

GIS in the Petroleum Industry

Exploration and exploitation tool

By:

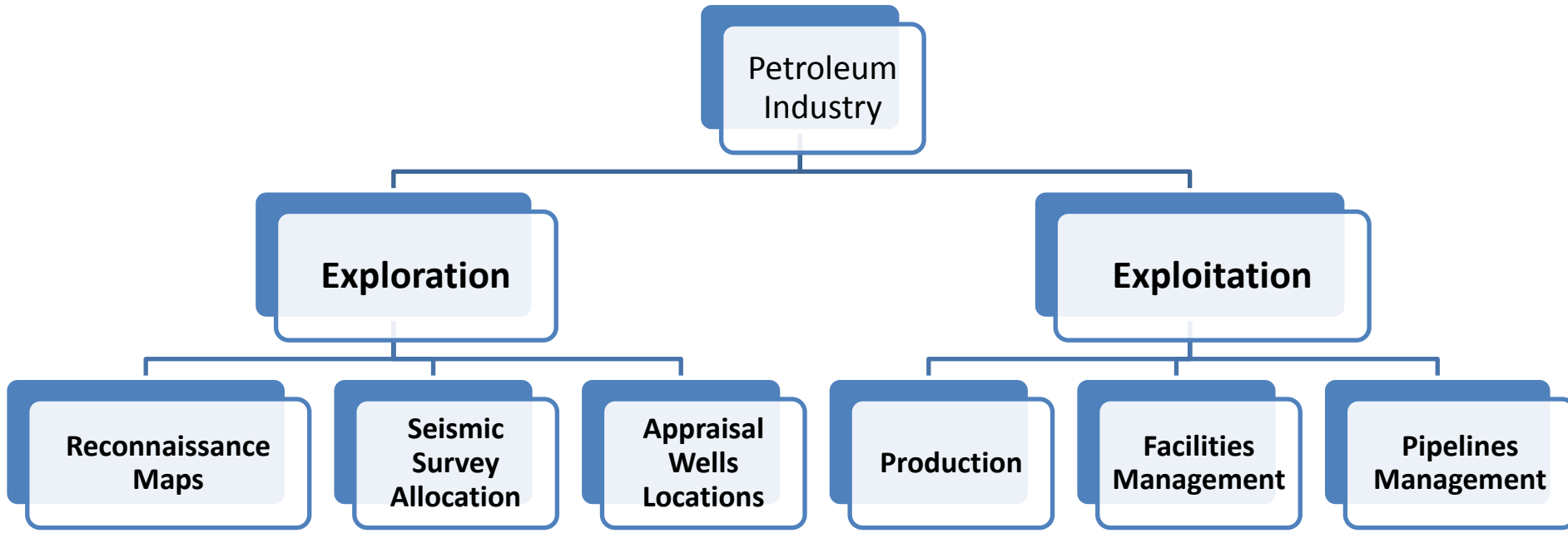
Mohammed Ali Hammad Jabir

Course Instructor

Dr. Baqer AL-Rmadan

Talking Points

- **Introduction**
- **Historical back ground**
- **Aim of the paper**
- **Work Methodology**
- **First Case Study**
- **Second Case Study**
- **Conclusion**



