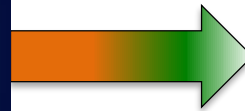


# Inter-Disciplinary Freshwater Lens Assessment Protocol for Karst Islands (Bantayan Island, Cebu Province, Philippines).



*By Robert M. DiFilippo*

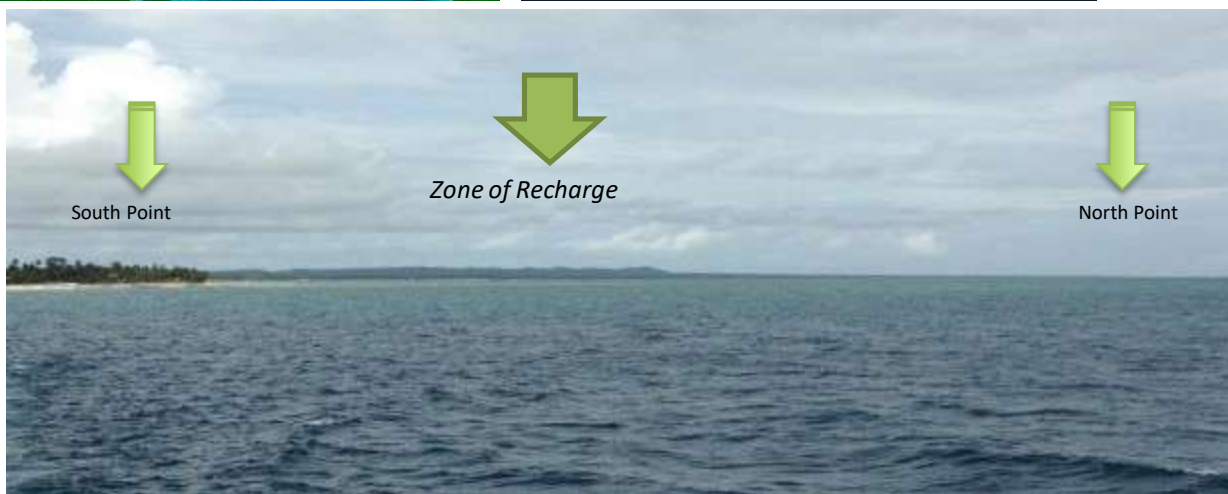
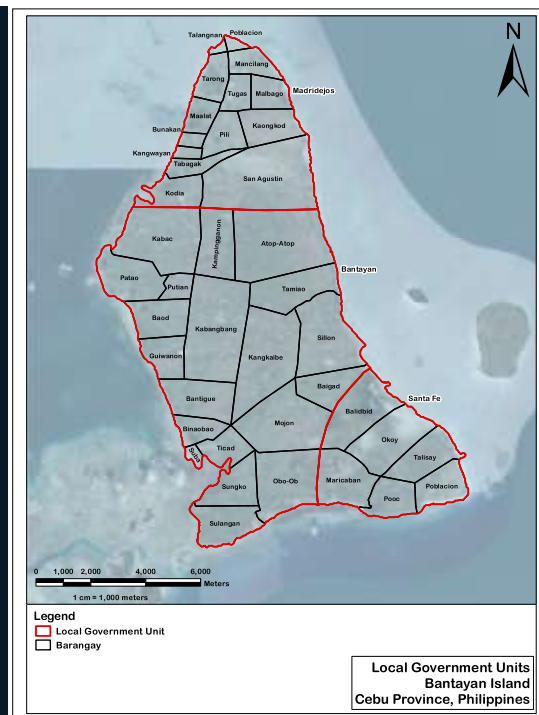
*[R.M.Difilippo@lboro.ac.uk](mailto:R.M.Difilippo@lboro.ac.uk)*

