine authoritative maps with narrative text, images, and multimedia content. They are a medium for harnessing the power of maps and geography to tell a story.

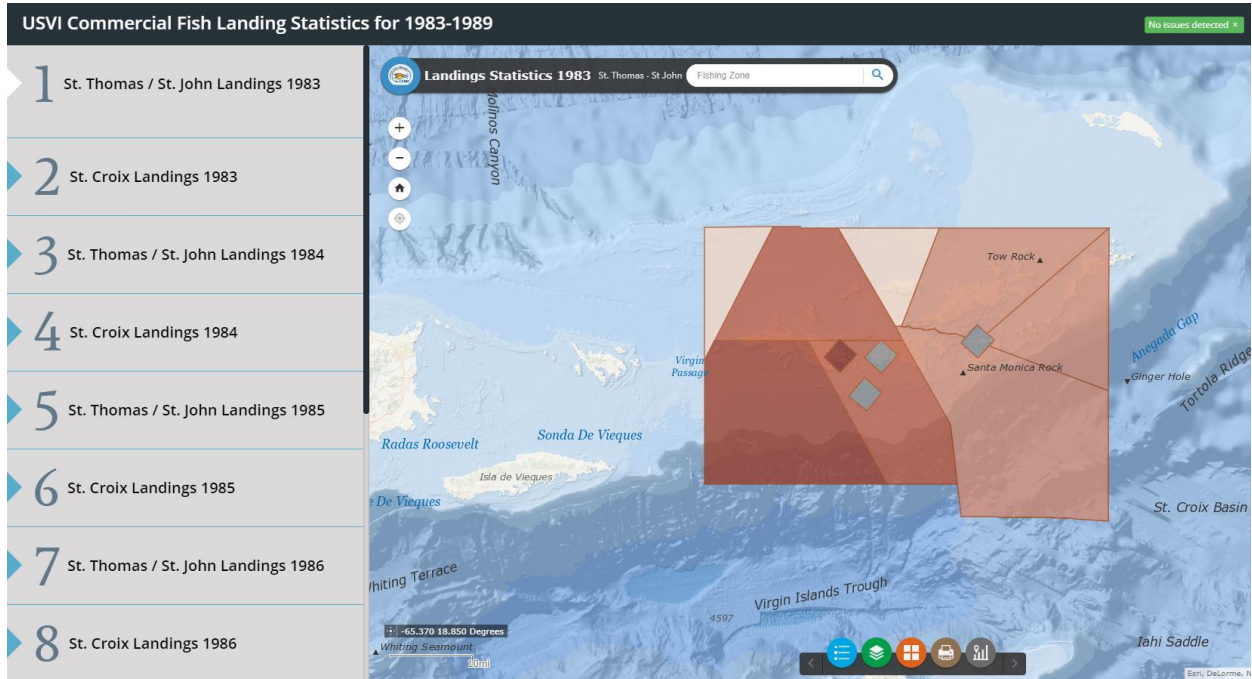
As a culmination of the USVI Commercial Landings Statistics Project, a story map per decade was created to share with the public the data and analysis results of the historic commercial landings reported data between 1983 and 2016.



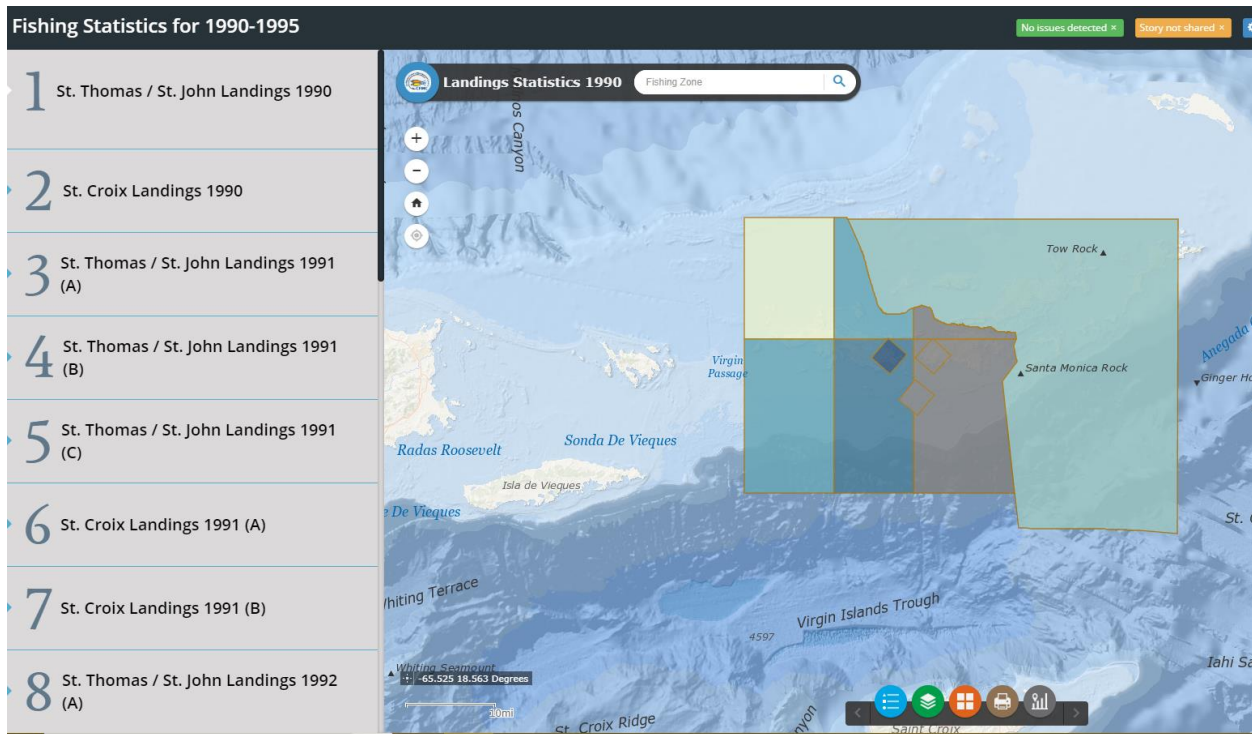
The story maps index the configured web applications described in the "*Configure USVI Commercial Landings Statistics Web Apps*" section.

Through these story maps, the history of commercial fish landings in USVI can be recreated, studied and analyzed. With the use of Web GIS this historical data, originally in table format, is brought to life in an interactive medium, bringing new insights to scientists, researchers, educators, fishermen and the general public.

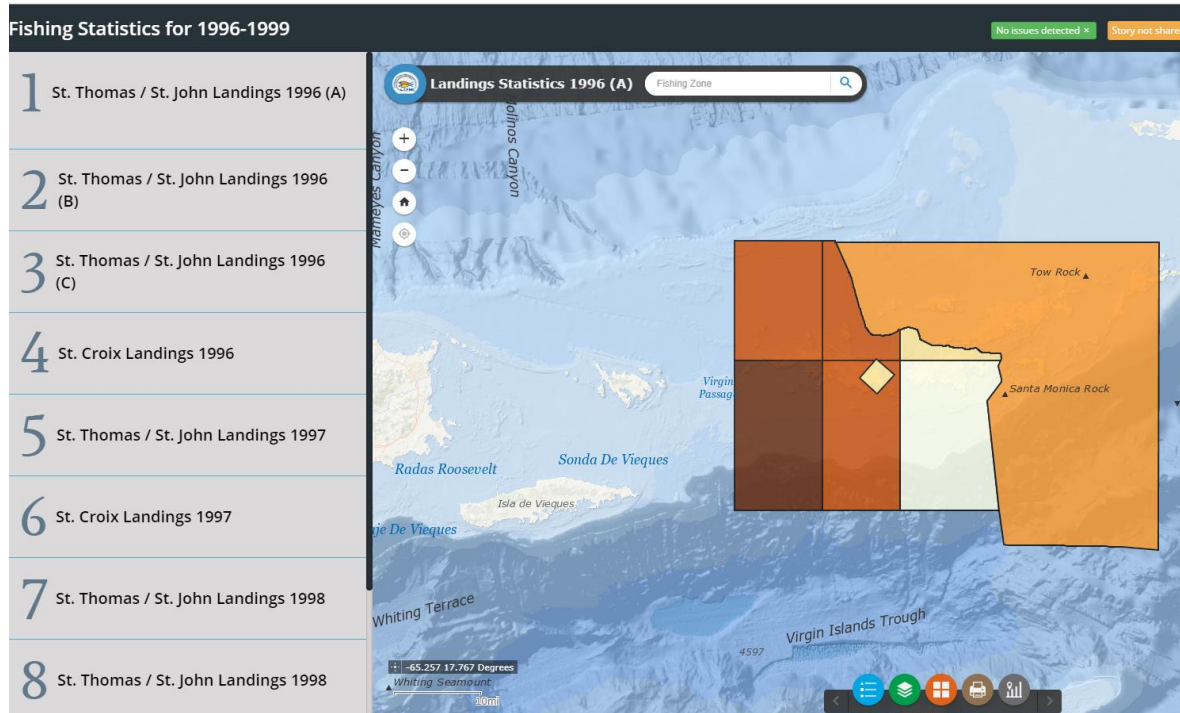
1983 -1989 Commercial Landings Reported Statistics Story Map



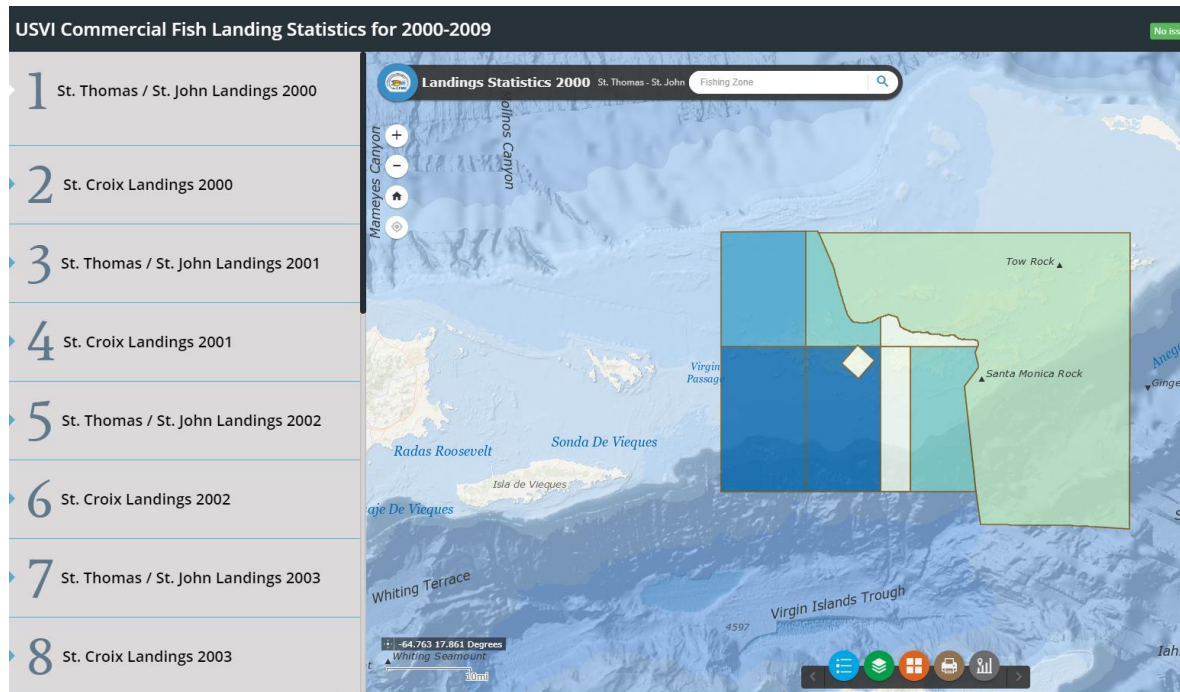
1990-1995 Commercial Landings Reported Statistics Story Map



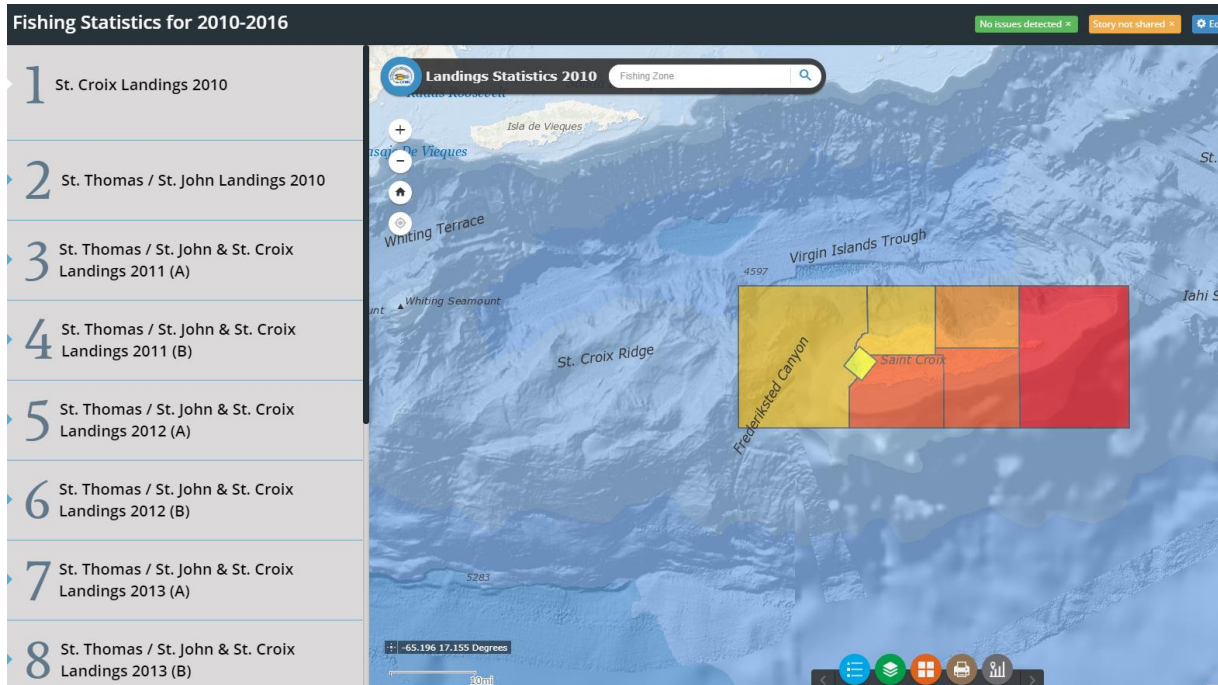
1990-1995 Commercial Landings Reported Statistics Story Map



2000-2009 Commercial Landings Reported Statistics Story Map



2010-2016 Commercial Landings Reported Statistics Story Map





ArcGIS Platform Implementation at the Caribbean Fisheries Management Council

March – June 2018

Task 4: ArcGIS Online Mesophotic Reefs Web Maps

Task 5: Technical Support

September 28th, 2018

Prepared for:
Graciela García Moliner
FMP and Habitat Specialist
Caribbean Fisheries and Management Council

Prepared by:
Geographic Mapping Technologies, Corp.
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San Juan, Puerto Rico 00917
Teléfonos: 787-250-8182/ 787-250-8185

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3. Task 5: Technical Support	19

1. Introduction

The following document summarizes Task 4: ArcGIS Online Mesophotic Reefs Web Maps and Task 5: Technical Support of the CFMC GIS Project: **Development of GIS access to coral and mesophotic reef data from Puerto Rico and the USVI, including commercial landings data**. These tasks were performed between March-June 2018.

Specific tasks include:

Task 4: ArcGIS Online Mesophotic Reefs Web Maps

Task 4.1 Design and create feature class for Mesophotic Reefs Sites

Task 4.2 Design and create feature class for Mesophotic Reefs Transects by Depth Range

Task 4.3 Load Mesophotic Reef Sites and Mesophotic Reefs Transects by Depth Range feature class to CFMC geodatabase.

Task 4.4 Configure ArcGIS Online Web Map for Mesophotic Reef Sites and configure videos and pictures

Task 5: Technical Support – (60 hrs)

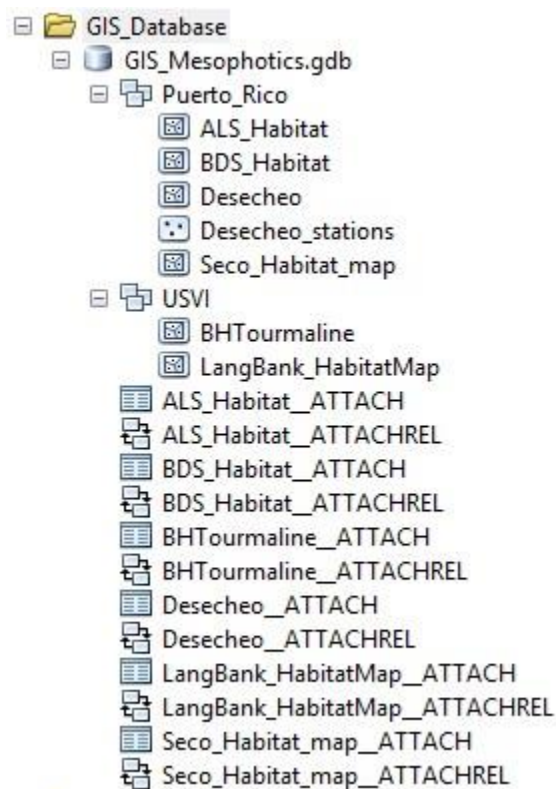
- Configure Mesophotic Reefs Web Apps
- Configure Mesophotic Reefs Story Map

2. Task 4: ArcGIS Online Mesophotic Reefs Web Maps

Task 4.1 Design and create feature class for Mesophotic Reefs Sites

Mesophotic Reefs Geodatabase was organized in datasets, one for Puerto Rico and the other for USVI data. Each dataset is composed of mesophotic benthic habitats feature classes per study site derived from the shapefiles provided by CFMC.

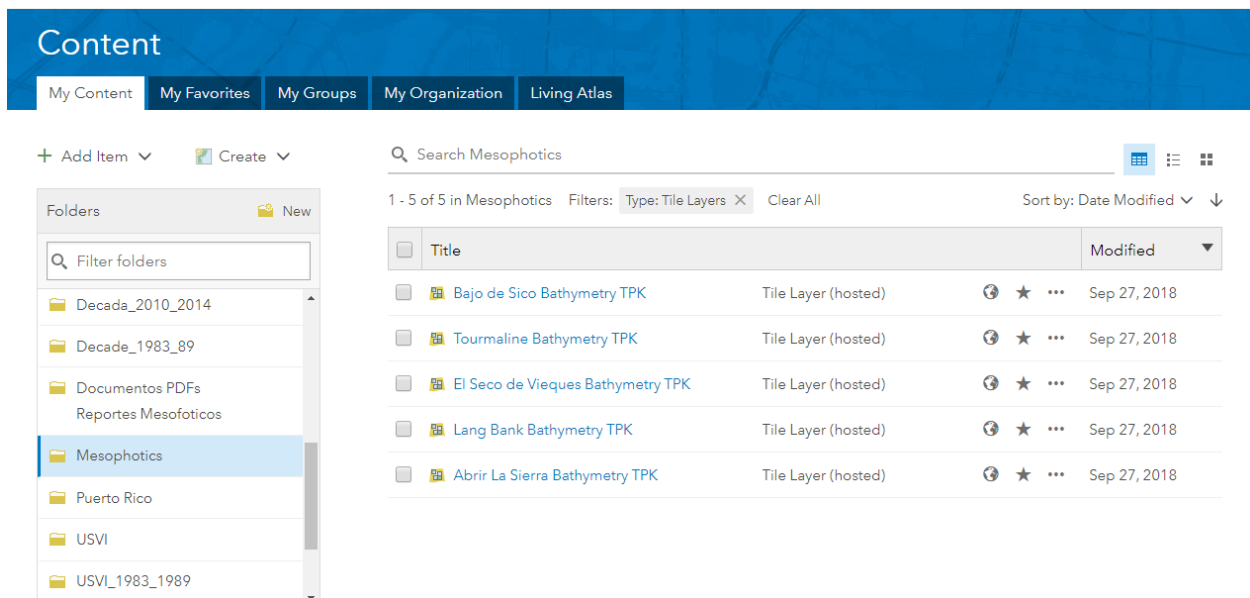
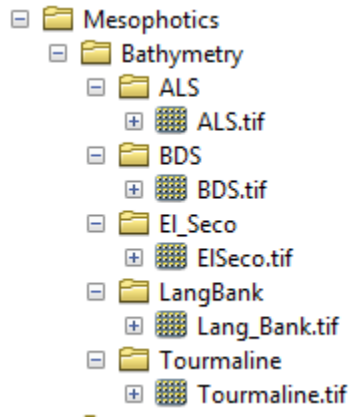
In addition to the feature classes, relationship classes were established to configure image and video attachments.



Task 4.2 Design and create feature class for Mesophotic Reefs Transects by Depth Range

CFMC staff decided not to process and publish the transect and study site shapefiles in order not to reveal to the public the exact location of the study site and thus protect this ecologically valuable habitats.

Instead, the bathymetry data was processed and published for each of the study sites to provide a general overview of the study area and its topographic characteristics.



Published Tile packages (TPK)

Task 4.3 Load Mesophotic Reef Sites and Mesophotic Reefs Transects by Depth Range feature class to CFMC geodatabase.







Mesophotic reefs benthic maps were imported into feature class. Once imported, features were dissolved based on benthic habitat type. Following the dissolve operation, image and video attachments were configured. Video selection was completed by CFMC. Bathymetry maps were processed and transformed into tile packages for upload to CFMC Organizational Account.

Task 4.4 Configure ArcGIS Online Web Map for Mesophotic Reef Sites and configure videos and pictures

A total of 6 web maps were configured, one for each Mesophotic Reef Sites.

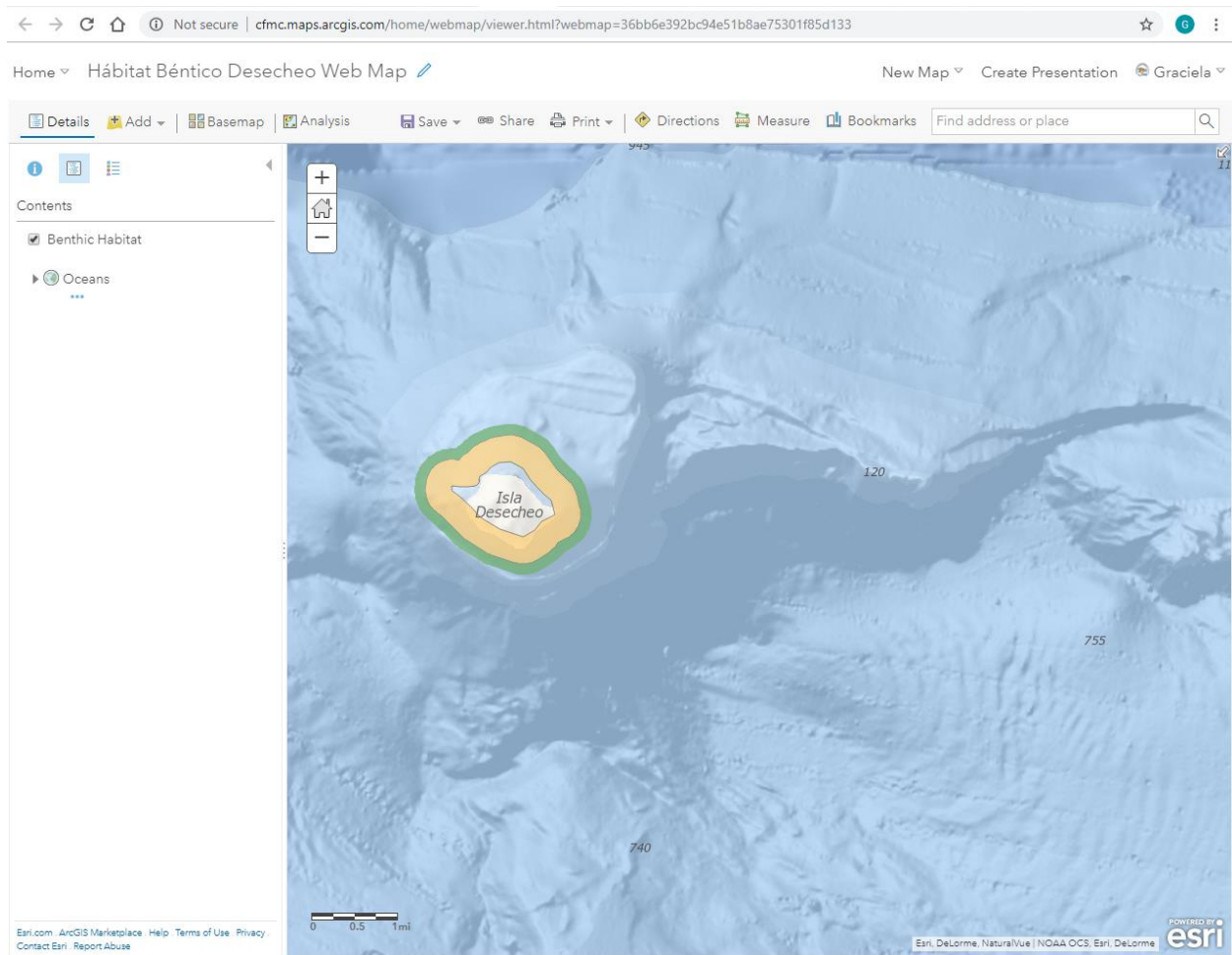
Search Mesophotics

1 - 6 of 6 in Mesophotics Filters: Type: Maps X Clear All Sort by: Date Modified v ↓

<input type="checkbox"/>	Title		Modified
<input type="checkbox"/>	 Hábitat Béntico Desecheo Web Map	Web Map	Aug 7, 2018
<input type="checkbox"/>	 Hábitat Béntico Lang Bank	Web Map	Aug 7, 2018
<input type="checkbox"/>	 Hábitat Béntico Tourmaline	Web Map	Aug 7, 2018
<input type="checkbox"/>	 Hábitat Béntico El Seco de Vieques	Web Map	Aug 7, 2018
<input type="checkbox"/>	 Hábitat Béntico Abrir La Sierra	Web Map	Aug 7, 2018
<input type="checkbox"/>	 Hábitat Béntico Bajo de Sico Web Map	Web Map	Aug 7, 2018

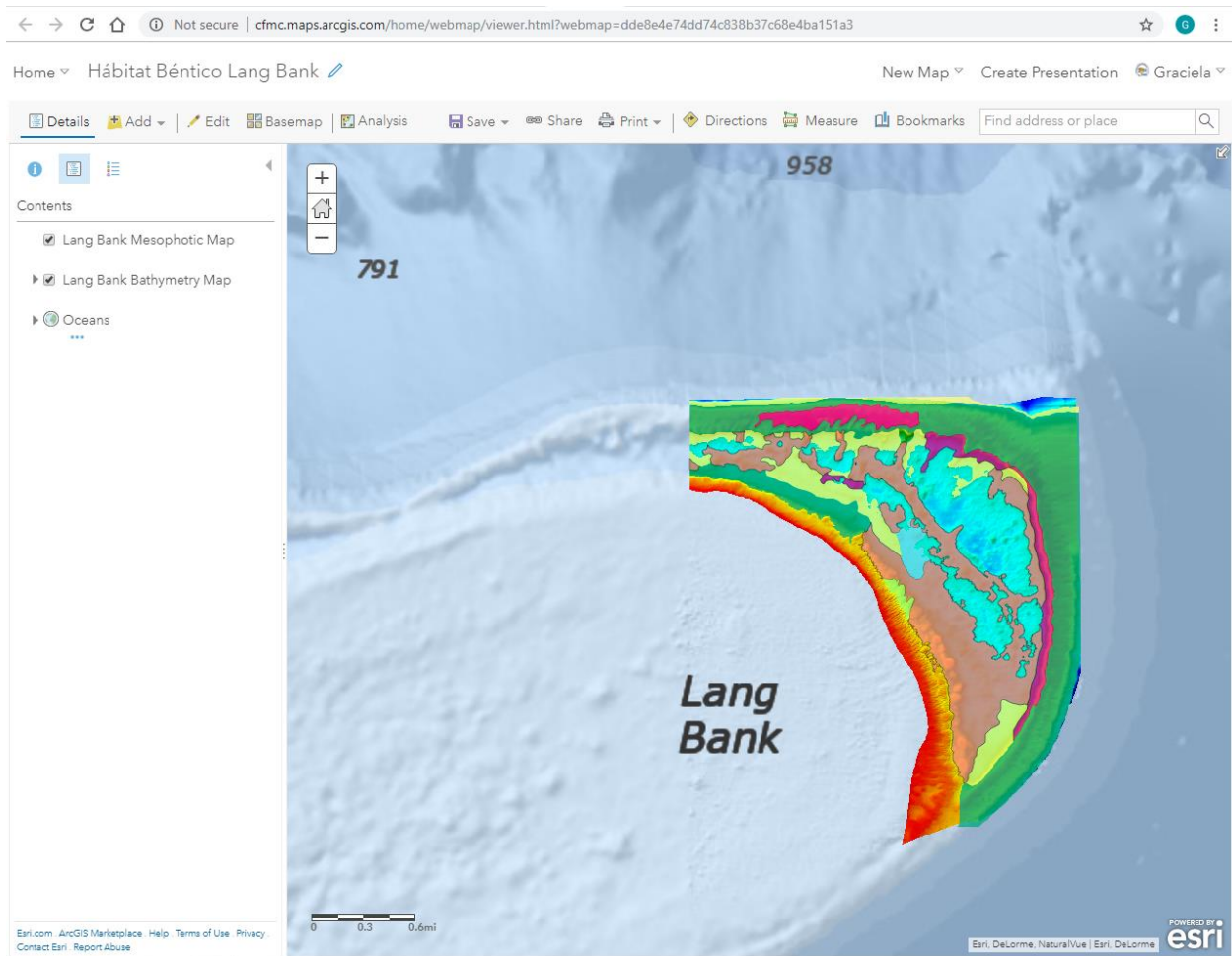
With the exception of the Desecheo Web Map, each web map is composed of two main layers: (1) Mesophotic map and (2) Bathymetry map. The bathymetry layer is a Hosted Tile Package. The Tile package consists of a set of tiles (images) from a raster published as a web tile in ArcGIS Online.