Historical Background



Early 1960s
GIS Embarks

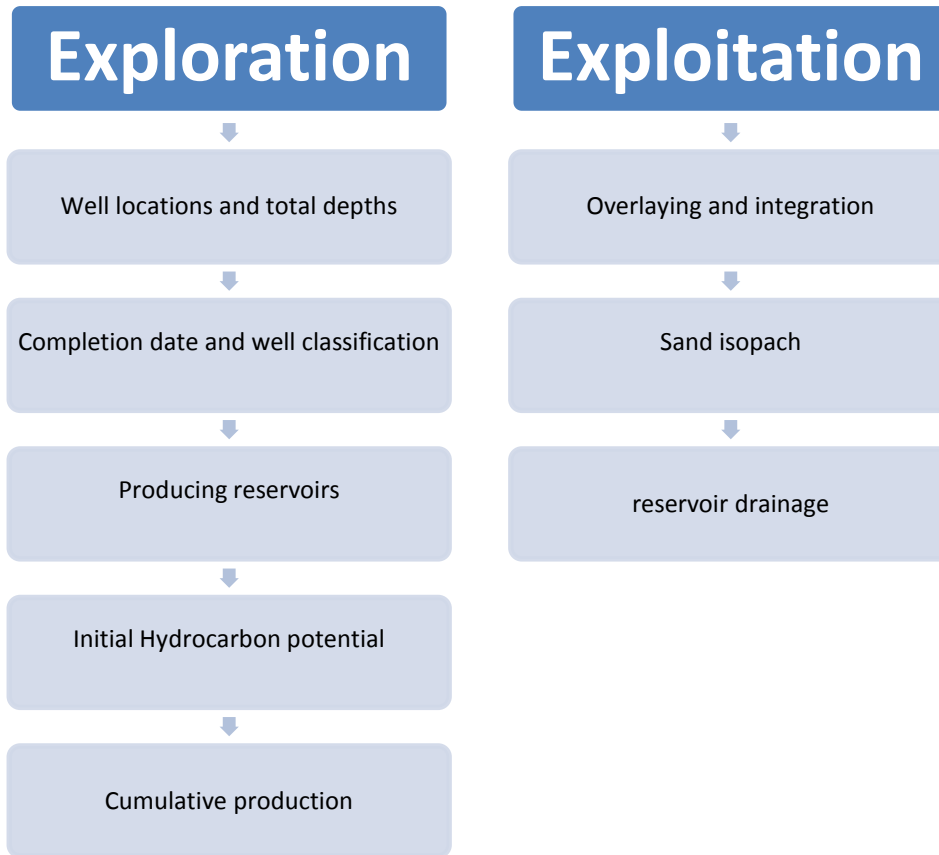
1990s
desktop
computer
users

1990s
GIS in Petroleum
Industry

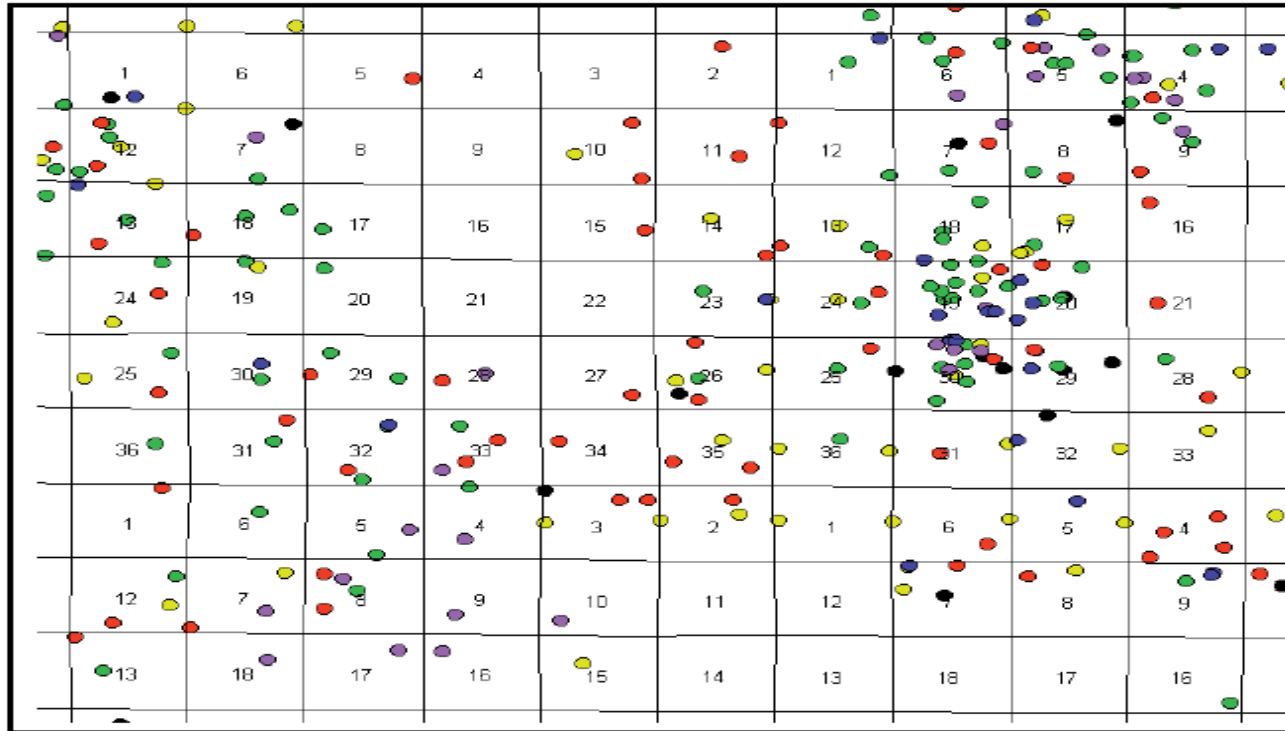
End 1990s
Commercial
Software

2000s
Advances in
Internet
Mapping

Application In Petroleum Industry