*Supervisors: Professor Lee Boshier and*

*Dr. Tom Dijkstra*

*June 2020*

# Vasaya Basin, Bantayan Island Cebu Province, Philippines



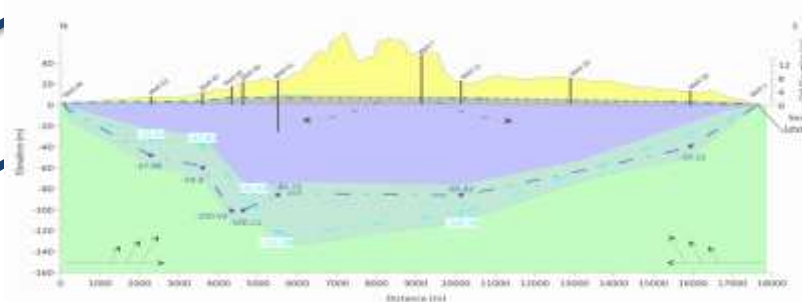
# Freshwater Lens Assessment Protocol

## Hydro Geologic Characterization

- Remote Sensing
- Geologic Mapping
  - 41 Field Sites Mapped
- Hydrogeologic Assessment
  - 25 Pumping Wells Assessed
- Tidal Studies Conducted (4)
- GW Mon & Sampling
  - 206 Samples Analysed
  - 2472 Analyses Processed