Hábitat Béntico Desecho Web Map



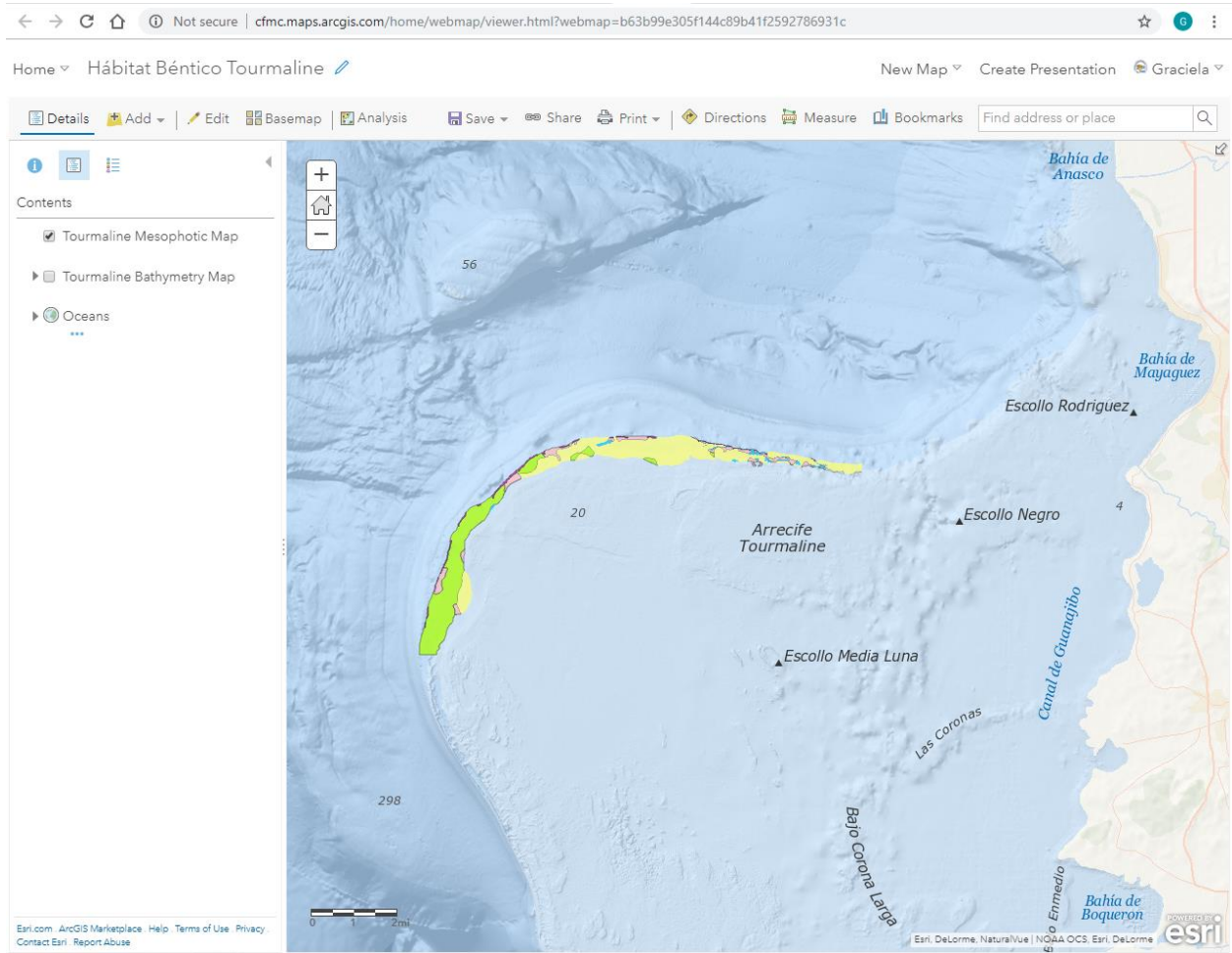
<http://cfmc.maps.arcgis.com/home/webmap/viewer.html?webmap=36bb6e392bc94e51b8ae75301f85d133>

Hábitat Béntico Lang Bank



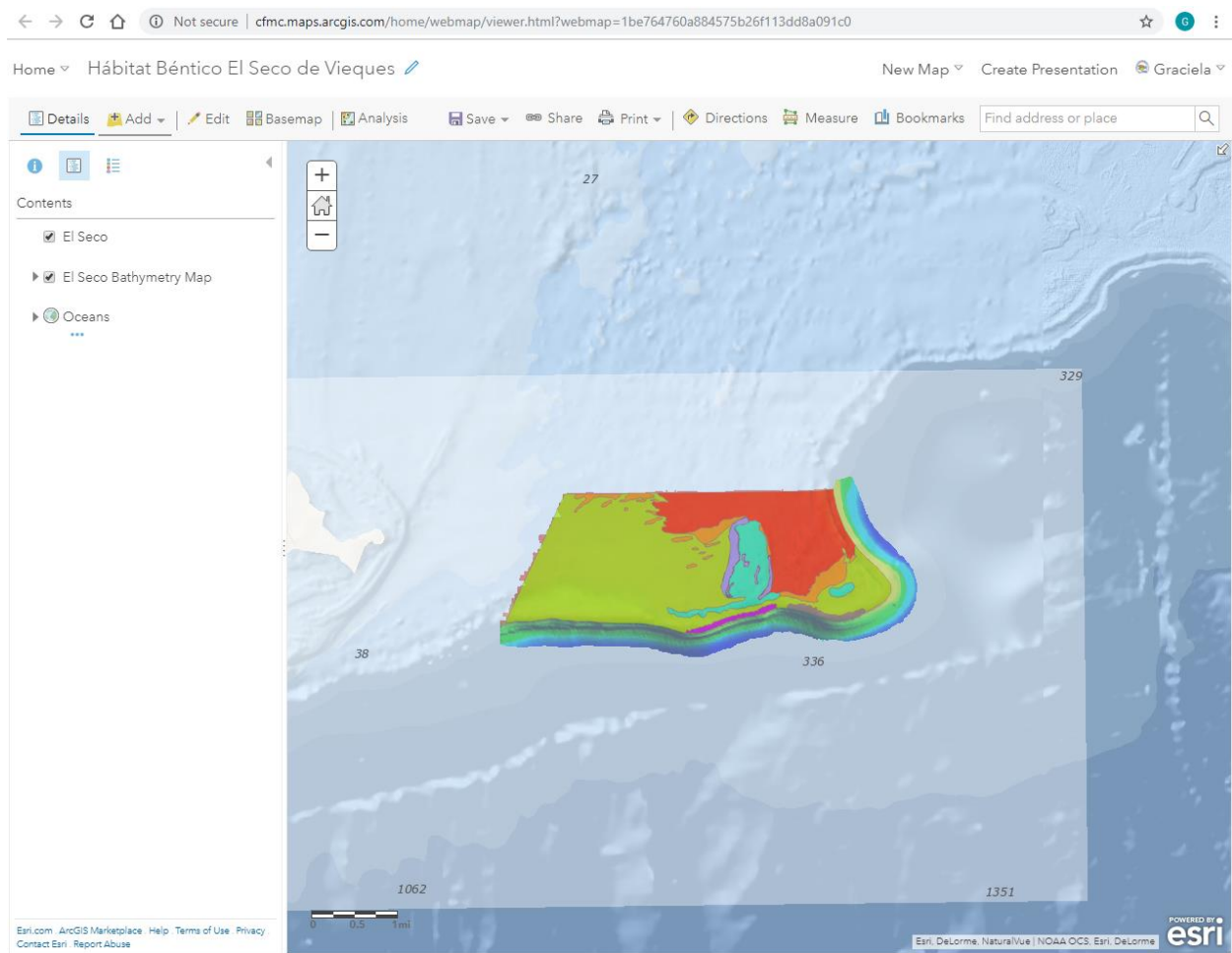
<http://cfmc.maps.arcgis.com/home/webmap/viewer.html?webmap=dde8e4e74dd74c838b37c68e4ba151a3>

Hábitat Béntico Tourmaline



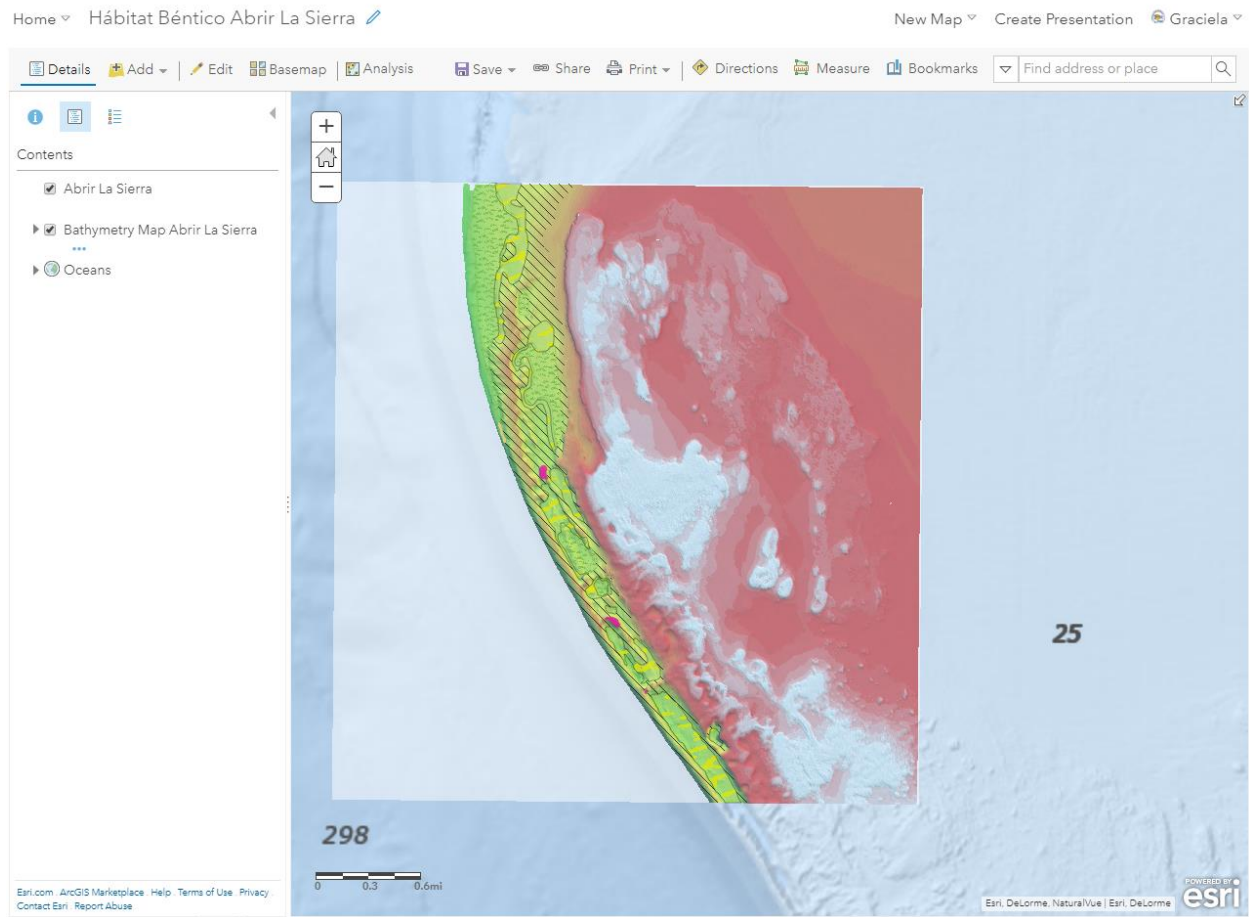
<http://cfmc.maps.arcgis.com/home/webmap/viewer.html?webmap=b63b99e305f144c89b41f2592786931c>

Hábitat Béntico El Seco de Vieques



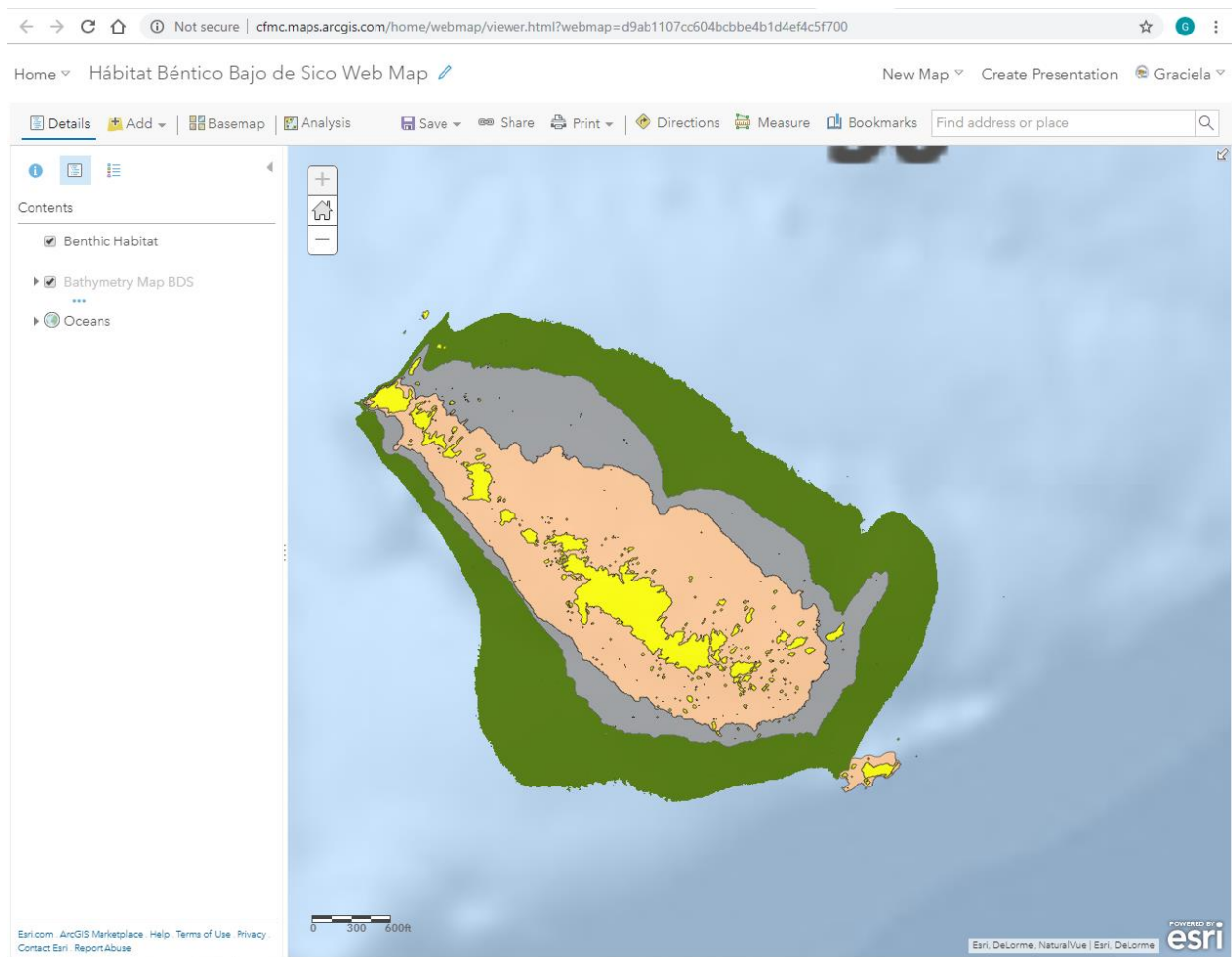
<http://cfmc.maps.arcgis.com/home/webmap/viewer.html?webmap=1be764760a884575b26f113dd8a091c0>

Hábitat Béntico Abrir La Sierra



<http://cfmc.maps.arcgis.com/home/webmap/viewer.html?webmap=0934f9ec92aa4284b296e6d49fd7514f>

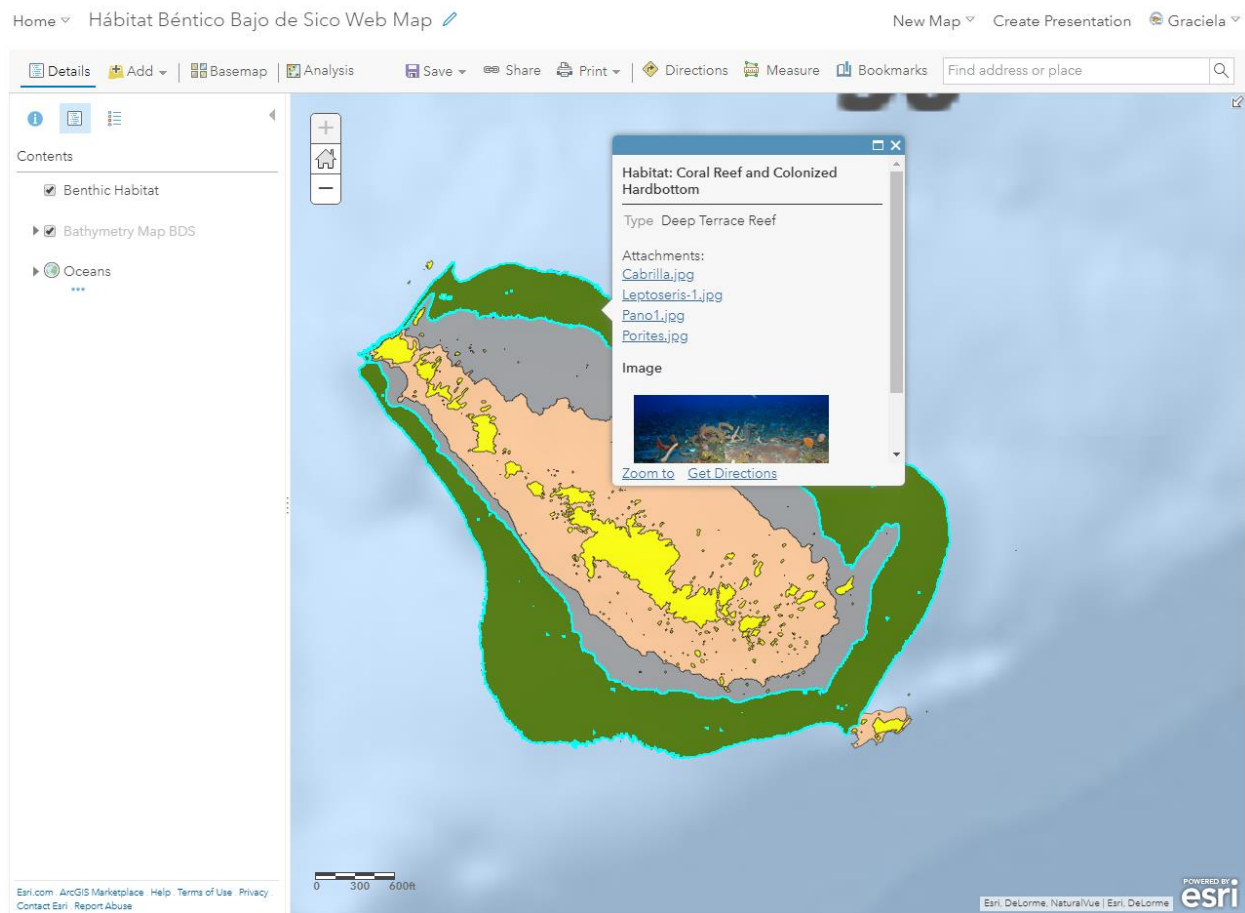
Hábitat Béntico Bajo de Sico Web Map



<http://cfmc.maps.arcgis.com/home/webmap/viewer.html?webmap=d9ab1107cc604bcbbe4b1d4ef4c5f700>

For each web map, the following elements were configured:

- Transparency
- Visibility Range
- Symbology
- Pop-Up
- Images representing each of the benthic habitats per Mesophotic Reef Site.



Images are visible when clicking on a benthic habitat feature.

**ArcGIS Platform Implementation
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March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**

- Metadata, Credits and Tags were configured for each of the web maps, feature layers and tile packages.

The screenshot shows the metadata page for a web map titled "Hábitat Béntico El Seco de Vieques". The page is organized into several sections:

- Overview:** Includes a thumbnail image of a coral reef, a description of the web map, and metadata such as creation date (May 8, 2018), update date (Sep 27, 2018), and view count (965).
- Description:** Contains detailed text in Spanish and English describing the study's purpose, data sources, and findings regarding mesophotic benthic habitats.
- Layers:** Lists the layers included in the web map, such as "El Seco", "El Seco Bathymetry Map", "World Ocean Base", and "World Ocean Reference".
- Terms of Use:** A section for the map's terms of use.
- Item Information:** Shows a progress bar for item information, a "Top Improvement" link, and social media sharing options.
- Details:** Provides information about the item's size (3 kb), sharing settings (Everyone (public)), and a star rating.
- Owner:** Identifies the owner as "cfmc_pr" with a "Change Owner" link.
- Folder:** Shows the item is located in the "Mesophotics" folder.
- Categories:** Indicates that the item has not been categorized.
- Tags:** Lists tags such as "Mesophotic, mesophotic reefs, reefs, El Seco de Vieques, El Seco, benthic habitats, PR, Puerto Rico".
- Credits (Attribution):** Lists the organization "Caribbean Fisheries Management Council (CFMC) Web Map Creation: Patricia Matos López-Intern Geographic Mapping".

**ArcGIS Platform Implementation
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ArcGIS Online Mesophotic Reefs Web Maps**

All feature layers and tile packages are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named Mesophotics.

The screenshot shows the ArcGIS Online interface. On the left, there is a 'Folders' pane with a search bar and a list of folders: Decade_1983_89, Documentos PDFs Reportes Mesofoticos, Mesophotics (selected), Puerto Rico, USVI, USVI_1983_1989, and USVI_1990_1999. Below the folders is a 'Categories' section with 'Cartucho', 'Story Maps PR', and 'Mesophotic Reefs (1)'. Under 'Item Type', 'Layers' is selected, showing sub-categories like Feature Layers, Tile Layers, Map Image Layers, Imagery Layers, Scene Layers, Tables, Layer Files, and Scenes.

The main content area shows a list of 16 items in the 'Mesophotics' folder, filtered by 'Type: Layers'. The items are sorted by title. The table below represents the data shown in the screenshot:

Title	Type	Modified
Tourmaline_TPK	Tile Package	May 11, 2018
Tourmaline_TPK	Tile Layer (hosted)	May 11, 2018
Tourmaline Mesophotic Map	Feature Layer (hosted)	Aug 2, 2018
Tourmaline Mesophotic Map	Service Definition	Jul 31, 2018
Mesophotic_ELSeco	Service Definition	May 3, 2018
Mesophotic_ELSeco	Feature Layer (hosted)	May 29, 2018
Lang_Bank_TPK	Tile Layer (hosted)	May 11, 2018
Lang_Bank_TPK	Tile Package	May 11, 2018
Lang_Bank_Mesophotic_Map	Feature Layer (hosted)	Jun 6, 2018
Lang_Bank_Mesophotic_Map	Service Definition	May 11, 2018
El Seco TPK	Tile Package	May 8, 2018
El Seco TPK	Tile Layer (hosted)	May 8, 2018
Desecheo_Mesophotics	Feature Layer (hosted)	May 22, 2018
Desecheo_Mesophotics	Service Definition	Apr 30, 2018
CFMC_mackage.gdb	File Geodatabase	Oct 25, 2016
BDS_mesophotics	Service Definition	Apr 30, 2018

At the bottom of the list, there are navigation buttons: 'Previous', '1' (selected), '2', and 'Next'.

