

Applications of Earth Observation for Disaster Risk Management



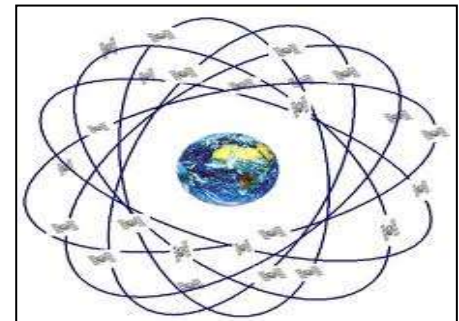
Hicham EZZINE,
Regional Centre for Disaster Risk Reduction

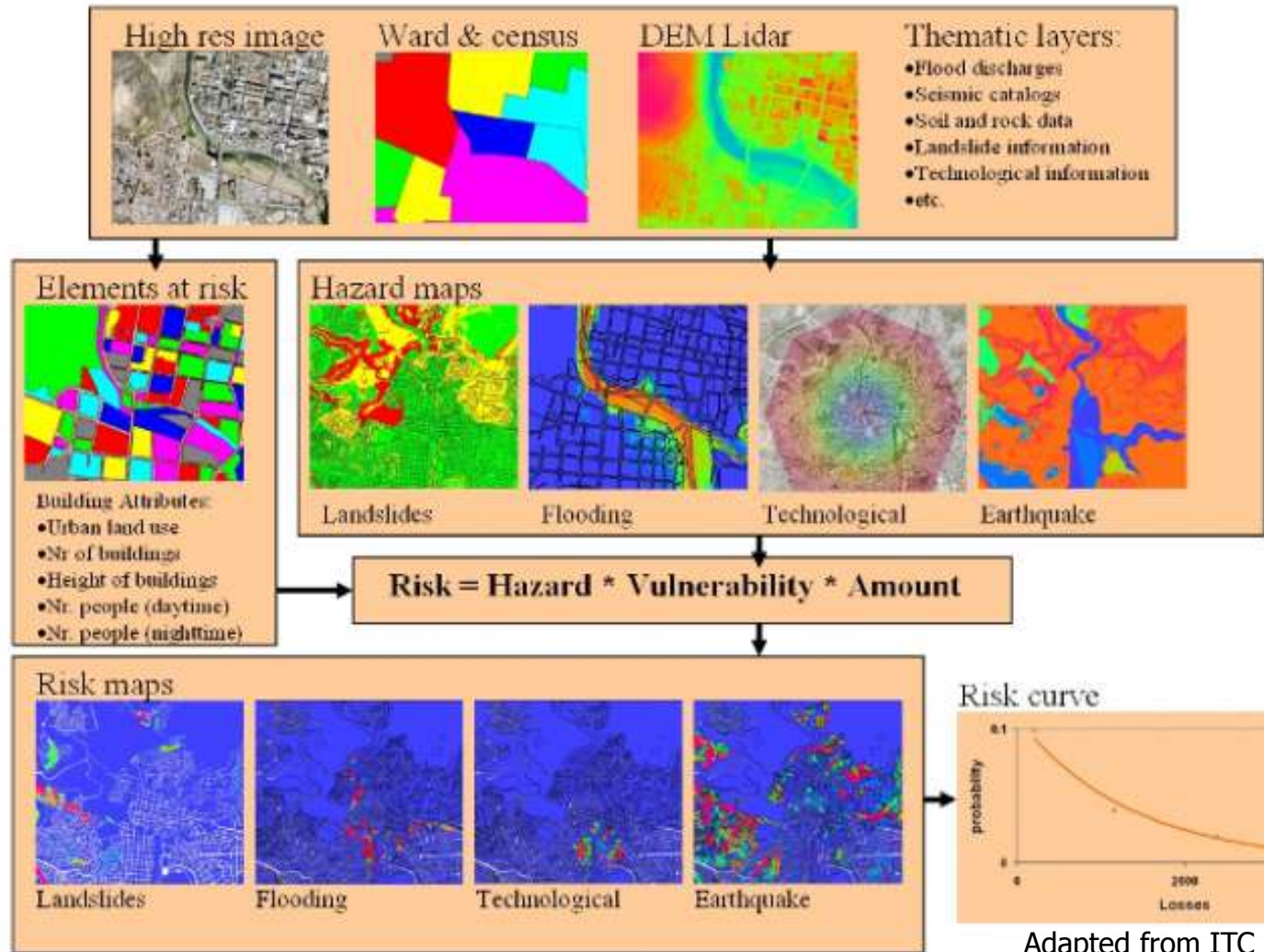
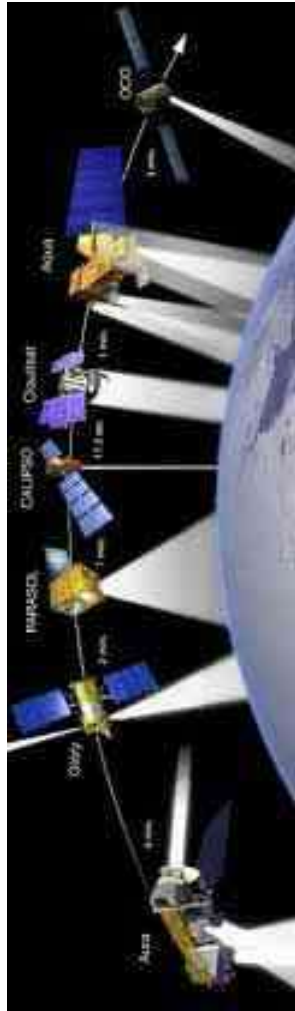


Cooperative Governance
Traditional Affairs



THE DISASTER RISK MANAGEMENT CYCLE



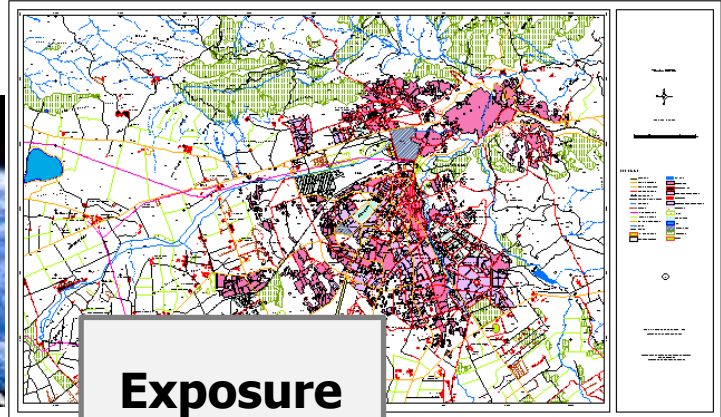
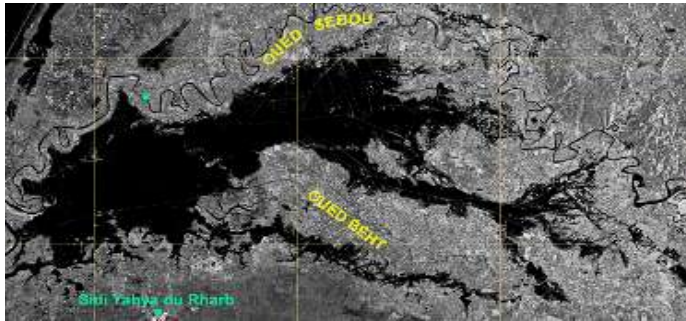


