The Geographical Names Database of The Kingdom of Saudi Arabia

By

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GEOSA
الهـيئة العـامـة للمسـاحـة
والمعلومـات الجيومكانية
General Authority for Survey
and Geospatial Information

INTRODUCTION

- Having reliable database management systems helps with the adequate storage and effective management of geospatial data.

- With that in mind, the General Authority for Survey and Geospatial Information in the KSA developed the Geographical Names Database of the country.

- I am happy to take you through the objective, overview, and structure of the geographical names database of the Kingdom of Saudi Arabia.

GENERAL AUTHORITY FOR SURVEY AND GEOSPATIAL INFORMATION

▪ General Authority for Survey and Geospatial Information is the national authority for Surveying and GIS activities in the KSA.

▪The authority is the custodian of the geographical names in the KSA, and it has a dedicated department for collecting and documenting geographical names.

▪In addition, the authority leads the National Committee on Geographical Names in the KSA.

MANDATE

The authority aims to regulate, develop, supervise, and monitor the survey, geospatial information, & related imagery sectors in the Kingdom.

The key goals included in the mandate are as follows.

- Establish & maintain rules, standards

- Propose and enact Laws

- Build national capacities

- Supervise publications of Atlases.

- License sector activities

- Protect stakeholder interests

- Attract investment & growth in the sector.

- Develop and approve National Geospatial Infrastructure

- Cooperate with International agencies, organizations, etc.

- Provide specialized consultancy & support for borders.

- Develop and Implement strategic Plans

- Provide geospatial consultancy services.

- Represent Kingdom in its field of specialty.

GEOGRAPHICAL NAMES DATA MANAGEMENT- EVOLUTION


Geographical names were stored on papers

Then, we relied on spreadsheets to store names.

Now, geographical names are stored in a geodatabase

GEOGRAPHICAL NAMES DATABASE OF THE KSA - OVERVIEW

▪ The Geographical Names Database is an oracle-based enterprise geodatabase.

▪The database currently has about 140,000 names stored in it.

▪ Geographical names are represented with a point feature class, and the names' extent is defined with a polygon and a line feature class.

▪ The geodatabase also contains an alternative names table and an attachment table.

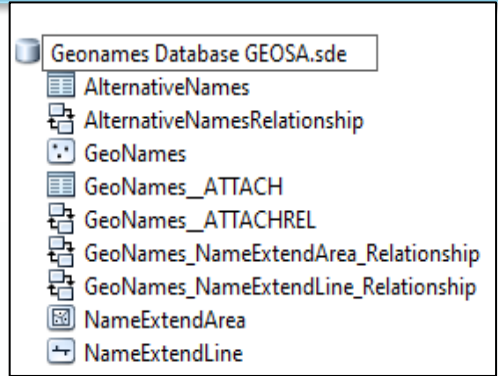▪ In the database, the geographical names are classified into eight themes.
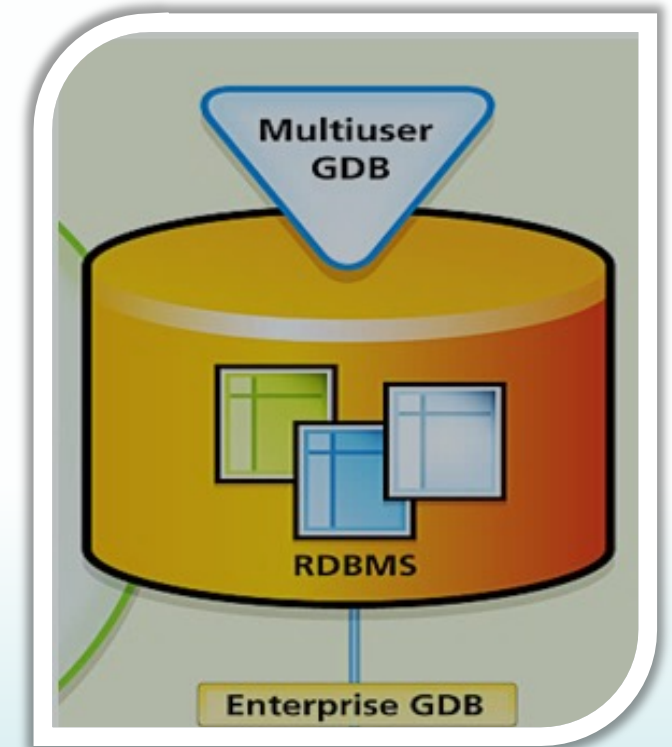
KEY OBJECTIVES

The database was developed to achieve the following goals,

- To effectively store and manage geographical names in a centralized database system.

- To increase data quality and security.

- To update the name's information in the field by smartphones or tablets both online & offline.

- To work in a multi-user environment.

- To share the Geographical Names Database with internal and external users, such as other departments and government organizations.