Reports for each of the 6 study areas are hosted on CFMC’s ArcGIS Organizational Account under a folder named Documentos PDFs Reportes Mesofóticos.

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**

The screenshot shows the ArcGIS Online interface. On the left, a 'Folders' pane displays a tree structure with the folder 'Documentos PDFs Reportes Mesofoticos' selected. On the right, a search bar contains the text 'Search Documentos PDFs Reportes Mesofoticos'. Below the search bar, a table lists six PDF reports, all dated 'Sep 27, 2018'. The reports are: Lang Bank Final Report, El Seco de Vieques Final Report, Abrir La Sierra Final Report, Tourmaline Final Report, Bajo de Sico Final Report, and Desecheo Final Report.

Title	Modified
Lang Bank Final Report	Sep 27, 2018
El Seco de Vieques Final Report	Sep 27, 2018
Abrir La Sierra Final Report	Sep 27, 2018
Tourmaline Final Report	Sep 27, 2018
Bajo de Sico Final Report	Sep 27, 2018
Desecheo Final Report	Sep 27, 2018

Mesophotic Reefs content (webmaps, web apps, feature layers, tile packages, and reports) is shared within the Arrecifes Mesofóticos – Mesophotic Reefs Group.

The screenshot shows the details for the 'Arrecifes Mesofóticos - Mesophotic Reefs' group. The owner is 'cfmc_pr', and it was created and last updated on 'Sep 27, 2018'. The group is set to be 'Viewable by: Everyone (public)'. A description states: 'This Group map showcases the immense diversity and striking beauty of deep reefs and associated marine communities in Puerto Rico and the USVI through a series of web maps and web applications.'

The Group has been set up as public for everyone to be able to view its contents.

Arrecifes Mesofóticos - Mesophotic Reefs

Overview Content Members Settings

Group Settings

Delete Protection

Prevent this group from being accidentally deleted.

Delete Group

Who can view this group?

- Only group members
 People in the organization (Caribbean Fishery Management Council)
 Everyone (public)

Who can join this group?

- Those who request membership and are approved by a group manager
 Only those invited by a group manager
 Anyone

Who can contribute content to the group?

- Group members
 Only group owner and managers

Sort group content by


Title Ascending

Save

Cancel

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
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ArcGIS Online Mesophotic Reefs Web Maps**

A second group for data download was created. This group is named Descarga de Datos Arrecifes Mesofóticos.



Descarga de Datos Arrecifes Mesofóticos

Owner: [cfmc_pr](#)

Created: Sep 27, 2018 Last Updated: Sep 27, 2018 Viewable by: Everyone (public)

This Group contains mesophotic reefs data available for download.

Delete Group

This group contains the mesophotic benthic habitats feature layers and final reports for download.

Descarga de Datos Arrecifes Mesofóticos

Overview
Content
Members
Settings

Refine Content

Group Categories

No Group Categories Yet

Categories allow group members to organize items consistently and provide a simple way to browse content in the group.

Set up group categories

Item Type

- Maps
- Layers
- Scenes
- Apps
- Tools
- Files

Date Modified

Tags

Shared

Search group content

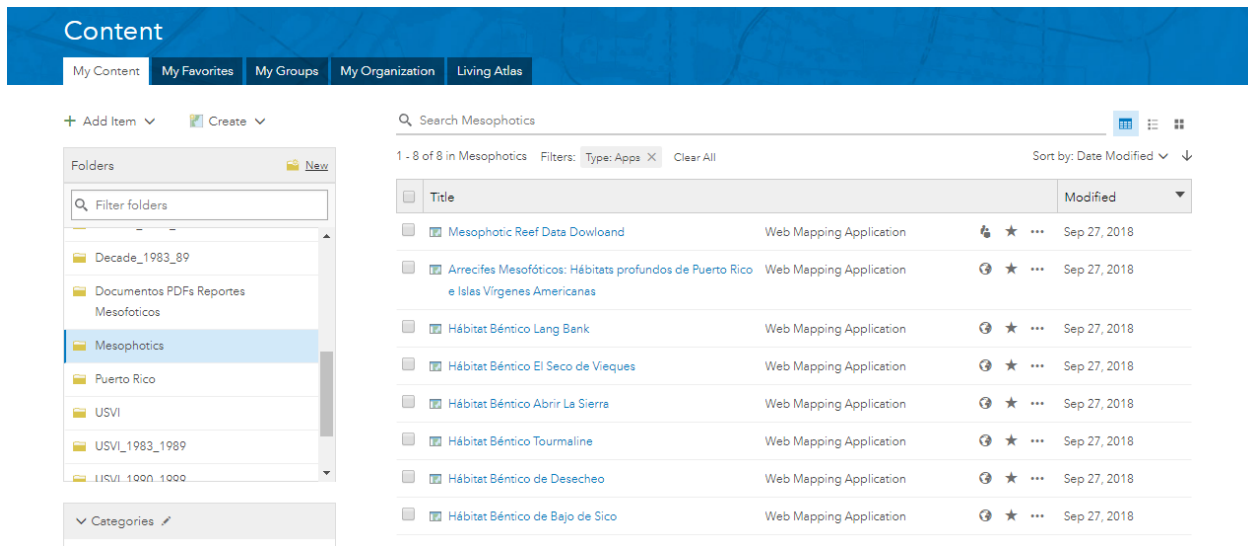
1 - 13 of 13 Sort by: Title

	Title		Modified	Owner	View Count
<input type="checkbox"/>	Abrir La Sierra Final Report		Sep 27, 2018	cfmc_pr	22
<input type="checkbox"/>	Abrir_La_Sierra_Mesophotic_Feature_Layer		Sep 27, 2018	cfmc_pr	235
<input type="checkbox"/>	Abrir_La_Sierra_Mesophotic_Feature_Layer_View		Sep 27, 2018	cfmc_pr	11
<input type="checkbox"/>	Bajo de Sico Final Report		Sep 27, 2018	cfmc_pr	10
<input type="checkbox"/>	Bajo_De_Sico_Mesophotic_Feature_Layer		Sep 27, 2018	cfmc_pr	282
<input type="checkbox"/>	Desecheo Final Report		Sep 27, 2018	cfmc_pr	12
<input type="checkbox"/>	Desecheo_Mesophotic_Feature_Layer		Sep 27, 2018	cfmc_pr	347
<input type="checkbox"/>	El Seco de Vieques Final Report		Sep 27, 2018	cfmc_pr	19
<input type="checkbox"/>	El_Seco_Vieques_Mesophotic_Feature_Layer		Sep 27, 2018	cfmc_pr	211
<input type="checkbox"/>	Lang Bank Final Report		Sep 27, 2018	cfmc_pr	18
<input type="checkbox"/>	Lang_Bank_Mesophotic_Feature_Layer		Sep 27, 2018	cfmc_pr	191
<input type="checkbox"/>	Tourmaline Final Report		Sep 27, 2018	cfmc_pr	19
<input type="checkbox"/>	Tourmaline_Mesophotic_Feature_Layer		Sep 27, 2018	cfmc_pr	216

3. Task 5: Technical Support

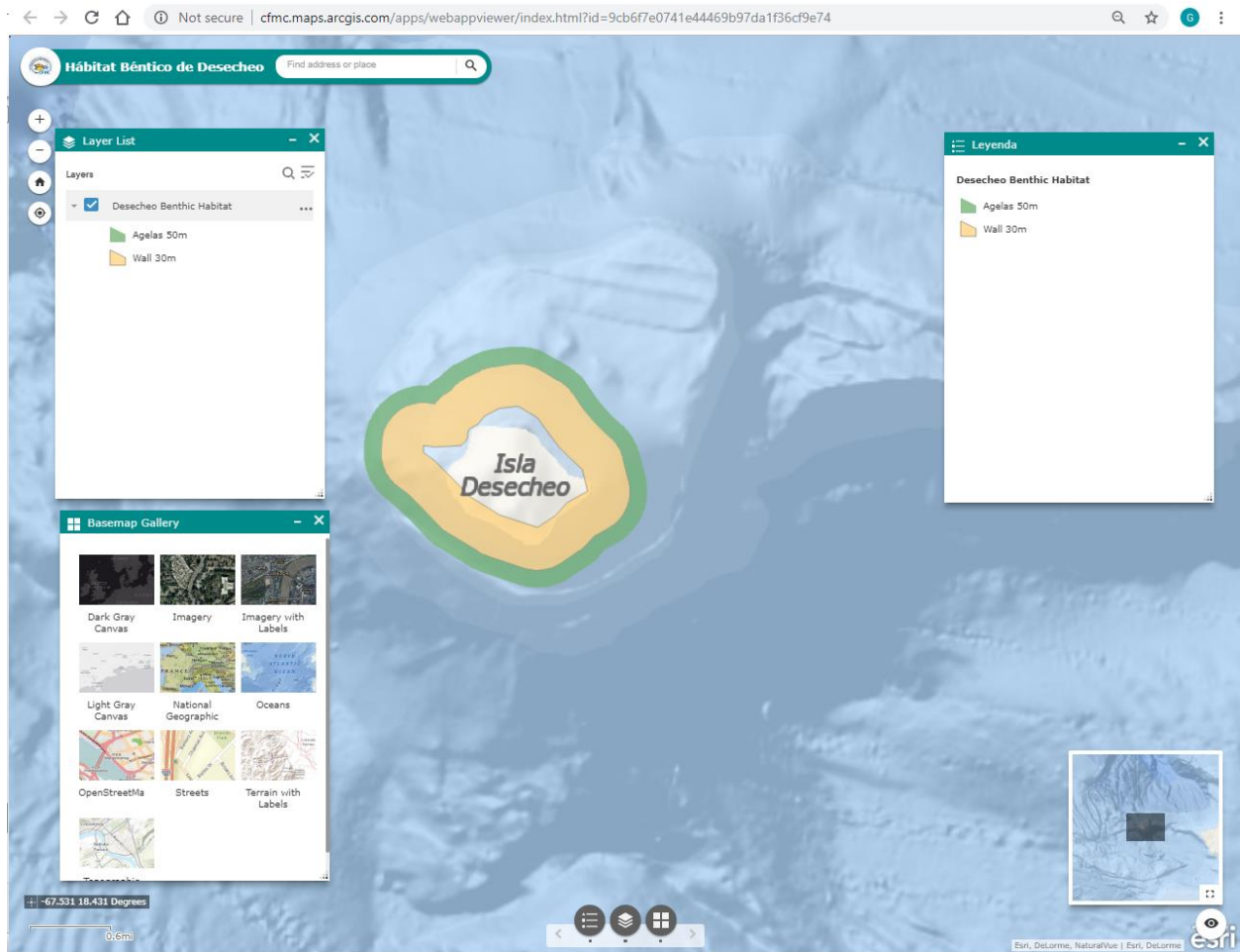
- **Configure Mesophotic Reefs Web Apps**

Web Maps configured in Task 4 were used as baseline to build web applications using ArcGIS Web App Builder.



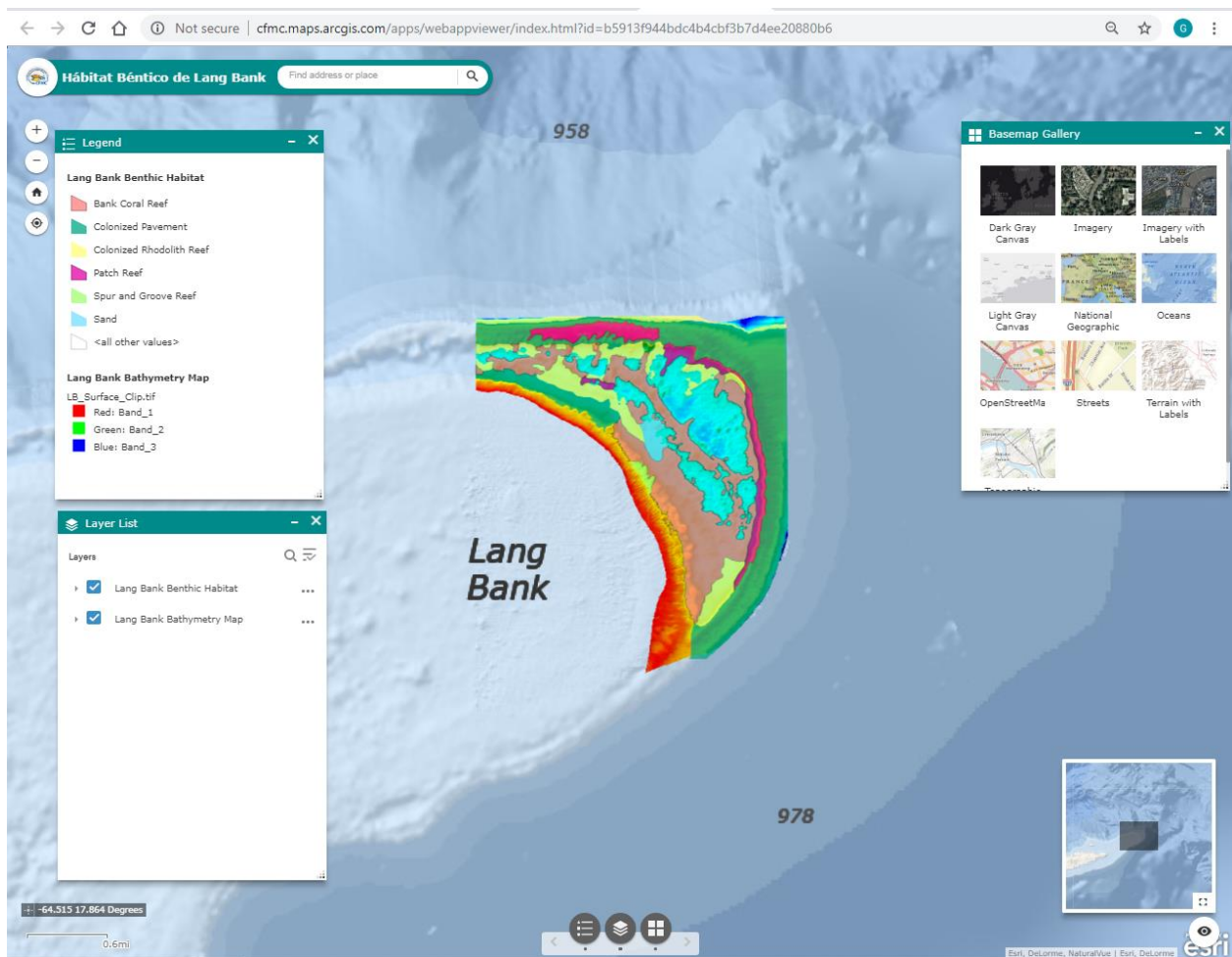
Each web application contains basic navigation tools and three configured widgets for visualizing map legend, selecting layers and changing base map respectively.

Hábitat Béntico Desecheo Web Map



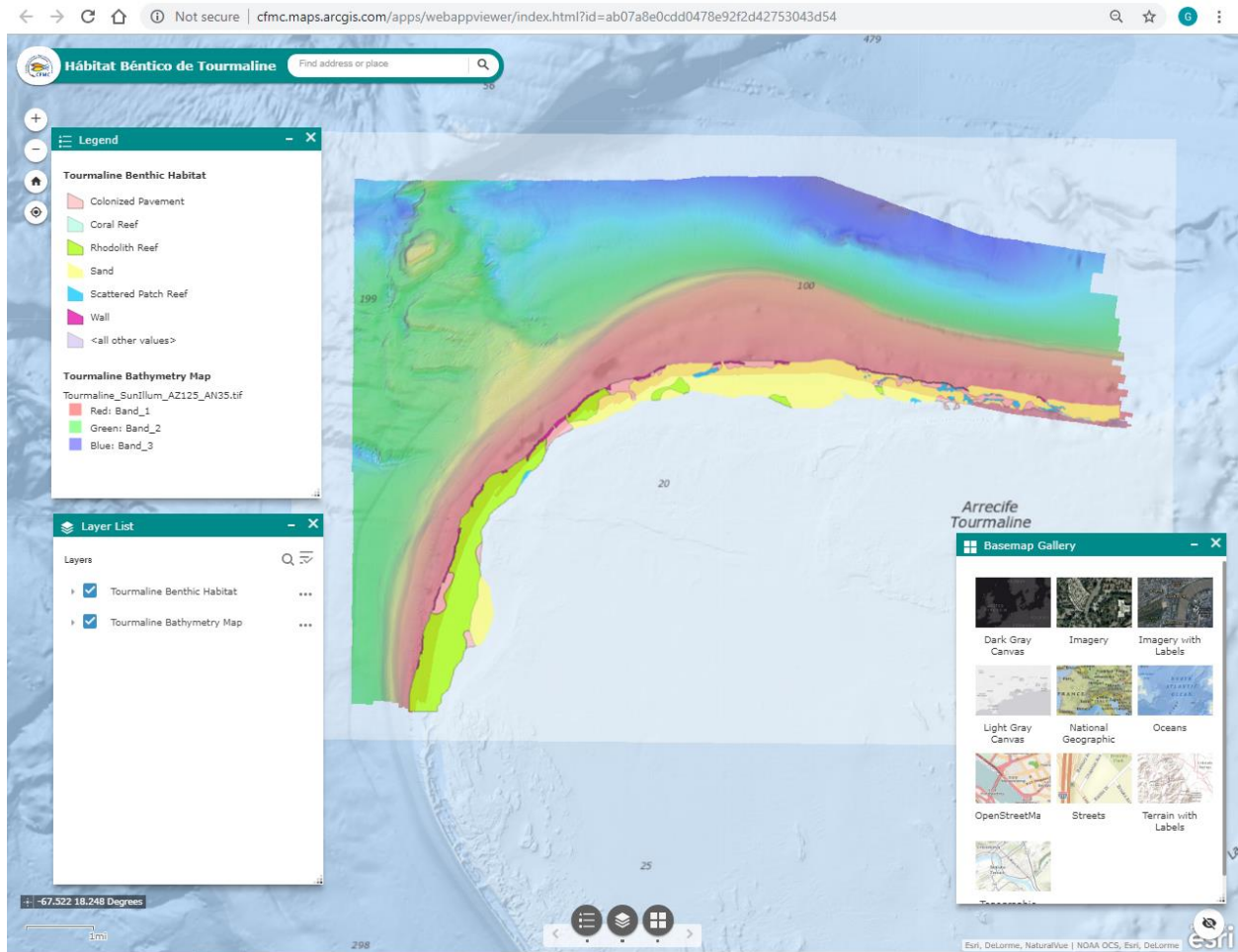
<http://cfmc.maps.arcgis.com/apps/webappviewer/index.html?id=9cb6f7e0741e44469b97da1f36cf9e74>

Hábitat Béntico Lang Bank



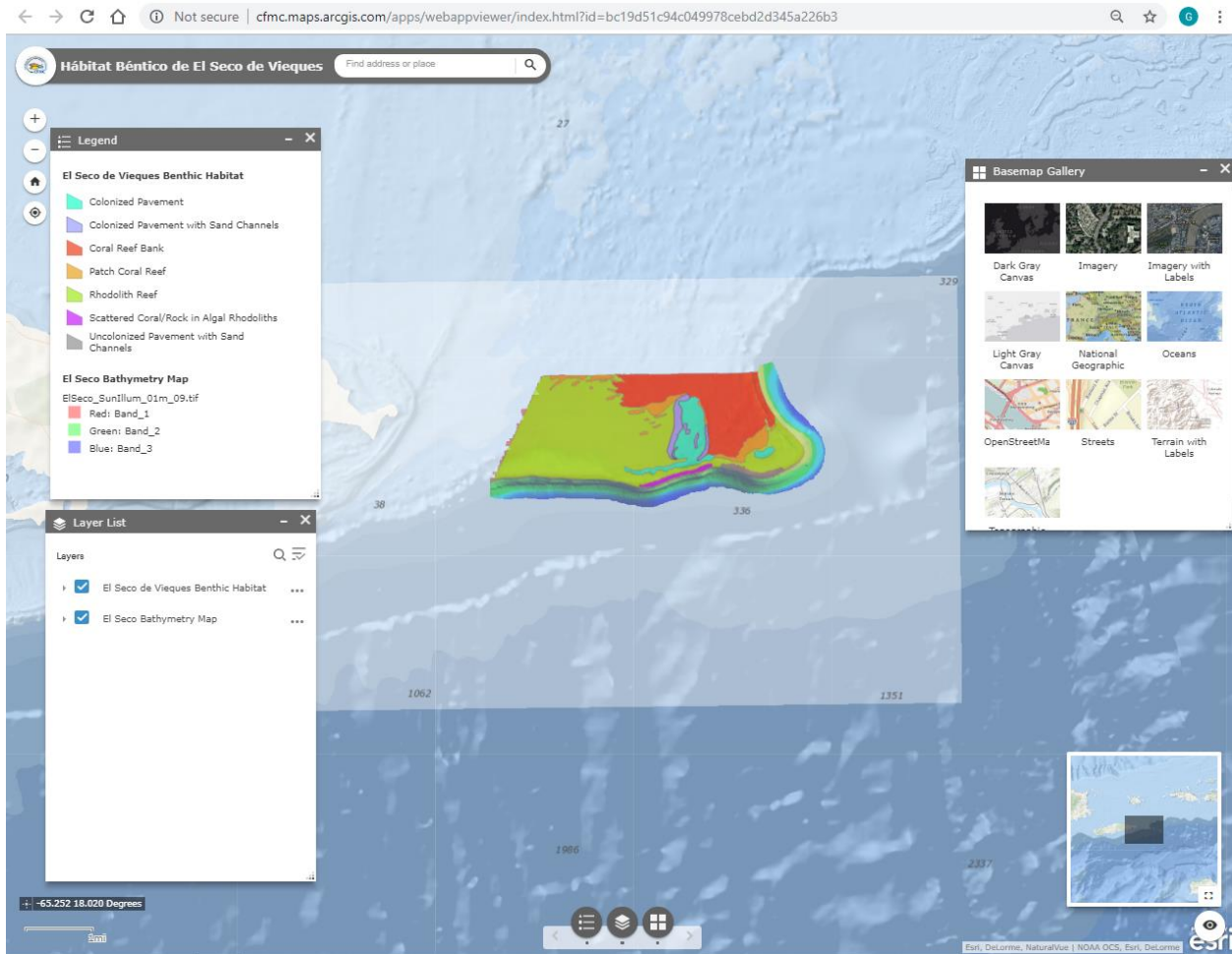
<http://cfmc.maps.arcgis.com/apps/webappviewer/index.html?id=b5913f944bdc4b4cbf3b7d4ee20880b6>

Hábitat Béntico Tourmaline



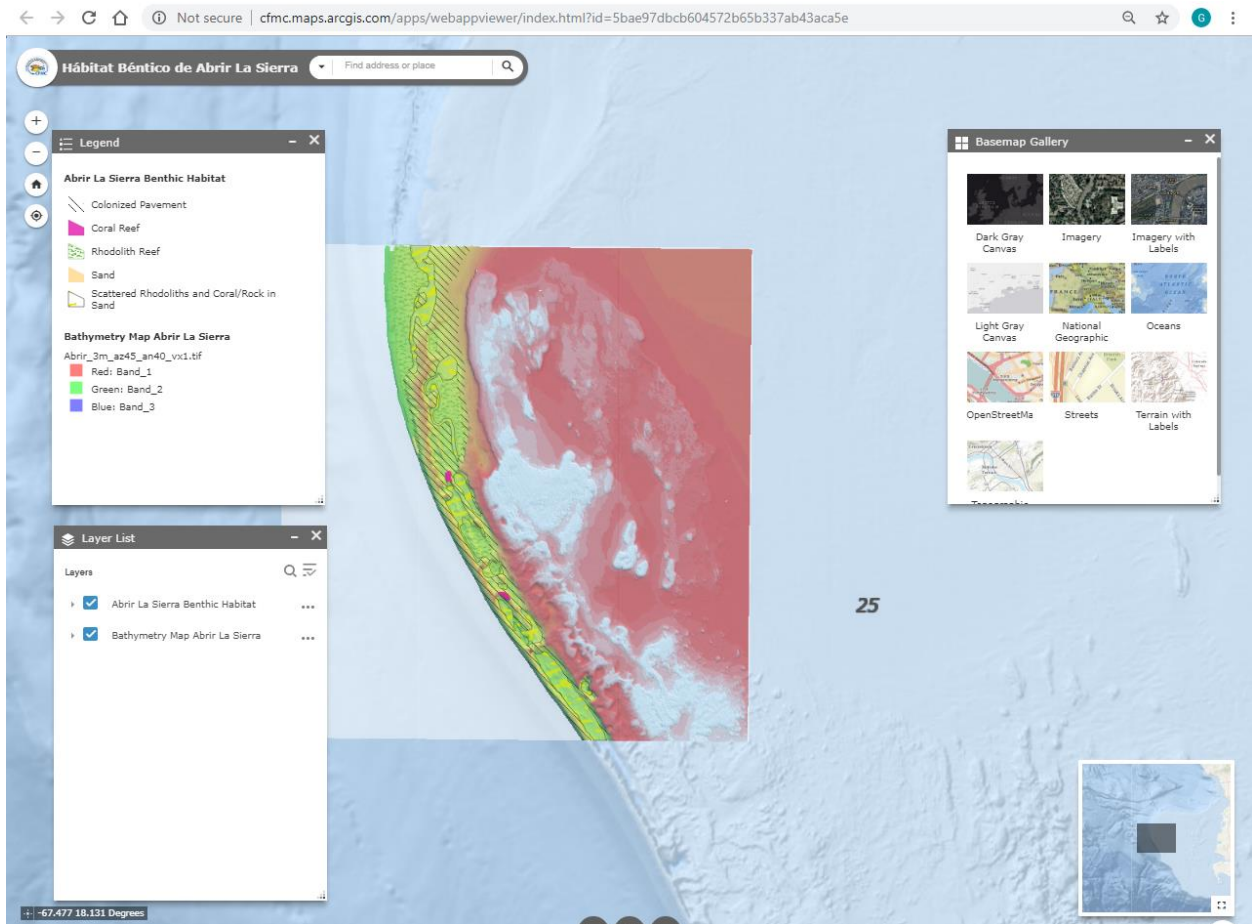
<http://cfmc.maps.arcgis.com/apps/webappviewer/index.html?id=ab07a8e0cdd0478e92f2d42753043d54>