Exploration



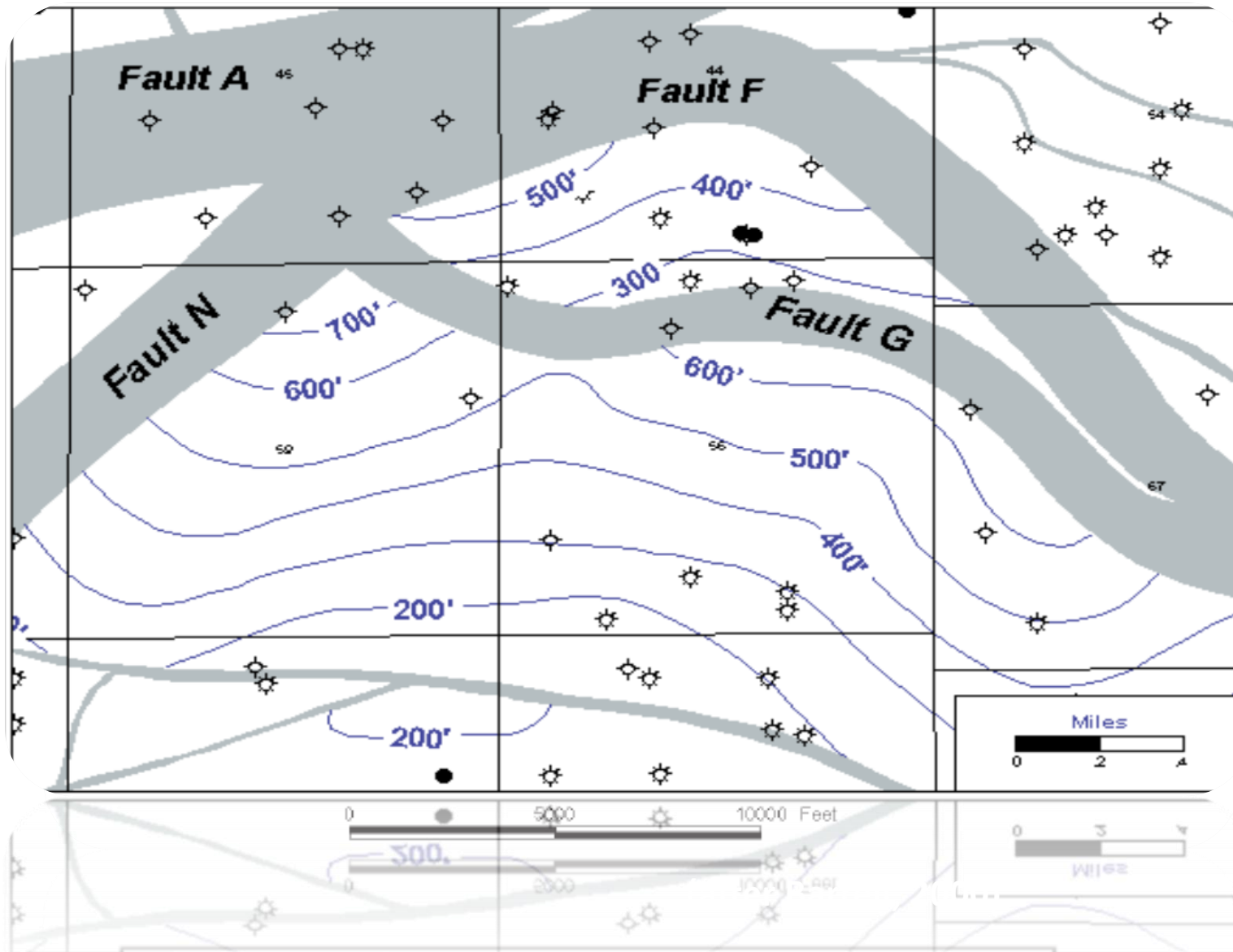
(after Barrell, 2000)

- SPUD DATE**
- 1900 - 1950
 - 1950 - 1960
 - 1960 - 1970
 - 1970 - 1980
 - 1980 - 1990
 - 1990 - Present

- 1880 - Present
- 1880 - 1880
- 1810 - 1880
- 1820 - 1810
- 1820 - 1820
- 1800 - 1820
- SPUD DATE



