

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



**University of Kabul
Faculty of Environmental Sciences**

National Conference of IT Usage in GIS

Presentation: Universities GIS Curriculum

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Ministry of Rural Rehabilitation and Development, Kabul

Universities GIS Curriculum

What to be taught in Afghanistan Universities

Contents

- **Introduction**
- **GIS use in different sciences discipline**
- **GIS curriculum for non-GIS degree program**
- **Challenges and Recommendations**

Universities GIS Curriculum

Geographical Information System (GIS)

- ❖ **System:** Hardware, Software, Database, Computer languages
 - GIS Software: ArcGIS, Manifold GIS, QGIS,...
 - GIS Database System: PostGIS, PostGree, SQL Sever, Oracle Spatial.....
 - Computer Languages: C#, Java script, Visual Bsic. Net, Python...
- ❖ **Spatial Location:** a geographical location (Vector, Raster)
- ❖ **Information:** visualization and analyses of data

Universities GIS Curriculum

GIS Use in Geography

- Physical geography
- Political geography
- Topography and Relief
- Contour Map
- Population geography

[Afghanistan Administrative Map]



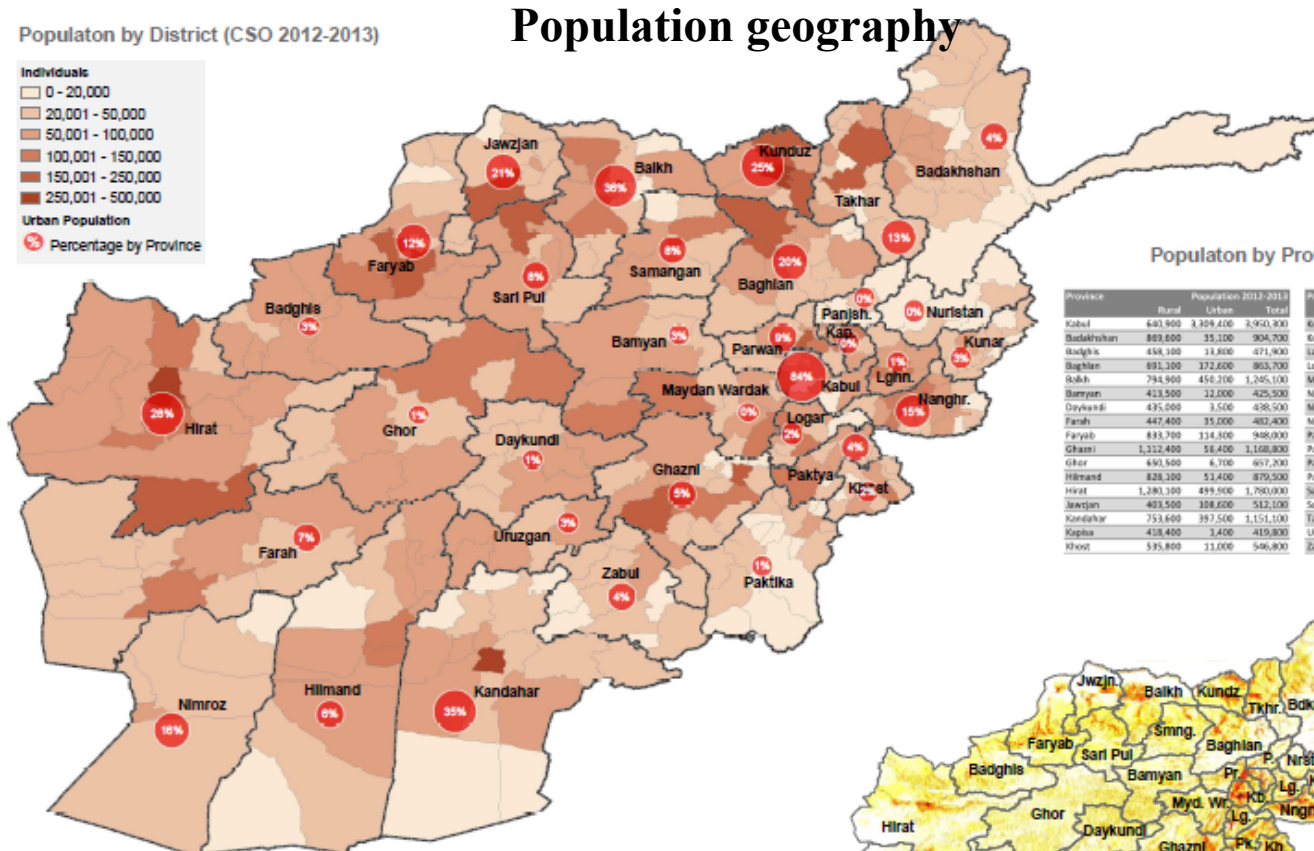
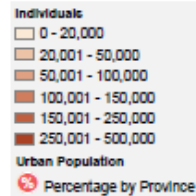
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GIS Use in Geography

2012-2013 Population Thematic and Density

WASH CLUSTER

Population by District (CSO 2012-2013)



Population by Province (CSO 2012-2013)

Province	Rural	Urban	Total
Kabul	640,900	1,094,400	1,735,300
Badakhshan	89,600	33,100	122,700
Badghis	458,300	11,800	470,100
Baghlan	991,300	321,600	1,312,900
Balkh	794,900	456,100	1,251,000
Bamiyan	413,500	22,000	435,500
Daykundi	435,000	3,500	438,500
Faryab	447,400	35,000	482,400
Ghazni	1,112,400	114,300	1,226,700
Herat	440,500	6,700	447,200
Hilmand	828,100	51,400	879,500
Kandahar	1,281,100	499,500	1,780,600
Kapisa	403,500	308,600	712,100
Kunar	753,600	397,500	1,151,100
Kunduz	418,400	3,400	421,800
Logar	535,800	11,000	546,800
Nangrahar	413,700	11,100	424,800
Nuristan	718,800	237,000	955,800
Paktia	418,300	4,300	422,600
Paktika	163,800	5,300	169,100
Panjshir	564,800	2,800	567,600
Parwan	1,225,000	211,000	1,436,000
Samangan	133,700	24,900	158,600
Saripul	140,000	0	140,000
Takhar	411,200	3,600	414,800
Uruzgan	101,800	23,100	124,900
Zabul	144,100	0	144,100
Zirbul	578,000	55,600	633,600



0 125 250 km

Disclaimer and Source:
 Date Printed: 27 Nov 2012 5:53:10 PM
 Administrative Boundary: AIMS
 General Content: CSO, Landsat 2010
 Datum/Projection: WGS-84 / Geographic

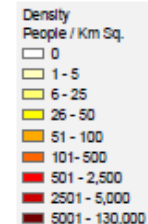
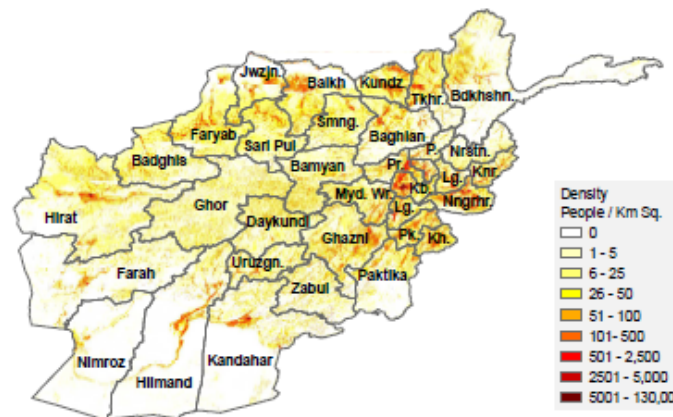
The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

File: WASH_CSO_DEMOGRAPHICS_A3

Humanitarian Response
<http://afg.humanitarianresponse.info>



Notes:
 1) The CSO population figures for 2012-2013 are projections only.
 2) The population by district is the number of individuals, including both urban and rural, and male and female populations.
 3) The population density is presented as the number of people per square kilometre.