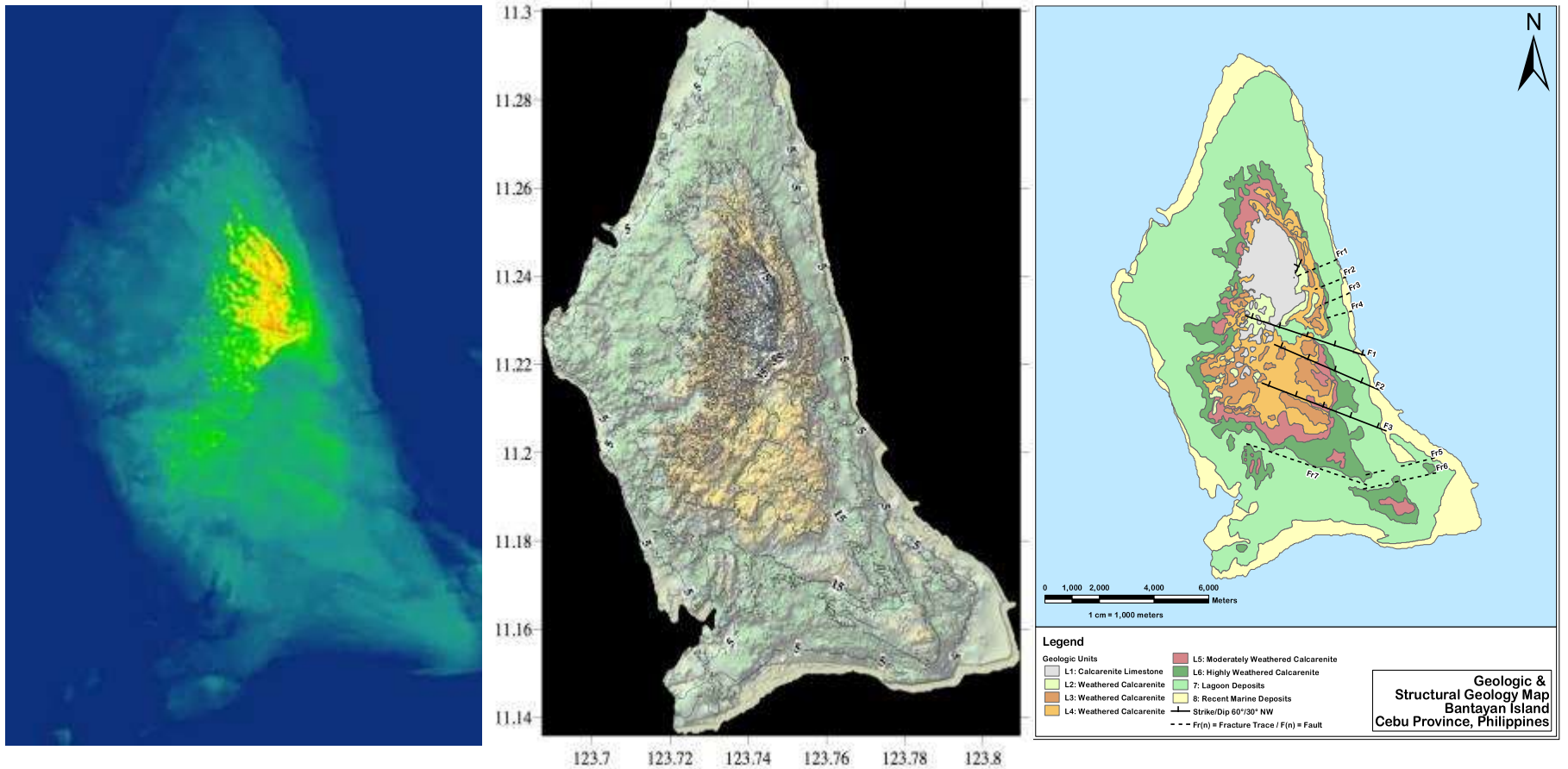
## Stakeholder Interaction

- Well Owner Survey
  - 37 Issued
- Laboratory Reports Issued
  - 74
- Semi-Structured Interviews
  - 30 Completed

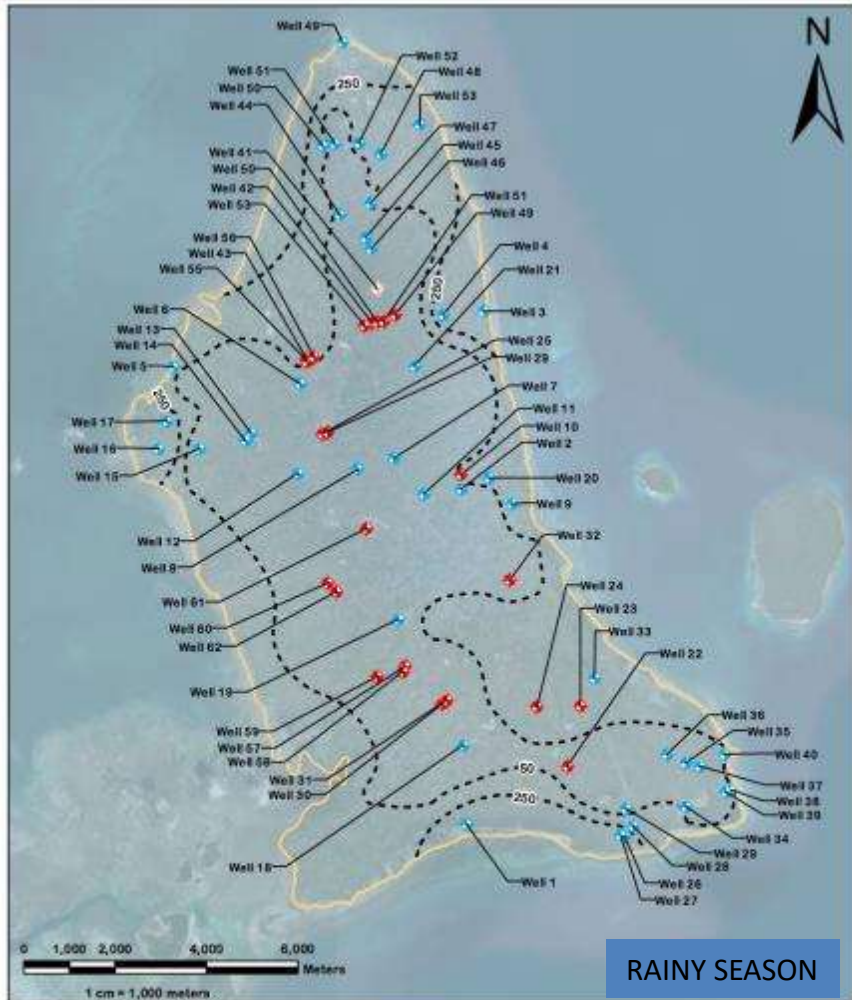


Groundwater Vulnerability Indicator Assessment

# LiDAR Imagery and Digital Elevation Model, Geologic & Tectonic Lineament Map, Bantayan Island, Cebu Province, Philippines