Adapted from ITC

INRODUCTION

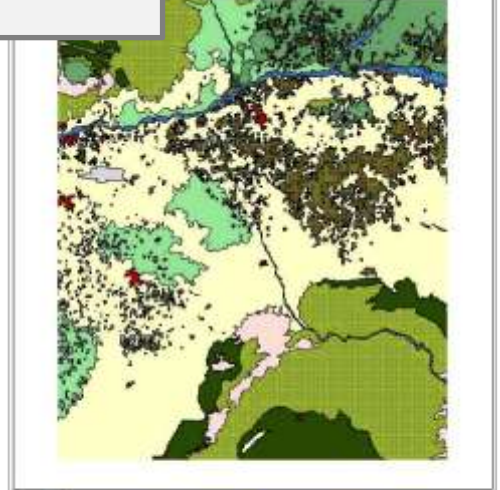
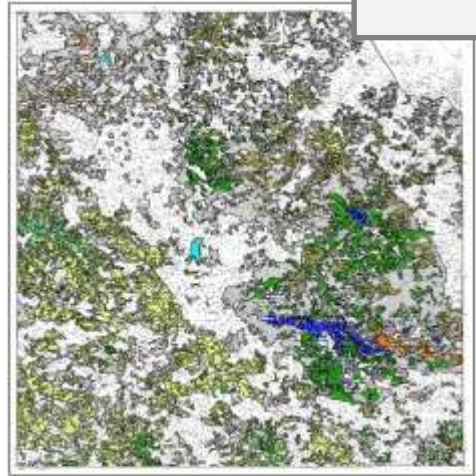
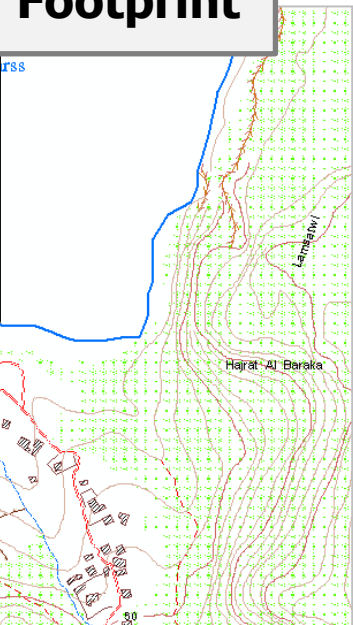
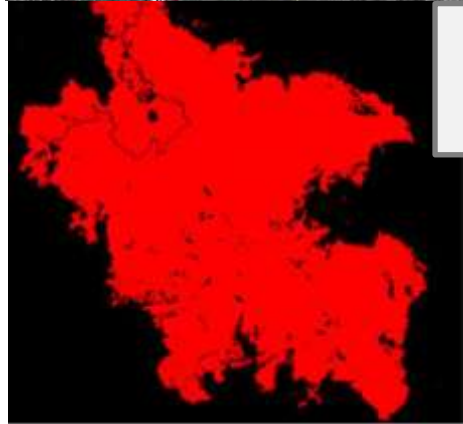
Post-Disaster: Damage Assessment

DaLa / PDNA



Disaster Footprint

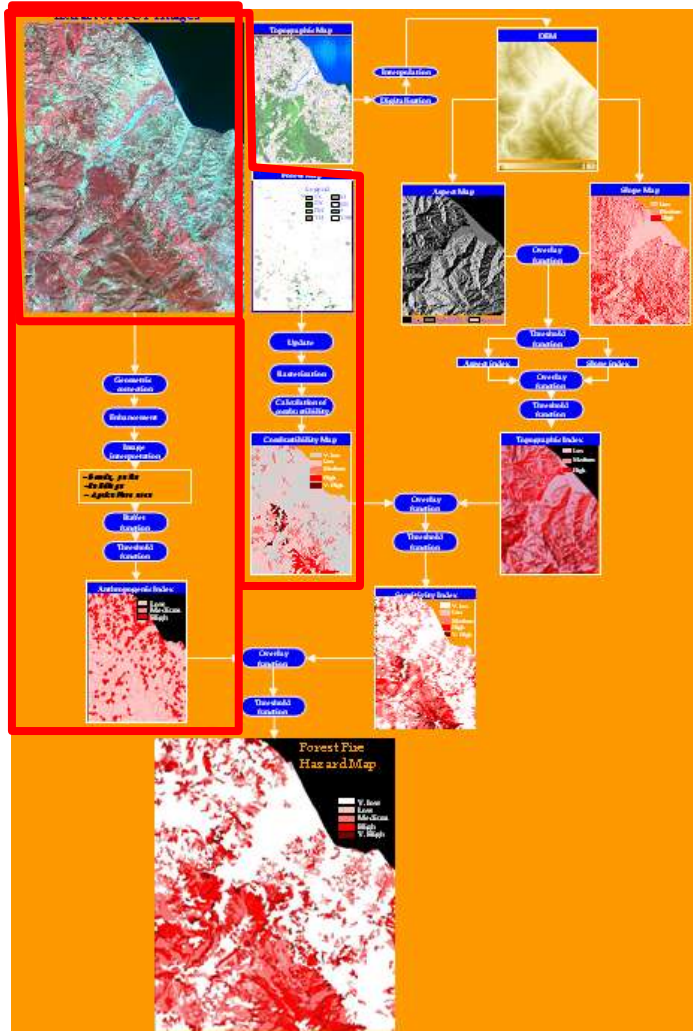
Exposure



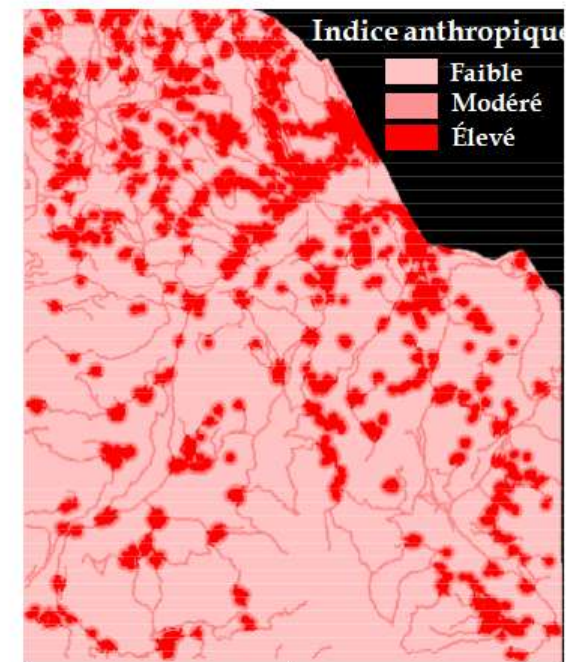
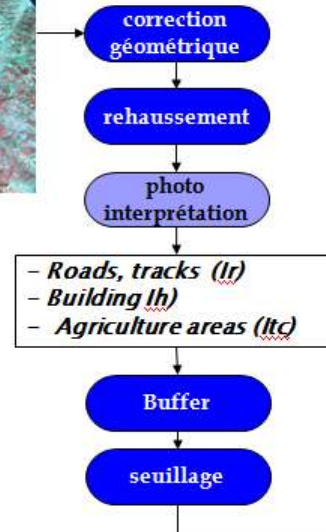
FOREST FIRES