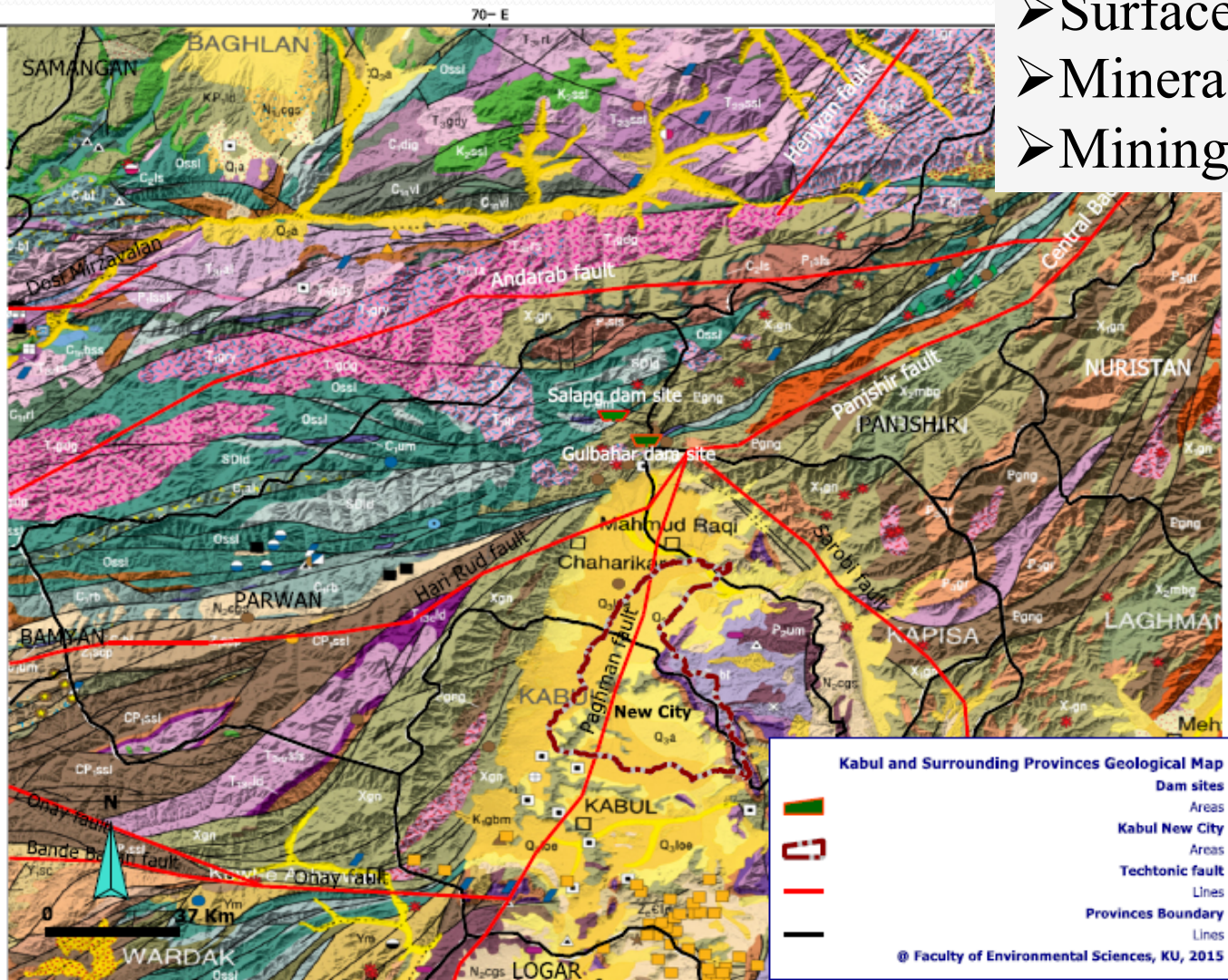


Population Density (Landsat 2010)

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GIS Application in Geology

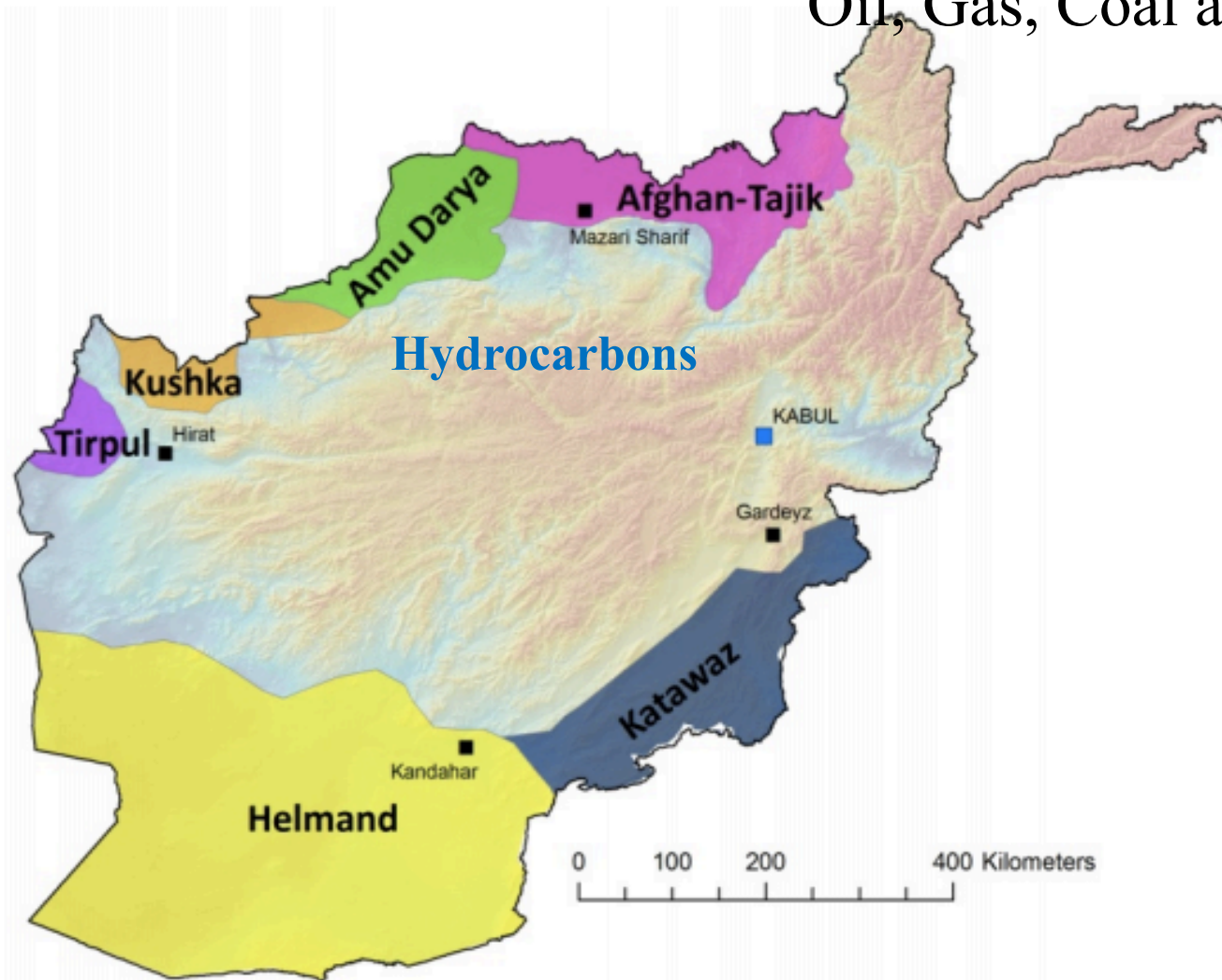
- Surface geology
- Mineralogy and Mining
- Mining pollution