- To create a Geographical Names Portal (Search engine/explorer) for the users inside and outside the authority.

DATABASE ELEMENTS

Geonames Database GEOSA.sde
- AlternativeNames
- AlternativeNamesRelationship
- GeoNames
- GeoNames__ATTACH
- GeoNames__ATTACHREL
- GeoNames_NameExtendArea_Relationship
- GeoNames_NameExtendLine_Relationship
- NameExtendArea
- NameExtendLine

NameExtendArea

The polygon feature class delineates the extent of the area features such as Mountains, Dunes, etc. The name's extent helps cartographers to place names appropriately on the map

NameExtendLine

The Line feature class delineates the extent of the line features such as Wadi, Stream, etc. The name's extent help cartographers to place names appropriately on the map

GeoNames_NameExtendArea_Relationship

GeoNames_NameExtendLine_Relationship

GeoNames

This is the essential element in the database. This point feature class represents all the geographical names and contains all the information about them.
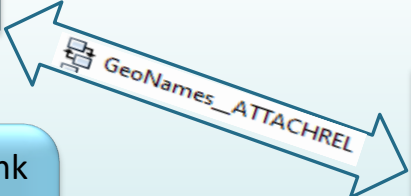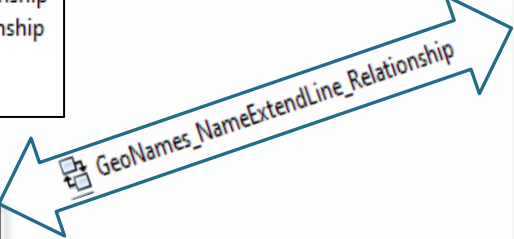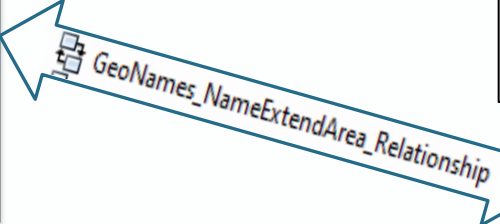
AlternativeNames

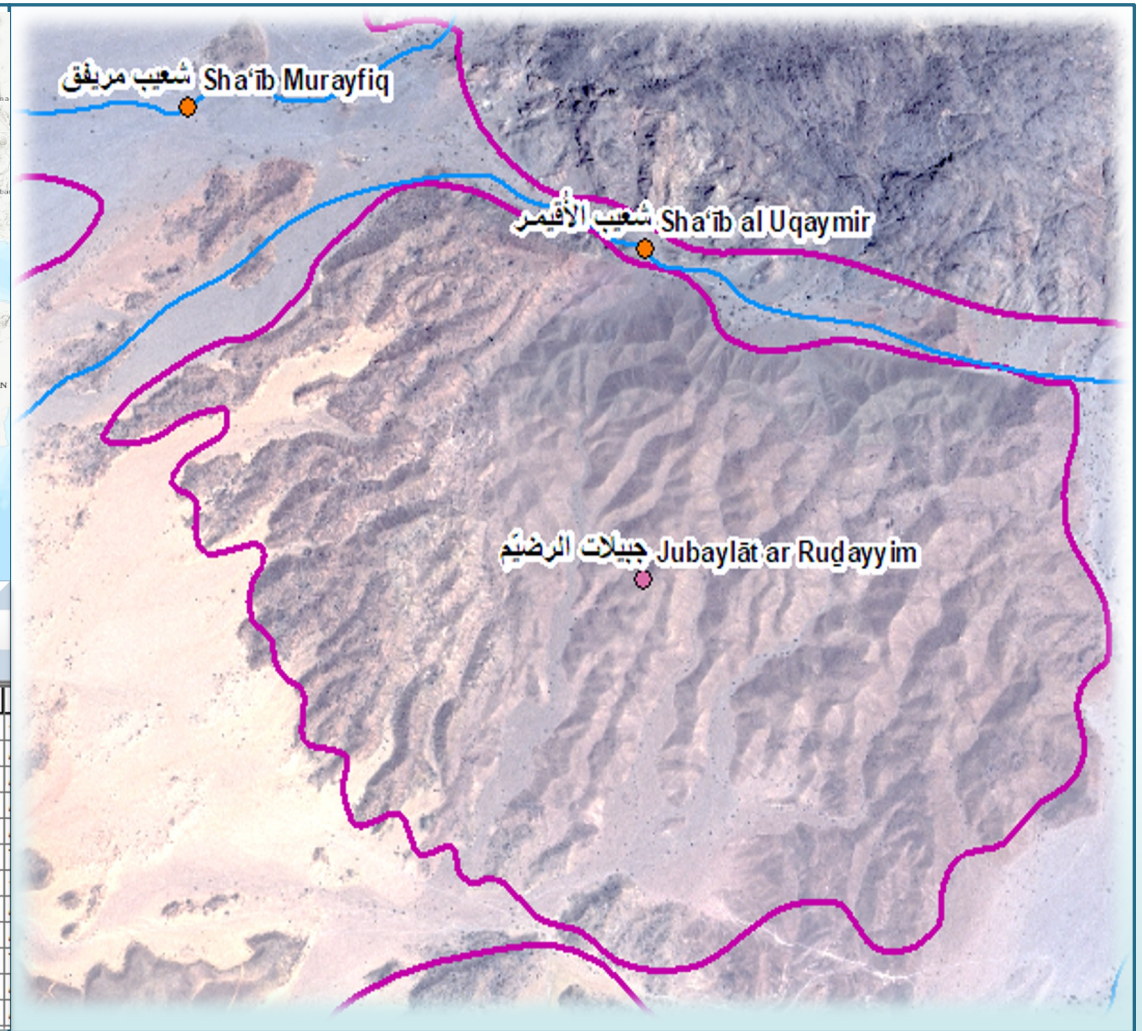This table stores the alternative names of the geographical names.