Hábitat Béntico El Seco de Vieques



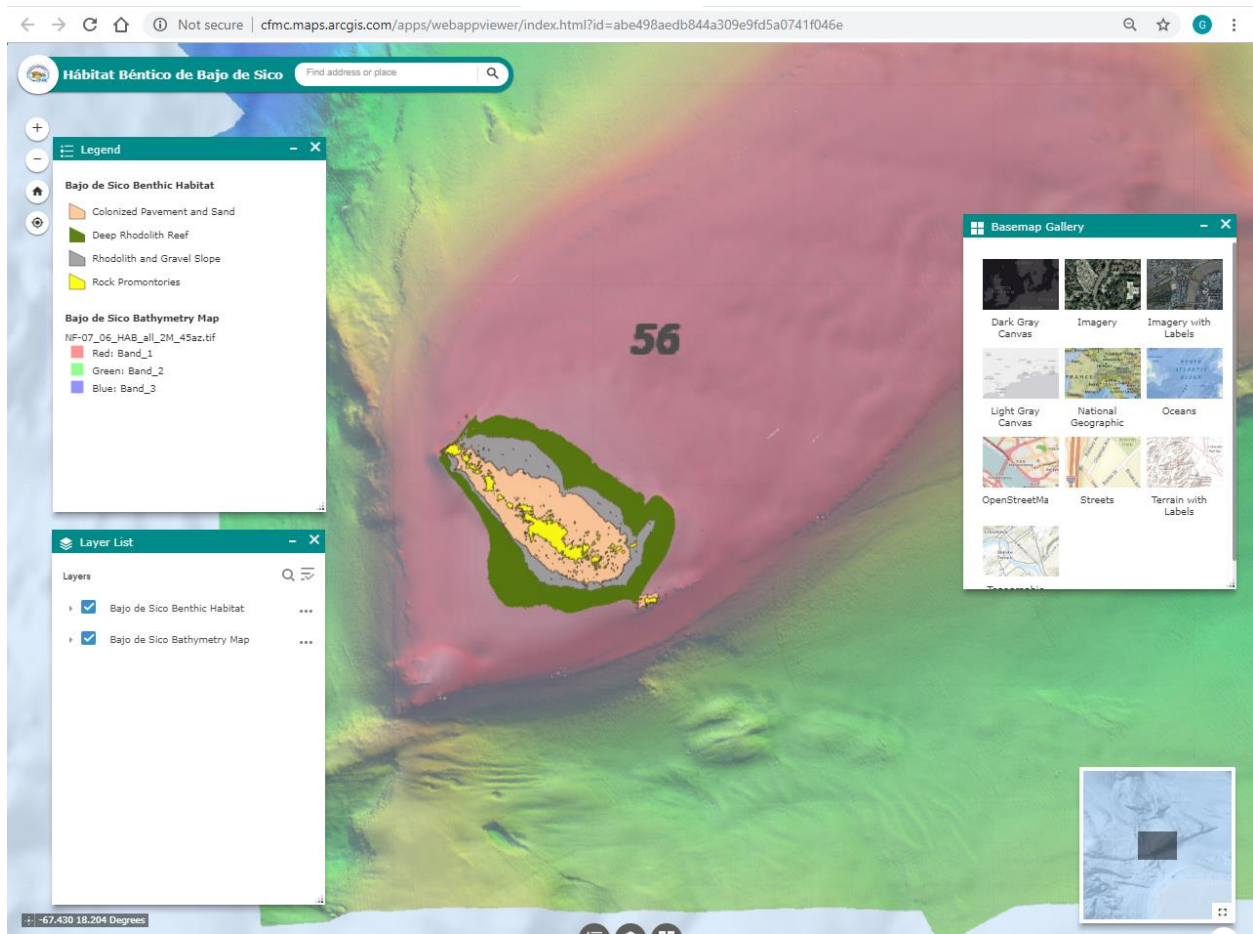
<http://cfmc.maps.arcgis.com/apps/webappviewer/index.html?id=bc19d51c94c049978cebd2d345a226b3>

Hábitat Béntico Abrir La Sierra



<http://cfmc.maps.arcgis.com/apps/webappviewer/index.html?id=5bae97dbcb604572b65b37ab43aca5e>

Hábitat Béntico Bajo de Sico Web Map



<http://cfmc.maps.arcgis.com/apps/webappviewer/index.html?id=abe498aedb844a309e9fd5a0741f046e>

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**

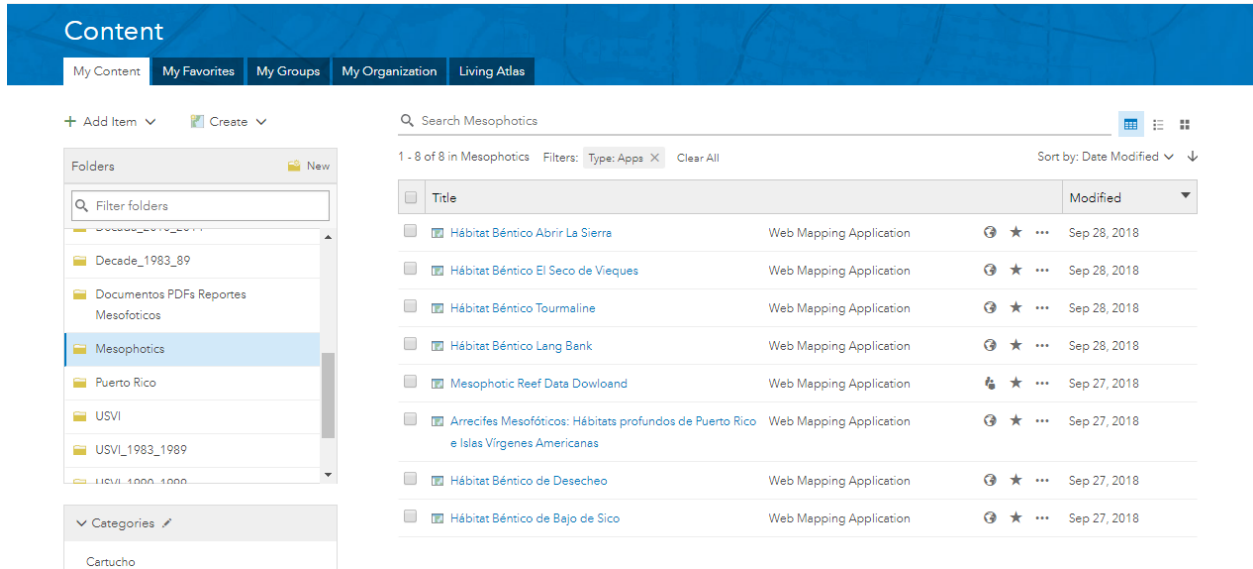
- Metadata, Credits and Tags were configured for each of the web applications.

The screenshot shows the metadata page for a web application titled "Hábitat Béntico Lang Bank". The page is divided into several sections:

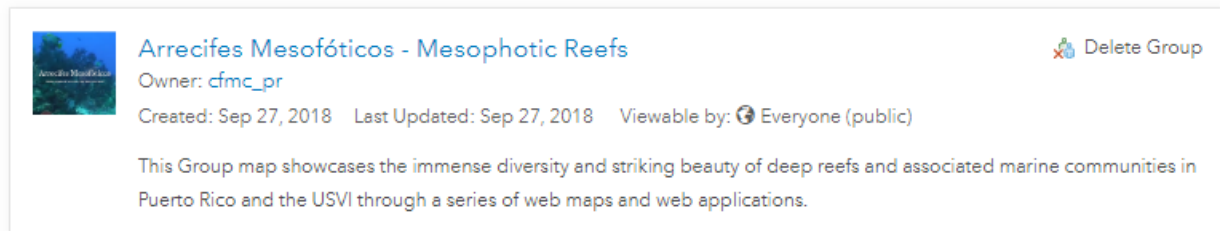
- Overview:** Includes a thumbnail image of a fish, a title, a description, and metadata such as "Created: May 17, 2018", "Updated: Sep 28, 2018", and "View Count: 220".
- Description:** Contains three paragraphs of text in Spanish and English, detailing the study's purpose and findings.
- Terms of Use:** A section for specifying special restrictions, currently empty.
- Comments:** A section for user feedback, currently showing zero comments.
- Item Information:** A progress bar indicating the item's quality, with a "Top Improvement" link.
- Details:** Lists technical specifications like "Size: 62 kb", "Shared with: Everyone (public)", and "API: JavaScript".
- Owner:** Identifies the creator as "dmc_pr".
- Folder:** Shows the item is located in the "Mesophotics" folder.
- Categories:** A section for categorizing the item, currently empty.
- Tags:** Lists relevant keywords such as "USVI, Lang Bank, CFMC, reefs, Mesophotics, Mesophotic app, mesophotic reefs, benthic habitats, St. Croix".
- Credits (Attribution):** Provides acknowledgment to the "Caribbean Fisheries Management Council (CFMC) Web App Creation: Noel Sánchez - Intern Geographic Mapping Technologies, Corp.".

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**

All web applications are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named Mesophotics.



Mesophotic Reefs web applications are shared within the Arrecifes Mesofóticos – Mesophotic Reefs Group. The Group has been set up as public for everyone to be able to view its contents.



The Group has been set up as public for everyone to be able to view its contents.

- **Configure Mesophotic Reefs Story Maps**

Story Maps combine authoritative maps with narrative text, images, and multimedia content. They are medium for harnessing the power of maps and geography to tell a story.

As a culmination of the Mesophotics Reefs Project, a story map was built to share with the public the results of the scientific research and investigations sponsored by the CFMC and the National Oceanographic and Atmospheric Administration (NOAA) carried out between 2005 – 2014. The studies were an effort towards characterization of deep reefs and associated marine communities from Puerto Rico (PR) and the U. S. Virgin Islands (USVI).

The story maps features content, images, videos and maps of six deep reef habitats in Puerto Rico and the USVI:

- Desecheo, Puerto Rico
- Bajo de Sico Seamount, Mona Passage, Puerto Rico
- Abrir La Sierra, Puerto Rico
- El Seco de Vieques – Puerto Rico
- Tourmaline Reef, Puerto Rico
- Lang Bank, St. Croix, USVI

The story map contains maps, beautiful images and videos of deep reefs in Puerto Rico and the USVI showcasing the immense diversity and striking beauty of these unexplored depths.



<http://cfmc.maps.arcgis.com/apps/Cascade/index.html?appid=5551f885e3b24e9d8fbda1a143c87008>


Arrecifes Mesofóticos

Inicio Deseño Bajo de Sico Abrir La Sierra El Seco de Vieques Lang Bank Tourmaline Reportes Científicos Créditos Edit x Portal CFMC

Este proyecto es un esfuerzo para caracterizar los arrecifes a profundidades entre los 30 y 50 metros y las comunidades marinas de Puerto Rico e Islas Vírgenes de los Estados Unidos.


Tabs were configured for each of the six study sites.

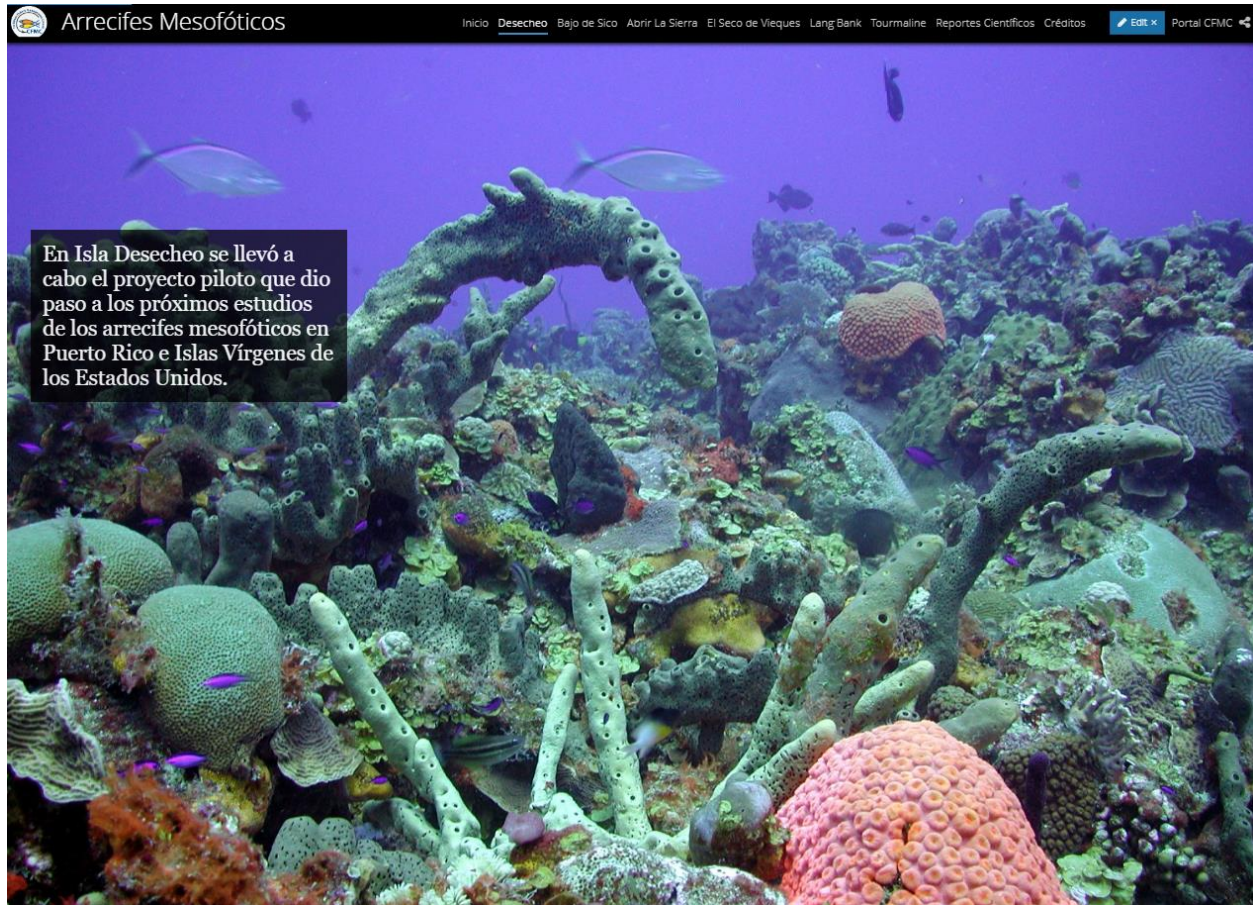
Arrecifes Mesofóticos Inicio Desecheo Bajo de Sico Abrir La Sierra El Seco de Vieques Lang Bank Tourmaline Reportes Científicos Créditos Edit x Portal CFMC



ISLA DESECHEO

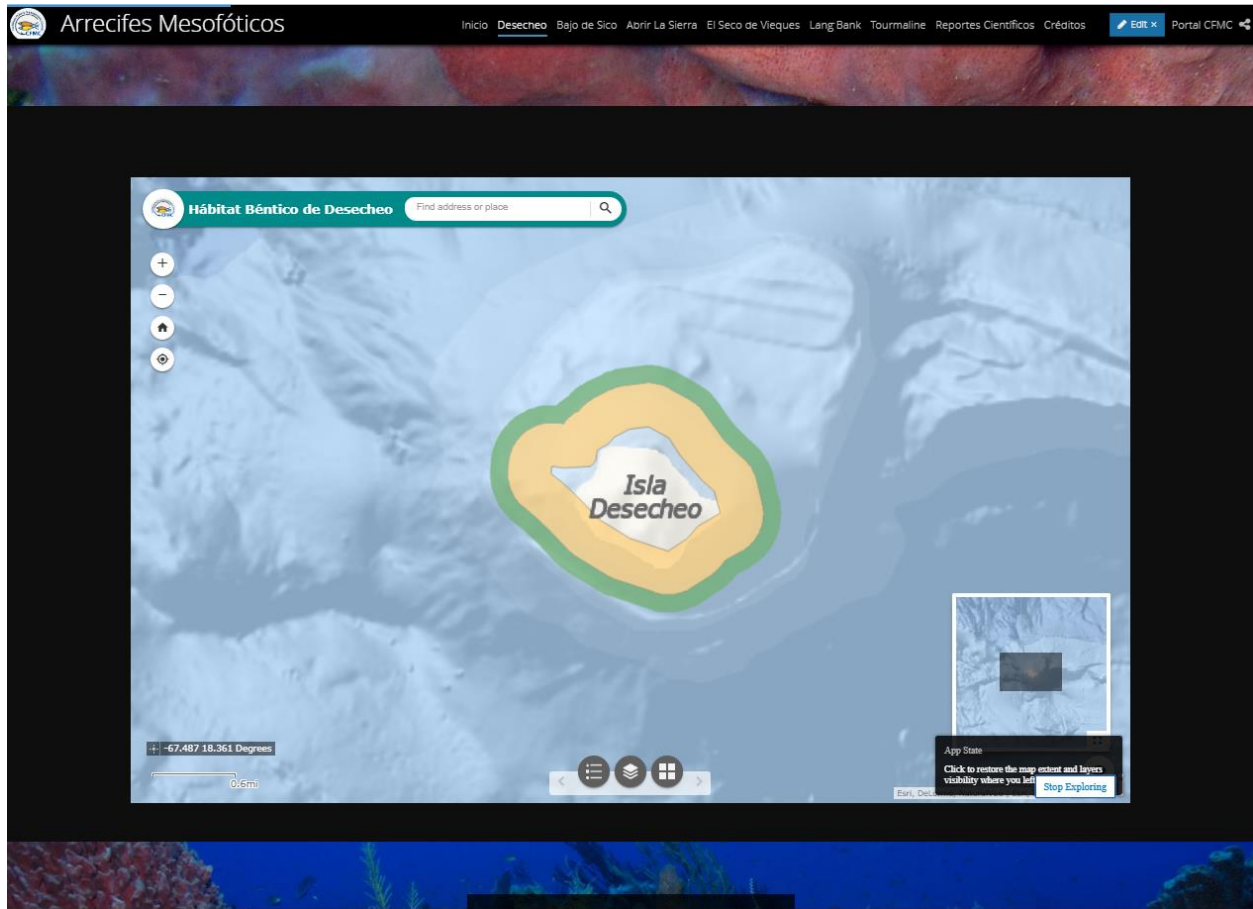
Desecheo es una isla designada como Reserva Natural desde 1999. Está ubicada a unas 12 millas náuticas del Municipio de Rincón, en la costa noroeste de Puerto Rico. Las profundidades circundantes de la isla oscilan entre 400 y 900 metros, aumentando abruptamente hacia el norte de la reserva, donde se encuentra uno de los bordes de la trinchera puertorriqueña.



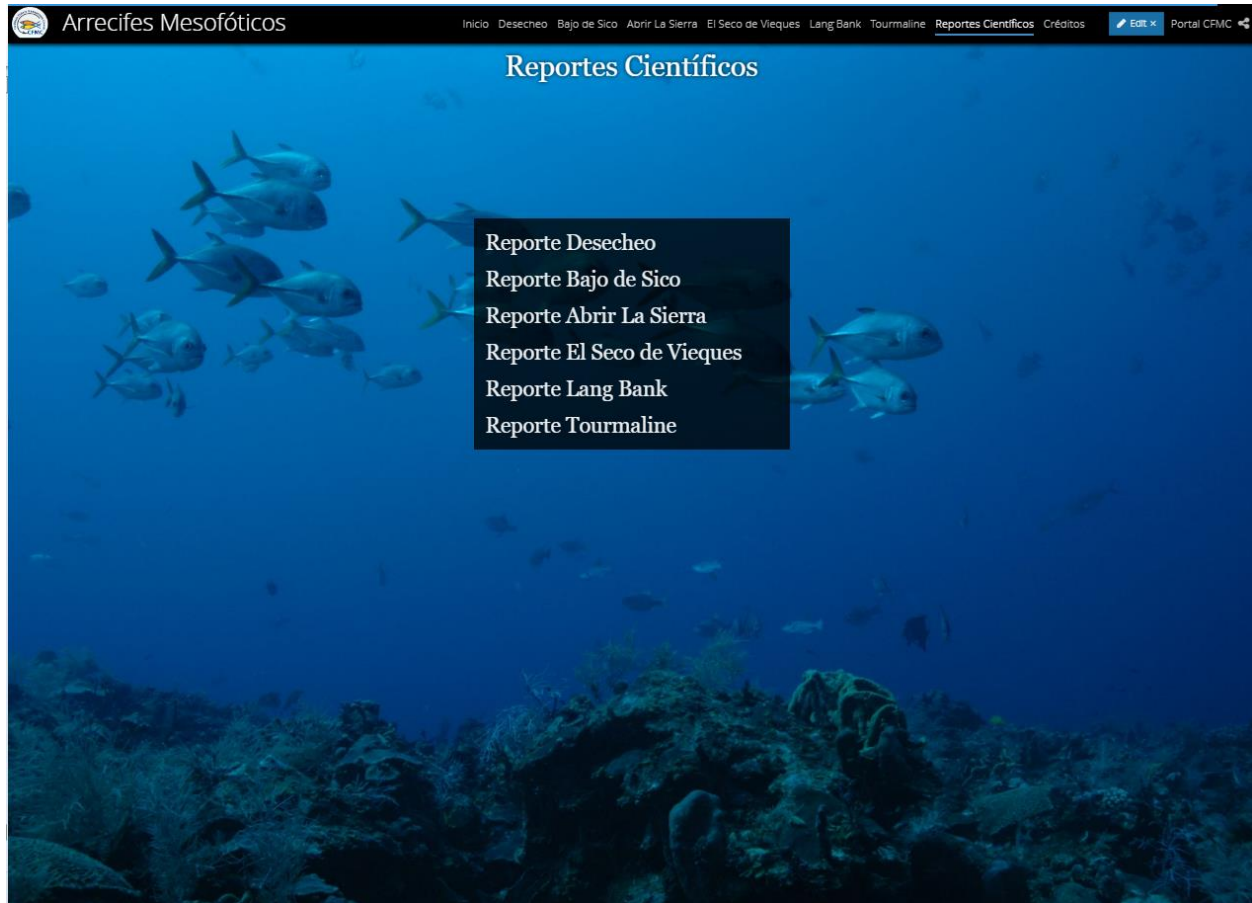


For each study site, authoritative content was included.

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**

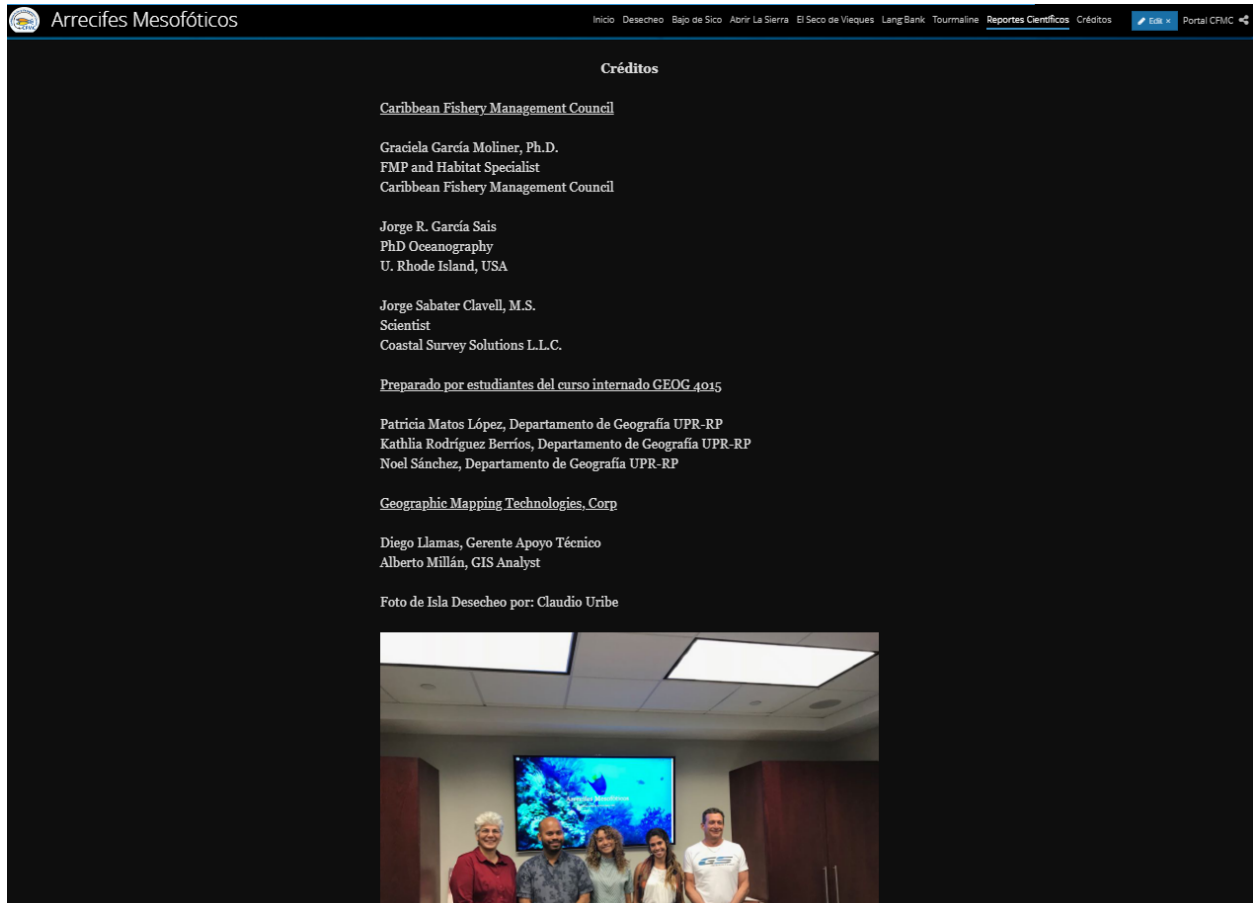


The web applications were embedded within the story map to highlight the location of the study site and share the mesophotic benthic habitat maps and bathymetry maps.



The scientific reports were included within the story map and are available for download.

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**



A Credits Tab acknowledges all resources involved in the creation of the Mesophotics Reefs Project.

URL for the complete story map:

<http://cfmc.maps.arcgis.com/apps/Cascade/index.html?appid=5551f885e3b24e9d8fbd41a143c87008>

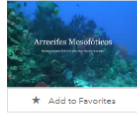
ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps

- Metadata, Credits and Tags were configured for the Story Map.