Pre-Disaster: Risk Assessment

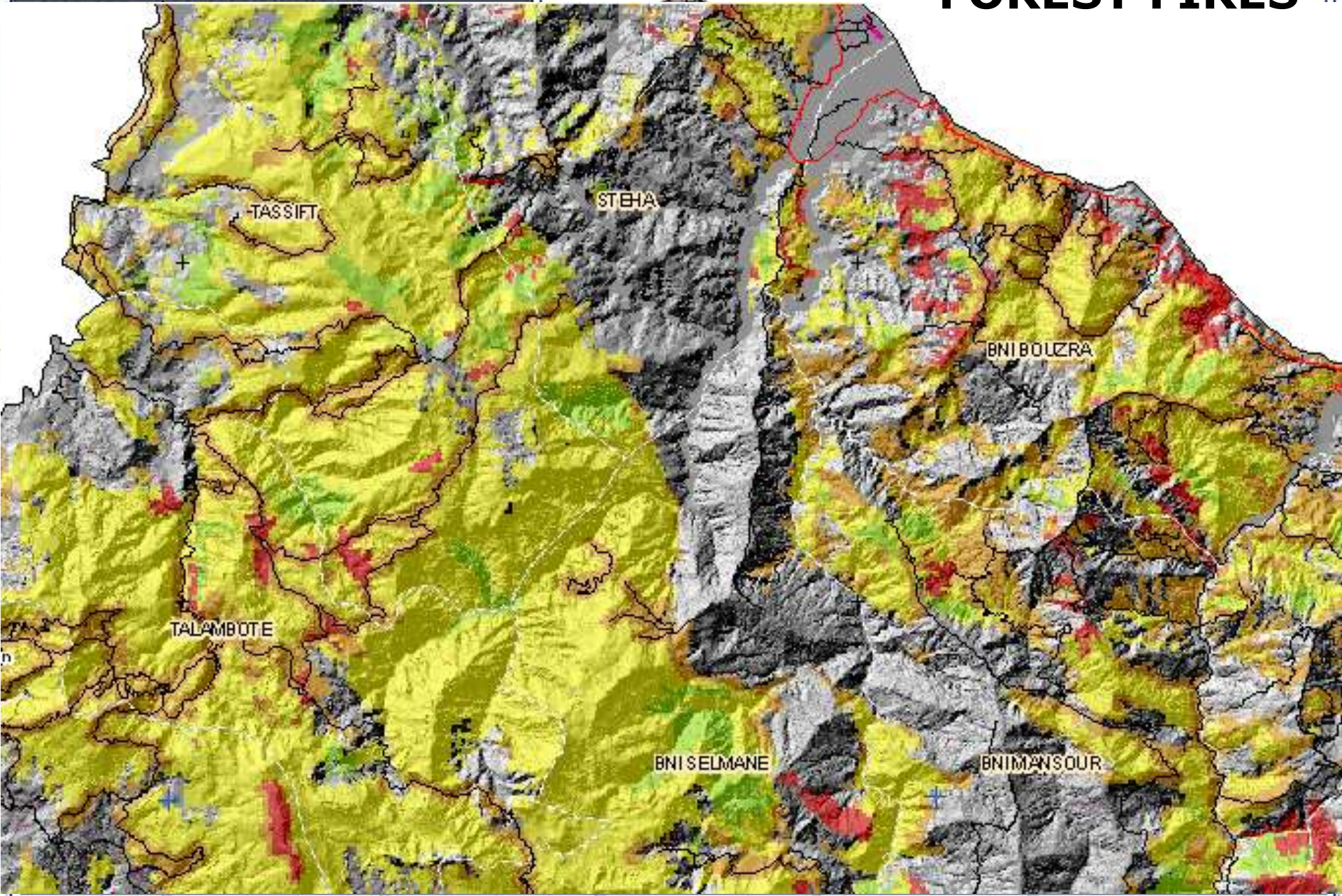
- Assessment of structural Risk
- Assessment of conjectural Risk



Anthropogenic Index



FOREST FIRES

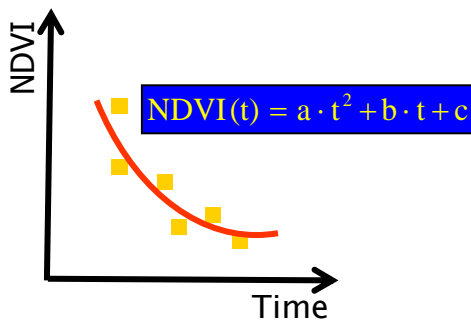


FOREST FIRES

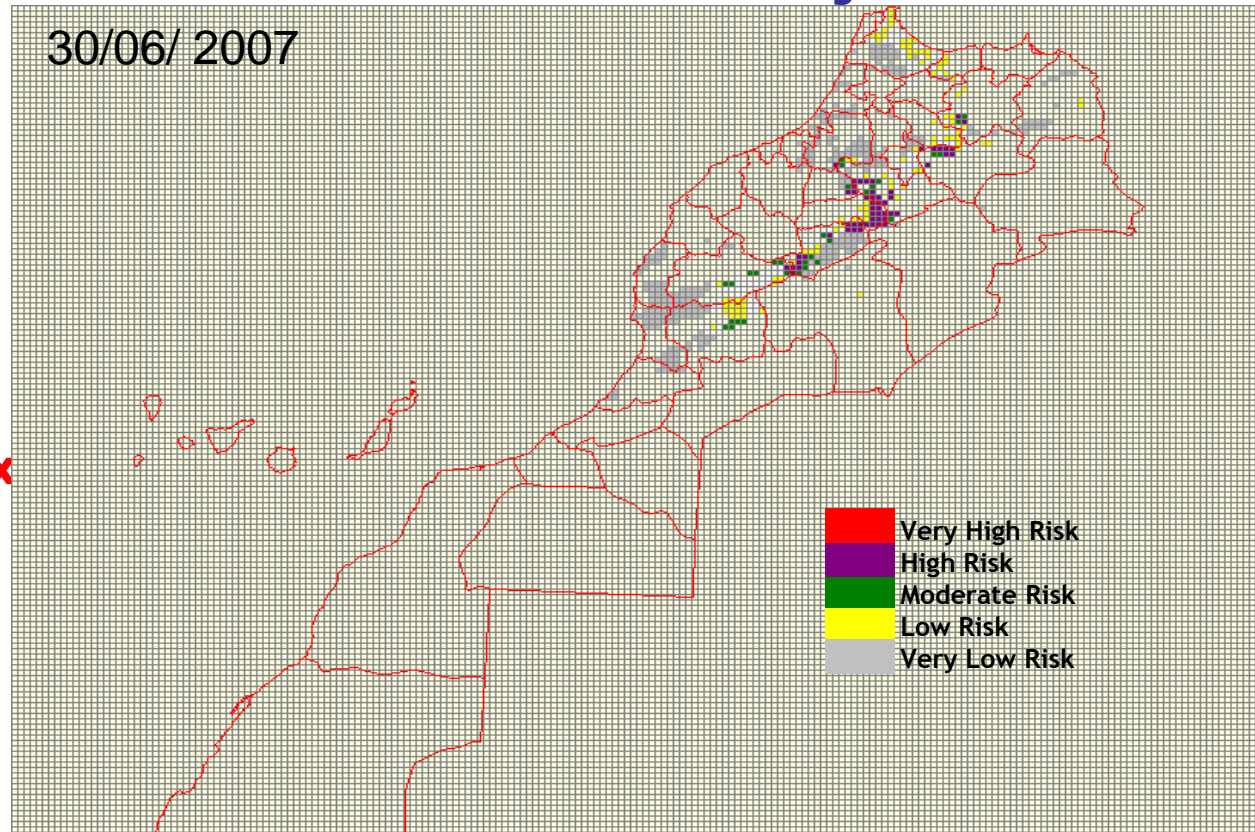
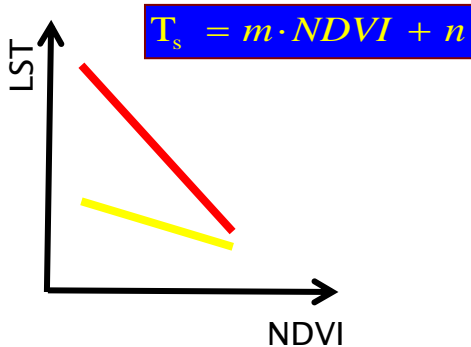
Pre-Disaster: Risk Assessment