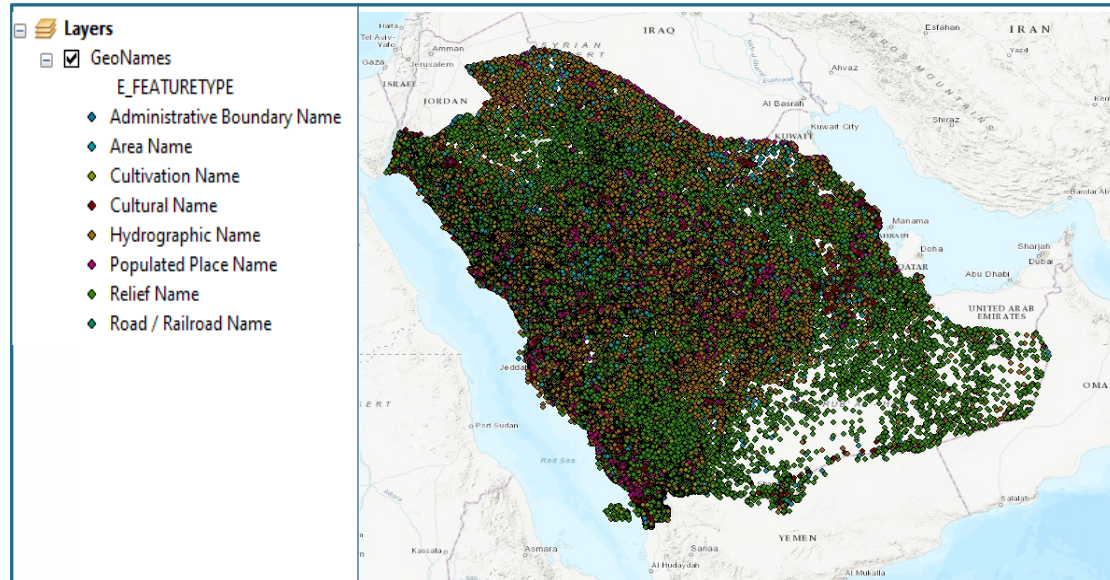*AlternativeNamesRelationship*

Relationship classes link the Geonames feature class with NameExtent feature classes and tables.

GeoNames__ATTACHREL

GeoNames__ATTACH

This table stores voice files and pics of the geographical names.

MAP VIEW

ATTRIBUTE FIELDS

The following are the primary attribute fields in the GeoNames feature class.

Field Name	Alias	Description	Data type
OBJECTID	OBJECTID	An ObjectID is a unique, not null, integer field that uniquely identifies table rows in a geodatabase.	ObjectID
GLOBALID	GLOBALID	GlobalIDs uniquely identify a feature or table row in a geodatabase.	GlobalID
E_FEATURE	Feature	Feature name in English	text
A_FEATURE	المعـلم	Feature name in Arabic	text
ARABICN	ArabicName	Geographical Name in Arabic	text
ROMANN	RomanName	Geographical Name in Roman	text
E_FEATURETYPE	FeatureType	Feature Classification Category in English	Short Integer
A_FEATURETYPE	نوع المعلم	Feature Classification Category in Arabic	Short Integer
E_PROVINCE	Province	Province Name in English	text
A_PROVINCE	المنطقة الادارية	Province Name in Arabic	text
E_DATASOURCE	DataSource	The owner organization of the data.	text
E_NAMESTATUS	NameStatus	Name Status in English('Approved,' 'Unapproved,' 'Documented,' Expired' or 'other')	text
COMMENTS	Comments	Names comments	text
LONGITUDE	Longitude	Longitude in decimal degrees	Float
LATITUDE	Latitude	Latitude in decimal degrees	Float
GN_ID	GN_ID	Same as Object ID	Long Integer
MAP_25K	Map_25K	Map Sheet number Scale 1:25K	text

FEATURE CATALOGUE

The geographical names have been categorized into eight themes (Feature type) in the GeoNames feature class. The following subtypes were created to represent the themes. Sub-classes (Feature) are represented by domains.