Universities GIS Curriculum

GIS Application in Geology

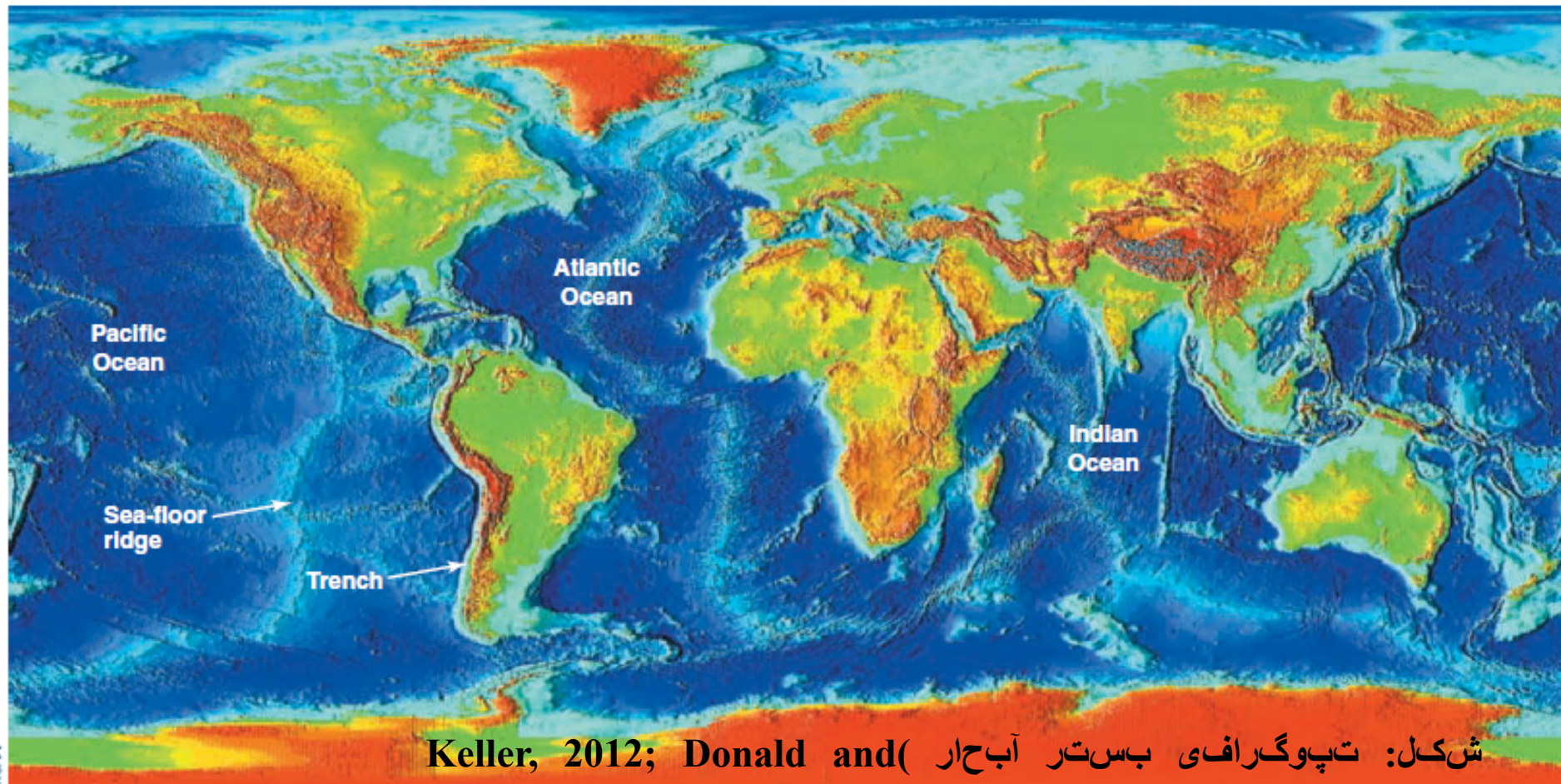
Oil, Gas, Coal and Peat Deposits



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GIS Application in Geology

Sea Floor Topography

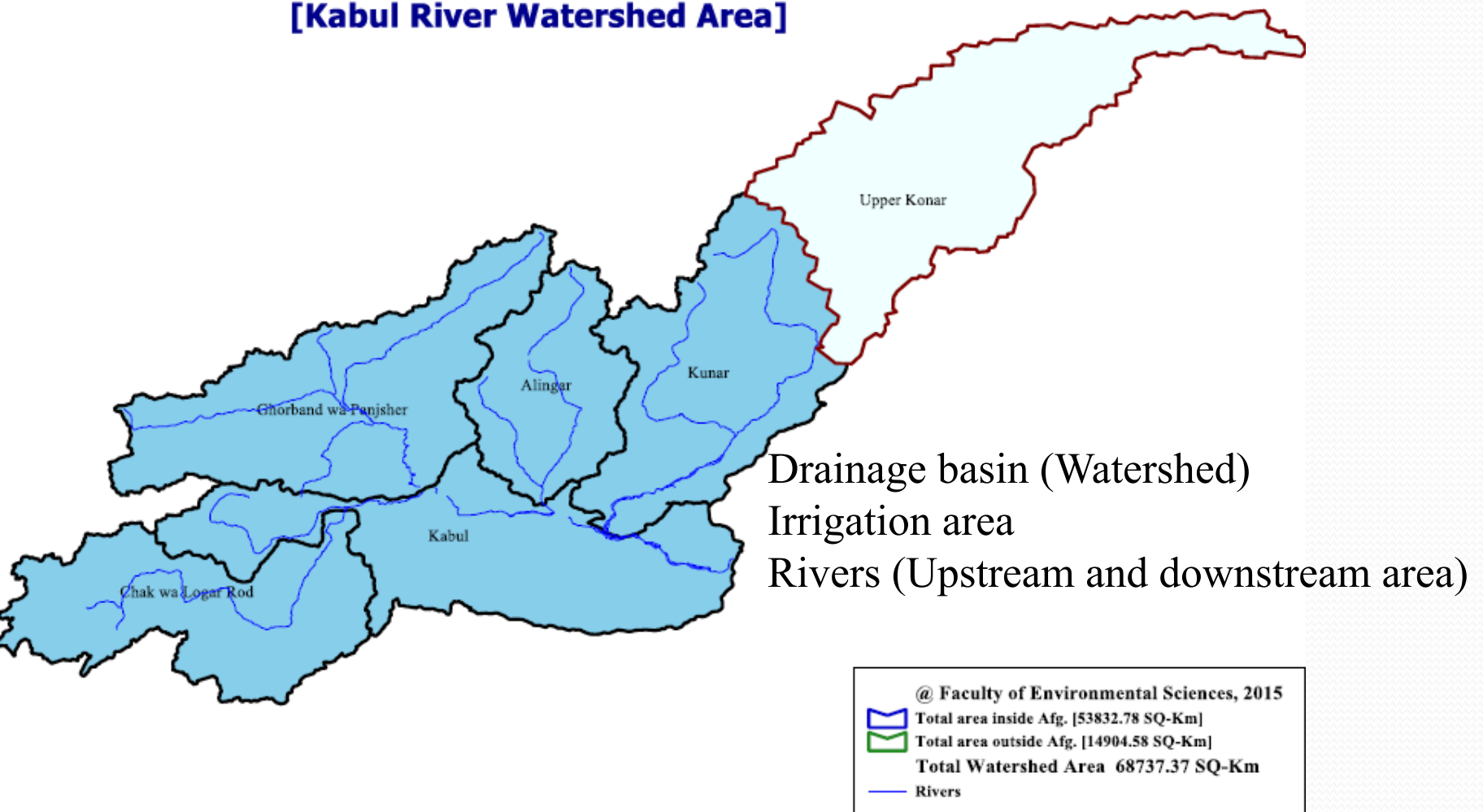


شکل: تپوگرافی بستر آبحار (Keller, 2012; Donald and David, 2009)