- Assessment of structural Risk
- **Assessment of conjectural Risk**

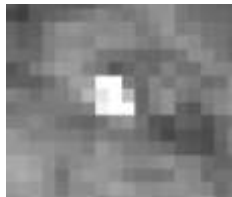
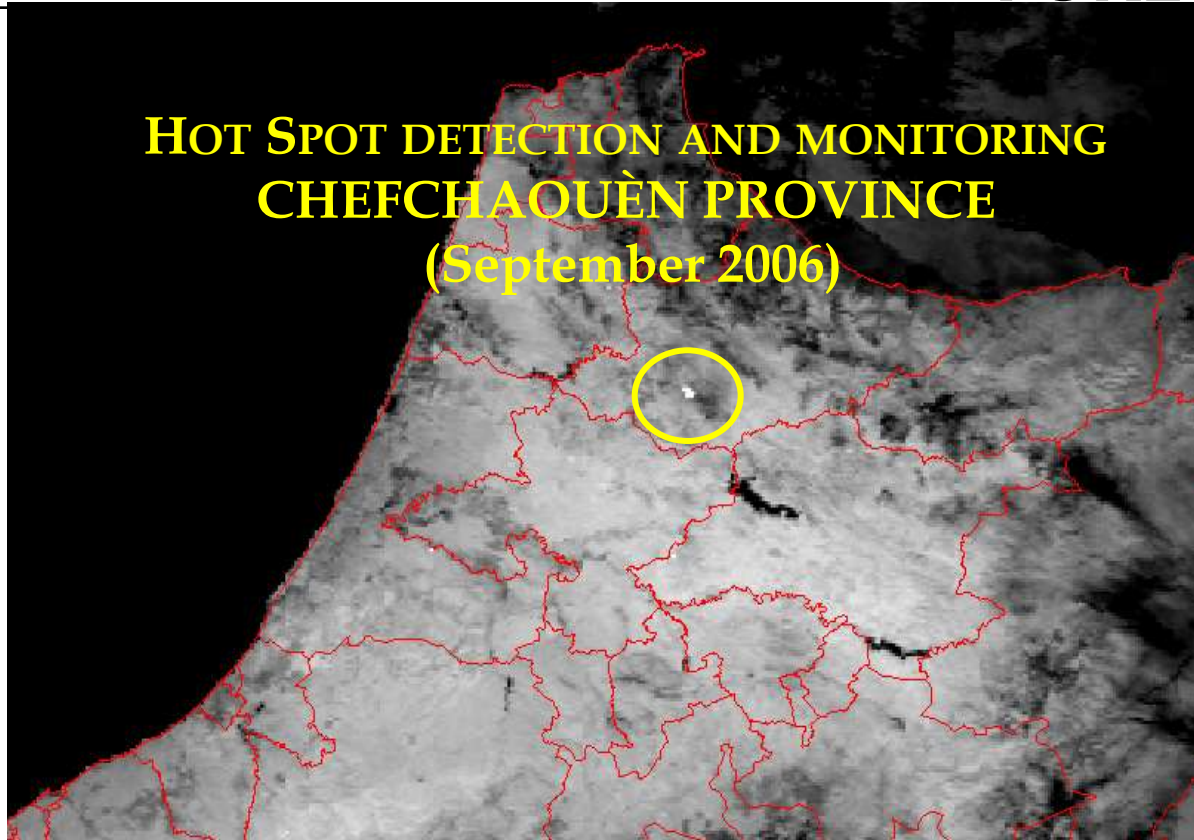
- Vegetation regression index



- Vegetation drought index



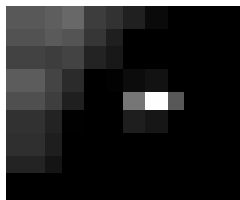
HOT SPOT DETECTION AND MONITORING CHEFCHAOUËN PROVINCE (September 2006)



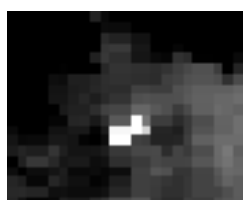
04/09/2006
à 13 h 25



07/09/2006
à 13 h 36



05/09/2006
à 13 h 15



06/09/2006 à
13 h 05



08/09/2006
à 14 h 27



08/09/2006
à 14 h 30



09/09/2006
à 14 h 18

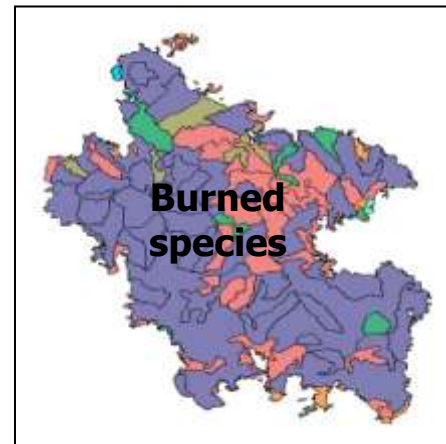
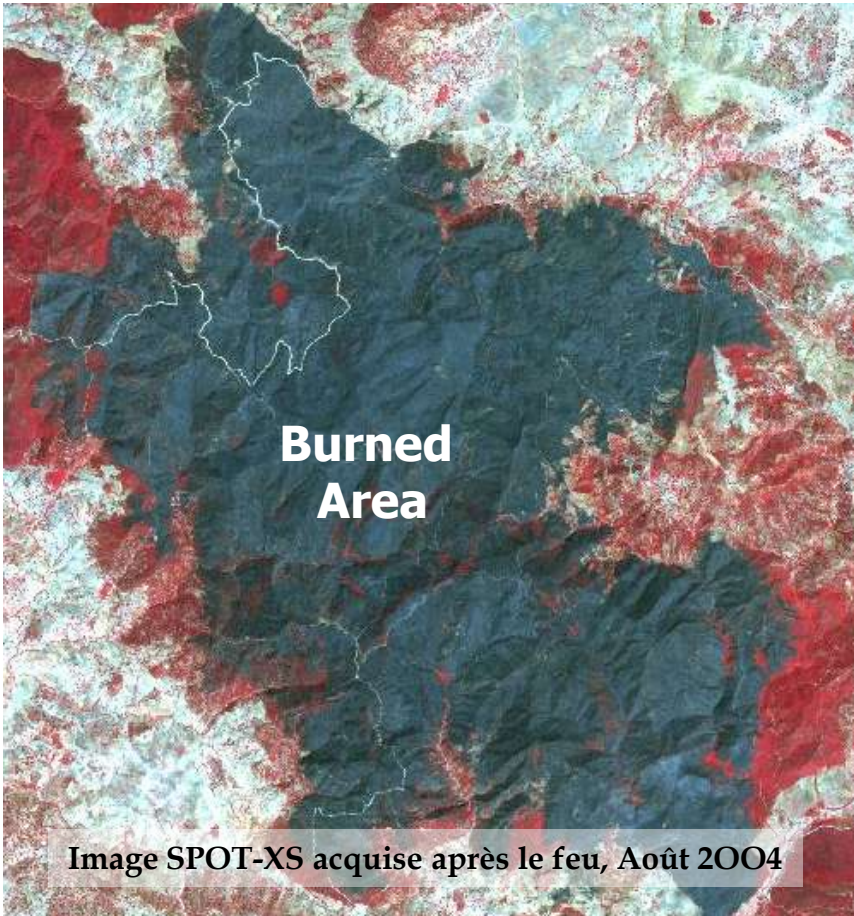