For Eg: Name = بئر البعقة (Bi'r Al Ba'qah)   Theme (Feature Type) : Hydrographic Name   Feature = Water Well

CODE	E_FEATURE_TYPE	A_FEATURE_TYPE	TOTAL DOMAIN VALUES
10	Administrative Boundary Name	اسم منطقة ادارية	5
20	Hydrographic Name	اسم معلم مائي	35
30	Area Name	اسم منطقة	10
40	Populated Place Name	اسم منطقة مأهولة	4
50	Road / Railroad Name	اسم طريق بري / سكة الحديد	9
60	Cultural Name	اسم منشأة حضرية	72
70	Relief Name	اسم تضاريسي	35
80	Cultivation Name	اسم مشاريع زراعية	6

OBJECTID *	Feature	المعـلم	ArabicName	RomanName	FeatureType	نوع المعلم
293	water well	بئر ماء	بئر اللواوي	Bi'r al Luwāwī	Hydrographic Name	اسم معلم مائي
294	water well	بئر ماء	بئر اللّيا	Bi'r al Liyyā	Hydrographic Name	اسم معلم مائي
295	mountain	جبل	جبل الشهبا	Jabal ash Shahbā	Relief Name	اسم تضاريسي
296	mountain	جبل	جبل الكتيّد	Jabal al Kitayyid	Relief Name	اسم تضاريسي

GEOGRAPHICAL NAMES STATISTICS

The following table shows the availability of the geographical names in the database for each theme (Name Class)

THEME	GEONAMES COUNT
Administrative Boundary Names	856
Populated Place Name	27516
Hydrographic Name	56601
Road / Railroad Name	755
Cultivation Name	2867
Cultural Name	3904
Area Name	5506
Relief Name	43710
Total Names	141715

DOMAINS

Domain values are used in various fields in the GeoNames feature class. Here are a few examples,

A few domain values for Hydrographic Names

Code	English Description	Arabic Description
DAM	dam	سد
WAD	wadi	وادي
PND	pond	حوض
LK	Lake	بحيرة
STM	stream	جدول
CNL	canal	قناة

A few domain values for Cultural Names

Code	English Description	Arabic Description
MALL	mall	مركز تجاري
MKT	market	سوق
HTL	hotel	فندق
HSP	hospital	مستشفى
HSPC	clinic	عيادة
CTRM	medical center	مركز طبي

A few domain values for Province field
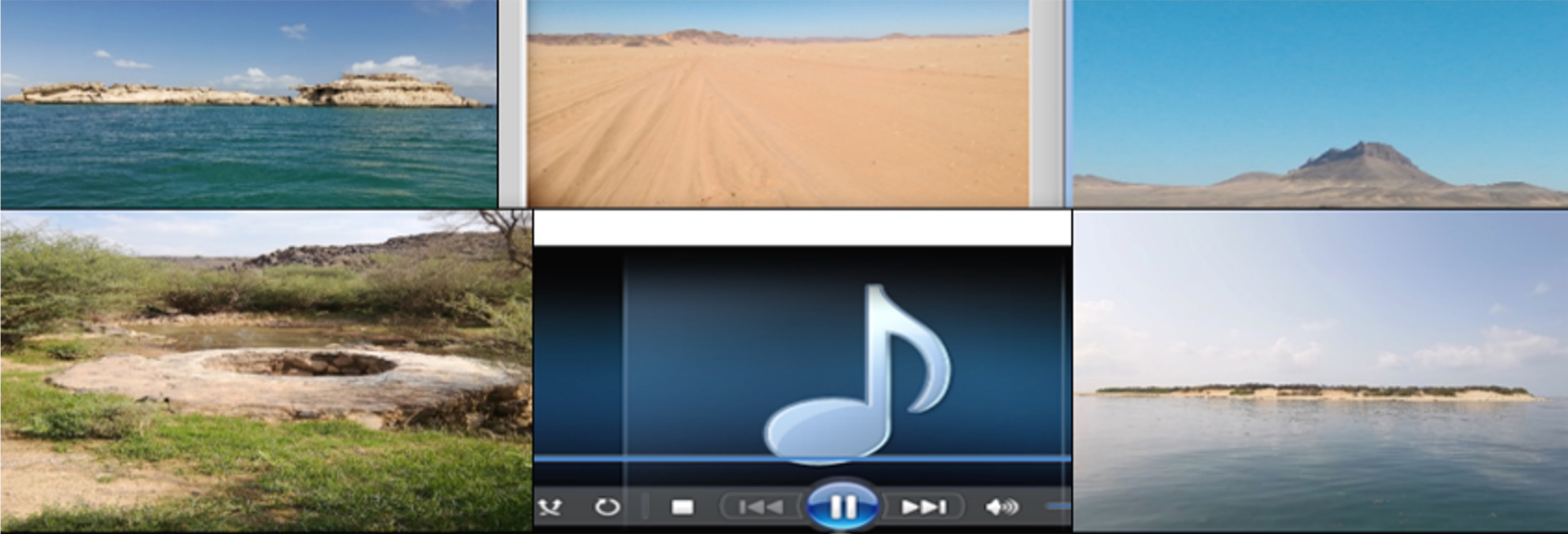
Code	English Description	Arabic Description
RD	Al Riyadh	الرياض
MK	Makkah	مكة المكرمة
MD	Al Madinah	المدينة المنورة
QS	Al Qassim	القصيم
EP	Eastern Province	المنطقة الشرقية
AS	Asir	عسير
TB	Tabuk	تبوك
HL	Hail	حائل
NB	Northern Borders	الحدود الشمالية
JZ	Jizan	جازان
NJ	Najran	نجران
BH	Al Bahah	الباحة
JF	Al Jawf	الجوف