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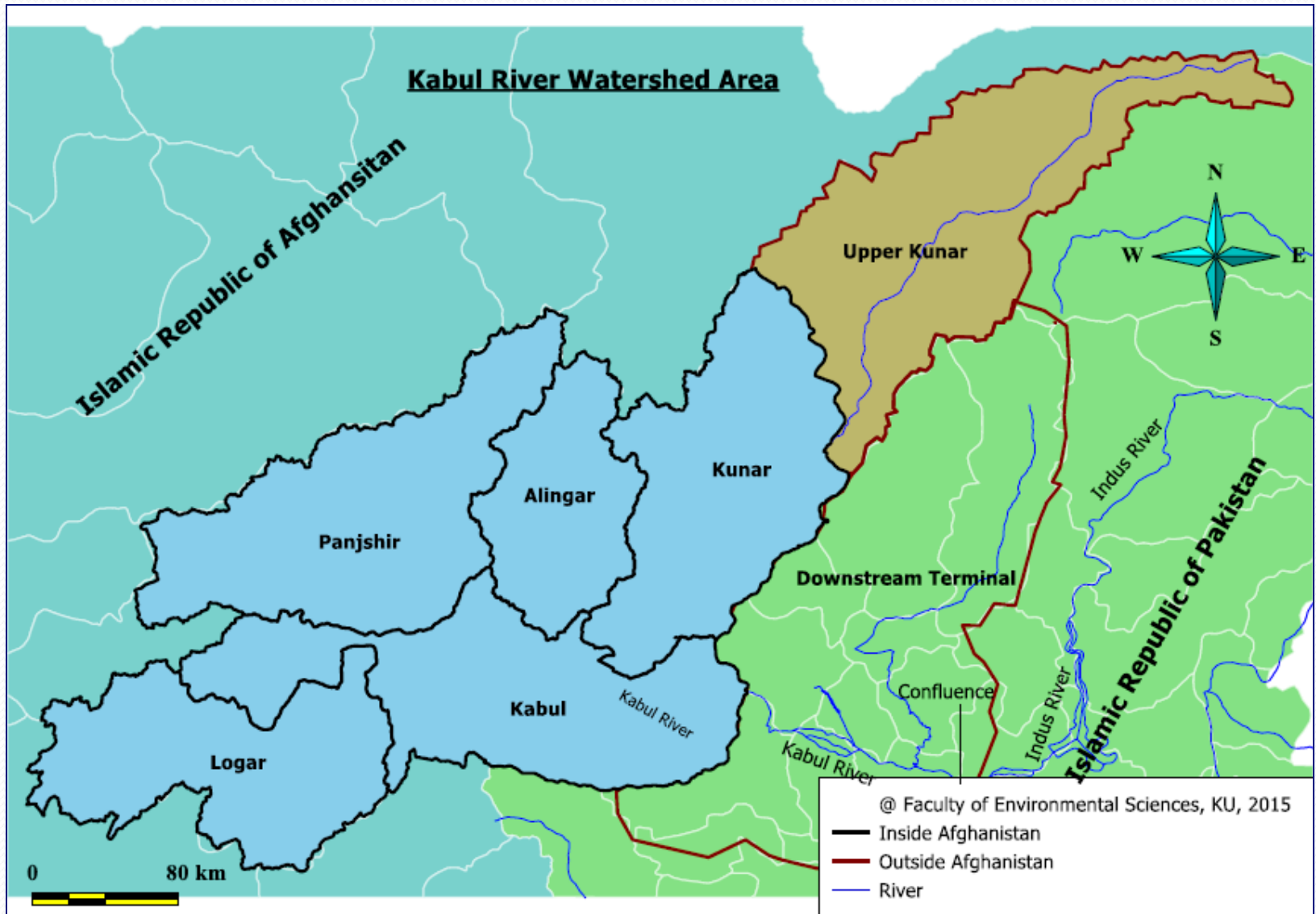
GIS Use in Hydrology

[Kabul River Watershed Area]