Arrecifes Mesofóticos: Hábitats profundos de Puerto Rico e Islas Vírgenes Americanas [Edit](#)

Overview Usage Settings

[Edit Thumbnail](#)

 Este Storymap muestra imágenes, características y datos sobre seis hábitats bénticos de Puerto Rico y las Islas Vírgenes de los Estados Unidos. [Edit](#)

Web Mapping Application by [cfmc_pr](#)

Created: May 3, 2018 Updated: Sep 27, 2018 View Count: 775

[Add to Favorites](#) [Authoritative](#)

Description

This story maps is an effort of the Caribbean Fisheries Management Council (CFMC) to share with the public the comprehensive, scientific research and investigations sponsored by the CFMC and the National Oceanographic and Atmospheric Administration (NOAA) carried out between 2005 - 2014. The studies were an effort towards characterization of deep reefs and associated marine communities from Puerto Rico (PR) and the U. S. Virgin Islands (USVI).

The story maps features content, images, videos and maps of six deep reef habitats in Puerto Rico and the USVI:

- Desecheo, Puerto Rico
- Bajo de Sico Seamount, Mona Passage, Puerto Rico
- Abrir La Sierra, Puerto Rico
- El Seco de Vieques - Puerto Rico
- Tourmaline Reef, Puerto Rico
- Lang Bank, St. Croix, USVI

The story map contains maps, beautiful images and videos of deep reefs in Puerto Rico and the USVI showcasing the immense diversity and striking beauty of these unexplored depths.

For more in depth information regarding these scientific investigations please refer to the Official Final Reports which are available for download from the Reportes Científicos Tab on the Story Map:

- Inventory and Atlas of Corals and Coral Reefs, with Emphasis on Deep-Water Coral Reefs from the U. S. Caribbean EEZ - December 2005
- Characterization of benthic habitats and associated reef communities at Bajo de Sico Seamount, Mona Passage, Puerto Rico - December 2007
- Mesophotic benthic habitats and associated marine communities at Abrir La Sierra, Puerto Rico - March 2010
- Characterization of benthic habitats and associated mesophotic coral reef communities at El Seco, southeast Vieques, Puerto Rico - December 2011
- Characterization of mesophotic benthic habitats and associated reef communities at Tourmaline Reef, Puerto Rico - April 2013
- Mesophotic Benthic Habitats and Associated Reef Communities at Lang Bank, St. Croix, USVI - August 2014

Terms of Use

[View Application](#)

[Configure App](#)

[Share](#)

Item Information

Learn more

Low High

Top Improvement: [Add terms of use](#)

Details

Size: 83 MB

Shared with: Everyone (public), DPNR_DFW, Contenido Destacado, Caribbean Fishery Management Council

API: JavaScript


Purpose: Ready To Use

★★★★★

[Facebook](#) [Twitter](#) [LinkedIn](#)

Owner

[Change Owner](#)

 cfmc_pr

Folder

Mesophotics [Move](#)

Categories

[Edit](#)

Mesophotic Reefs

Tags

[Edit](#)

Story Map, Mesophotic, Mesophotics, reefs, mesophotic reefs, benthic habitats, PR, Puerto Rico, USVI, Apps, CFMC

Credits (Attribution)

[Edit](#)

Graciela García Moliner, Ph.D. FMP and Habitat Specialist Caribbean Fishery Management

**ArcGIS Platform Implementation
Caribbean Fisheries Management Council
March – June 2018
ArcGIS Online Mesophotic Reefs Web Maps**

All web applications are hosted on CFMC’s ArcGIS Organizational Account organized under a folder named Mesophotics.

The screenshot shows the ArcGIS Online interface. On the left, the 'Content' sidebar is visible with the 'Mesophotics' folder selected. The main content area displays a search for 'Mesophotics' with 8 results. The results are as follows:

Title	Type	Modified
Hábitat Béntico Abrir La Sierra	Web Mapping Application	Sep 28, 2018
Hábitat Béntico El Seco de Vieques	Web Mapping Application	Sep 28, 2018
Hábitat Béntico Tourmaline	Web Mapping Application	Sep 28, 2018
Hábitat Béntico Lang Bank	Web Mapping Application	Sep 28, 2018
Mesophotic Reef Data Dowload	Web Mapping Application	Sep 27, 2018
Arrecifes Mesofóticos: Hábitats profodicos de Puerto Rico e Islas Vírgenes Americanas	Web Mapping Application	Sep 27, 2018
Hábitat Béntico de Desecheo	Web Mapping Application	Sep 27, 2018
Hábitat Béntico de Bajo de Sico	Web Mapping Application	Sep 27, 2018

Mesophotic Reefs Story Map was shared within the Arrecifes Mesofóticos – Mesophotic Reefs Group. The Group has been set up as public for everyone to be able to view its contents.

The screenshot shows the details for the 'Arrecifes Mesofóticos - Mesophotic Reefs' group. The group is owned by 'cfmc_pr' and is public. The description states: 'This Group map showcases the immense diversity and striking beauty of deep reefs and associated marine communities in Puerto Rico and the USVI through a series of web maps and web applications.'



ArcGIS Platform Implementation at the Caribbean Fisheries Management Council

Task 6: Technology Transfer and Trainings Report

September 24th, 2018

Prepared for:
Graciela García Moliner
FMP and Habitat Specialist
Caribbean Fisheries and Management Council

Prepared by:
Geographic Mapping Technologies, Corp.
54 Calle Mayagüez
San Juan, Puerto Rico 00917
Teléfonos: 787-250-8182/ 787-250-8185

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Introduction3
Course: ArcGIS Desktop I4
Course: ArcGIS Desktop II5
Addendum 1: ArcGIS Desktop 1 – Sept 10-11, 20186
Addendum 1: ArcGIS Desktop 2 – Sept 12-14, 20187

Introduction

The following document summarizes Task 6: Technology Transfer and Trainings of the CFMC GIS Project: **Development of GIS access to coral and mesophotic reef data from Puerto Rico and the USVI, including commercial landings data.** ArcGIS Desktop 1 and ArcGIS Desktop 2 trainings were held at GMT, Corp. facilities in Hato Rey, from September 10, 2018 through September 14, 2018. A total of four persons participated in both training sessions.

This document provides a brief description of the courses offered as well as a copy of the assistance sheets and evaluation forms.

Course: ArcGIS Desktop 1

Complete Course Title: ArcGIS 1: Introduction to GIS

Duration: 2 Days

Date: September 10, 2018 – September 11, 2018

Participants: 4

Description:

This course introduces GIS concepts and ArcGIS tools used to visualize real-world features, discover patterns, and communicate information. Using ArcMap and ArcGIS Online, participants work with GIS maps, explore data, and analyze maps and data as they learn fundamental concepts that underlie GIS technology.

Course: ArcGIS Desktop 2

Complete Course Title: ArcGIS Pro: Essential Workflows

Duration: 3 Days

Date: September 12, 2018 – September 14, 2018

Participants: 4

Description:

This course extends foundational GIS knowledge and explores some of the most common GIS workflows using the ArcGIS Pro application. The course introduces techniques and general best practices to map, manage, analyze, and share data and other GIS resources. Hands-on exercises will give participants the experience needed to efficiently work with ArcGIS Pro.



ArcGIS Platform Implementation in the Caribbean Fishery Management Council.

Task 9: ArcGIS for Server Basic Installation and Deployment

September 25th, 2018

Prepared for:
Graciela García Moliner
FMP and Habitat Specialist
Caribbean Fisheries and Management Council

Prepared by:
Geographic Mapping Technologies, Corp.
54 Calle Mayagüez
San Juan, Puerto Rico 00917
Teléfonos: 787-250-8182/ 787-250-8185

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Document Control

<i>VERSION</i>	<i>DELIVERY DATE</i>	<i>DESCRIPTION</i>
1.0	September 25th, 2018	First version of the ArcGIS Platform installation and Configuration documentation.

1. Introduction

The following document summarizes Task 9: ArcGIS for Server Basic Installation and Deployment of the CFMC GIS Project: **Development of GIS access to coral and mesophotic reef data from Puerto Rico and the USVI, including commercial landings data**. This document describes the installation and configuration process of all ArcGIS Platform components (ArcGIS License Manager, ArcGIS Desktop-ArcMap, ArcGIS Pro and ArcGIS Server) installed in the infrastructure of the Caribbean Fishery Management Council (CFMC), specifically on machine DESKTOP-3TRDRBG. The installation and configuration was completed on August 2nd, 2018.

2. ArcGIS Platform Components

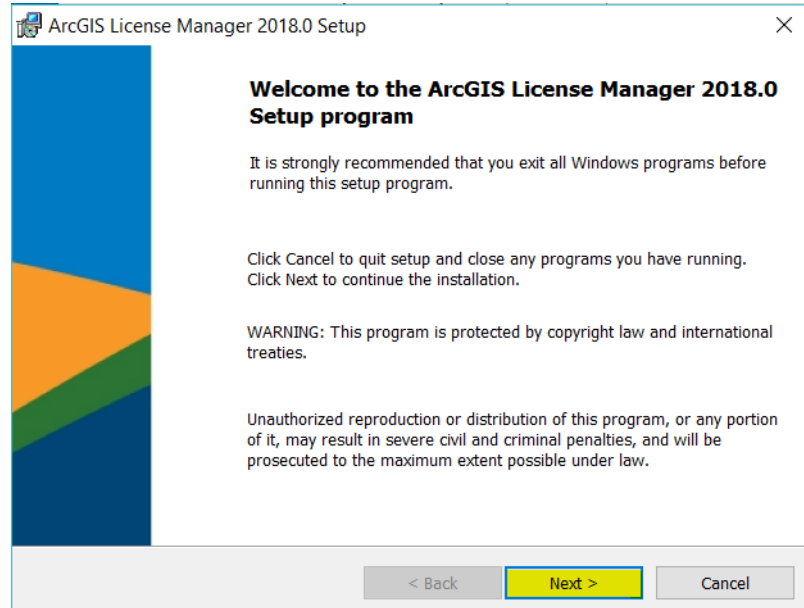
The components described below were installed in computer assigned by CFMC named DESKTOP-3TRDRBG.

- ArcGIS License Manager
- ArcGIS Desktop 10.6.1
- ArcGIS Background Geoprocessing 10.6.1
- ArcGIS Licence Manager 10.6.1
- ArcGIS PRO 2.2.1
- ArcGIS for Server 10.6.1

2.1. ArcGIS License Manager 10.6.1 Installation and Configuration

The License Manager is manages licenses for all concurrent ArcGIS Desktop clients. The installation process for the license manager and the license authorization in ArcGIS Desktop is described below:

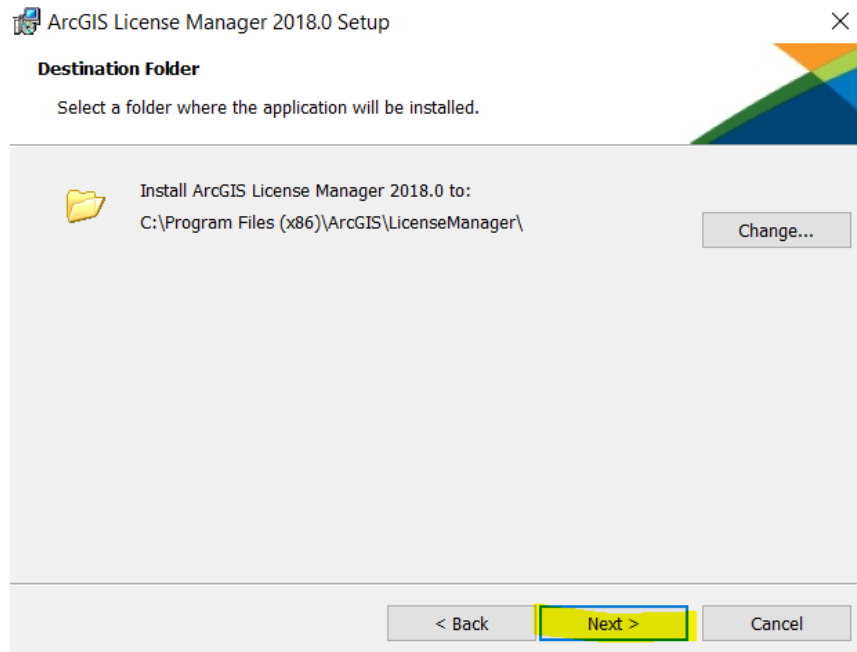
Step 1. Double click on the installation file and then press Next.



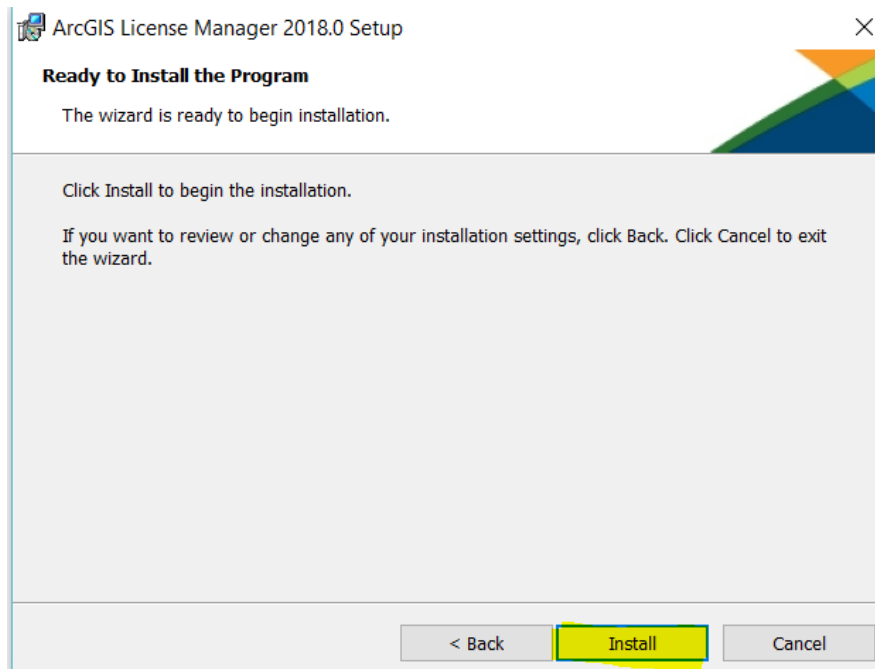
Step 2. Accept the master license agreement and press Next.



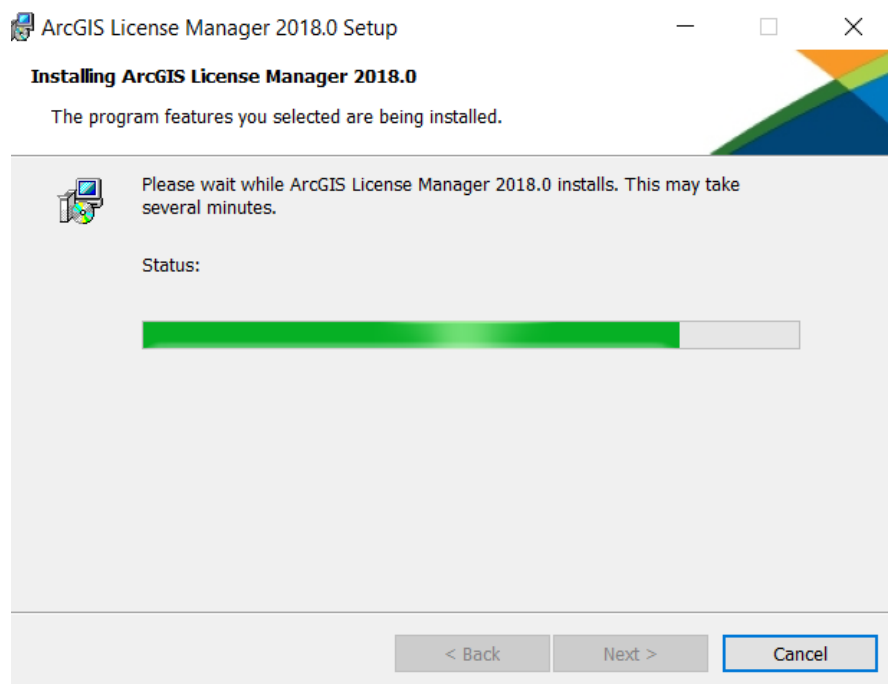
Step 3. Press Next.



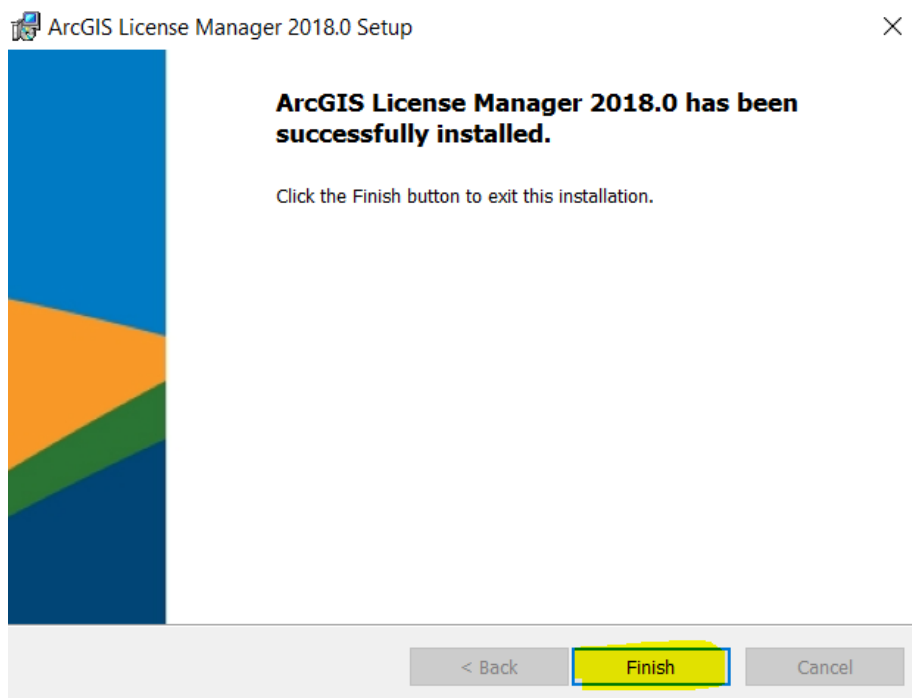
Step 4. Press Install.



Step 5. Let the installation run.



Step 6. Once completed, press Finish.



Step 7. The next consists in software authorization. The license server was identified through the License Manager as localhost, since it is the same computer that provides the licensing.

Software authorization process:

Software Authorization Wizard

Authorization Options
You must authorize the license server prior to use. Select from the options below.

Authorization Options

- I need to authorize licenses on my license server.
- I have already authorized core licenses and need to authorize additional extensions.
- I have received an authorization file and am now ready to finish the authorization process.

Product to be Authorized

- ArcGIS Desktop
- ArcGIS Pro
- ArcGIS Engine
- Esri CityEngine

Software Authorization Wizard ✕

Authorization Method
Select the method you want to use to authorize the software.

Authorize with Esri now using the Internet.
(This automatic method is the easiest way to authorize. It requires an Internet connection.)

Authorize at Esri's website or by email to receive your authorization file.

Authorize your software from a local license server.

ArcGIS Platform Implementation
Caribbean Fisheries Management Council
Task 9: ArcGIS for Server Installation and Deployment

Software Authorization Wizard



Authorization Information

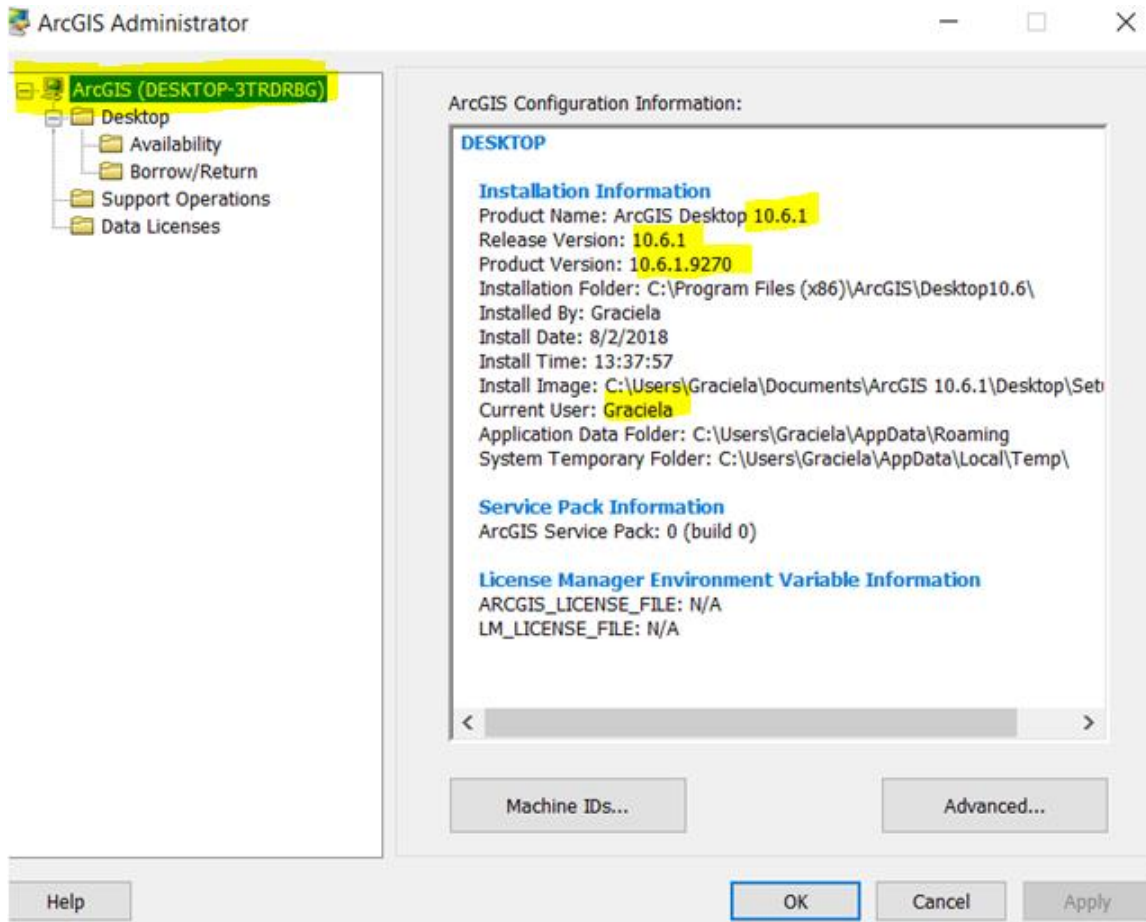
We will use the following information to verify our records and authorize your use of the software. (* required field)

*First Name:	<input type="text" value="Graciela"/>
*Last Name:	<input type="text" value="Garcia Moliner"/>
*Organization:	<input type="text" value="CFMC"/>
Department:	<input type="text"/>
*Address 1:	<input type="text" value="270 Muñoz Rivera Ave. Suite 401"/>
Address 2:	<input type="text"/>
*City:	<input type="text" value="San Juan"/>
*State/Province:	<input type="text" value="Puerto Rico"/>
*Zip/Postal Code:	<input type="text" value="00918"/>
*Location:	<input type="text" value="Puerto Rico"/>
*Phone Number:	<input type="text" value="(787) 766-5926"/>
*Email:	<input type="text" value="graciela.garcia-moliner@noaa.gov"/>
Comment:	<input type="text"/>

Optional user-defined authorization description.