A few domain values for Data Source Field

CODE	English Description	Arabic Description
GEOSA	General Authority for Survey & Geospatial Information	الهيئة العامة للمساحة والمعلومات الجيومكانية
GDMS	General Directorate of Military Survey	الإدارة العامة للمساحة العسكرية
SGS	Saudi Geological Survey	الهيئة المساحة الجيولوجية السعودية
MIMR	Ministry of Industry and Mineral Resources	وزارة الصناعة والثروة المعدنية
GAS	General Authority for Statistics	الهيئة العامة للإحصاء

ATTACHMENTS

The geographical names database includes an attachment table that allows attaching files such as voices (pronunciation), pictures, and videos of geographical features.

ATTACHMENTID *	REL_GLOBALID *	CONTENT_TYPE	ATT_NAME	DATA_SIZE	DATA	GLOBALID *
1	{30A4EFBD-D49D-4352-93C8-98B03F20D627}	image/jpeg	شعب نقب الفرع-01.jpg	1441255	Blob	{302F3702-18E1-49DD-8CDF-7A946EC73C6A}
2	{30A4EFBD-D49D-4352-93C8-98B03F20D627}	video/mp4	شعب نقب الفرع-14.mp4	54042	Blob	{93B12C1D-CD88-4618-A4D0-C421115D9810}
3	{349CF82A-36EA-4C49-B24C-C2BD7EFA29F0}	video/mp4	شعب النفاذات-18.mp4	50430	Blob	{BACB09FC-B99F-46A2-B9F3-ACF065A46890}
4	{349CF82A-36EA-4C49-B24C-C2BD7EFA29F0}	image/jpeg	شعب النفاذات-01.jpg	1472114	Blob	{49061276-3A0B-4602-8C40-85C102067CA5}
5	{0D4707C2-8279-4FFD-8244-A221529E2E04}	video/mp4	شعب الحرد-13.mp4	40414	Blob	{BBA44671-4C16-4E80-8FAA-FDF867218D31}
6	{0D4707C2-8279-4FFD-8244-A221529E2E04}	image/jpeg	شعب الحرد-01.jpg	1472114	Blob	{A5755C88-95A1-4FB4-B81B-4286B6C31301}
7	{908B987D-E1DD-4C44-8432-0BCE48B8FDB7}	image/jpeg	وادي ريان-01.jpg	2385841	Blob	{0998F682-73D4-470F-9594-FCFE9F8CF02A}
8	{908B987D-E1DD-4C44-8432-0BCE48B8FDB7}	video/mp4	وادي ريان-03.mp4	46249	Blob	{EFAFA4AF-E8C5-4126-8814-9DA45F1C2CFE}
9	{9E60DF62-E530-4224-8D33-4FCD998B16B9}	video/mp4	شعب الحريرد-12.mp4	40404	Blob	{D10E49A6-42C4-444A-9692-0664BEE6E8BF}
10	{9E60DF62-E530-4224-8D33-4FCD998B16B9}	image/jpeg	شعب الحريرد-01.jpg	2003470	Blob	{B75CA910-4CA6-46DA-ABFB-804C771AC21B}
11	{E109AE37-0282-46DA-B795-F7CFBB3B3F8B}	video/mp4	ثمة ام طلحة-04.mp4	46252	Blob	{3E33C04A-975B-4A01-B52F-6E8A35A1BF6C}
12	{E109AE37-0282-46DA-B795-F7CFBB3B3F8B}	image/jpeg	ثمة ام طلحة-01.jpg	1085894	Blob	{9EE24A64-3B6A-4B5F-B605-8C67DA5DCE0D}

❑ One of the most powerful characteristics of the database is that it can store the "extent" of features.

❑ Area features like mountains, dunes, etc., are represented with a polygon feature class, and linear features like streams, roads, etc., are represented with a line feature class.