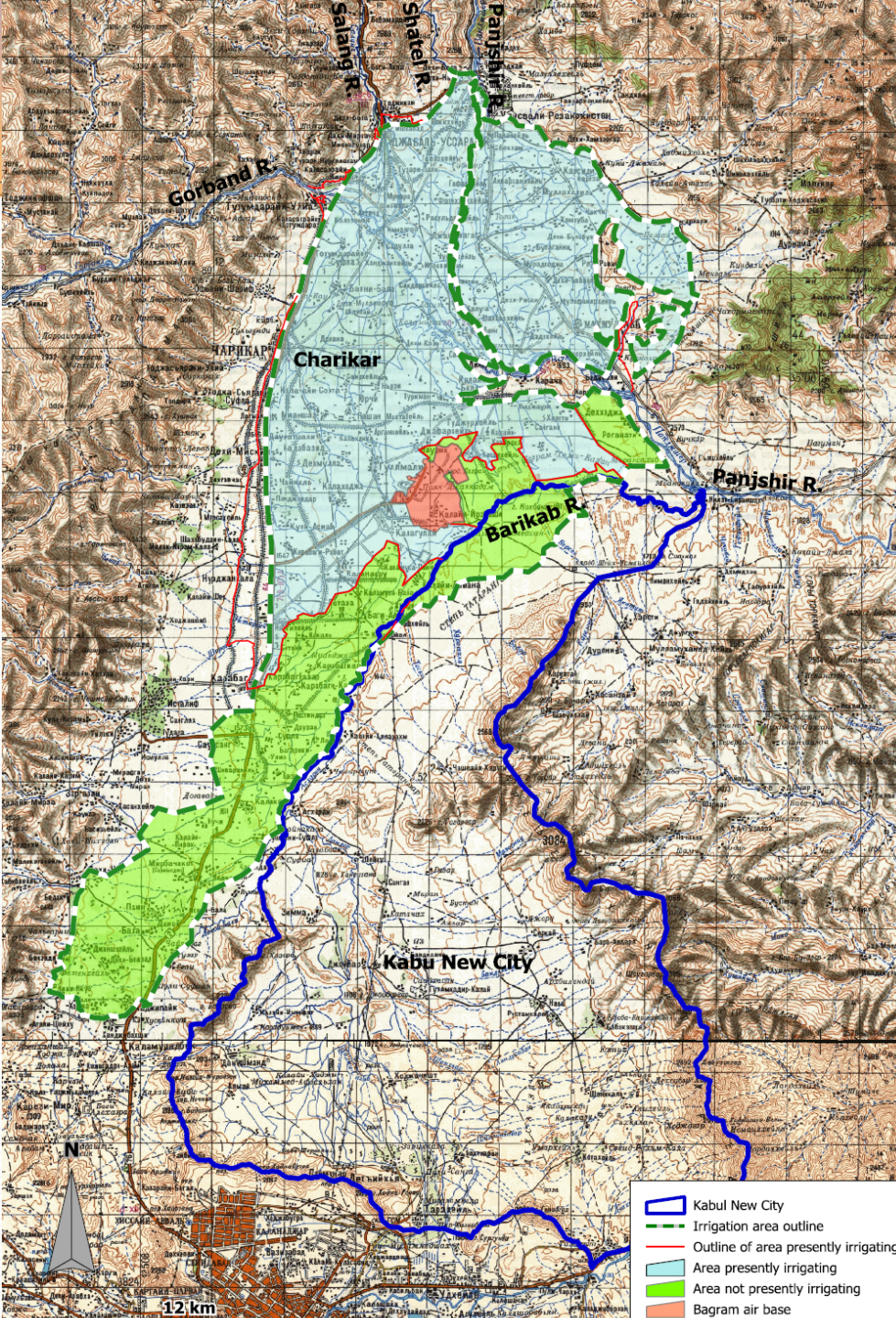
Universities GIS Curriculum

GIS Use in Hydrology



GIS Use in Hydrology

Irrigation area



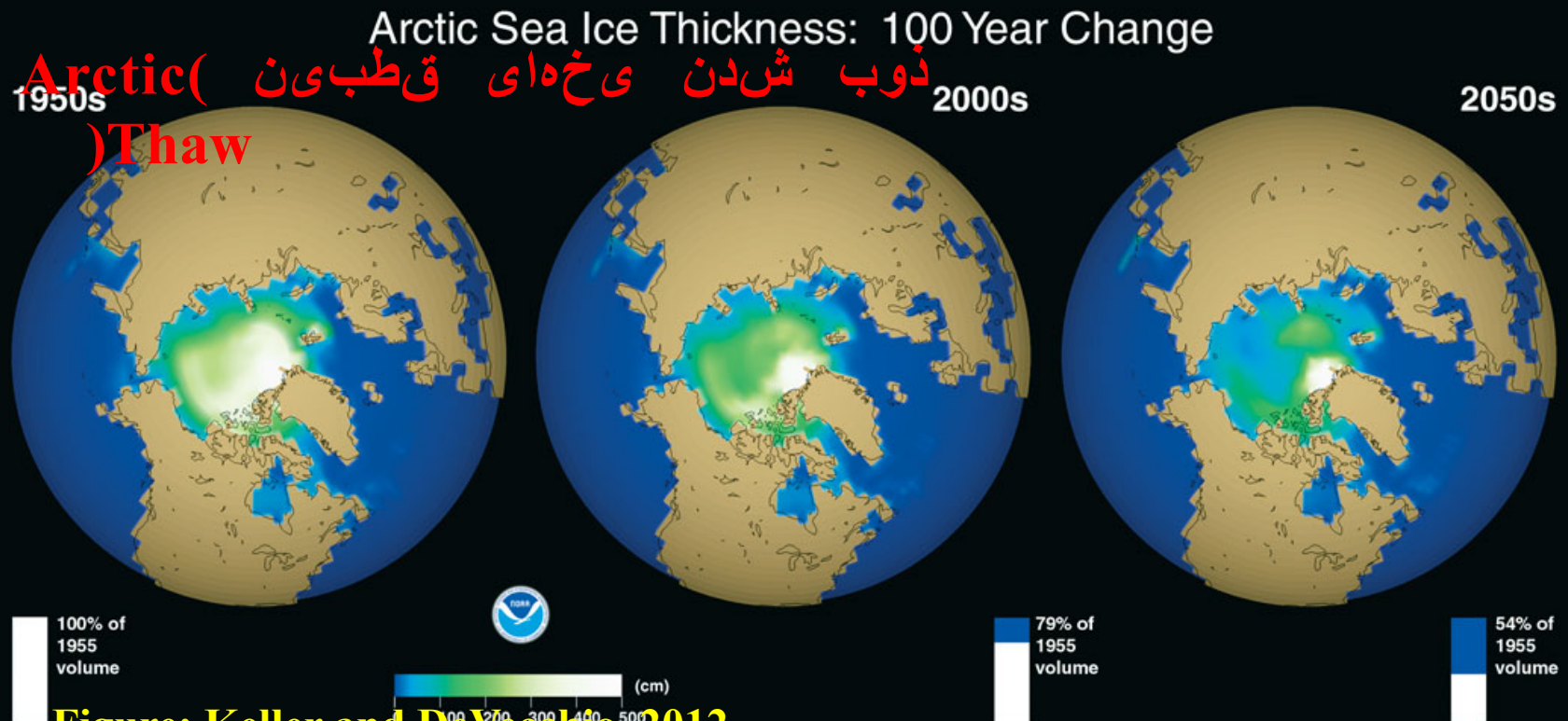
- Kabul New City
- Irrigation area outline
- Outline of area presently irrigating
- Area presently irrigating
- Area not presently irrigating
- Bagram air base

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GIS Application in Environmental Problems

Environmental Pollution

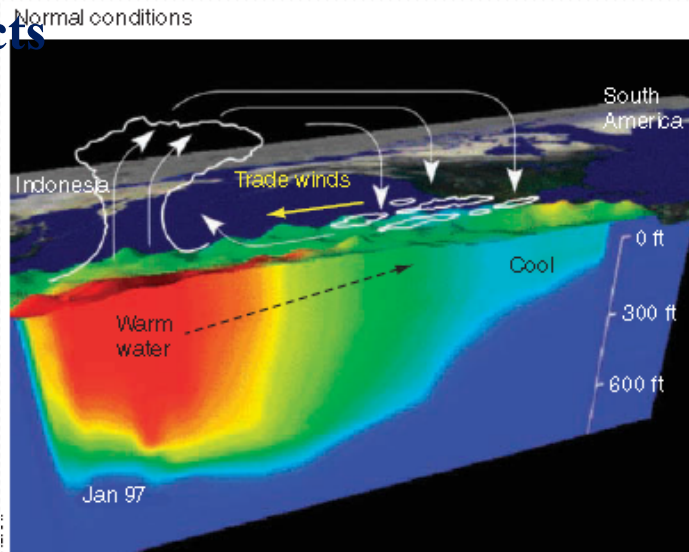
Global Warming and Climate Change



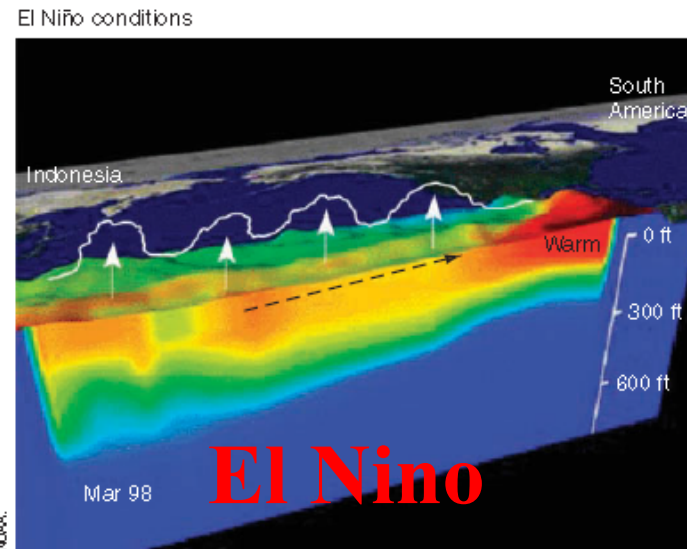
Universities GIS Curriculum

GIS Application in Environmental Problems

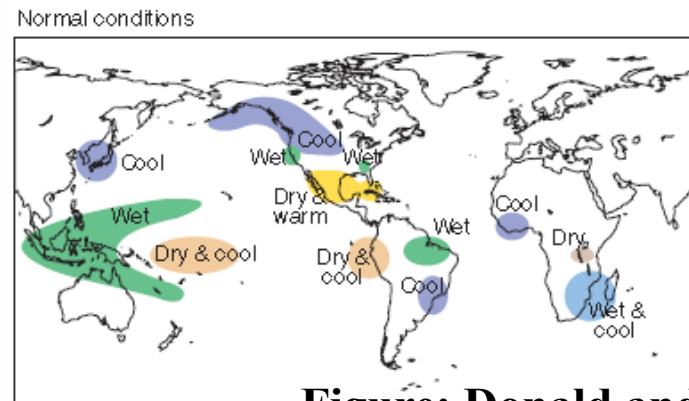
Climate Change (تأثيرات تغير اقلیم) (Effects)



