



human energy

# Ground-truthing Resources at Risk in Indonesia

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## ABSTRACT

Resources at Risk (RAR) are sites in an incident area which exhibit environmental, archaeo-cultural, or socio-economic sensitivity. Oil Spill Response Plans rely on RAR programs to make relative resource valuations which influence and determine oil spill response strategies and actions. The types and locations of the RAR are documented on an Environmental Sensitivity Index Map (ESIM). Ground-truthing is a critical component of RAR programs because it is used to confirm the validity of the ESIM and validate and document information concerning the status of RAR and oil spill response logistics. Stakeholder engagement and application of various survey methods during ground-truthing are necessary to develop a comprehensive understanding of RAR for an area.

## BACKGROUND

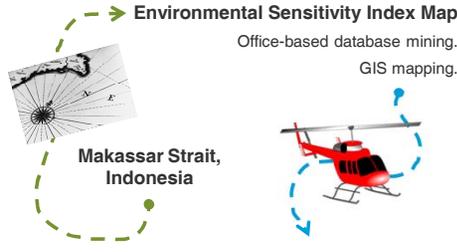
The Chevron Indonesia Business Unit conducted an RAR study to improve their Oil Spill Response Plan and evaluate various ground-truthing survey methods. The RAR study involved the following activities:

1. Identification of potential, credible oil spill scenarios and their associated risks (size, location, spread, etc.)
2. Generation of Environmental Sensitivity Index Maps which identify RAR
3. Development of tactical plans for protection and response of RAR which include training exercises

## RESOURCES AT RISK EXAMPLES

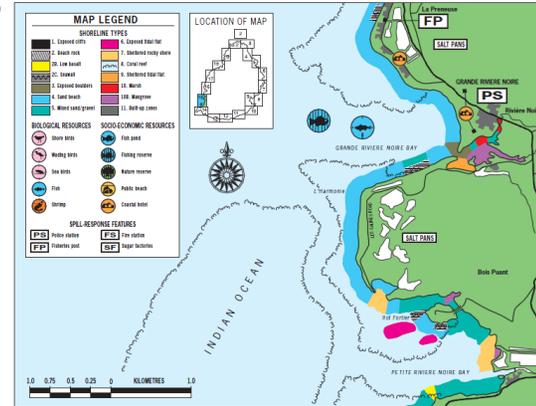


## GROUND-TRUTHING SURVEY METHODS



### Aerial Survey

Aerial survey of shoreline by helicopter.  
GPS, videos, photos, notes.  
Contiguous coverage of shoreline.



IPECA OIL SPILL PREPAREDNESS AND RESPONSE REPORT SERIES SUMMARY (1990-2005). An extract from the Coastal Sensitivity Atlas of Makassar, a large format atlas in which each map is accompanied by a range of descriptive text and information on specific resources. Note the coastal topography.

### Offshore Survey

Offshore survey of shoreline by boat.  
GPS, photos, notes.



### Onshore Survey

Onshore survey of shoreline by motor vehicle.  
GPS, photos, notes.  
Identification of access points and waterways.  
Shoreline categorization.



## OIL SPILL RESPONSE PLAN FACTORS

During ground-truthing, various factors were identified and documented for oil spill planning and response, including:

- Shoreline types
- Potential spill response staging and action areas
- Outfalls and waterways
- Quality of habitats
- Mixture of human uses and environmental habitats
- Socio-economics of local communities and cultures

## SURVEY METHOD COMPARISON

Survey Type	Survey Method Benefit			
	ESI Map	Aerial	Offshore	Onshore
Shoreline ESI maps	M	M/H	H	L
Response staging & logistics	L	M	L	H
Socio-economic concerns	L	L	M	H
Potential inland spill impacts	L	M	L	H
Biological resources	M	L	L	M
Shoreline coverage	M	H	M	L
Security	H	H	M	L

ESI - Environmental Sensitivity Index  
H- High M- Medium L- Low

## CONCLUSIONS

- University, policy, government, public affair and local community input was a powerful addition to the socioeconomic and ecological shoreline data collection.
- Historical oil spill response data and lessons learned are useful inputs for ESI maps and planning and response.
- Helicopter surveying is critical for integrating data from other survey methods (onshore and offshore) together.
- Approximately 27 km / shoreline could be mapped per day in the field.
- All survey methods provide beneficial information for ESI Mapping and oil spill planning and response logistics.
- Basic sea survival and helicopter underwater escape training should be considered for people conducting ground-truthing.