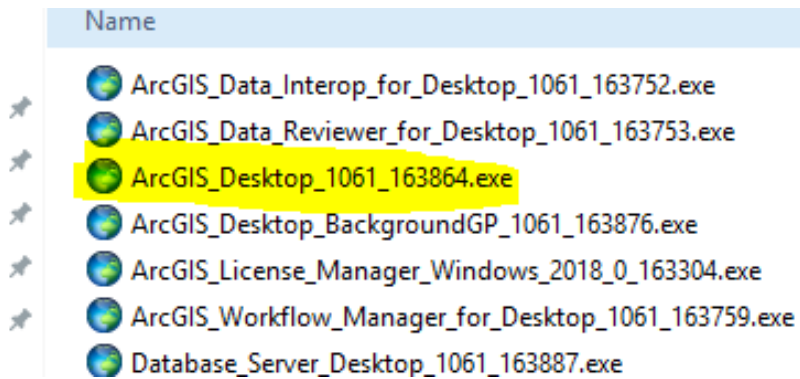
< Back **Next >** Cancel

ArcGIS Platform Implementation
Caribbean Fisheries Management Council
Task 9: ArcGIS for Server Installation and Deployment

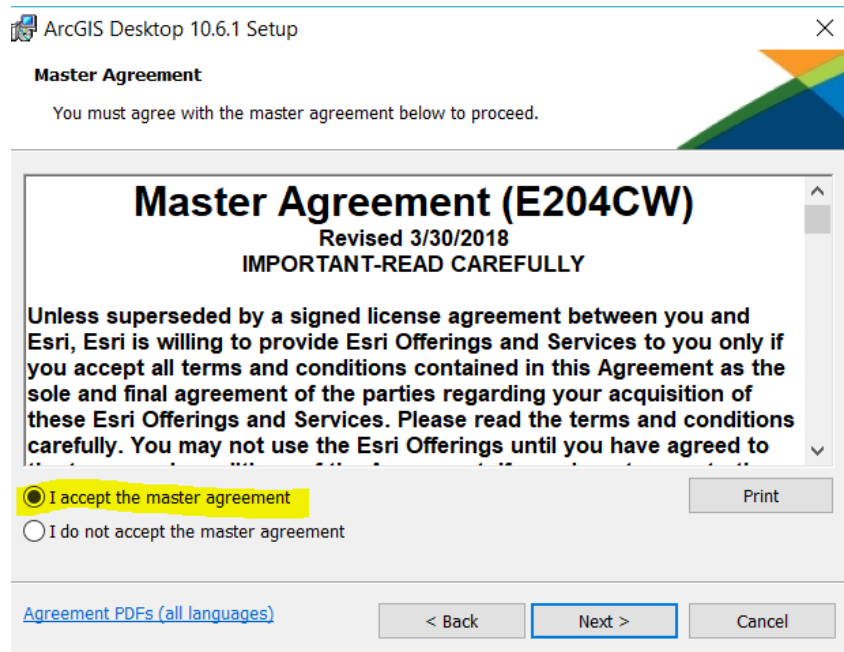
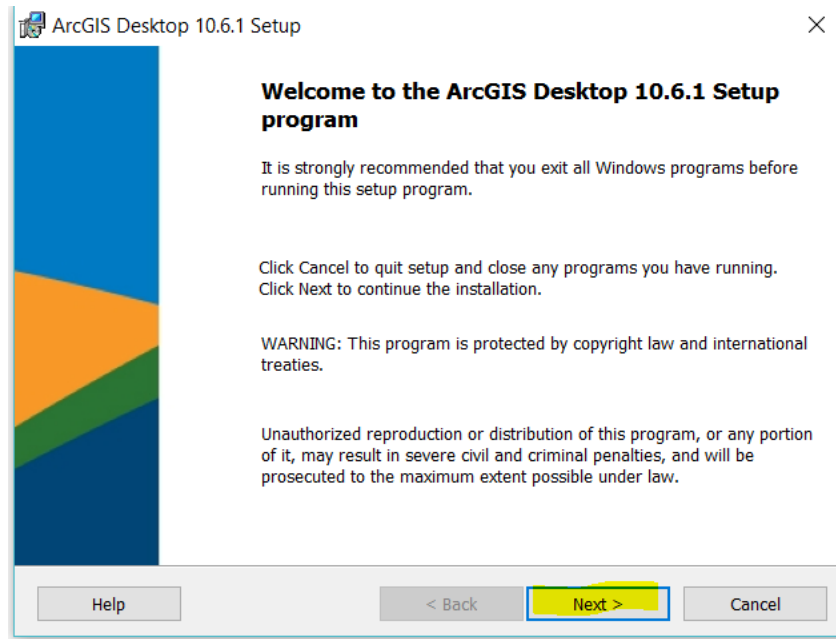


2.2. ArcGIS Desktop - ArcMap

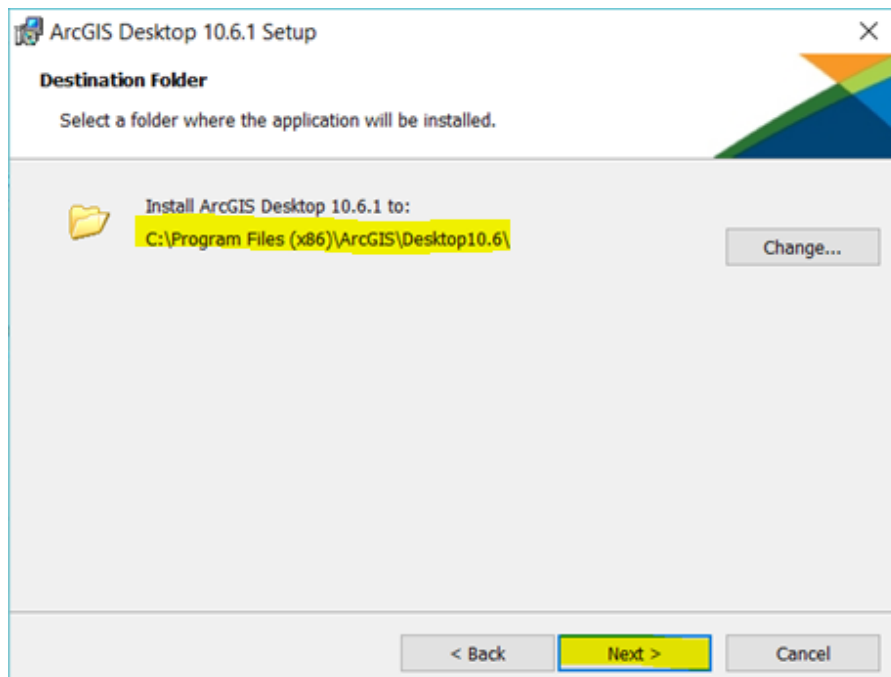
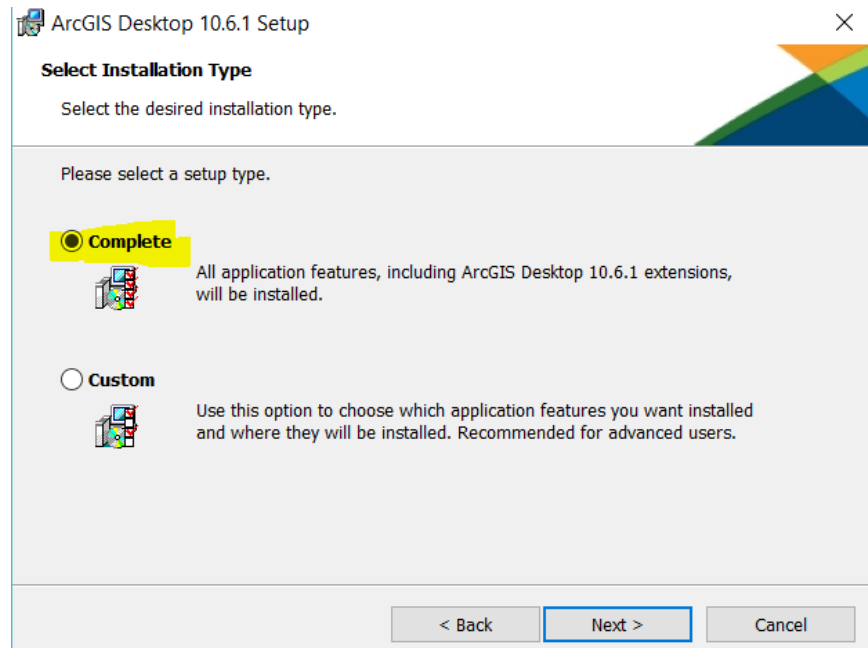
Step 1. Select the installation file to begin the installation process of the ArcGIS Desktop applications (ArcMap, ArcCatalog). To start the installation double click on the installation file.

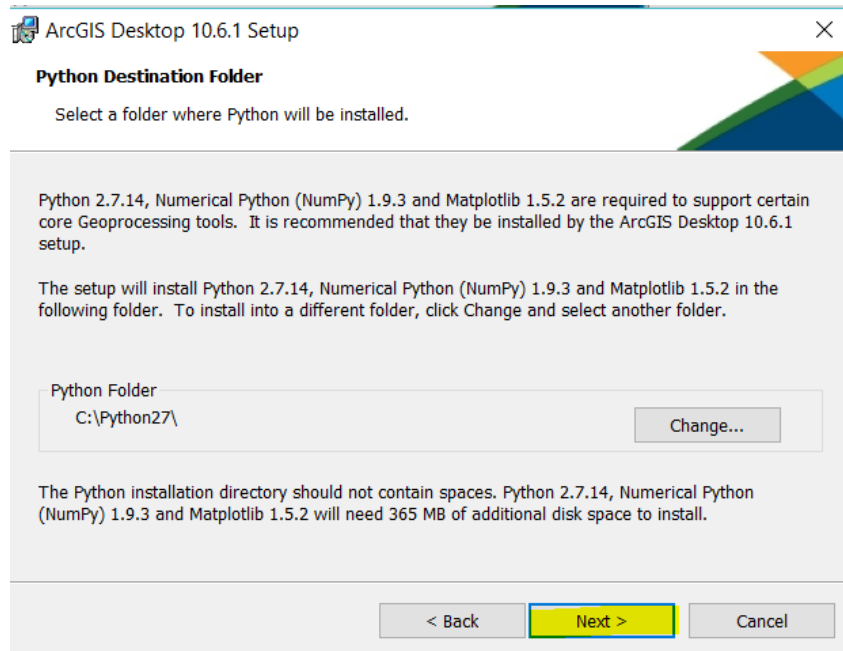


Step 2. Accept the licensing agreement and click Next.

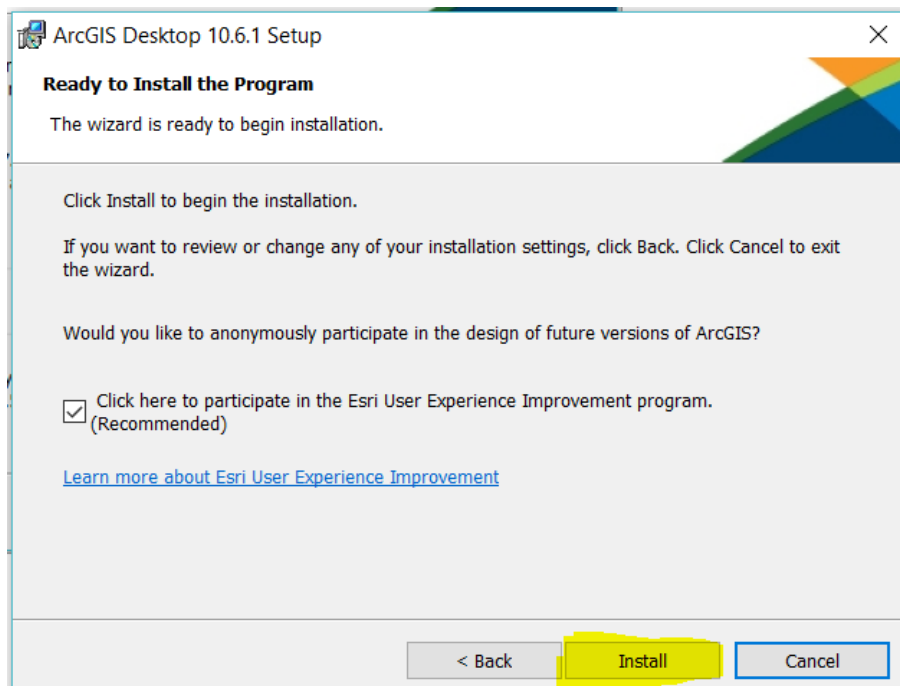


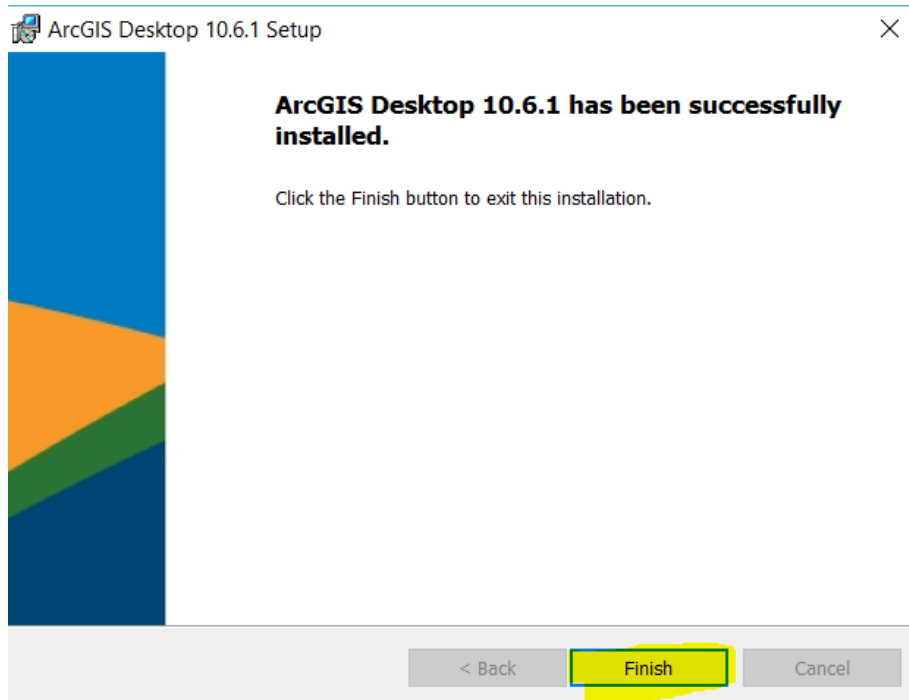
Step 3. In the option Select Installation Type, select Complete and then press Next. Keep the default installation options.





Step 4. Press Install. Let the installation run and finalize by selecting Finish.













2.3. ArcGIS Desktop Background Geoprocessing

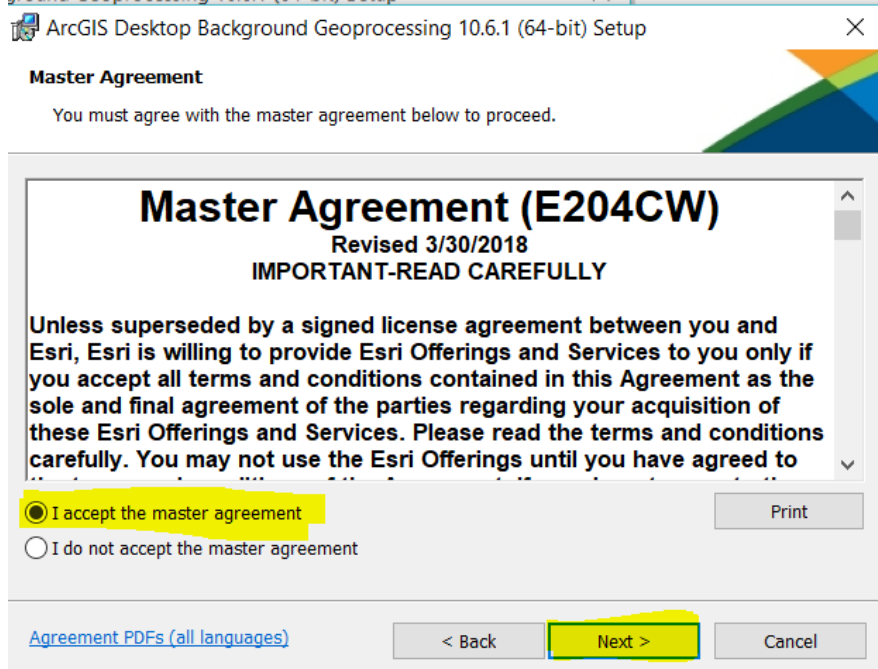
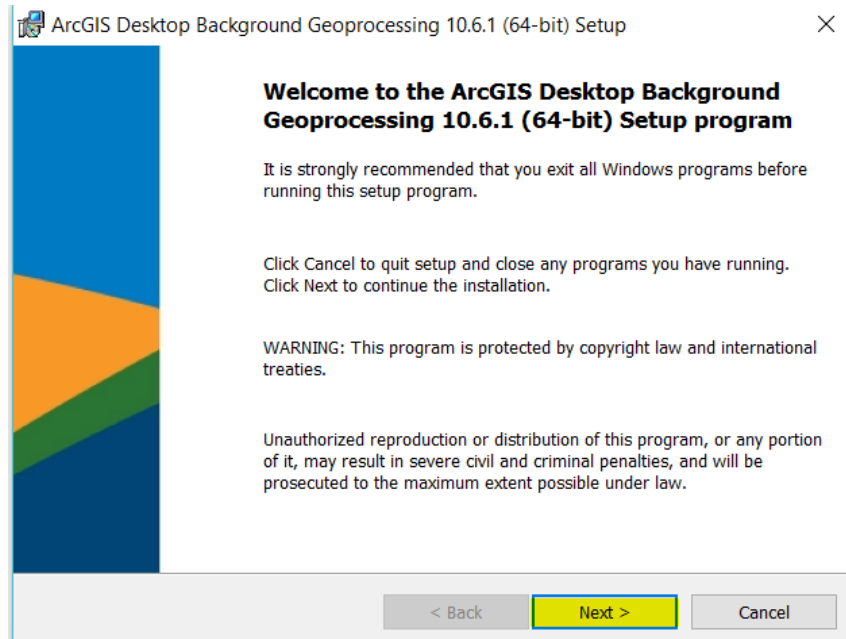
ArcGIS Desktop is built for 32 bits OS environments, but the "Background Geoprocessing" application, allows to use resources of the 64 bits operating systems when executing the geoprocessing tools. The use of 64-bit processing to perform analysis on systems with large amounts of RAM, can help to manage large amounts of data that otherwise could not be processed in a 32-bit environment. Since the execution is done in the native 64-bit environments, more hardware resources can be used.

Step 5. Select the installation file and then press "double click" the file to begin the installation process.

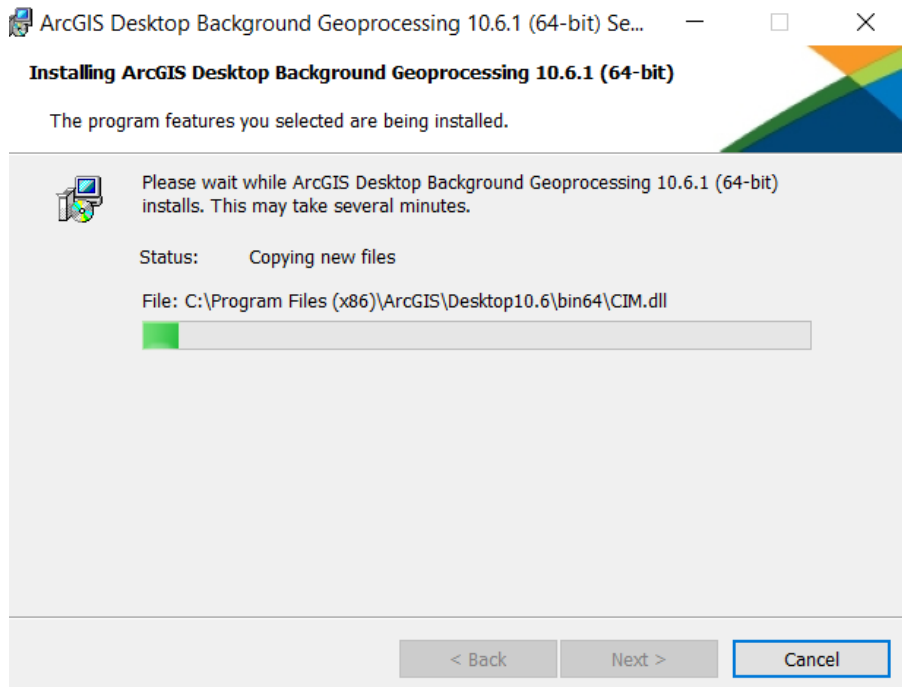
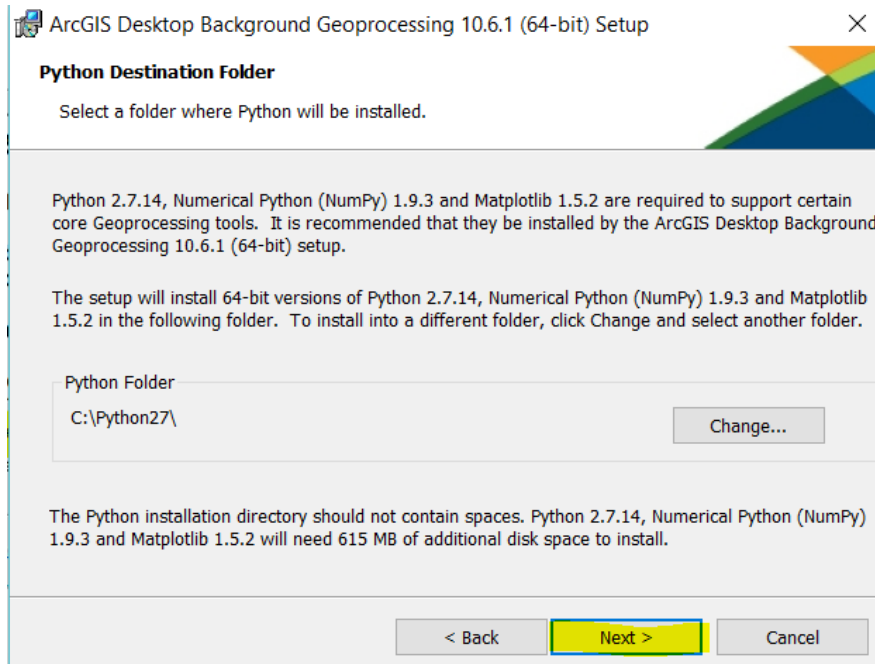
> Aplicaciones > ESRI > 10.6.1 > ArcGIS Desktop 10.6.1

Name	Date modif
 ArcGIS_Data_Interop_for_Desktop_1061_163752.exe	8/1/2018 10
 ArcGIS_Data_Reviewer_for_Desktop_1061_163753.exe	8/1/2018 10
 ArcGIS_Desktop_1061_163864.exe	8/1/2018 10
 ArcGIS_Desktop_BackgroundGP_1061_163876.exe	8/1/2018 10
 ArcGIS_License_Manager_Windows_2018_0_163304.exe	8/1/2018 10
 ArcGIS_Workflow_Manager_for_Desktop_1061_163759.exe	8/1/2018 10
 Database_Server_Desktop_1061_163887.exe	8/1/2018 10
 Microsoft_ODBC_Driver_17_SQL_Server_32bit_164451.exe	8/1/2018 10

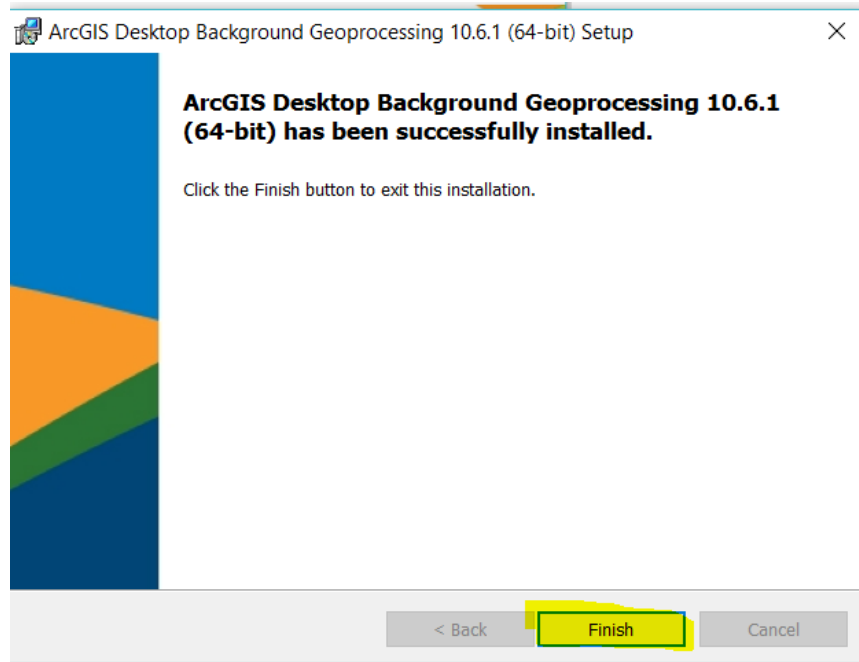
Step 6. To begin the installation process, double click the installation file. Accept the licensing agreement and click Next.



Step 7. Keep the default options and select Next.



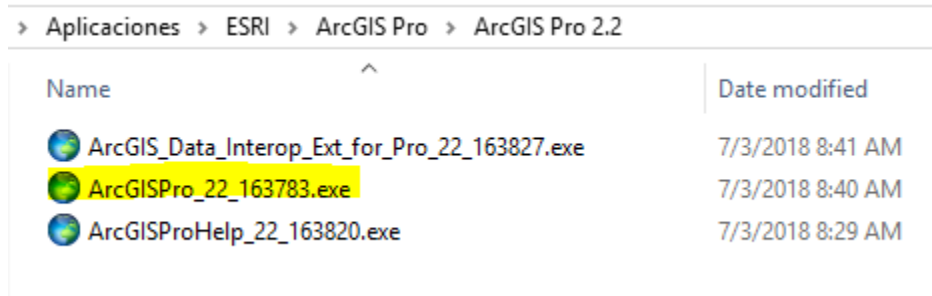
Step 8. After the installation process is completed, click Finish.



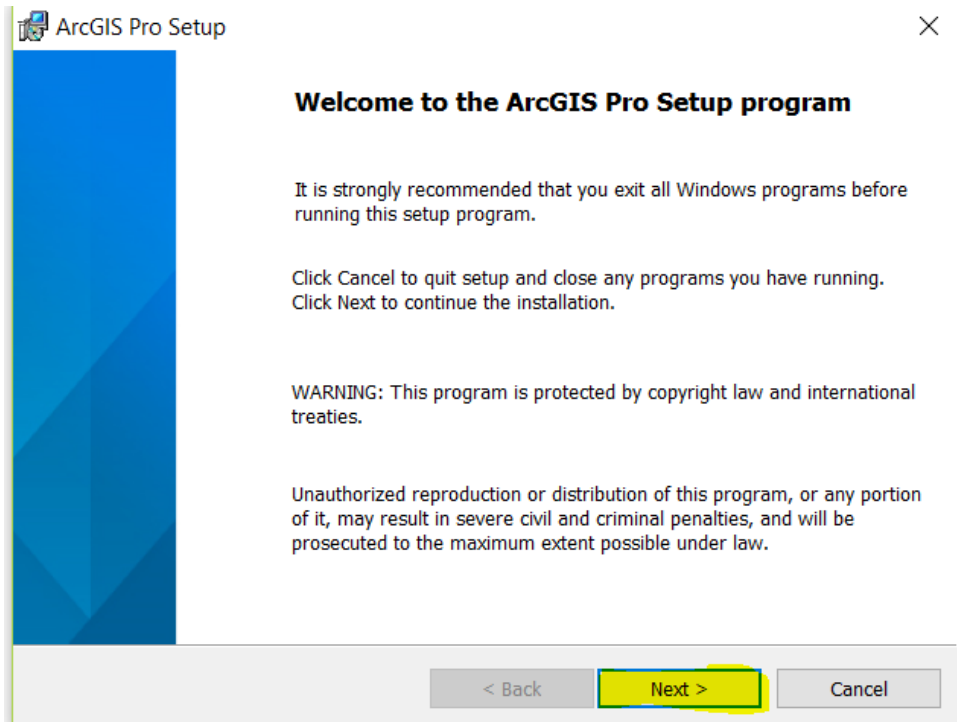
2.4. ArcGIS Pro 2.2.1 Installation

ArcGIS Pro is the essential application for creating and working with spatial data on desktop. It provides tools to visualize, analyze, compile, and share data. Projects in ArcGIS Pro can incorporate content from an organization's portal or ArcGIS Online. This section describes the installation process of ArcGIS Pro.