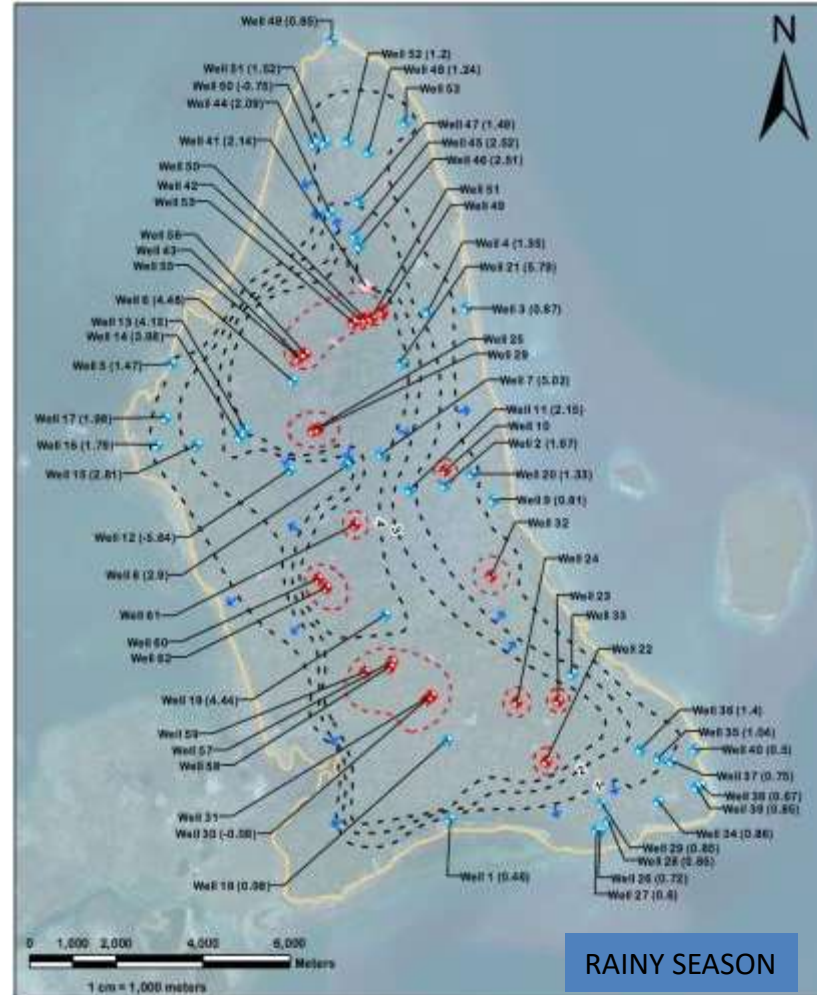


# Chloride Isoconcentration and Groundwater Gradient Maps, Bantayan Island, Cebu Province, Philippines



- Legend**
- - - Inferred Chloride Isoleth (Q4, 2017)
  - Non-Operating Pumping Well
  - Pumping Well
  - ◆ Monitoring Well
  - Shoreline