❑ The name's extent helps cartographers to place names appropriately and conveniently on maps.

ALTERNATIVE NAMES TABLES

The geographical names database includes a table that stores alternative geographical names (unofficial names) of features.

	OBJECTID *	GN_ID *	ArabicN	RomanN	Type	GLOBALID *
	1	23380	رجم الضعينة	Rijm Aḑ Ḏuʻayyinah	Old	{D06BA597-D9A5-40C4-94FF-B471DD96B53B}
	2	23233	جبل الشبرمية	Jabal ash Shubrumiyy	Local	{8E34EA50-B1F2-4C46-B804-6ACCB6F6F597}
	3	34673	ضلعان أمهات رؤوس	Ḑilʻān Ummahāt Ru'ūs	Local	{E88AFE99-DE42-4D76-9E86-D51FA0BD60C5}
	4	23329	حشة الحفيرة	Hishshat al Ḩufayyirah	Old	{6C9753E6-D2C9-40FD-83CE-E95BB05C9D1C}
	5	23383	سنفان أبو سدر	Sinfān Abū Sidir	Other	{BF310E78-271B-48DD-BCDF-F341F4B7239B}
	6	23345	جبل عروان	Jabal ʻArwān	Historical	{86B73FD0-8D54-4928-B642-32B885CFD1BE}
	7	23356	شعيب جهام	Shaʻīb Jahām	Old	{857DF083-CE97-4F41-BA47-C7DB8678CA14}
	8	23434	بئر الحسرج	Bi'r al Ḩasraj	Old	{EB247BE4-4A1B-40BC-9C09-CACD28AE7979}
	9	23356	شعيب الردينيات	Shaʻīb ar Rudayniyyāt	Local	{48D13B6A-B10B-422E-8479-DDD1A0891C34}
	10	23356	الروضة	Ar Rawḑah	Local	{2C4B624B-D079-4982-BE40-03234B858A61}
	11	23398	سقمان	Saqmān	Local	{415F2DF6-B882-4D60-8997-18651BD3561D}

EDITOR TRACKING

Editor tracking automatically records information about any additions and updates made in the geodatabase. It helps to maintain accountability and enforce quality control standards.

CREATED_USER	CREATED_DATE	LAST_EDITED_USER	LAST_EDITED_DATE	GN_ID *
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900074
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900075
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900076
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900077
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900078
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900079
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900080
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900081
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900082
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900083
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900085
PC	20-Mar-21 4:39:21 PM	K.SIYAF	12-Oct-22 8:09:49 AM	900086