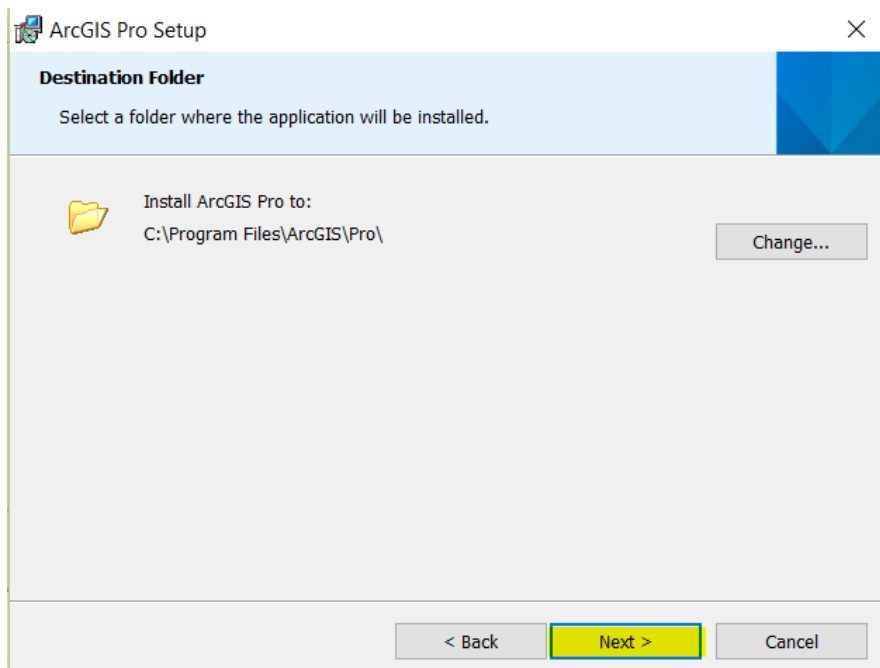
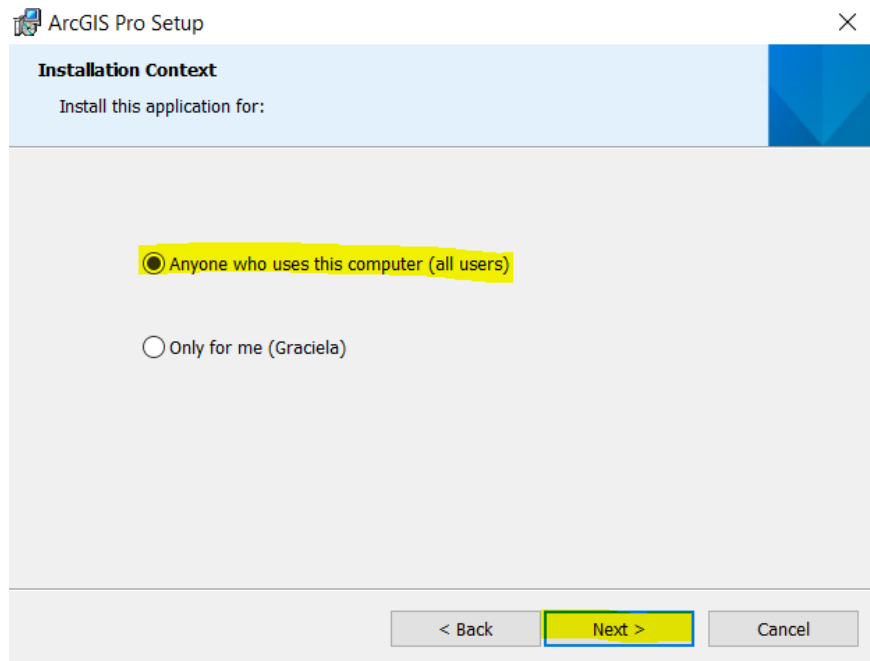
Step 1. Select the installation file to install the ArcGIS Pro application. To begin the installation process, "double click" on the file.



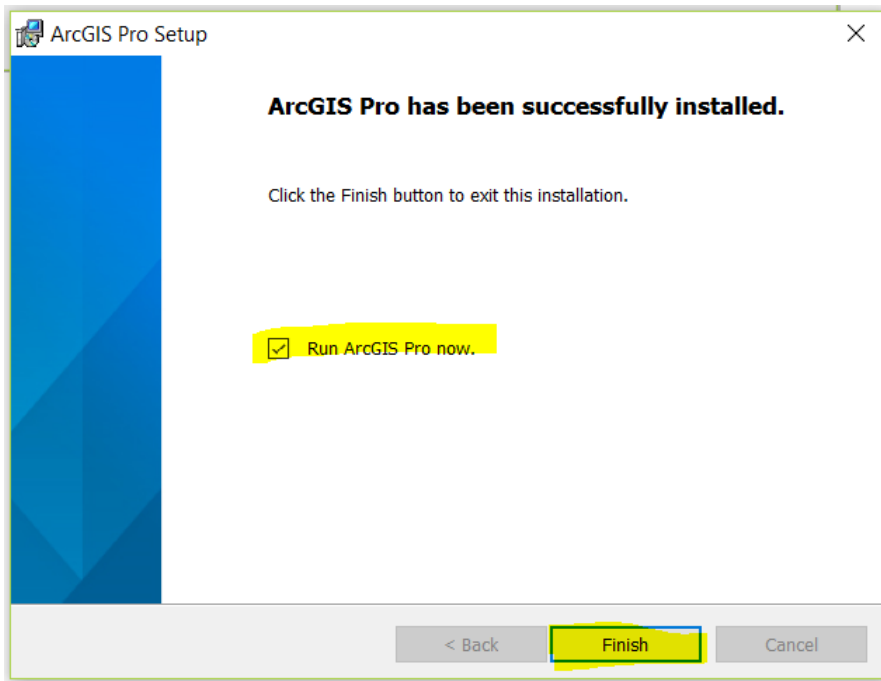
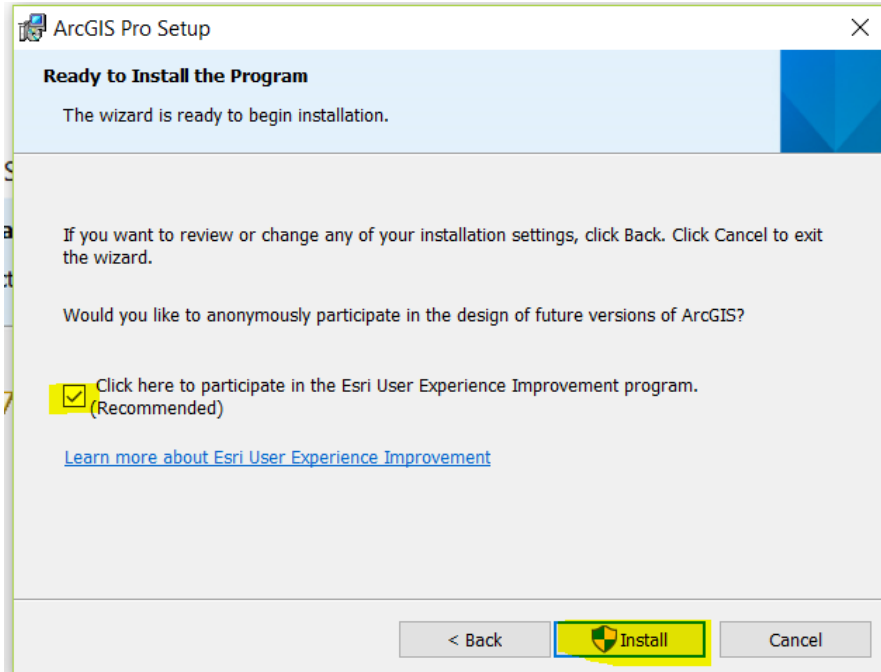
Step 2. Accept the licensing agreement and press Next.



Step 3. In the Installation Context window select Anyone who uses this computer (all users) option and then click Next. Keep the default options and then click "Next".



Step 4. In the window with the option Ready to Install the Program, click Next. After the installation process is completed, click Finish.



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The ArcGIS Pro licensing is managed by the CFMC organizational account (<https://cfmc.maps.arcgis.com>). This type of license is called "Named user license", so it is necessary to assign privileges to the user cfmc_pr so that this user can use the ArcGIS Pro application.

Step 5. Sign in to the CFMC organizational account (<https://cfmc.maps.arcgis.com>) In order to assign the ArcGIS Pro license to the cfmc_pr user select the the "Organization" > "Licenses" tab.

The screenshot shows the ArcGIS Pro licensing interface for the Caribbean Fisheries Management Council organization. The browser address bar shows cfmc.maps.arcgis.com/home/organization.html#licenses. The page title is "Caribbean Fishery Management Council". The navigation menu includes "Overview", "Members", "Licenses", "Status", and "Settings". The "Licenses" tab is selected. The interface displays the following information:

- Disable offline usage of ArcGIS Pro
- Product: ArcGIS Pro Standard
- Licenses: 1
- Available: 0
- Members: [Select All](#)
- Search by: Name
- Filter by level: Any (1) (2)
- Click to select a member.
- Selected Members: Click to remove a selected member.

Name	Username	Level	Licensed for	Last Used
Graciela Garcia-Moliner	cfmc_pr	(2)	Pro Standard	

Name	Username	Level
Graciela Garcia-Moliner	cfmc_pr	(2)

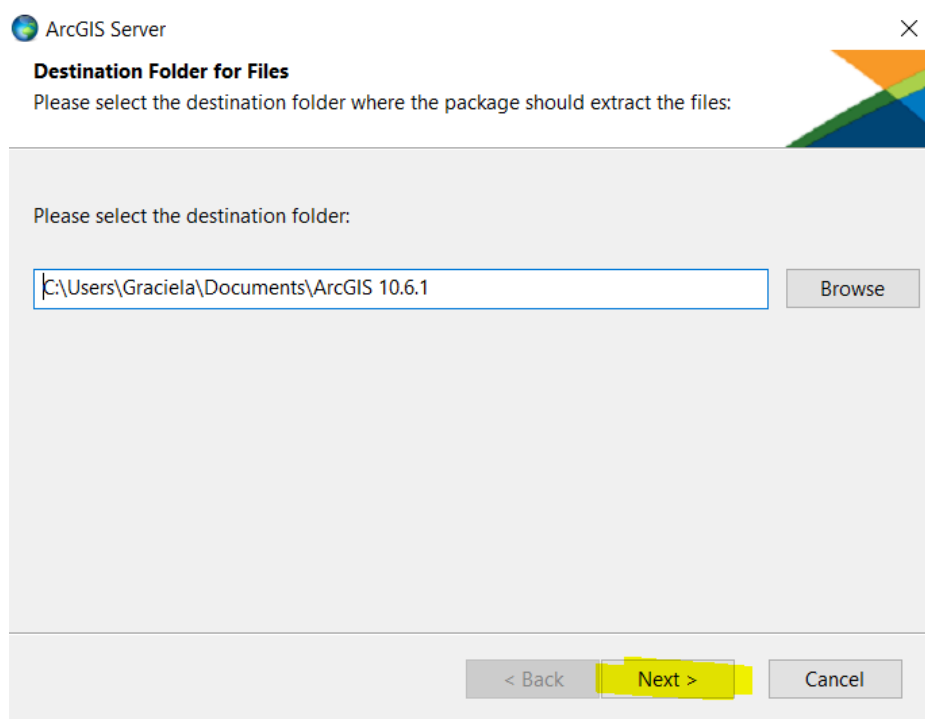
2.5. ArcGIS Server 10.6.1 Installation and Configuration

ArcGIS technology makes geographic information available to others in the organization and optionally anyone with an internet connection. This is accomplished through web services, which allow a powerful server computer to receive and process requests for information sent by other devices. ArcGIS Server opens GIS GIS to tablets, smartphones, laptops, desktop workstations, and any other devices that can connect to web services.

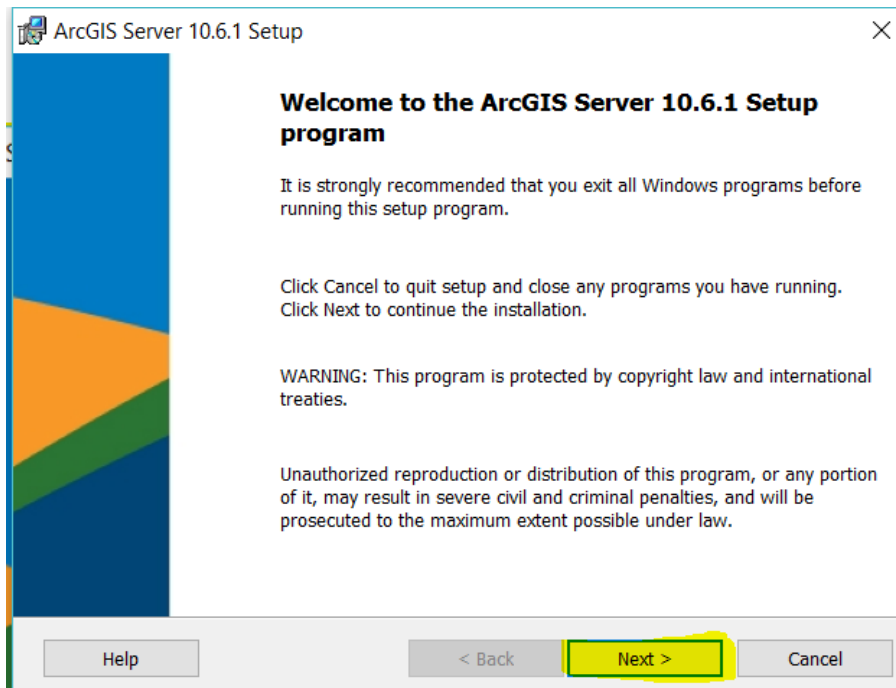
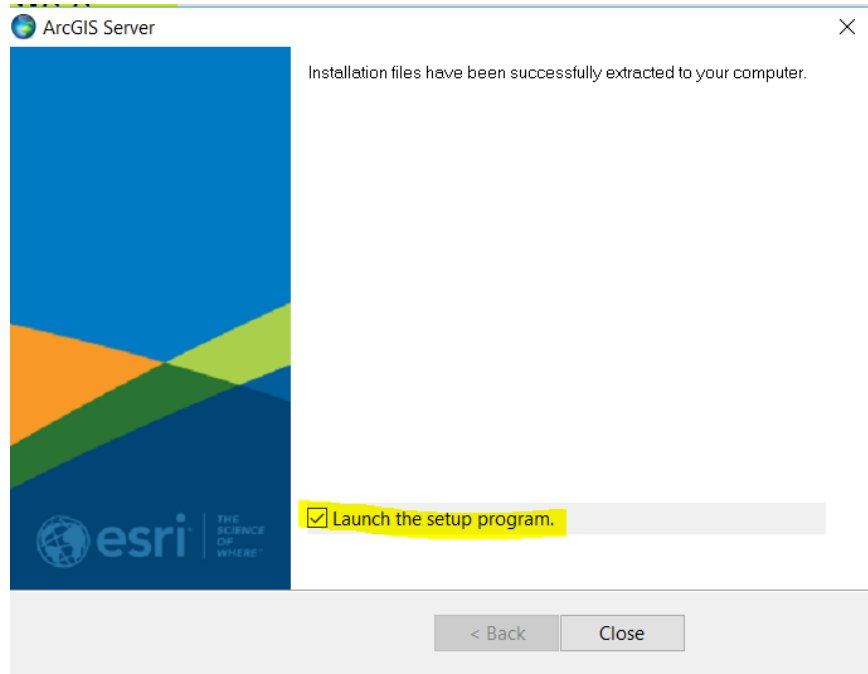
This section describes the installation process of ArcGIS Server 10.6.1 components on Graciela Moliner's computer (**DESKTOP-3TRDRBG**).

File Name	Date/Time	Type
ArcGIS_License_Manager_Linux_2010_0_102210x64.exe	8/1/2018 12:41 PM	Application
ArcGIS_License_Manager_Windows_2018_0_163304.exe	8/1/2018 12:39 PM	Application
ArcGIS Monitor 1061_164029.exe	8/1/2018 12:42 PM	Application
ArcGIS_Server_Windows_1061_163968.exe	8/1/2018 11:29 AM	Application
ArcGIS_Workflow_Manager_for_Server_1061_164020.exe	8/1/2018 10:43 AM	Application
CloudBuilder-10-6-1.application	8/1/2018 12:38 PM	Application Manif
Database_Server_Workgroup_1061_164004.exe	8/1/2018 10:42 AM	Application

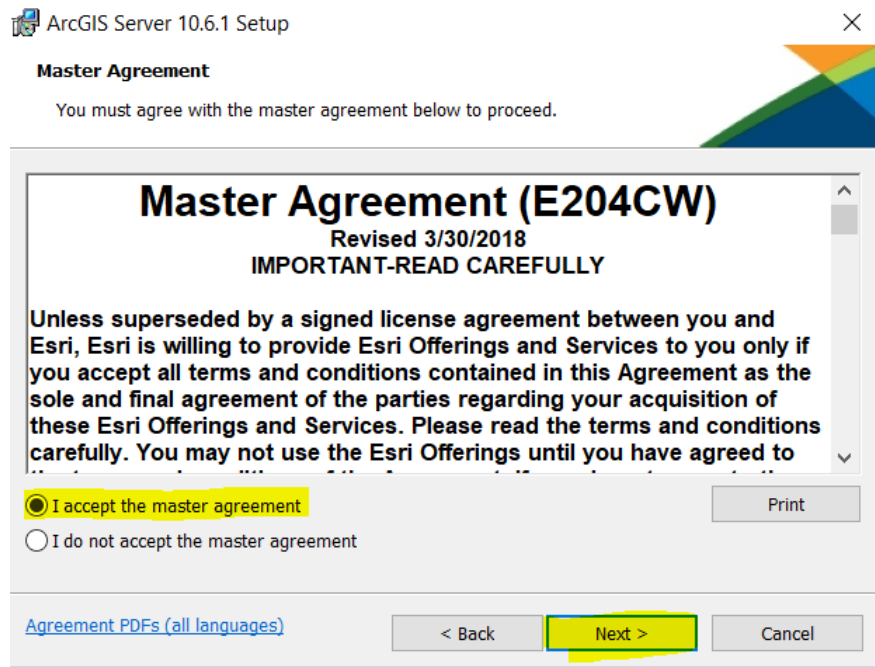
Step 1. Double click on the installation file an then click Next.



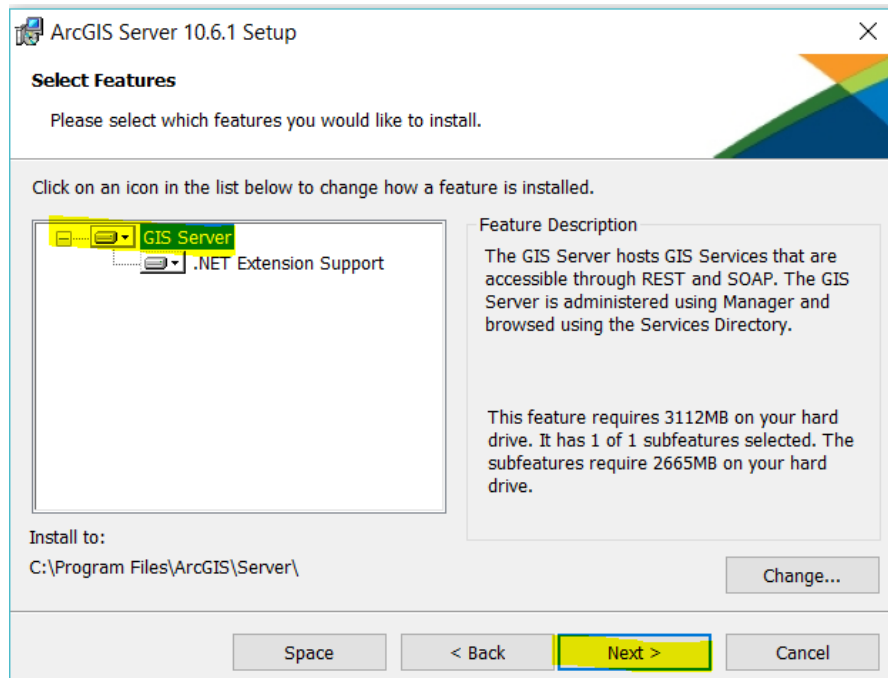
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Step 2. Accept the licensing agreement and press Next.



Step 3. In the "Select Features" window, keep the default options and click Next.



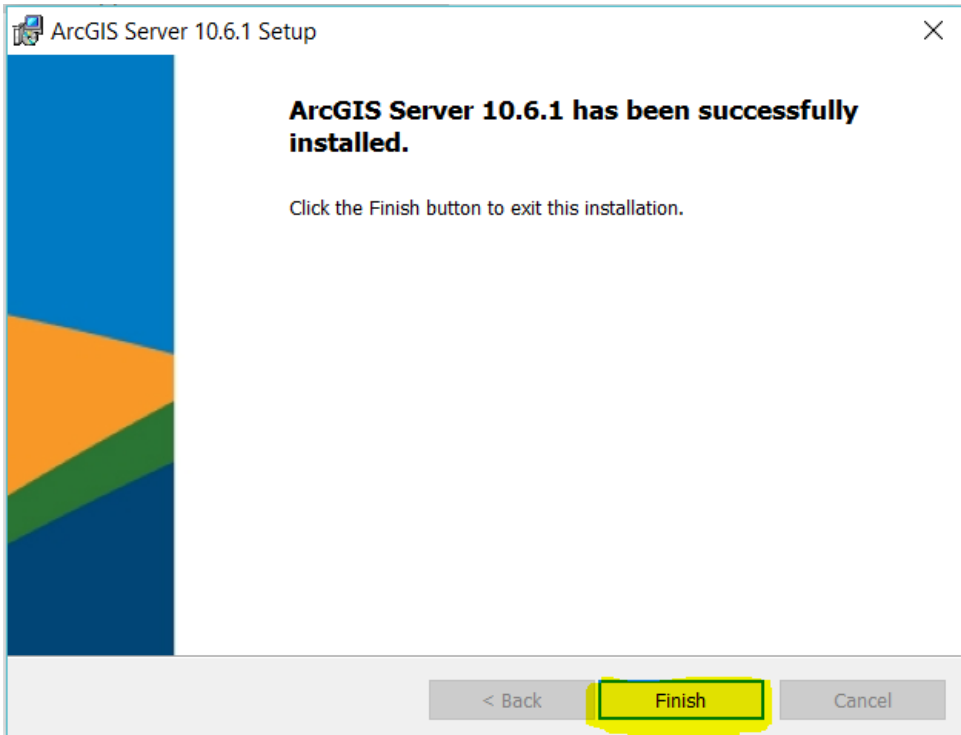
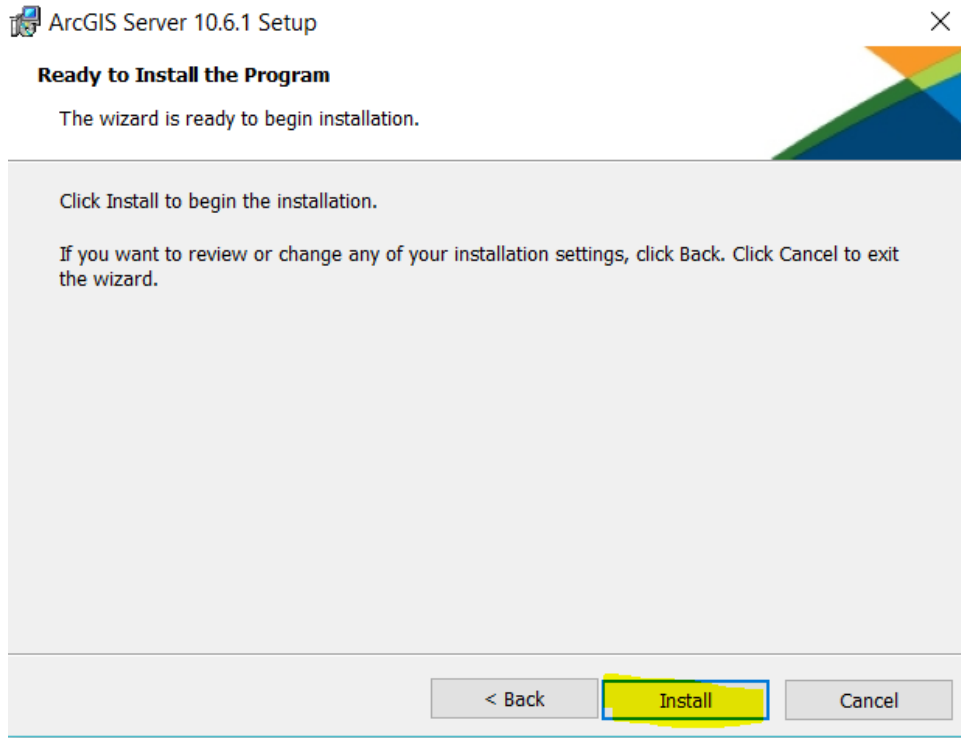
Step 4. During the installation process, a user account is created leaving the default name "arcgis" with password "arcgis". This user account is not a domain user and is used to access the operating system resources. The password must not be modified.

The screenshot shows the 'Specify ArcGIS Server Account' dialog box. It has a title bar 'ArcGIS Server 10.6.1 Setup' and a close button. The main heading is 'Specify ArcGIS Server Account' with the instruction 'Specify the account that the ArcGIS Server processes will run as.' There are two radio button options. The first option, 'Specify the account name and password:', is selected. Below it are three text input fields: 'ArcGIS Server Account:' containing 'arcgis', 'Password:' containing six dots, and 'Confirm password:' containing six dots. The second option, 'I have a configuration file with the account information generated by a previous run of this setup.', is unselected. Below it is a 'Filename:' text box and a 'Browse...' button. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

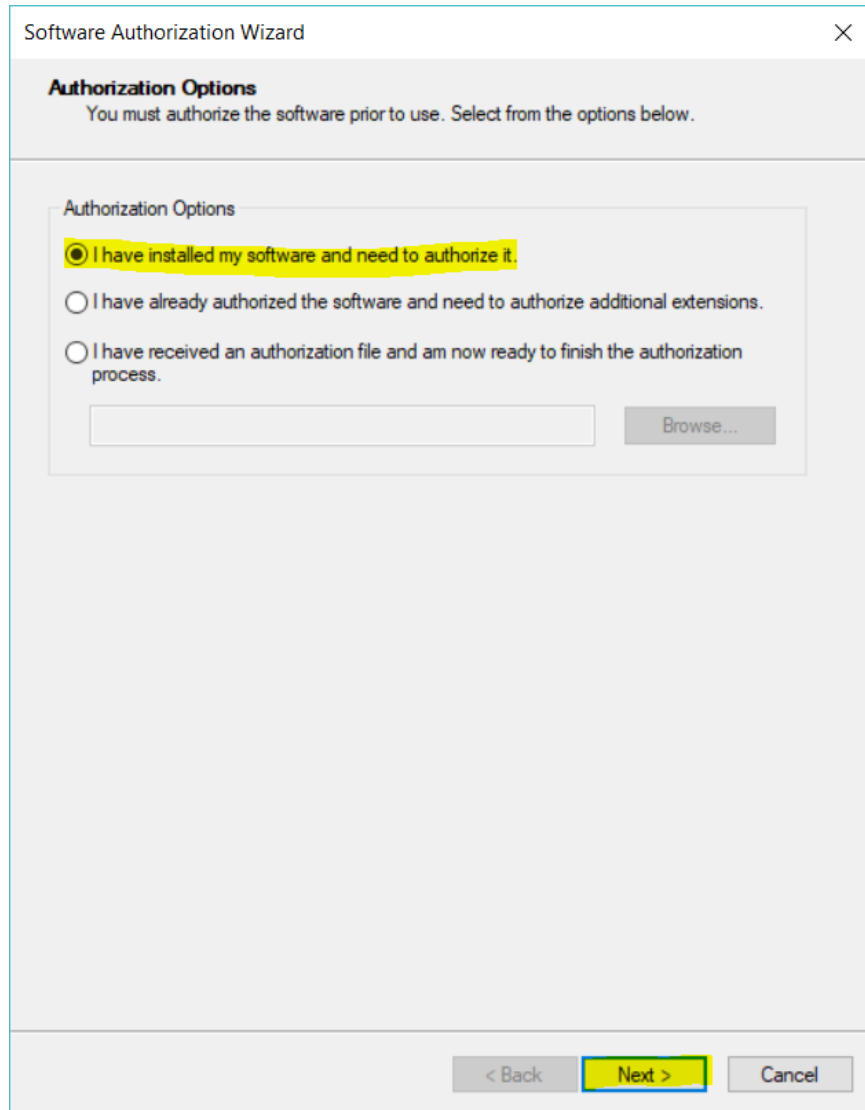
Step 5. The configuration file was not saved, it was not necessary at this time.