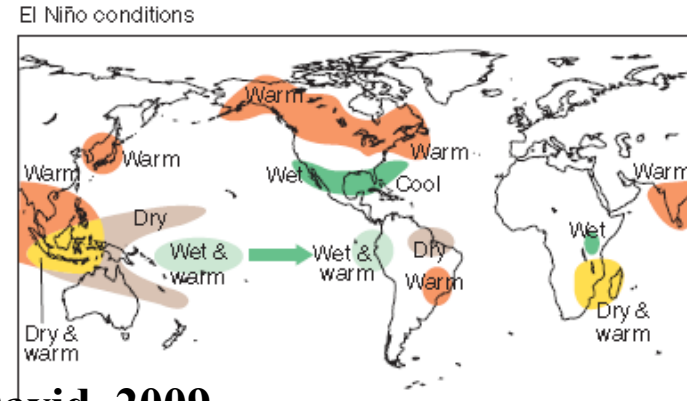
a



b



c



d

Figure: Donald and David, 2009

Universities GIS Curriculums

GIS Use in Natural Disaster

Earthquake focus GPS points

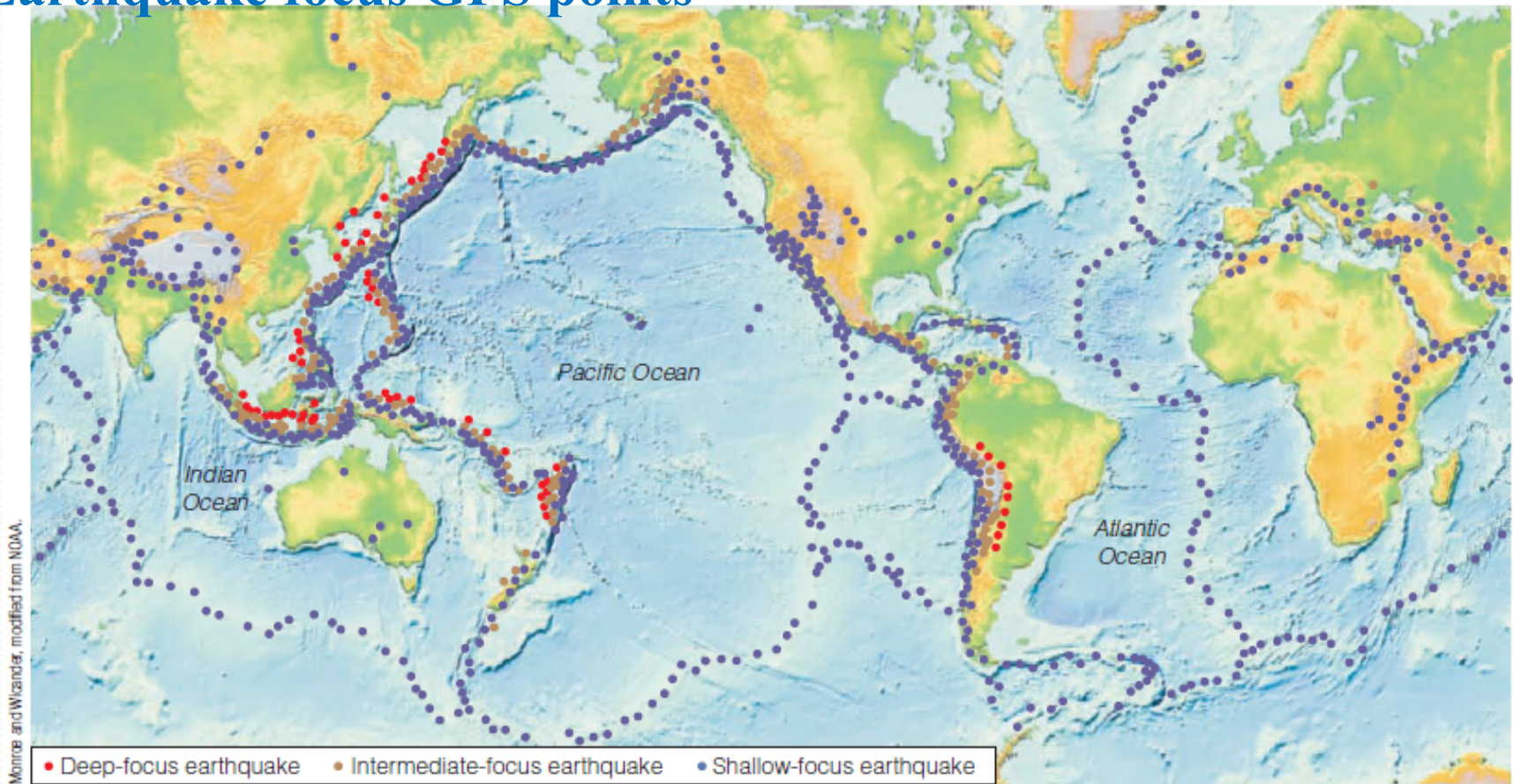


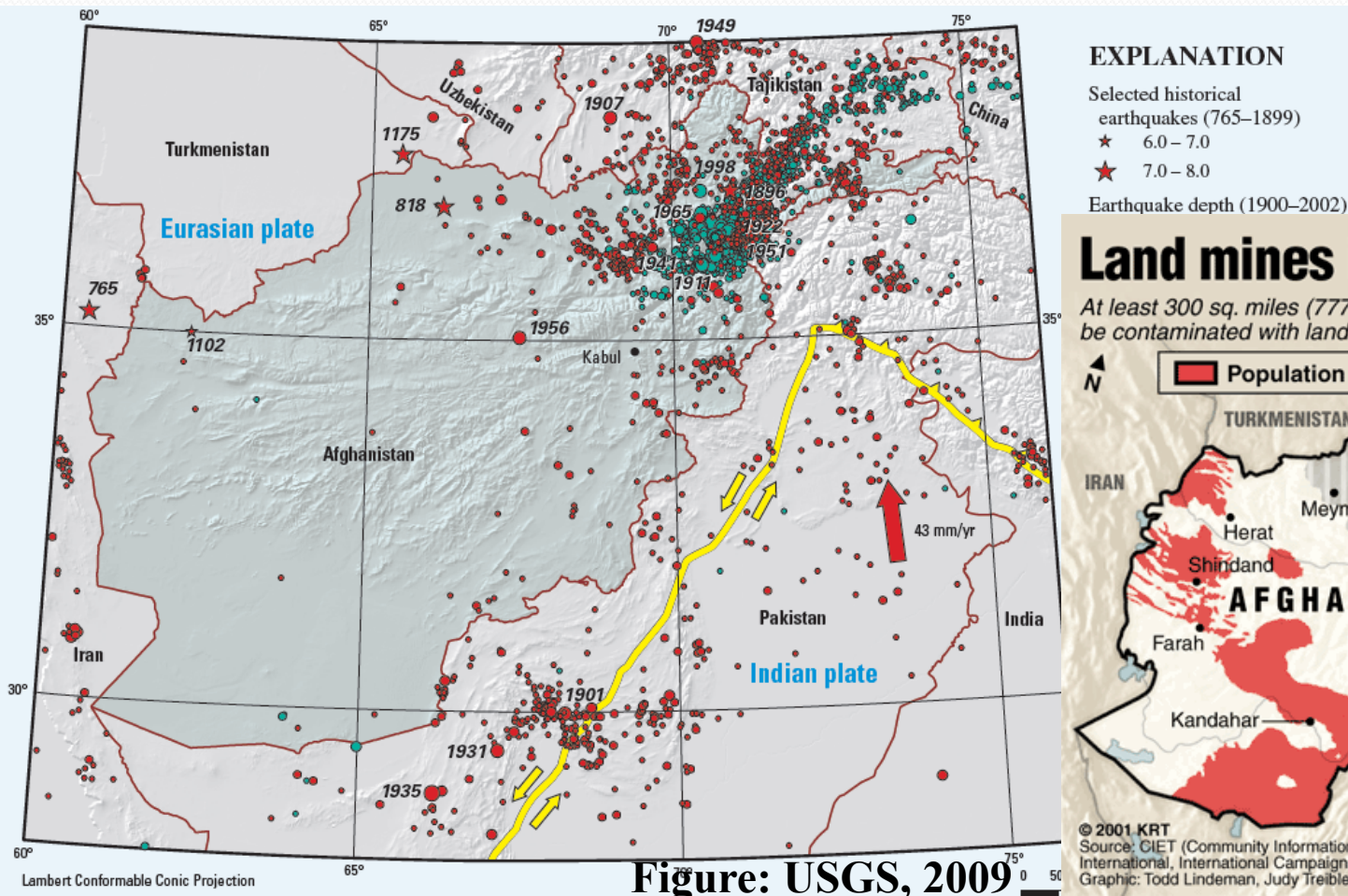
FIGURE 2-18. Most earthquakes are concentrated along boundaries between major tectonic plates, especially subduction zones and transform faults, with fewer along spreading ridges.