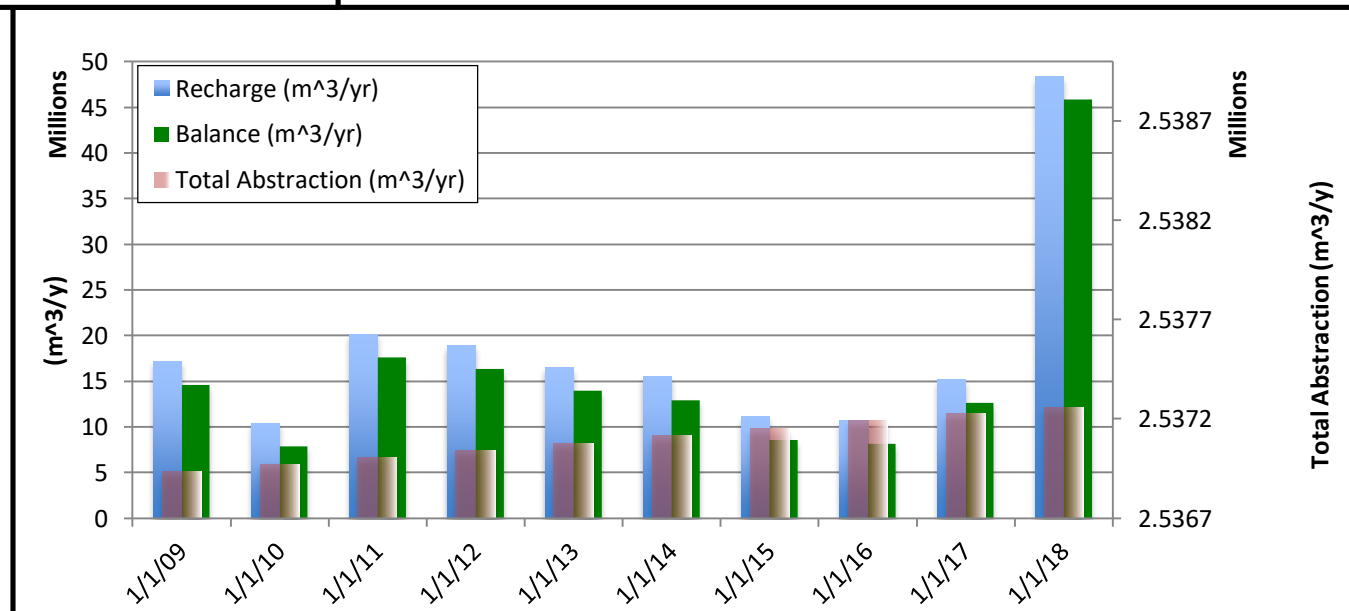
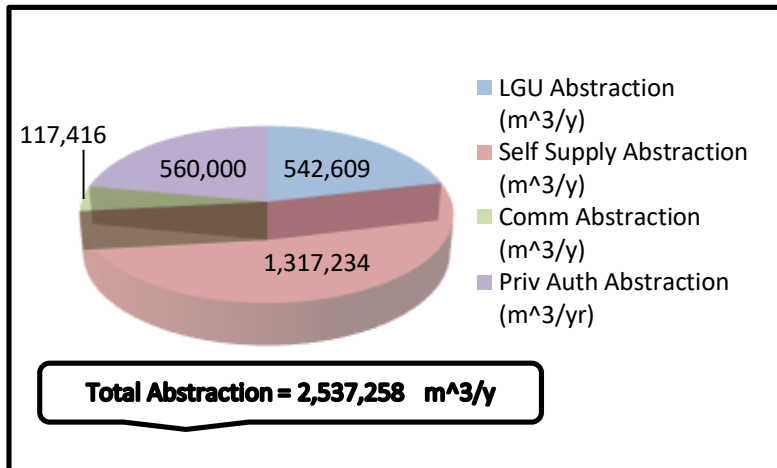
**Chloride Concentration Contours  
2017, Quarter 4  
Bantayan Island  
Cebu Province, Philippines**