The screenshot shows the 'Export server configuration file' dialog box. It has a title bar 'ArcGIS Server 10.6.1 Setup' and a close button. The main heading is 'Export server configuration file' with the instruction 'Export server configuration file'. The text below explains: 'Exporting a server config file helps you with installing multiple systems that use the same server configuration. It will create the user account, and grant it the necessary privileges on the system based on this configuration file.' There are two radio button options. The first option, 'Do not export configuration file.', is selected and highlighted with a yellow background. The second option, 'Export configuration file. This file should be placed in a properly secured directory.', is unselected. Below it is a 'Filename:' text box and a 'Browse...' button. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a yellow background.

Step 6. Click Install and at the end of the installation process click Finish.



Step 7. After the installation finished, ArcGIS for Server was authorized using the option I have installed my software and need to authorize it.



Software Authorization Wizard ×

Authorization Method
Select the method you want to use to authorize the software.

Authorize with Esri now using the Internet.
(This automatic method is the easiest way to authorize. It requires an Internet connection.)

Authorize at Esri's website or by email to receive your authorization file.

Software Authorization Wizard ✕

Authorization Information
We will use the following information to verify our records and authorize your use of the software. (* required field)

*First Name:	<input type="text" value="Graciela"/>
*Last Name:	<input type="text" value="Garcia Moliner"/>
*Organization:	<input type="text" value="CFMC"/>
Department:	<input type="text"/>
*Address 1:	<input type="text" value="270 Muñoz Rivera Ave. Suite 401"/>
Address 2:	<input type="text"/>
*City:	<input type="text" value="San Juan"/>
*State/Province:	<input type="text" value="Puerto Rico"/>
*Zip/Postal Code:	<input type="text" value="00918"/>
*Location:	<input style="border: none; background-color: #e0e0e0; padding: 2px;" type="text" value="Puerto Rico"/>
*Phone Number:	<input type="text" value="(787) 766-5926"/>
*Email:	<input type="text" value="graciela.garcia-moliner@noaa.gov"/>
Comment:	<input type="text"/>

Optional user-defined authorization description.

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Software Authorization Wizard

Authorization information (continued)
We will use the following information to verify our records and authorize your use of the software. (* required field)

*Your Organization: U.S. Federal Government/Tribes

*Your Industry: Fisheries & Wildlife

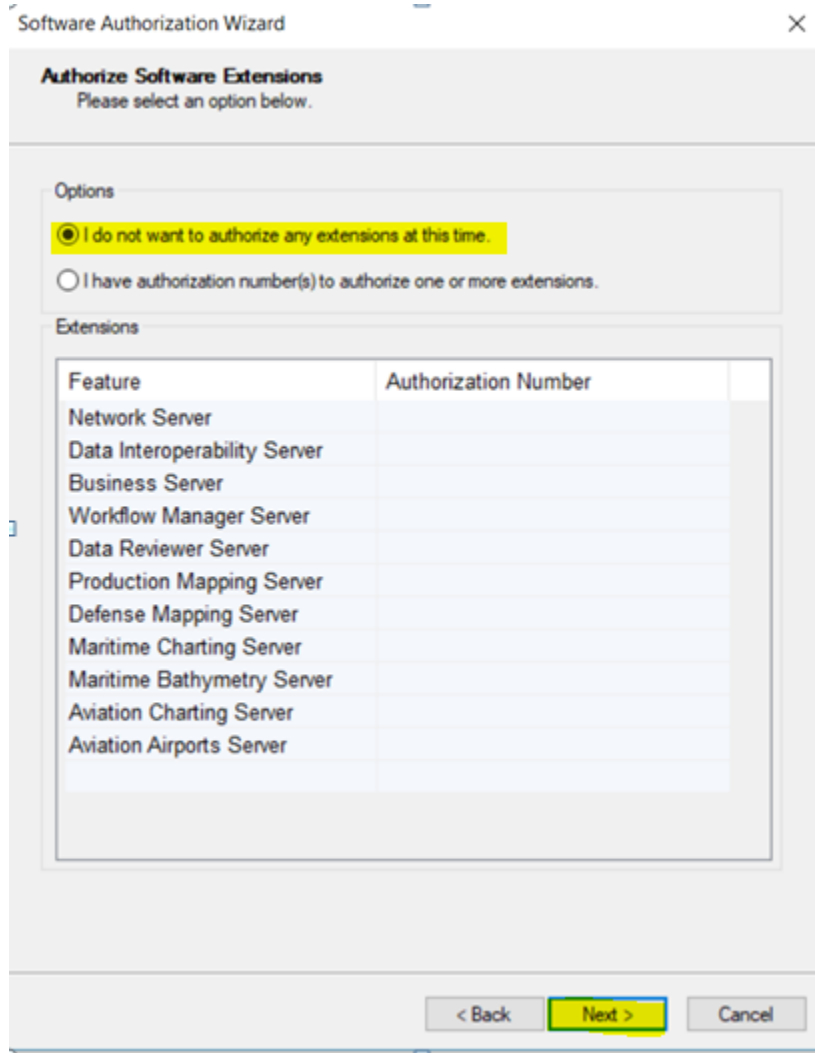
*Yourself: Analyst/Researcher/Specialist

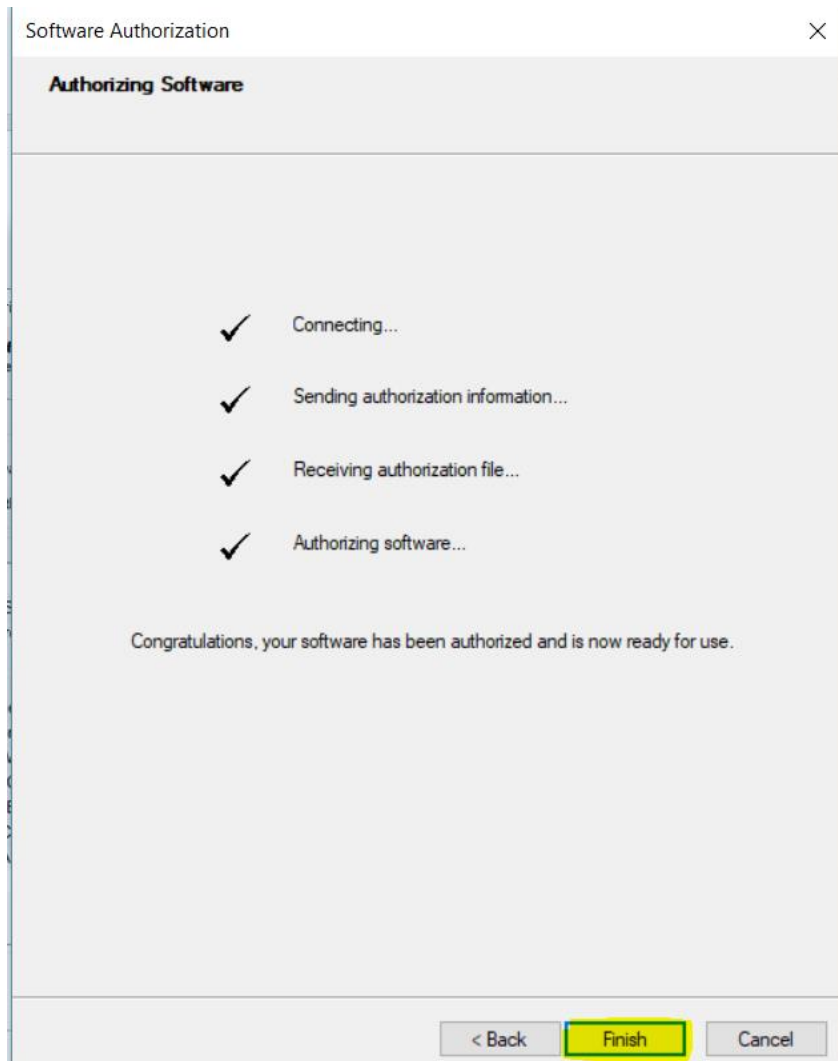
The personal information you supplied is protected under Esri's privacy policy. If you want to view Esri's privacy policy, click the View button below.

View...

< Back **Next >** Cancel

Step 9. In the "Authorize Software Extensions" window, the option "I do not want to authorize any extensions at this time" was selected. At the end of the authorization process, the "Finish" option was selected.

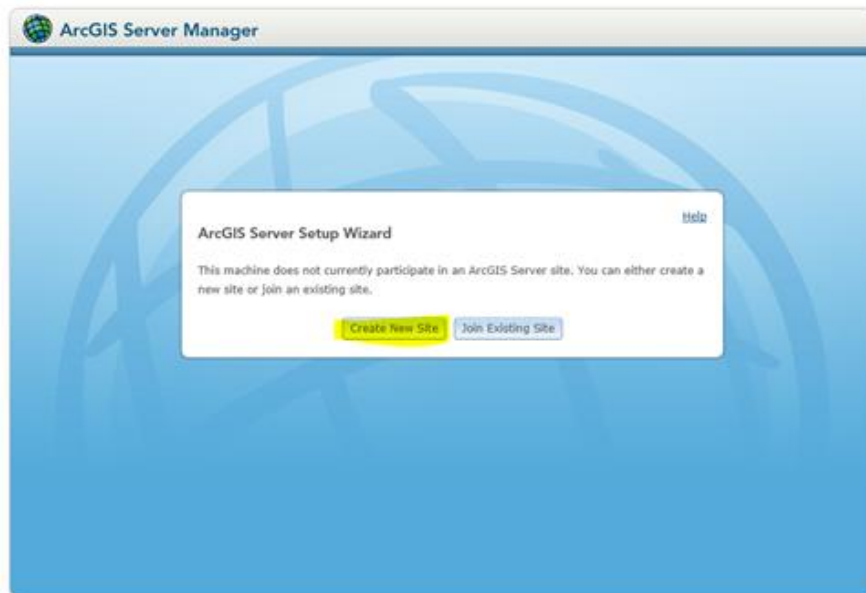




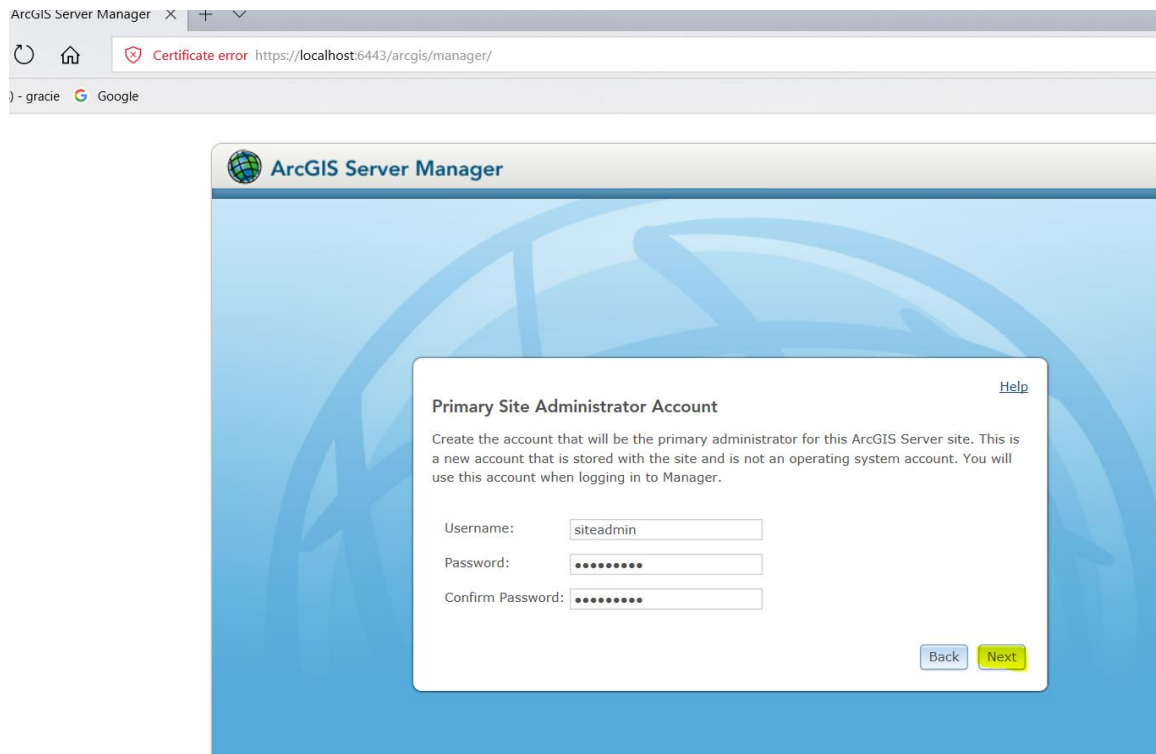
Step 10. After the ArcGIS for Server authorization is completed, an internet browser window opens automatically to create and configure the "New Site" or join an existing one. The "Create New Site" option is selected, to begin the site creation process.

Certificate error https://localhost:6443/arcgis/manager/

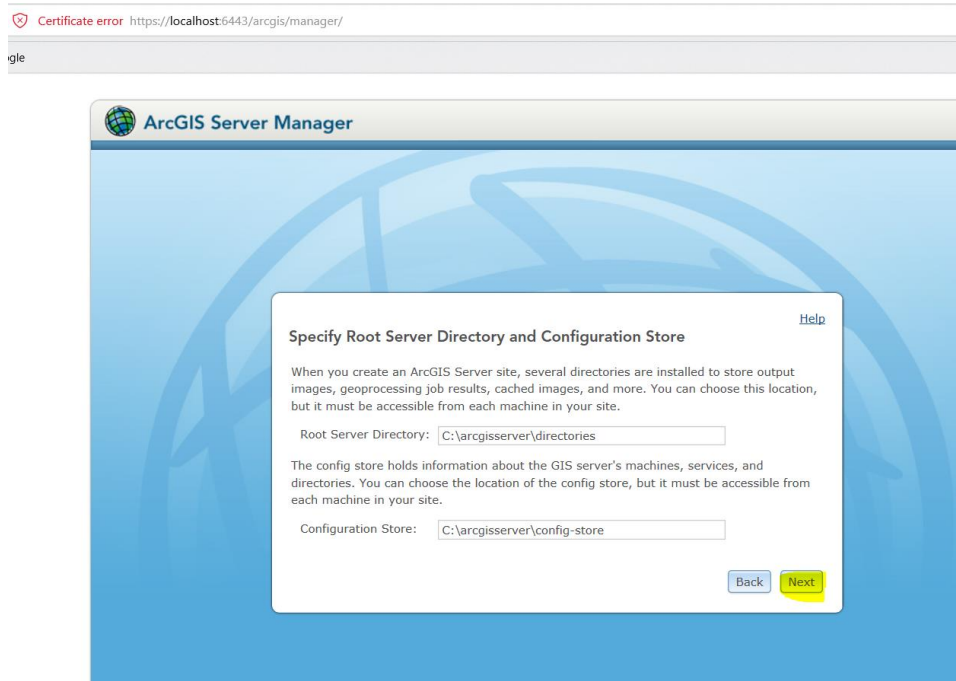
file



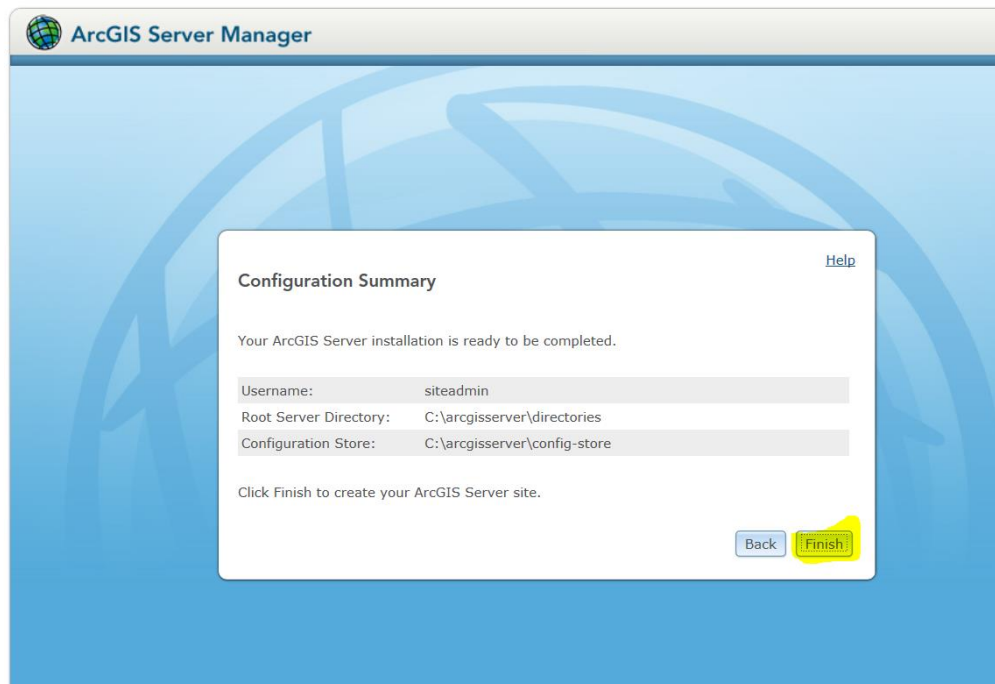
Step 11. For the ArcGIS Server administration account the “**siteadmin**” name was created.



Step 12. The partition Disk C: \ was specified as the container for the ArcGIS for Server directories.

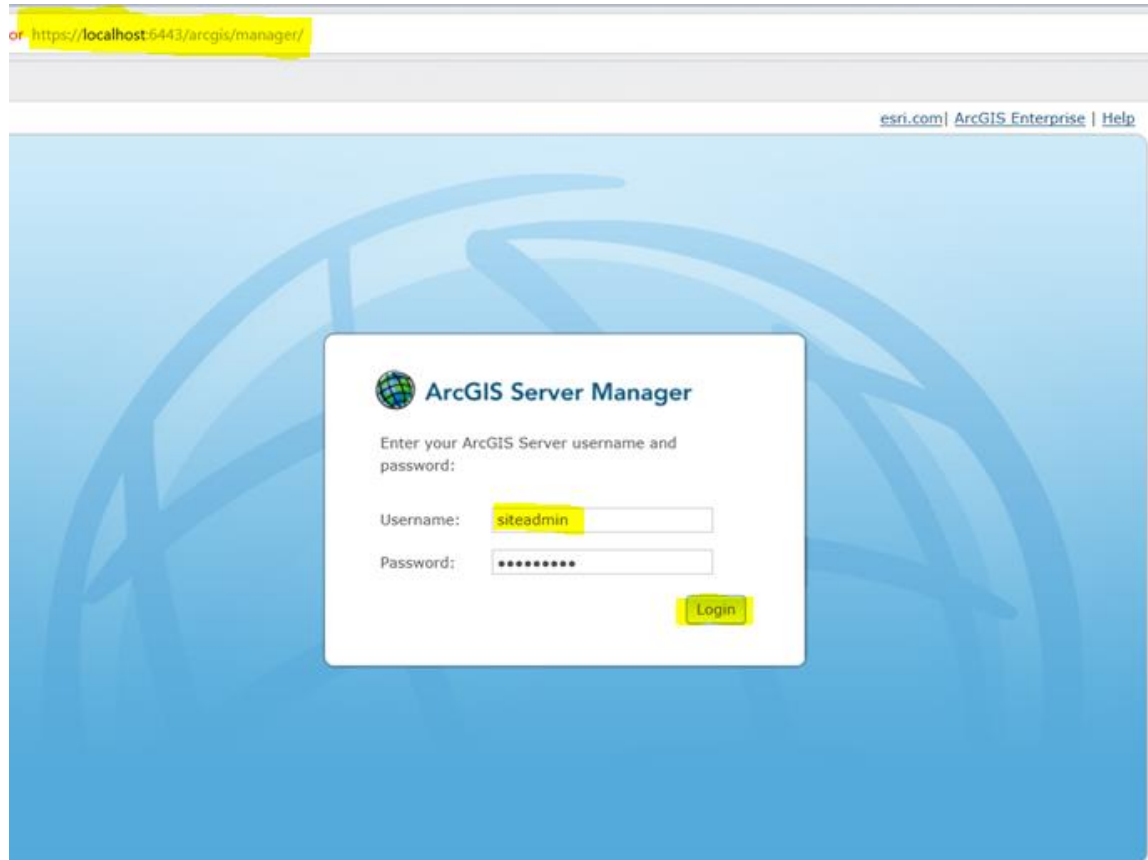


Step 13. Click **Finish**.



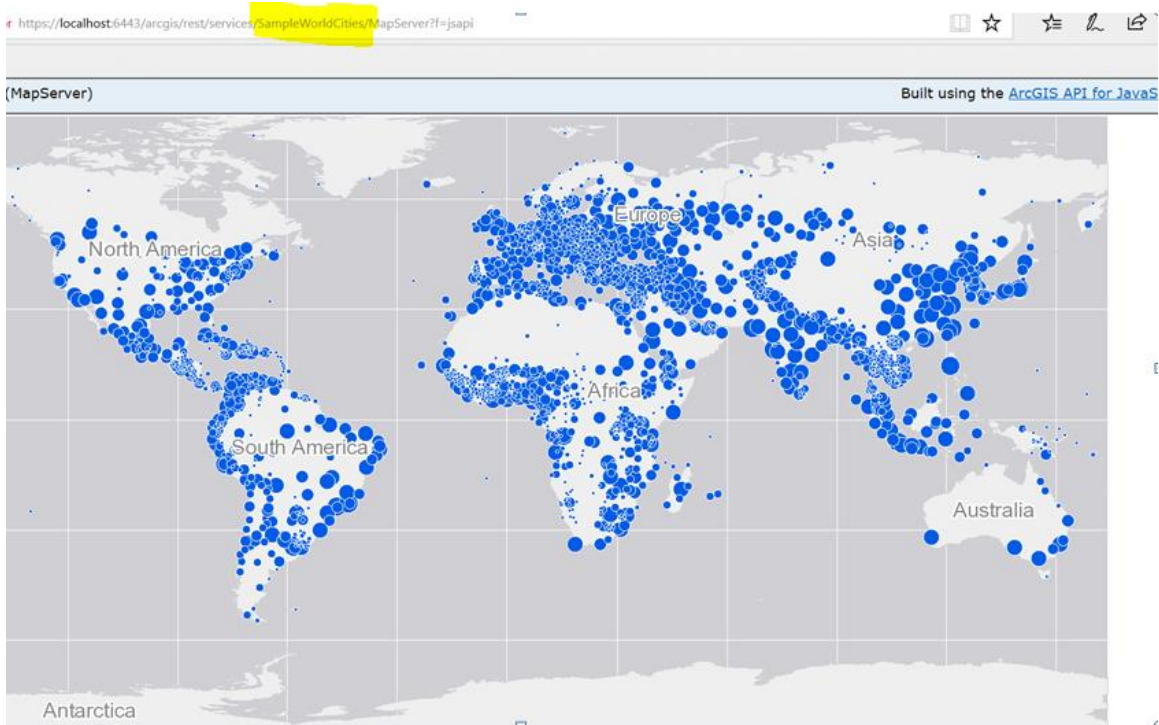
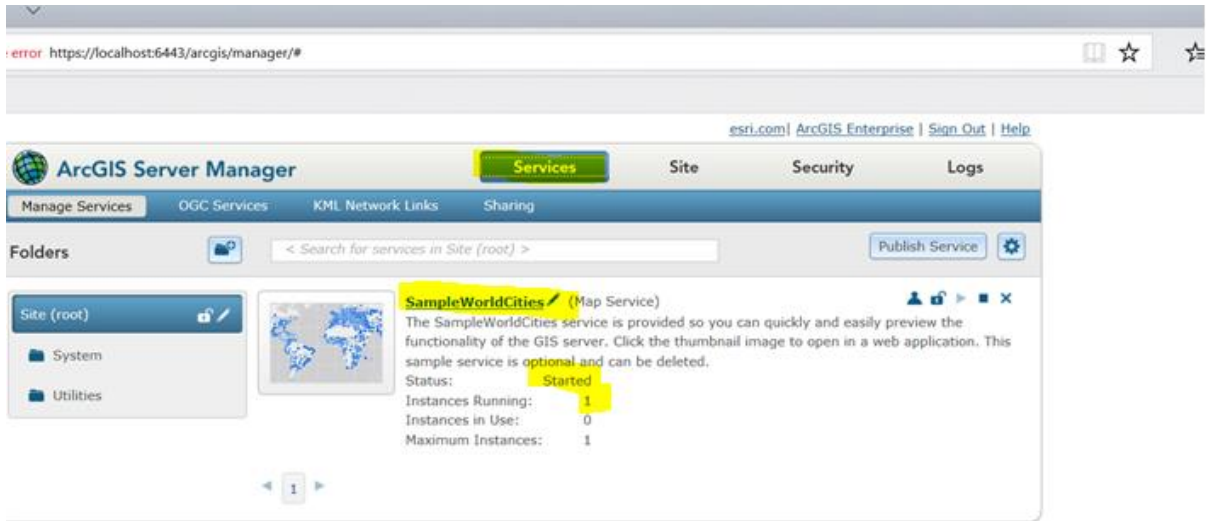
Step 14. The installation of ArcGIS Server was verified.

In order to verify if the installation was done successfully and ArcGIS Server is working as expected it must be done through the ArcGIS Server Manager application. The ArcGIS Server installation process configures a service called "**SampleWorldCities**". This service helps verify that the installation of the software was successful.



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In Manage Services, the SampleWorldCities Map service is selected.



3. User accounts and passwords

User	Password	Tipo
siteadmin	siteadmin	ArcGIS Server site administrator account
arcgis	arcgis	ArcGIS Server and OS account