Figure: Donald and David, 2009

Universities GIS Curriculums

GIS Use in Natural Disaster

Afghanistan Earthquake focus (GPS points)



Land mines in Afghanistan

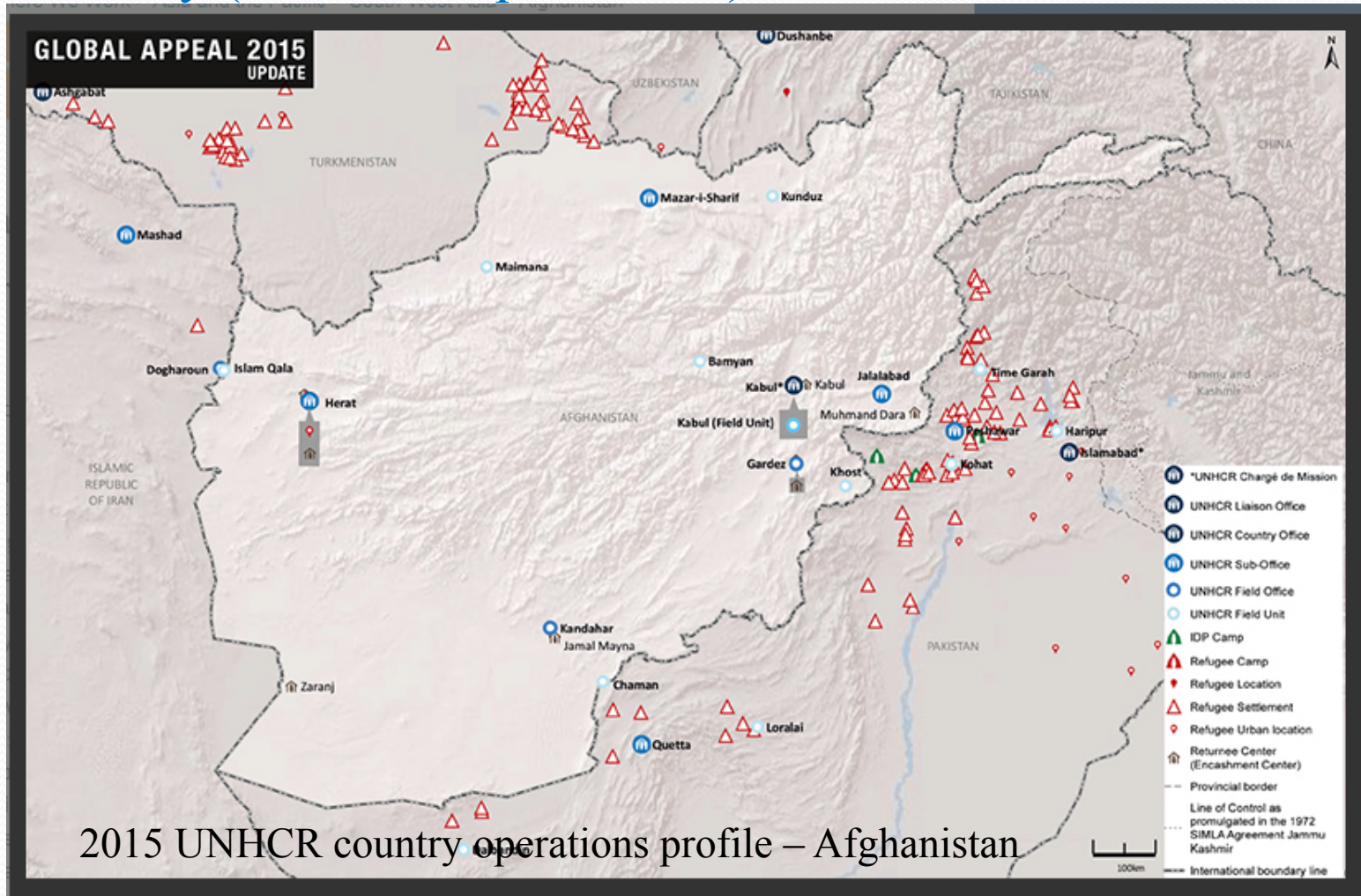
At least 300 sq. miles (777 sq. km) of Afghanistan are believed to be contaminated with land mines from its war with the Soviet Union.



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GIS Use in Natural Disaster

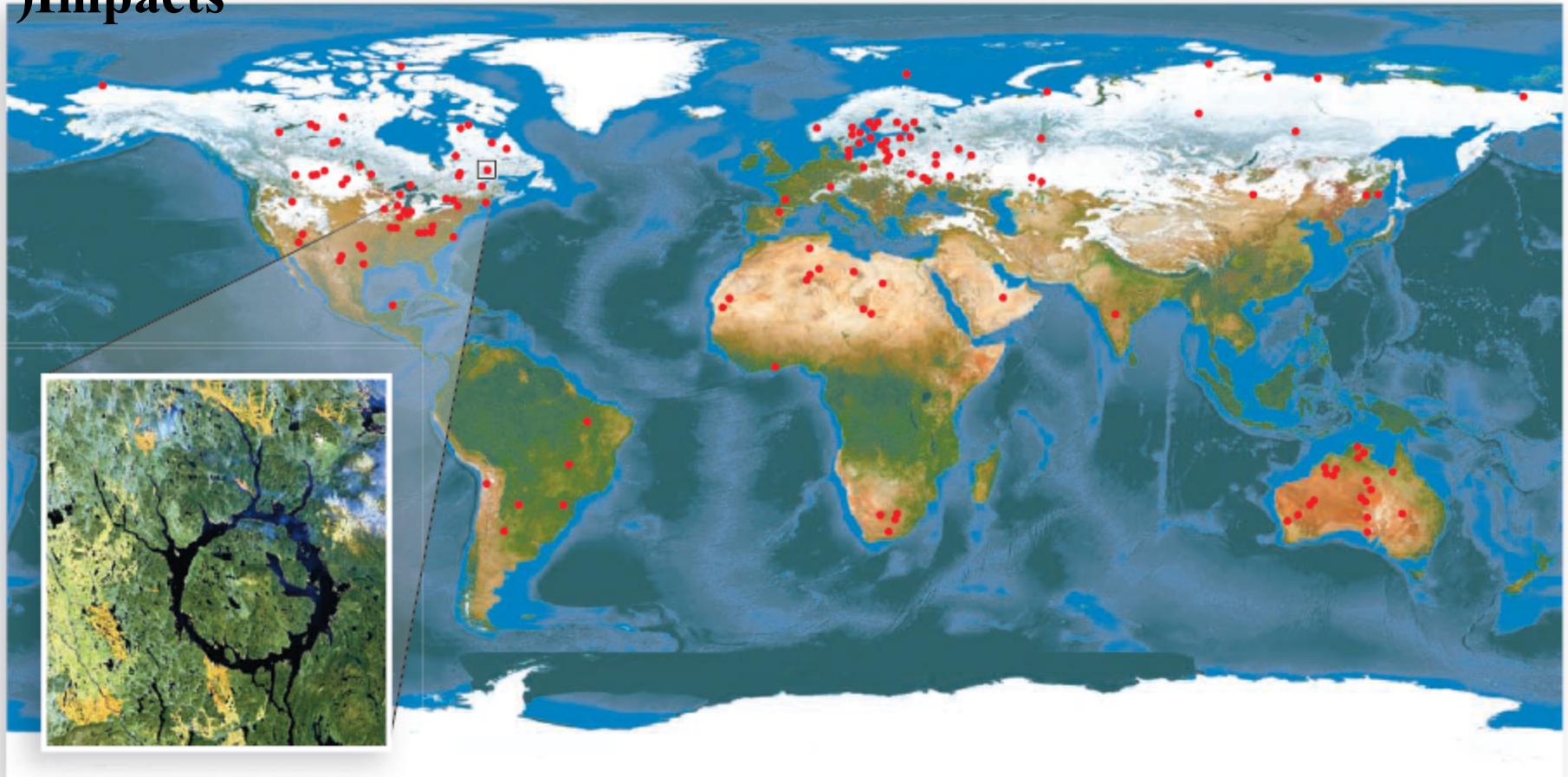
Vulnerability (Internal displacement)