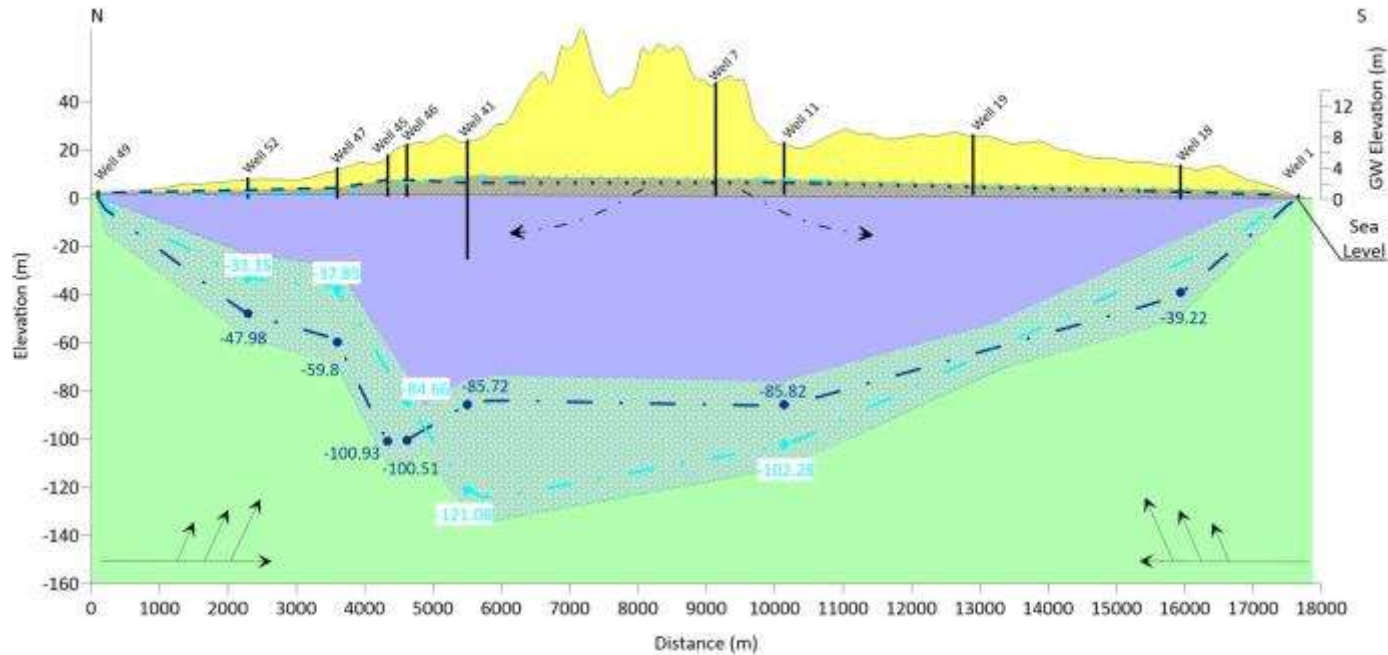
- Legend**
- - - Groundwater Elevation Contour and Flow Direction (Q4 2017)
  - Non-Operating Pumping Well
  - Pumping Well
  - ◆ Monitoring Well
  - Shoreline
  - Pumping Well Radius of Influence

**Groundwater Elevation Contours  
2017, Quarter 4  
Bantayan Island  
Cebu Province, Philippines**

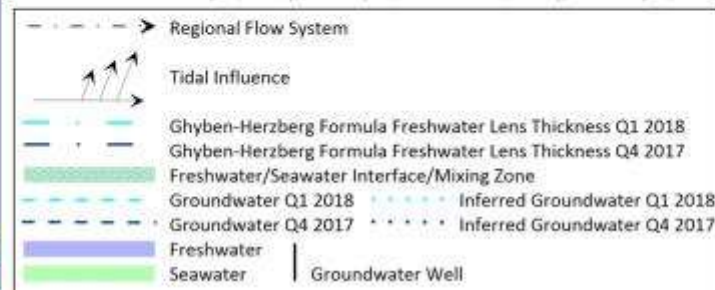
# Groundwater Abstraction and Groundwater Balance Results, Bantayan Island, Cebu Province, Philippines