Exploitation



Aim if the study

- Importance and Contribution

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graph TD; GIS[GIS] --- Exploration[Exploration]; GIS --- Exploitation[Exploitation]
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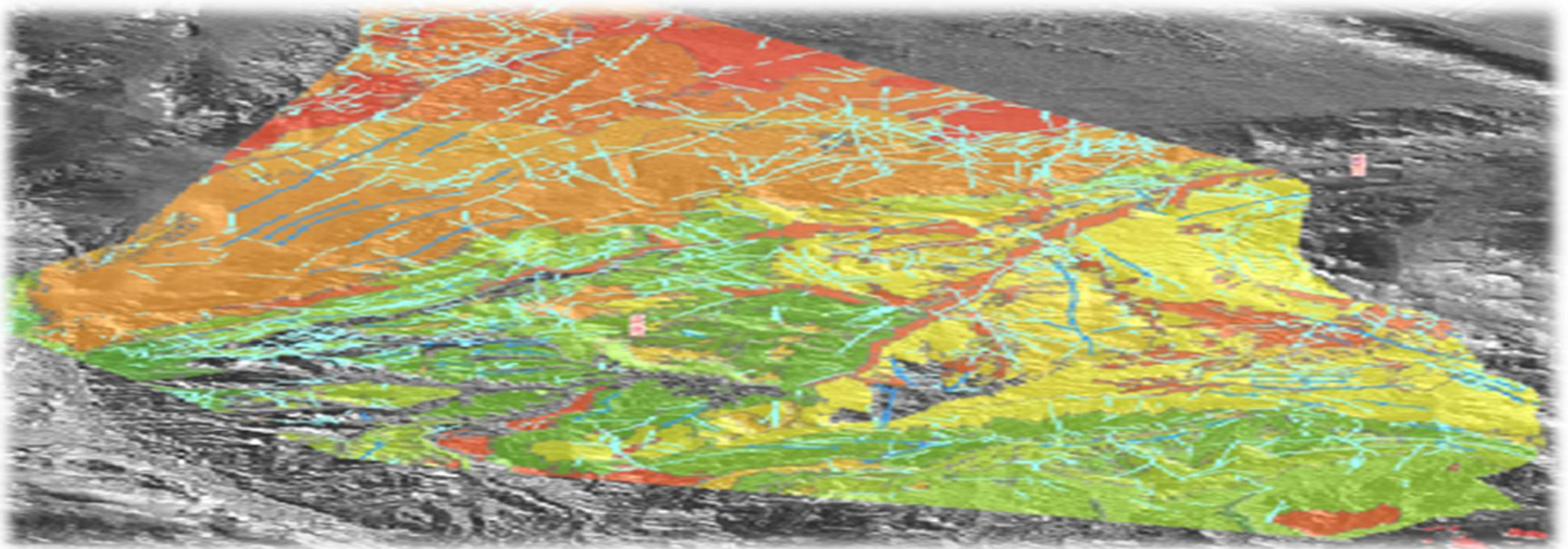
GIS