10/09/2006
à 14 h 18

FOREST FIRES

Post -Disaster: Damage Mapping

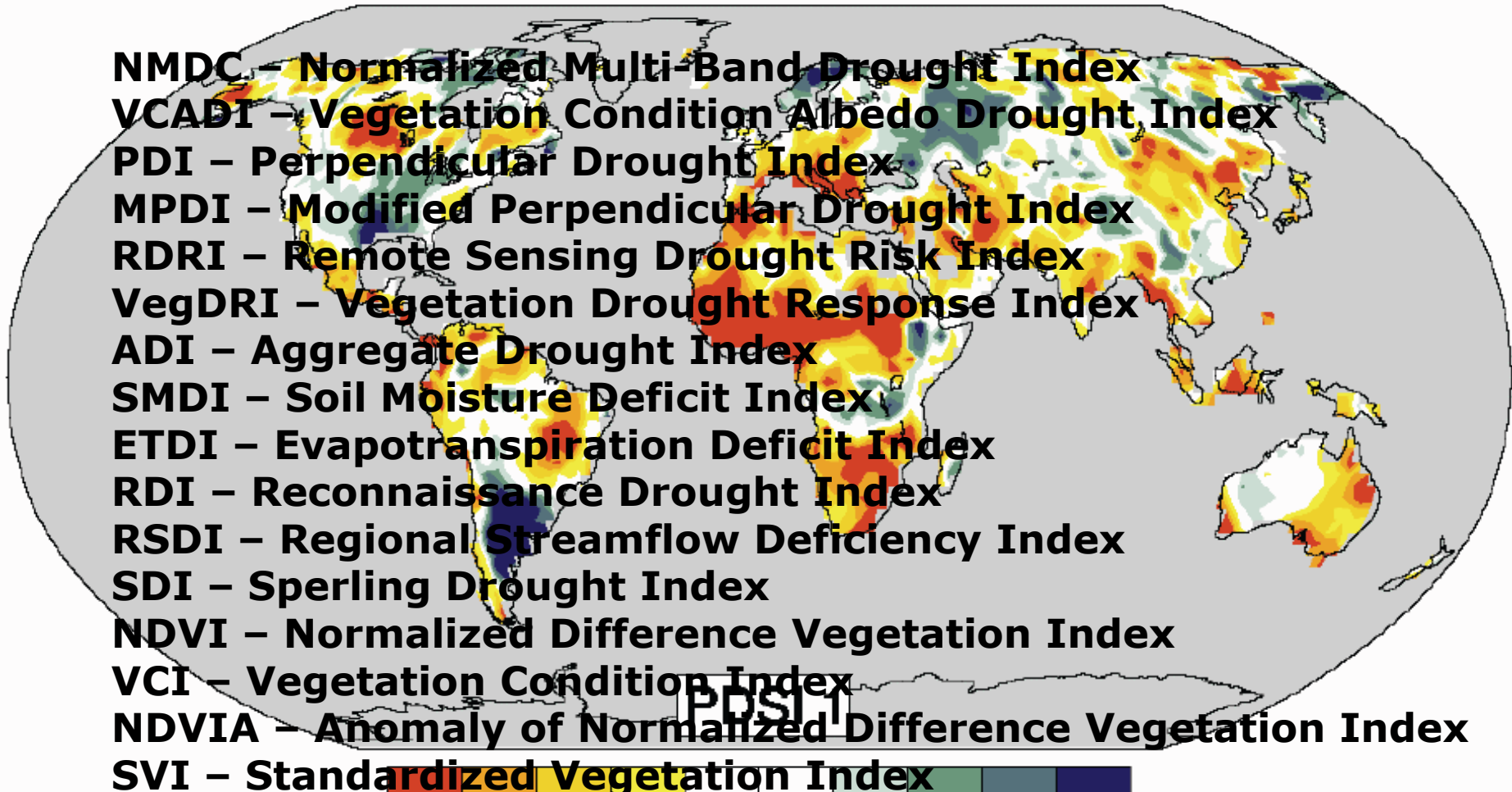
Cartography of burned area



Species	Area (ha)
Chêne liège	761,404
Chêne Vert	6,624
Feuillues	118,869
Matorral	142,127
Reboisement feuillu	6,999
Reboisement Résineux	2717,074
Terrains non Boisés	67,36
Total	3820,457

Commune	Area (ha)
Zoumi	2733
Beni Qoulla	1087
Total	3820

PDSI : 1900 - 2002



- NMDC** – Normalized Multi-Band Drought Index
- VCADI** – Vegetation Condition Albedo Drought Index
- PDI** – Perpendicular Drought Index
- MPDI** – Modified Perpendicular Drought Index
- RDRI** – Remote Sensing Drought Risk Index
- VegDRI** – Vegetation Drought Response Index
- ADI** – Aggregate Drought Index
- SMDI** – Soil Moisture Deficit Index
- ETDI** – Evapotranspiration Deficit Index
- RDI** – Reconnaissance Drought Index
- RSDI** – Regional Streamflow Deficiency Index
- SDI** – Sperling Drought Index
- NDVI** – Normalized Difference Vegetation Index
- VCI** – Vegetation Condition Index
- NDVIA** – Anomaly of Normalized Difference Vegetation Index
- SVI** – Standardized Vegetation Index

NDWI – Normalized Difference Water Index

IPCC, 2007

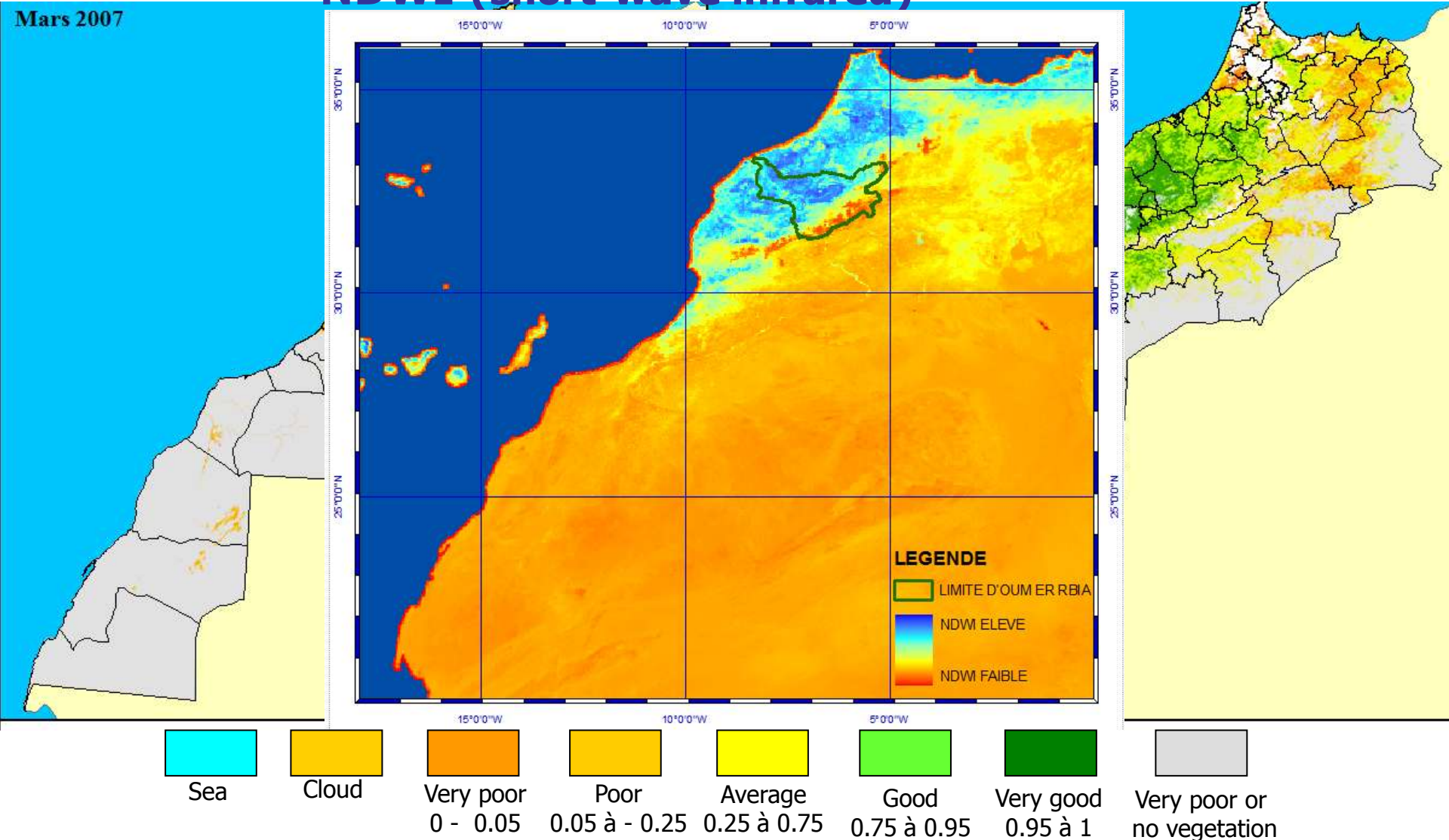
NDII – Normalized Difference Infrared Index