# Observational Model, Bantayan Island, Cebu Province, Philippines

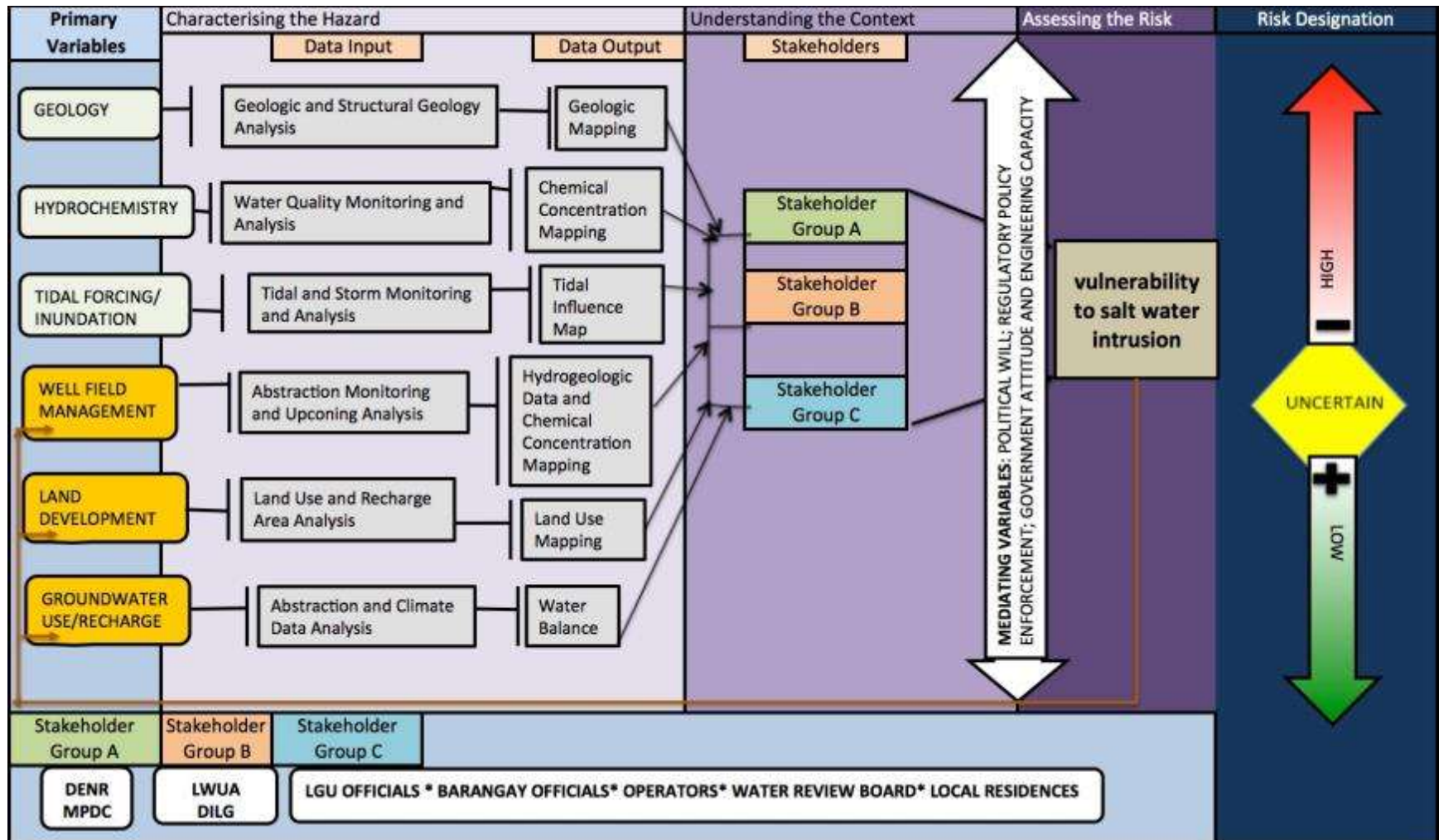


Data Excluded: Well 45 (Q1, 2018); Well 7 (Q4, 2017 and Q1, 2018); Well 19 (Q4, 2017 and Q1, 2018); Well 18 (Q1, 2018)