Exploration

Exploitation

FIRST CASE STUDY

OIL AND GAS IN ETHIOPIA USING GIS

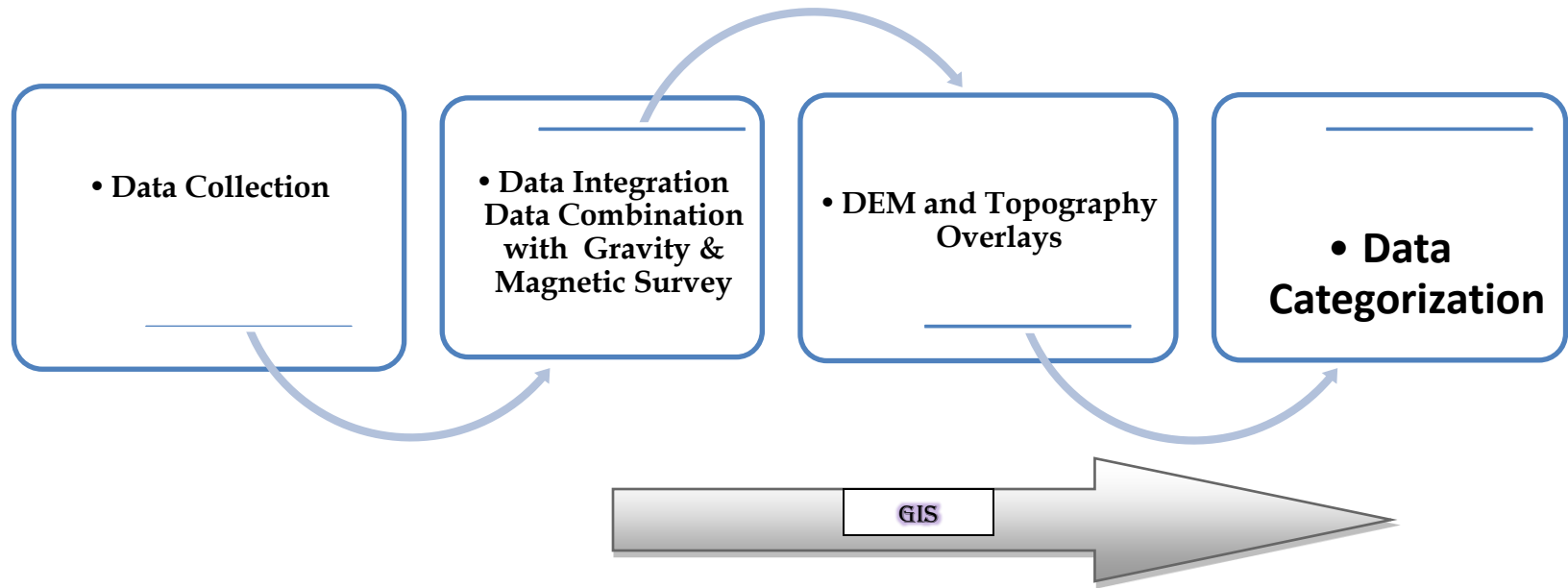


Geological background and project challenges

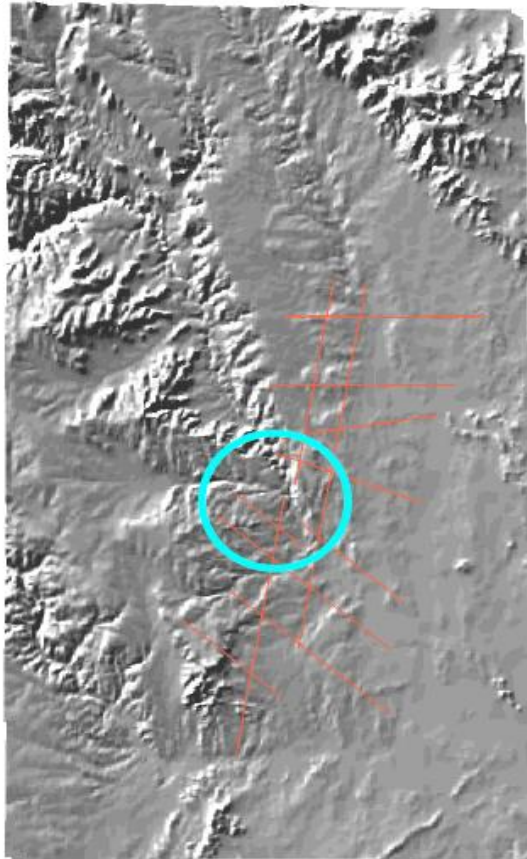


(after Abdlatef & Khar, 2008)

Regional Geological Mapping using GIS

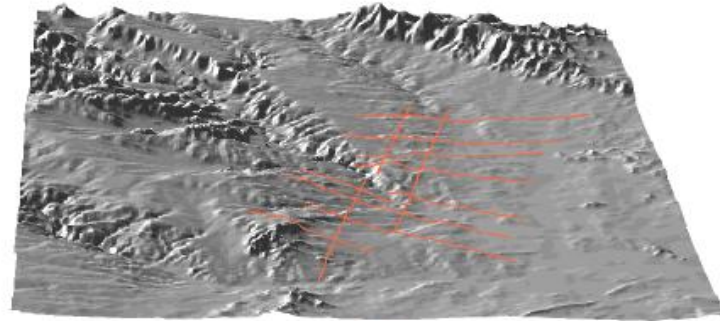


Seismic Survey Planning

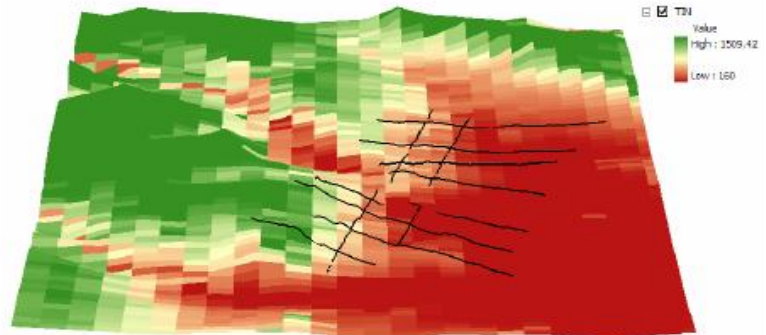


Aerial View

Aerial View



Perspective View (S-N)