LWCI – Leaf Water Content Index

DTx – agricultural drought index

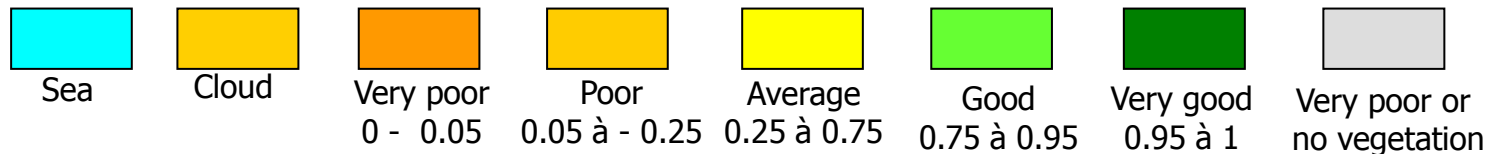
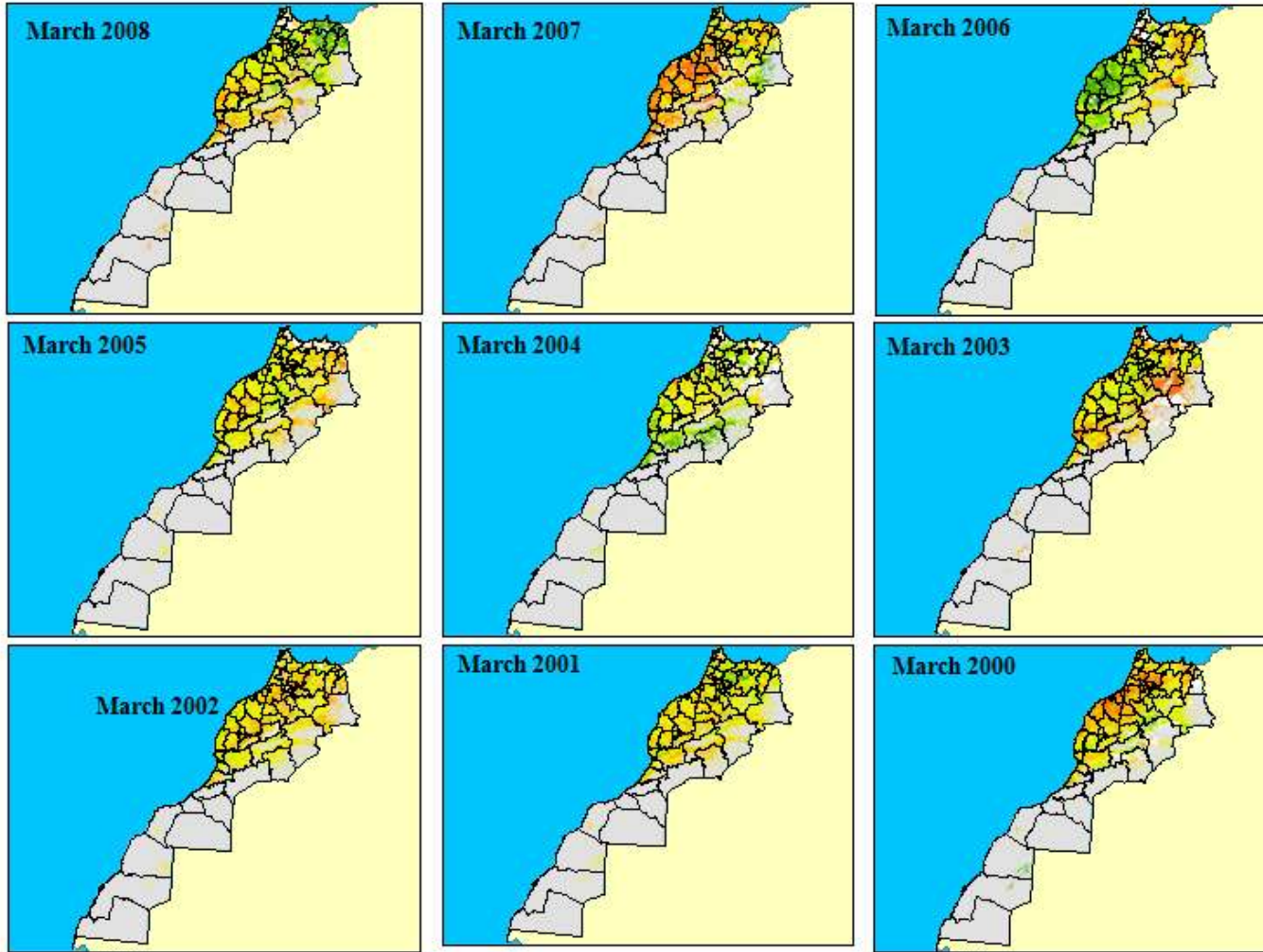
Standardized Vegetation Index: Drought Monitoring

- NDVI
- NDWI (short-wave infrared)