Universities GIS Curriculum

GIS Use in Natural Disaster

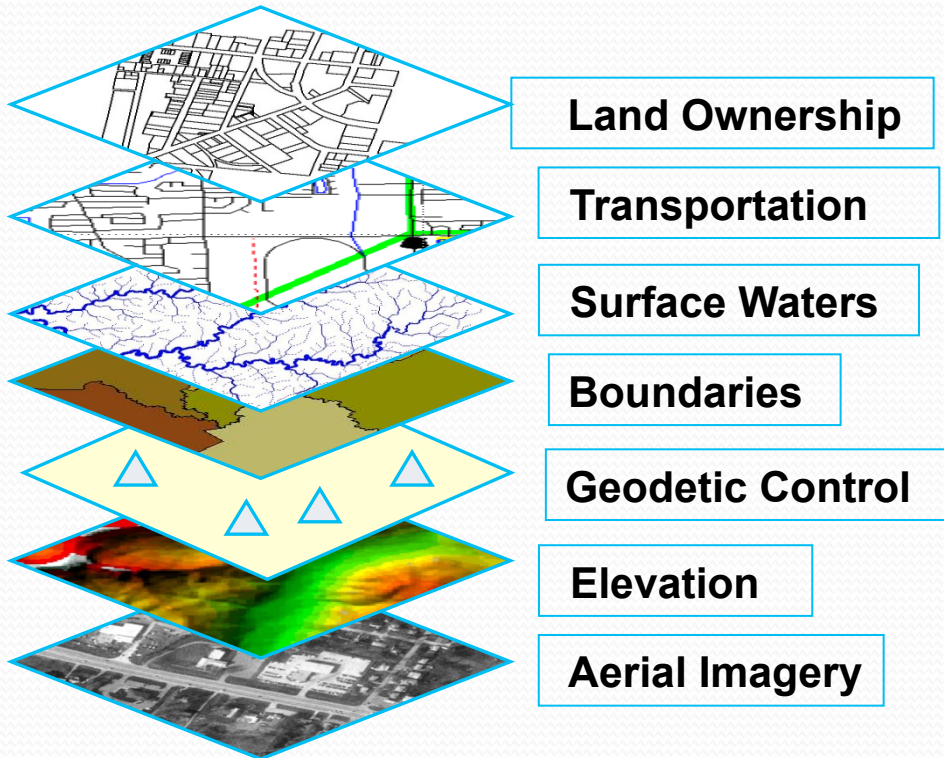
تأثیرات ستاره های دنباله دار و سنگها آسمانی (Asteroid and Comet Impacts)



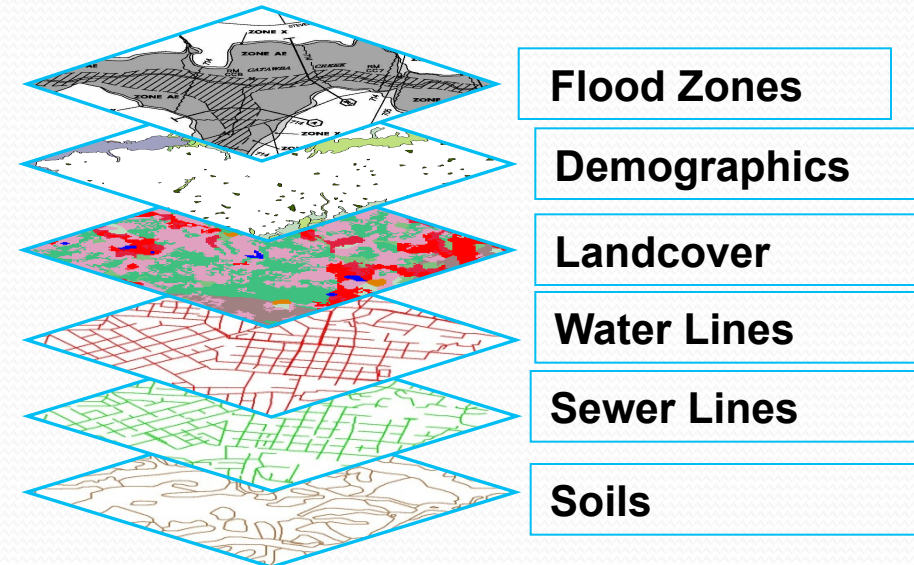
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GIS Use in Civil Engineering

Framework Data

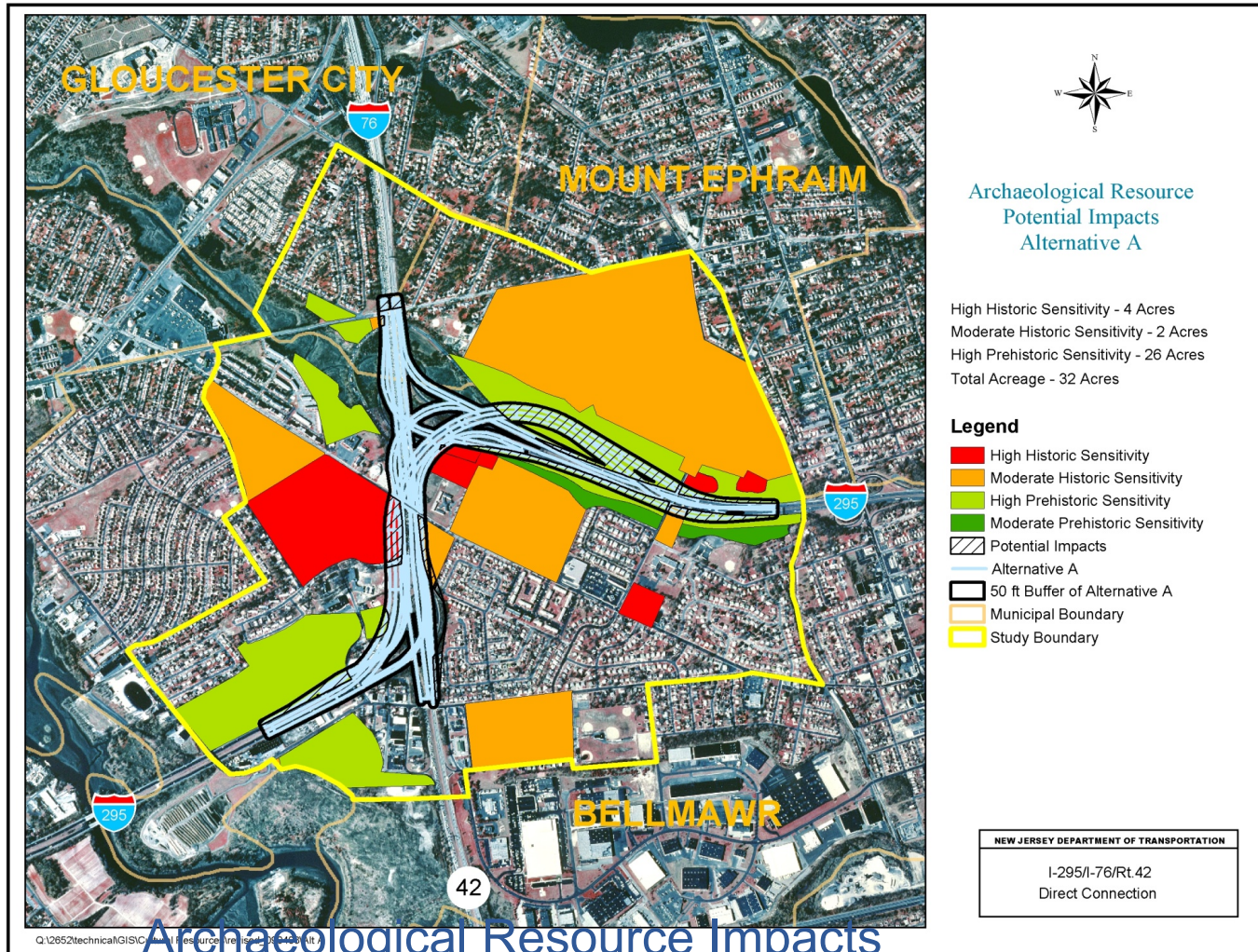


Other Thematic Data



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GIS Use in Civil Engineering



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GIS Use in City Planning

- Kabul New City



Universities GIS Curriculum

Basic Curriculum for Non-GIS Degree

GIS I

- Geography
- Cartography
- Introduction to Remote
- Aerial photography
- Geographic Information System (GIS)
- GIS Map (Contour, relief, Raster and Vector Maps)
- Georeferences
- GPS (Global Position System): GPS Survey, data processing and mapping

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Basic Curriculum for Non-GIS Degree

GIS II

- Spatial Data Processing
- Digital Image Processing
- Spatial Analysis
- GIS Application (Thematic issues)
- Image Data Processing (DEM)
- Google Earth & Google Maps
- Programming (C#, VB. Net, Jscript, Python)
- GIS Database Management System

Universities GIS Curriculum

Challenges and Recommendation

- Lack of GIS lab. In faculty
- Lack of required data
- Lack of coordination among related organizations
- Need data sharing
- Need GIS references, software, training and GIS lab.

Facilities

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تشکر

Thanks for Attentio