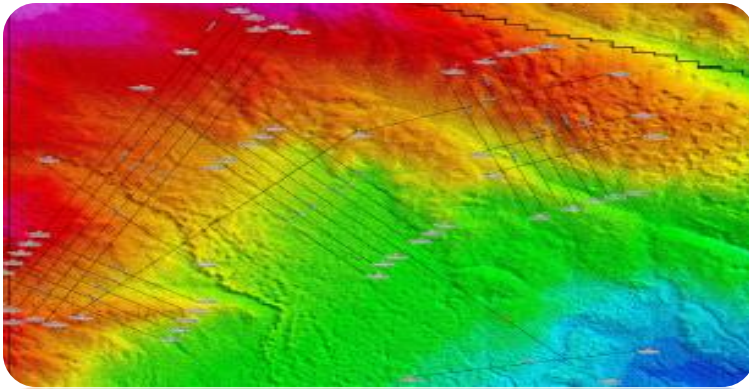


Digital Elevation Model

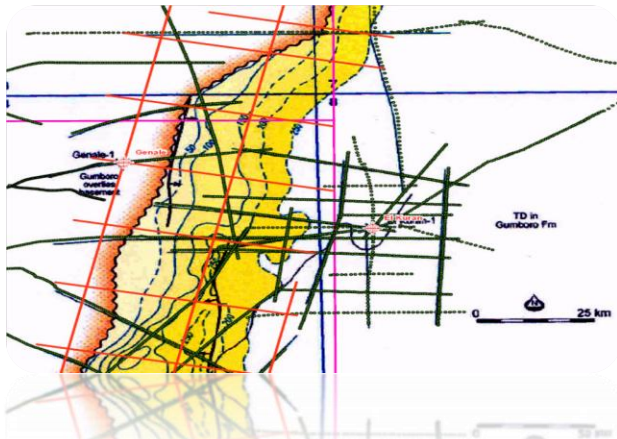


Benefits of Using GIS in Ethiopia Project

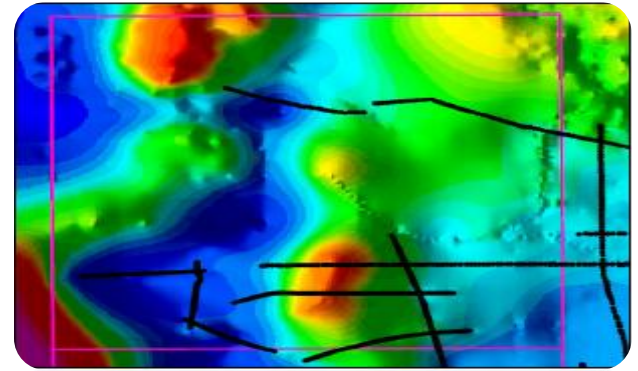
- Time consumed



- Cost savings

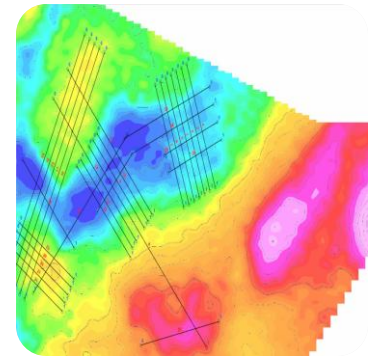


- contribution of various crews



- Presentation of the data
- Connecting multiple applications
- GEODATABASE

(PMU)