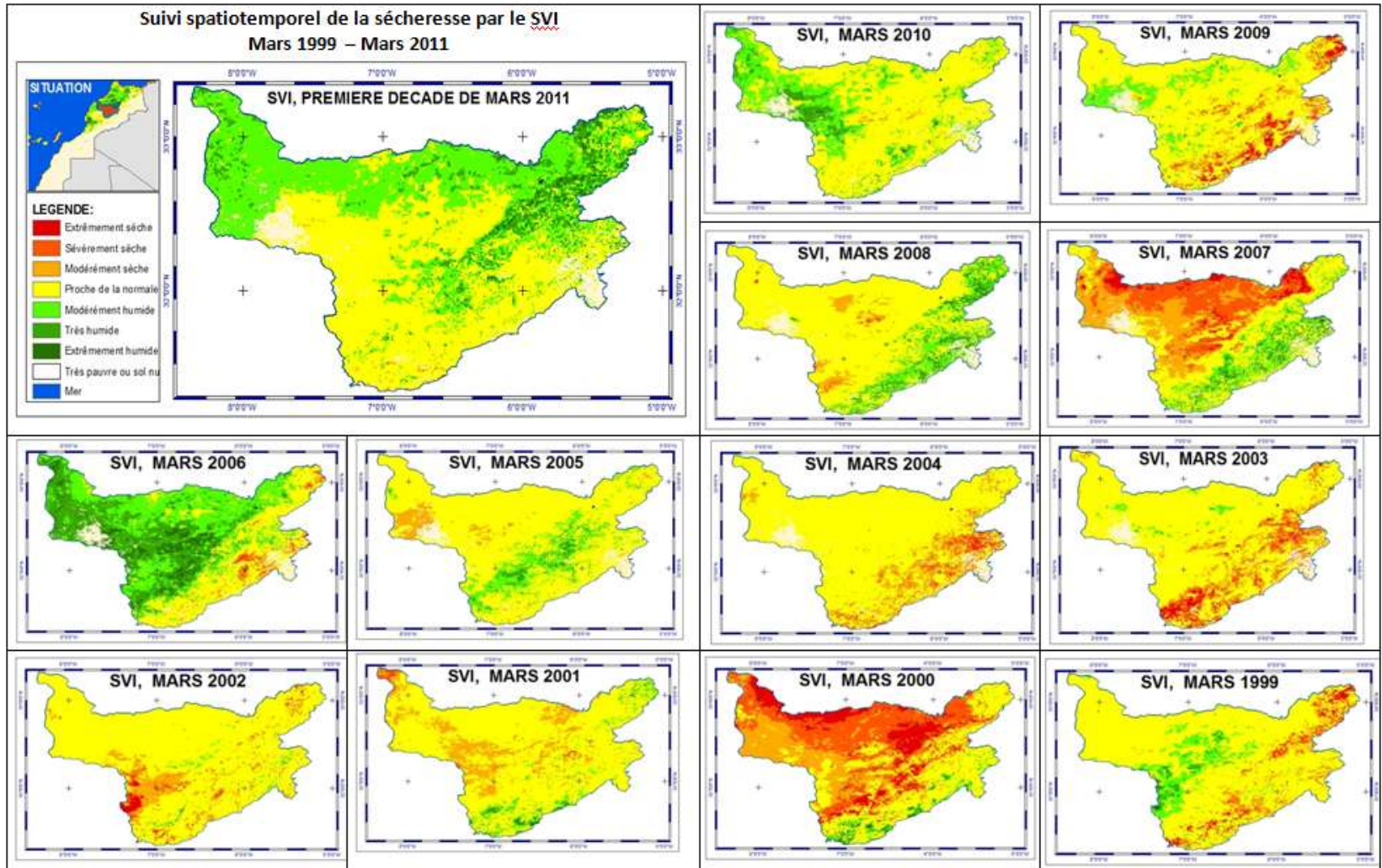
DROUGHT

Standardized Vegetation Index: Drought Monitoring

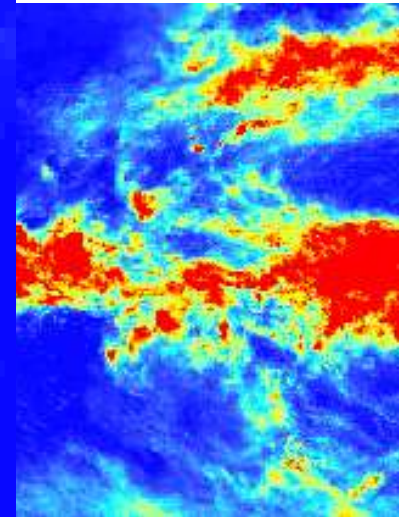
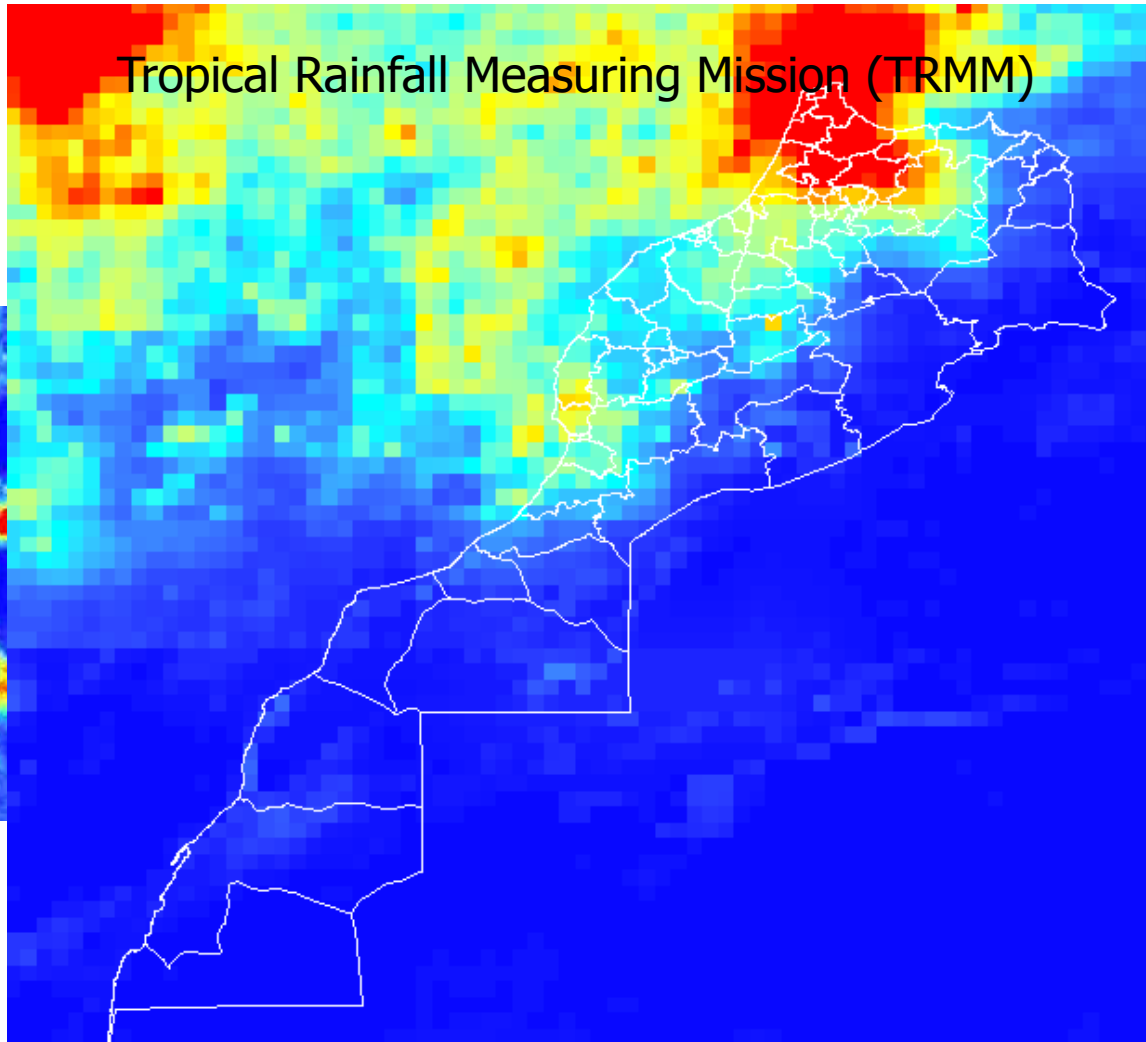
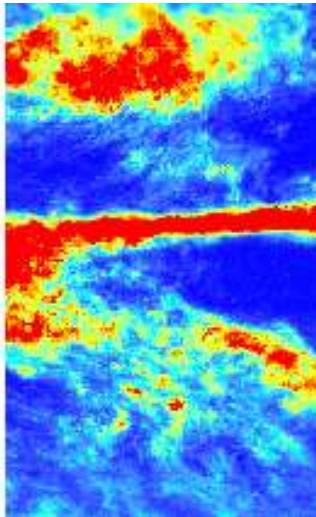