GEOGRAPHICAL NAMES COLLECTION PROCESS
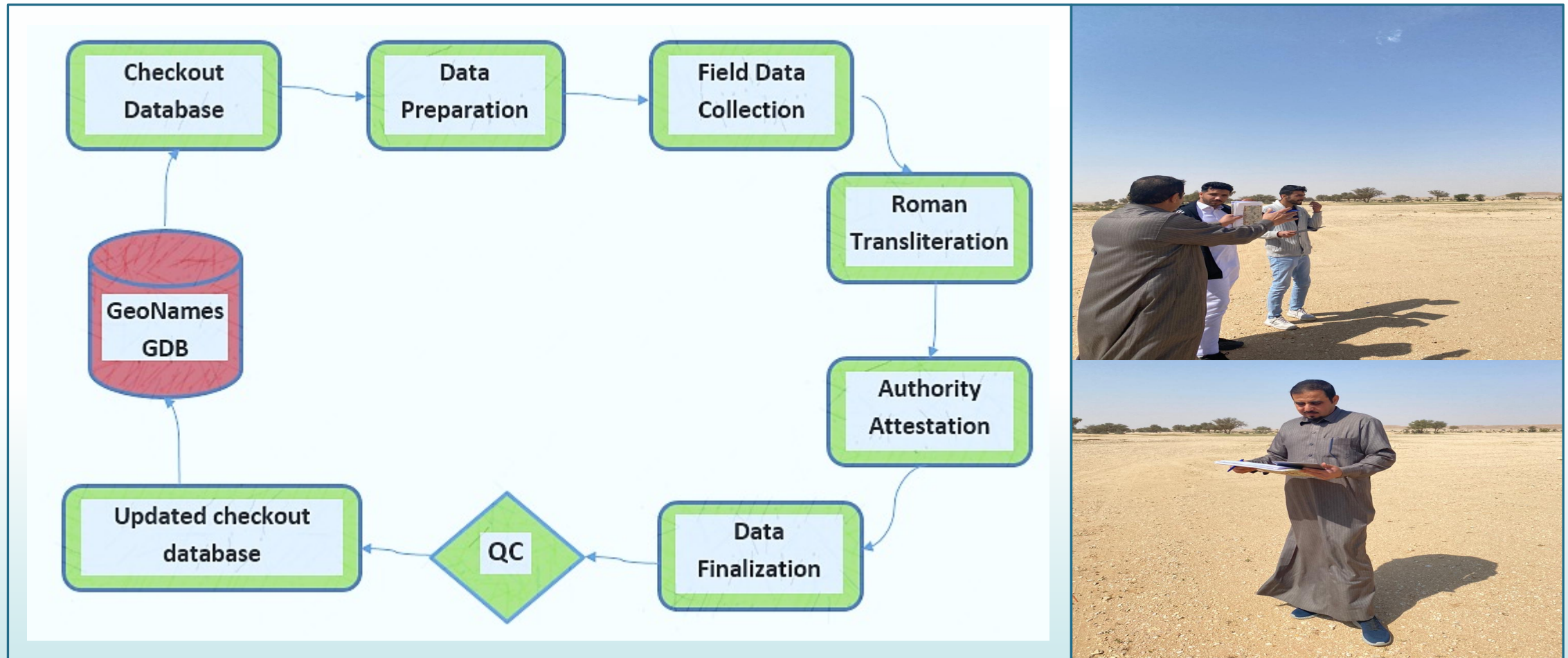
ISLAND PROJECT

- The island project was a significant achievement of the authority. In this project, island names were collected from the Red sea and Arabian gulf of the Kingdom's territory.

- Geographical names of the hydro features were also collected along with the multimedia files.