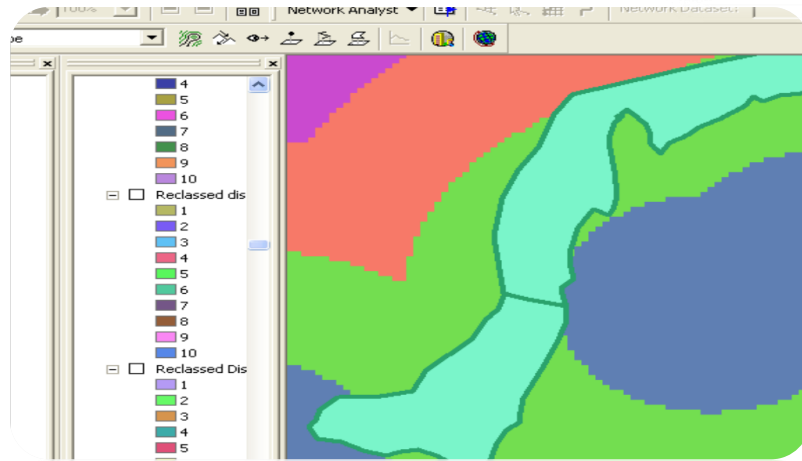
SECOND CASE STUDY

OPTIMAL OIL PIPELINE ROUTE SELECTION USING GIS

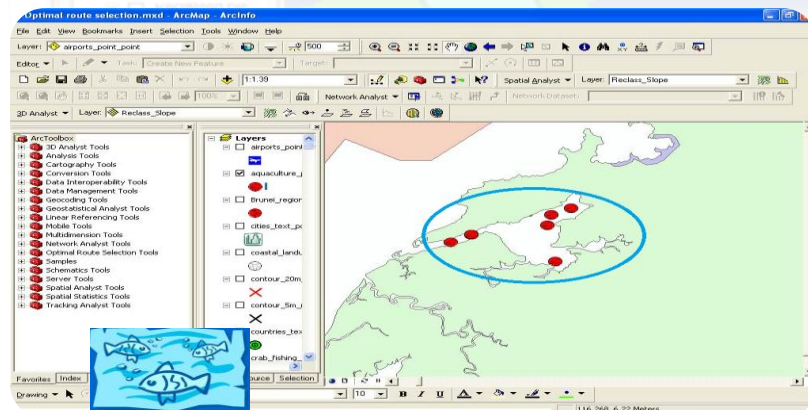
Pipeline Route Selection Using GIS



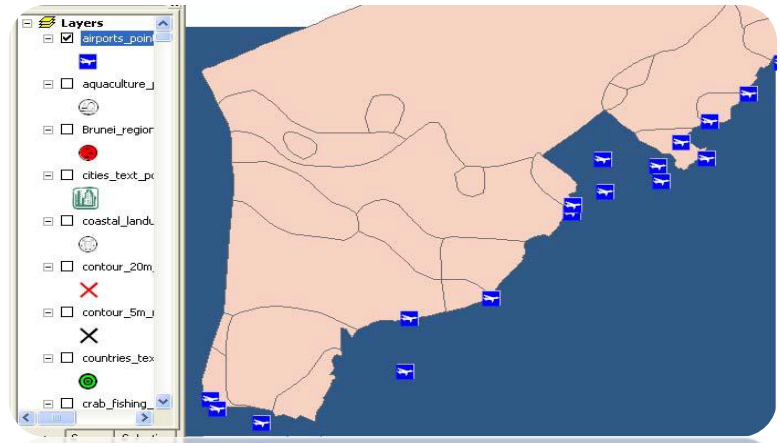
- evasion of prawn areas



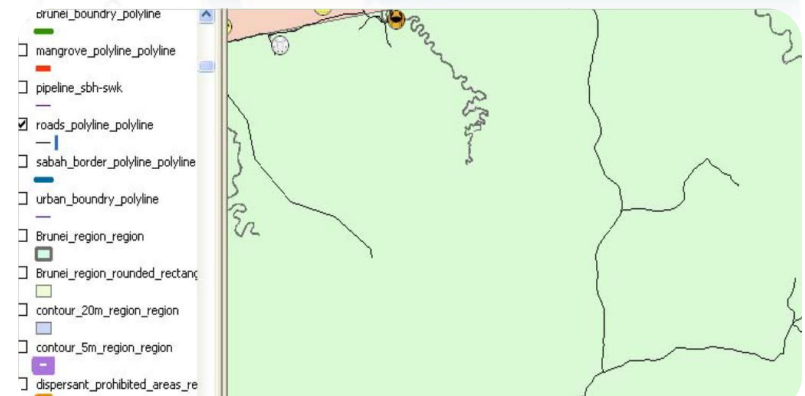
- evasion of Aquaculture areas



- Proximity to Airport



- Proximity to accessible roads



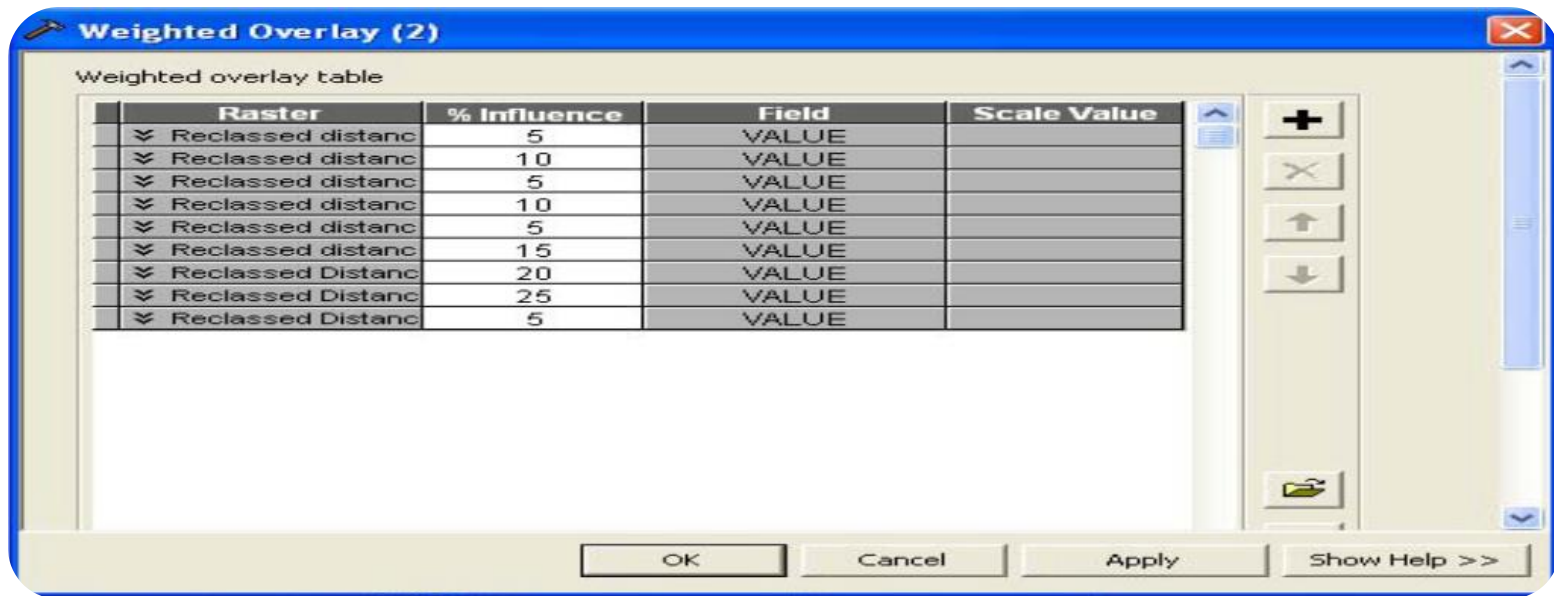
(after Balogun et al, 2012)