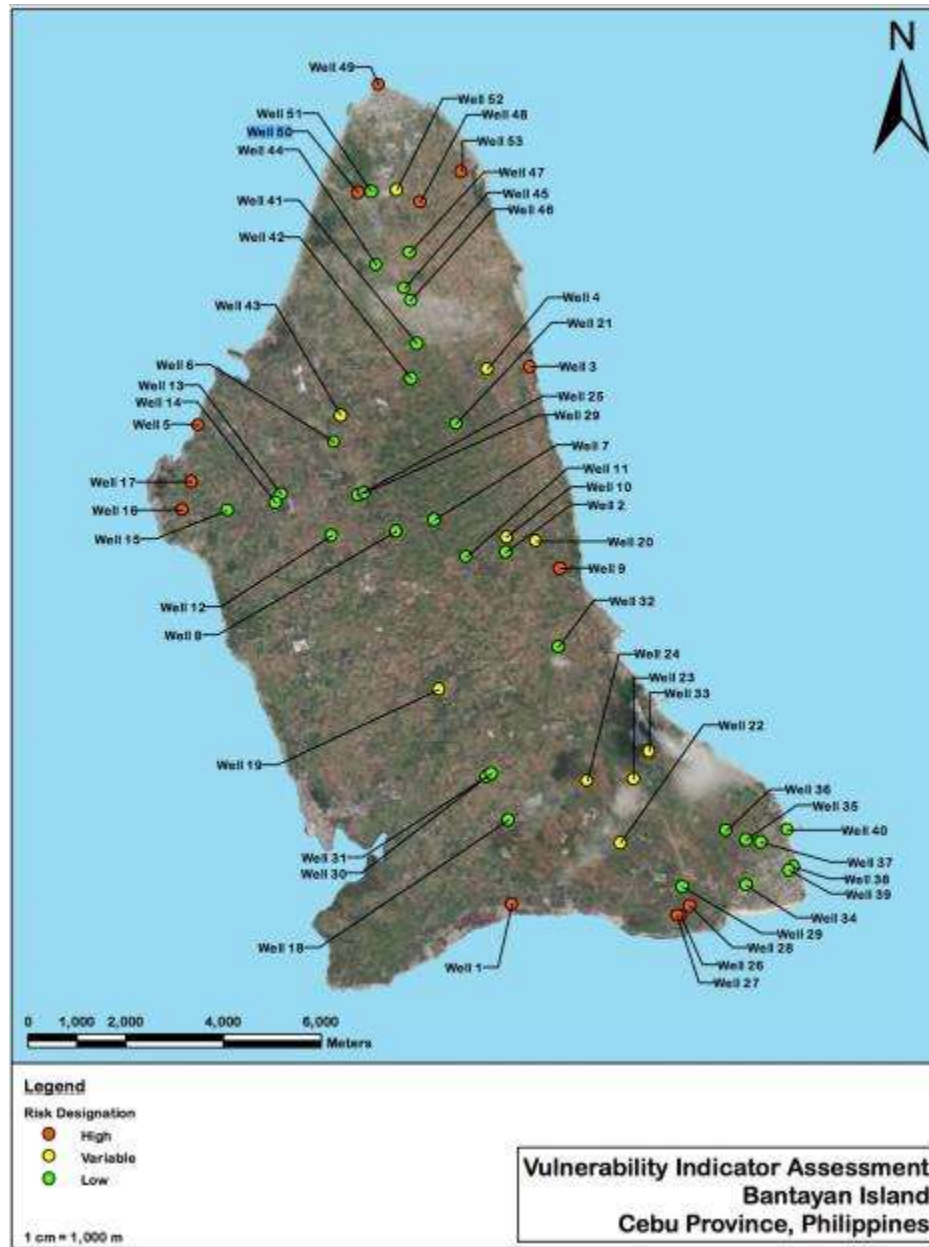
Observational Model  
Bantayan Island  
Cebu Province, Philippines

# Groundwater Vulnerability Indicator Assessment Model





# Vulnerability Indicator Assessment Map, Bantayan Island, Cebu Province, Philippines



Thank you for your kind attention!



*SETTING AN EXAMPLE IS NOT THE MAIN MEANS OF INFLUENCING OTHERS;  
IT IS THE ONLY MEANS. ALBERT EINSTEIN*