- About 1100 island names and 1900 names for other hydro and terrain features were collected and added to the geographical names database as part of the project.
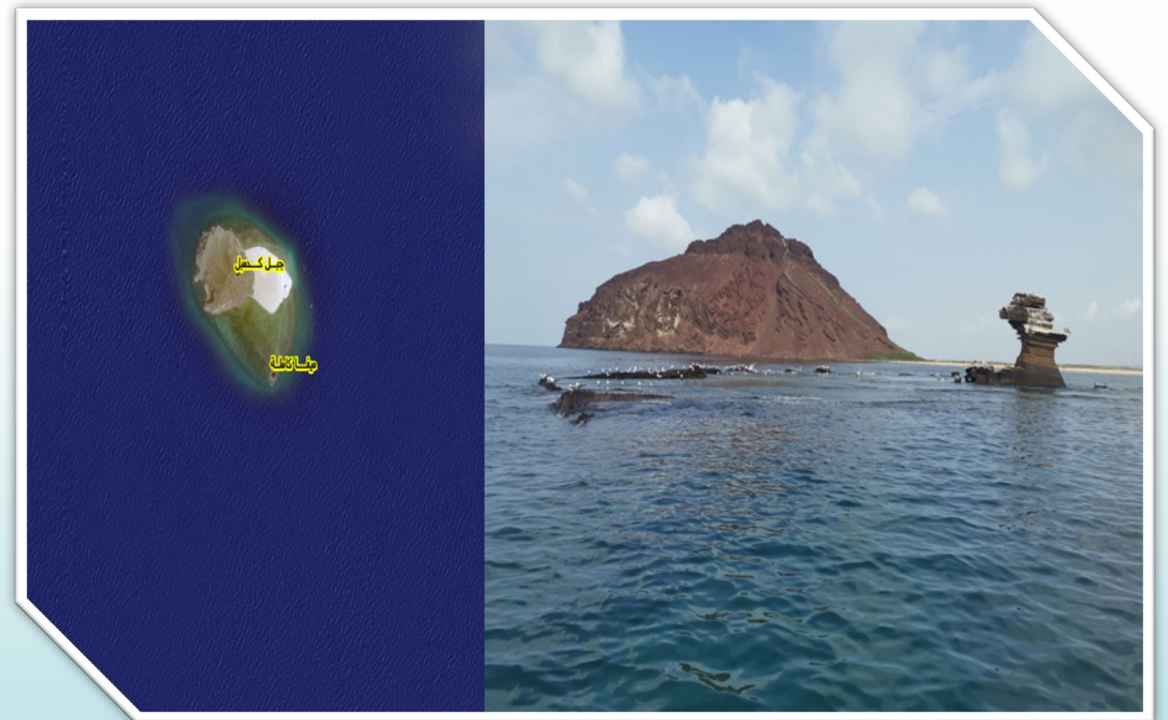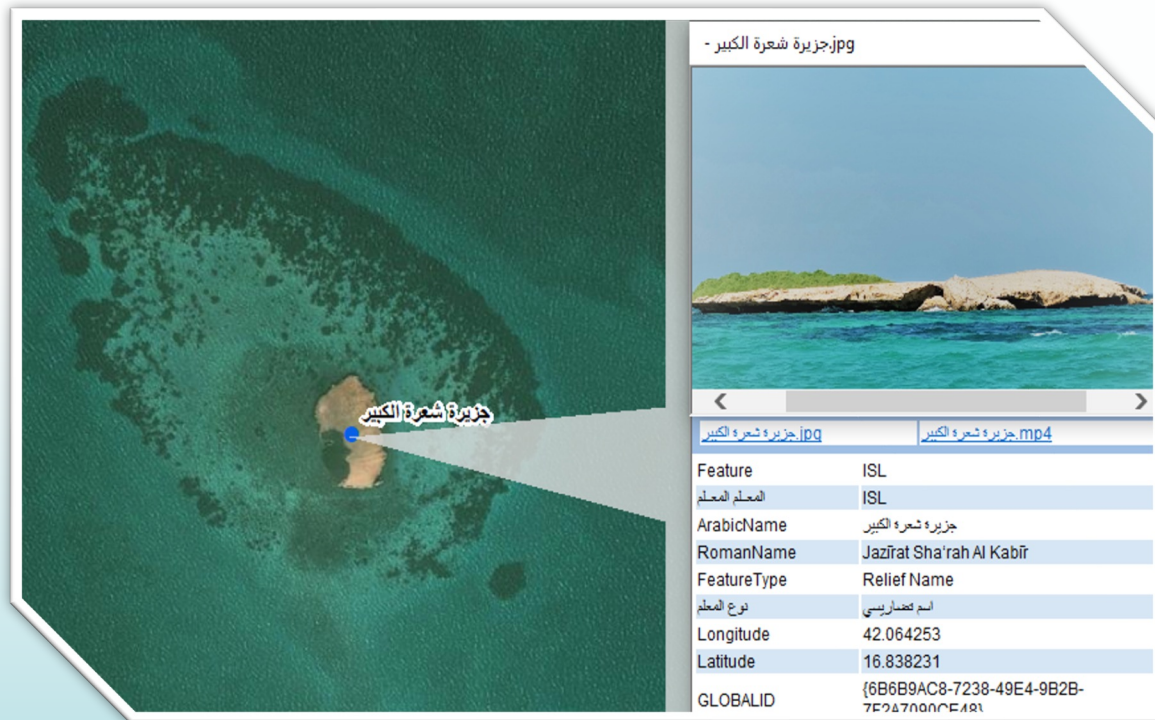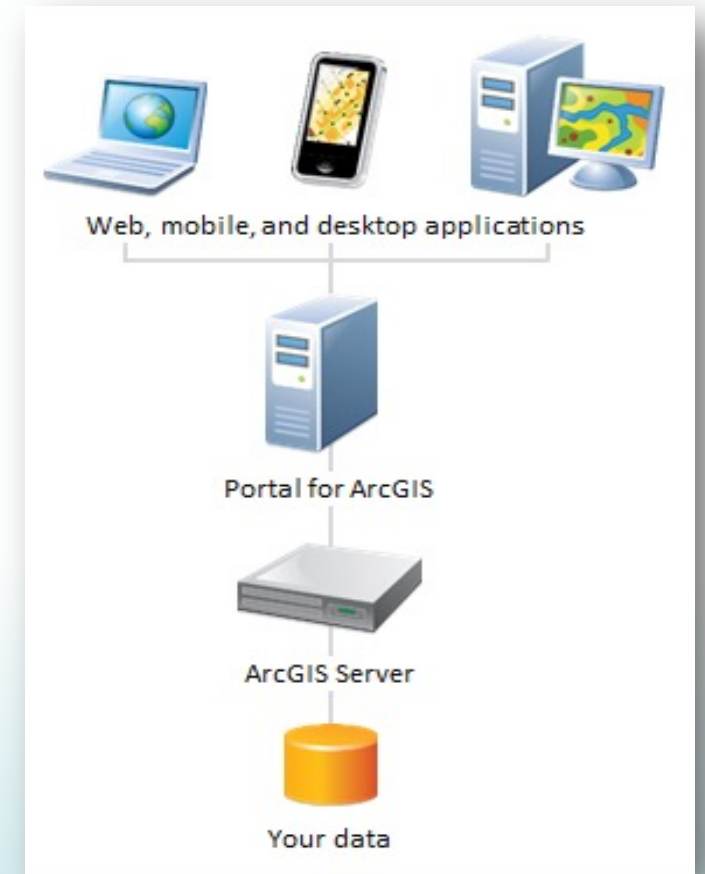
ISLAND BOOK

Islands books were published following the project—one for the Red Sea islands and the other for the Arabian gulf islands.

GEOGRAPHICAL NAMES DATABASE THE FUTURE

• An updated version of the geographical names portal/explorer/search engine is under construction.

• The Geographical Names Database schema will be modified by adding new details to benefit a wide range of users. The schema will have new fields and added domain values to accommodate more information.

• The database will be shared with other government organizations in the KSA, such as the Ministry of Transport, the General Authority for Statistics, the Saudi Post, the Ministry of Municipal and Rural Affairs etc.

Web, mobile, and desktop applications

Portal for ArcGIS

ArcGIS Server

Your data