Methodology for Creating the Route

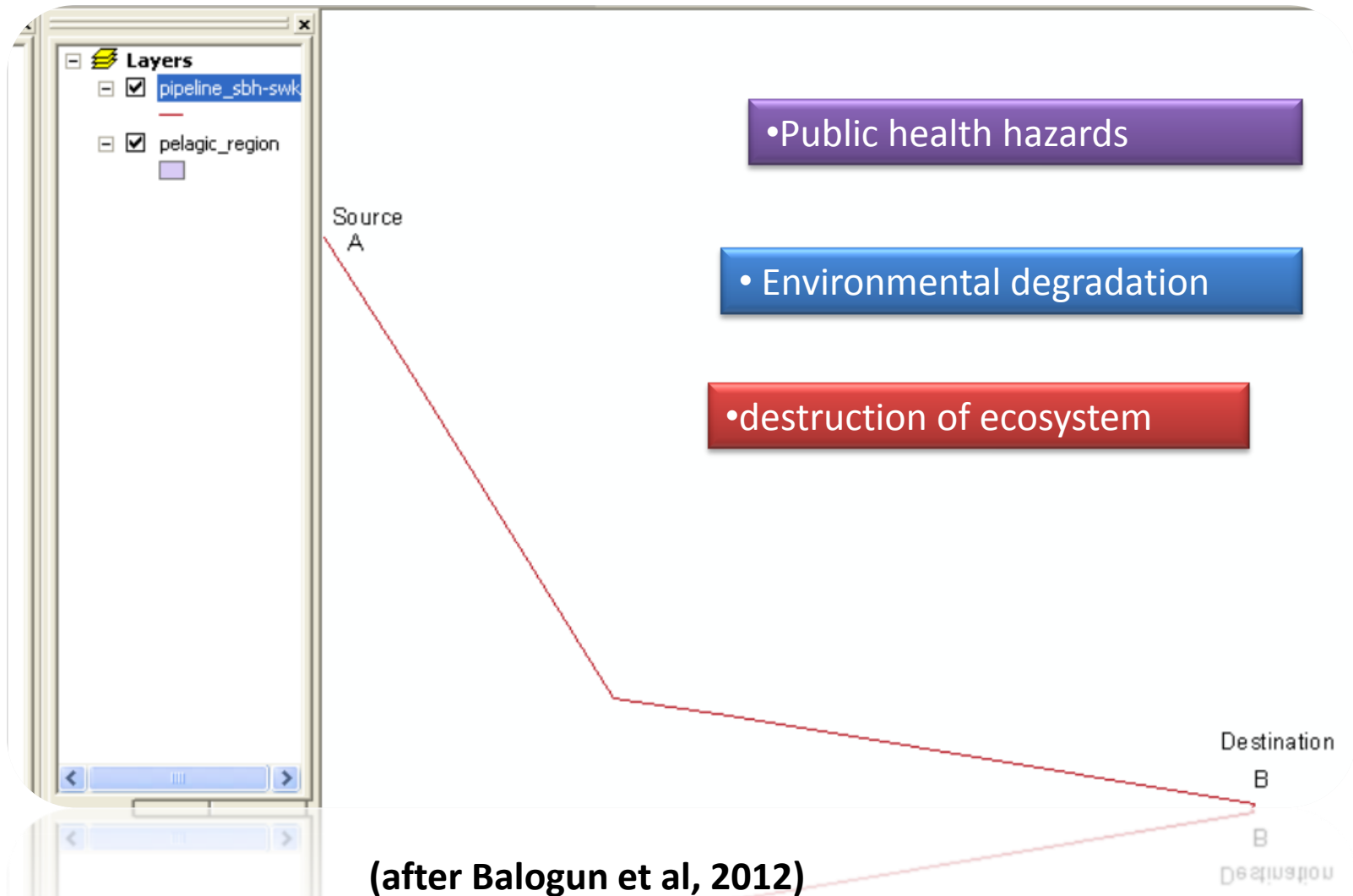
- ArcGIS 9.2 Spatial Analyst was utilized
- Rasteraization of vector maps
- Reclassifications
- Weighting of routing criteria
- Generation of Suitability Map
- optimal route Determination

Weighting

- varieties of parameters and variables
- involvement of the society
- Coding on 1 to 100

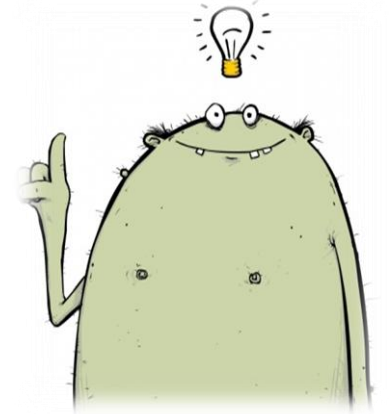


Results



Conclusion

- Capability of integration and comparison
- design the operations
- increased the assurance
- time and cost savings
- data quality
- Provide New Ways



References

- Barrell, K. A., 2000, *GIS: The exploration and exploitation tool. Applications in Geology*, No. 4, p. 237–248 (AAPG)
- Abdlatef, M. Z, Kahar, R. B., 2008, *Oil and Gas exploration in Ethiopia using GIS*.
- Balogun et al. 2012, *Optimal Oil Pipeline Route Selection using GIS: Community Participation in Weight derivation and Disaster Mitigation*. IACSIT Press, Singapore., IPCBEE vol.28
- Esri's PRESS (PUG) GIS for petroleum website.