DROUGHT

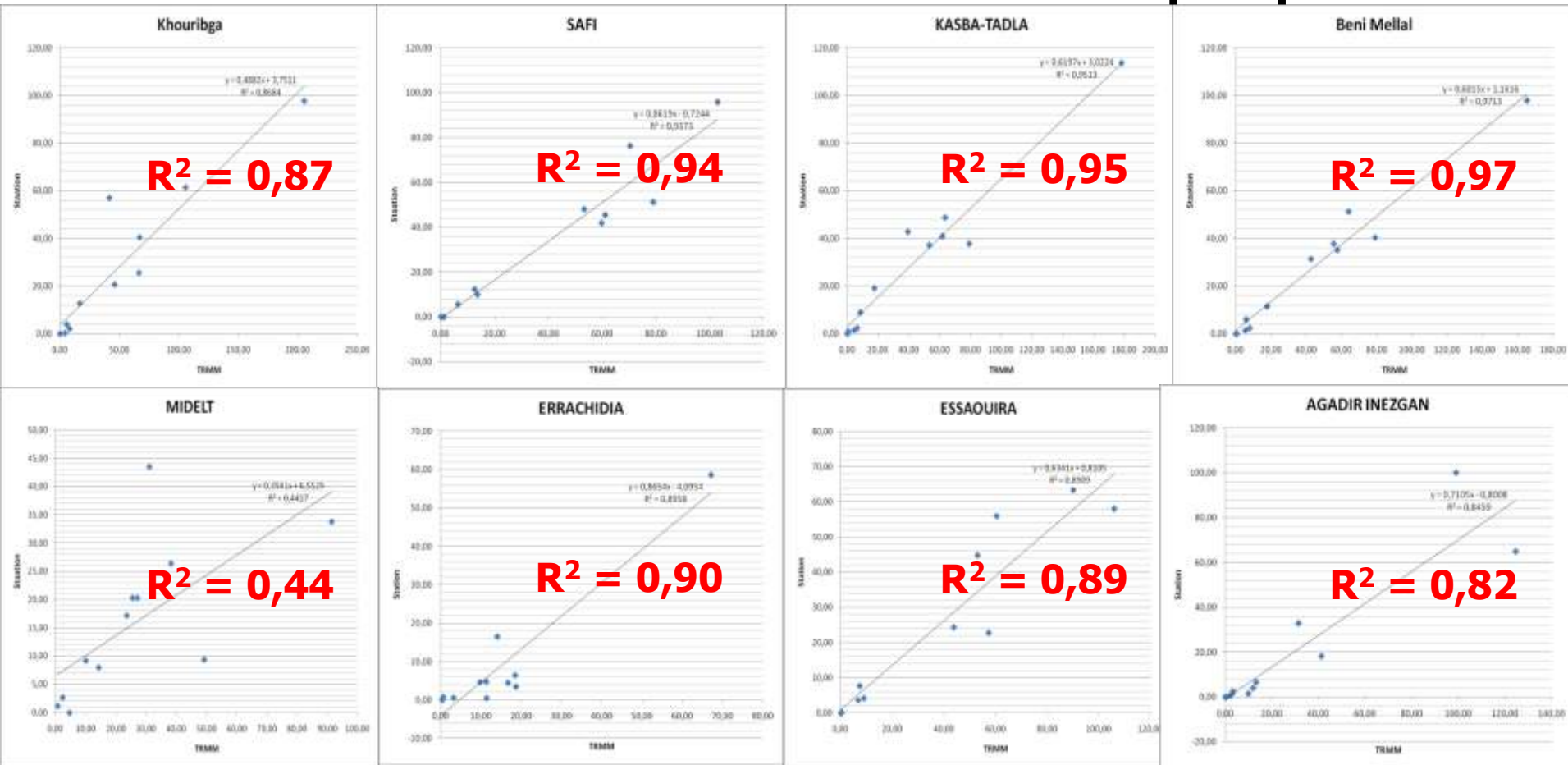
Standardized Vegetation Index: Drought Monitoring



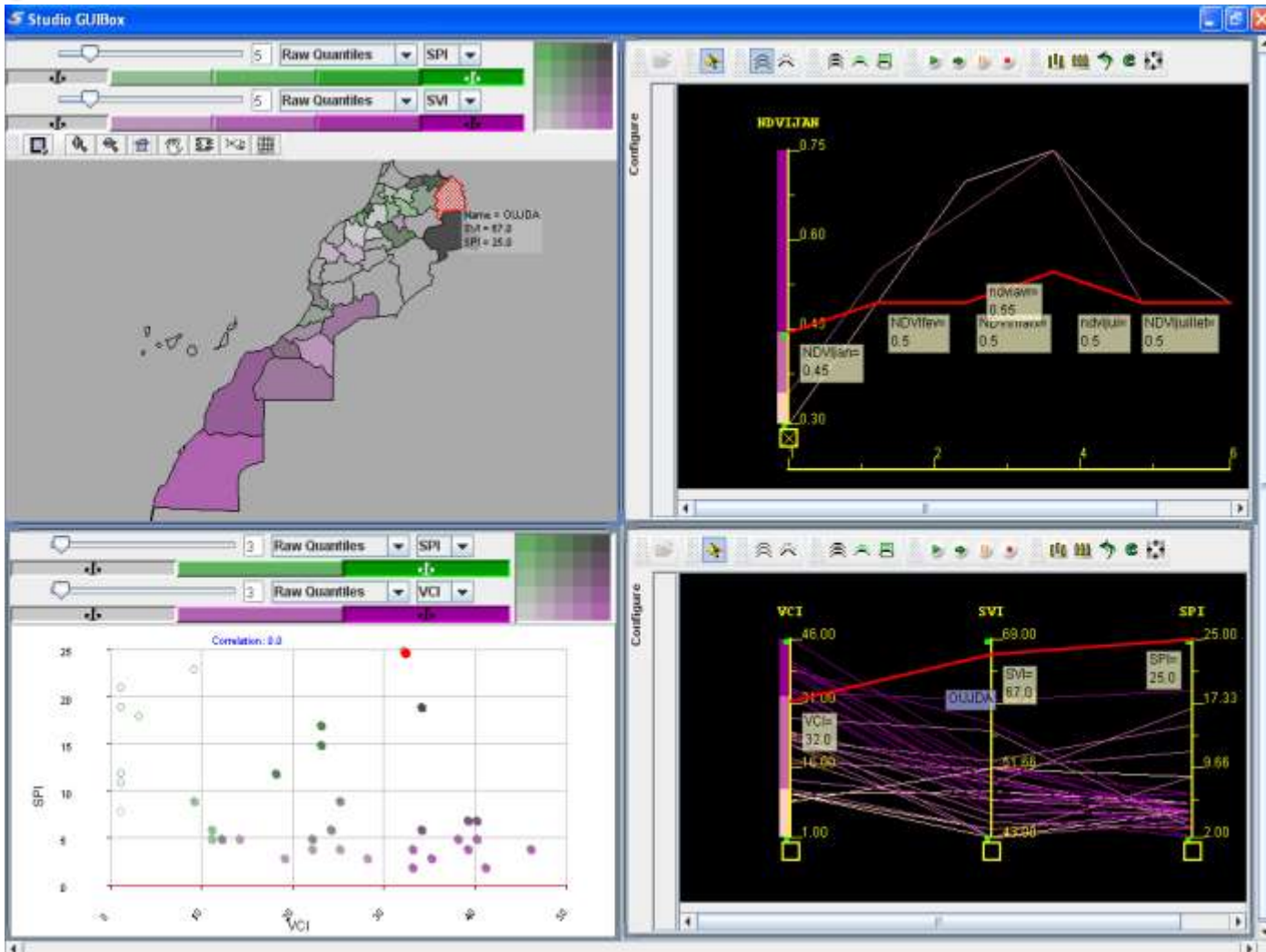
Tropical Rainfall Measuring Mission (TRMM)



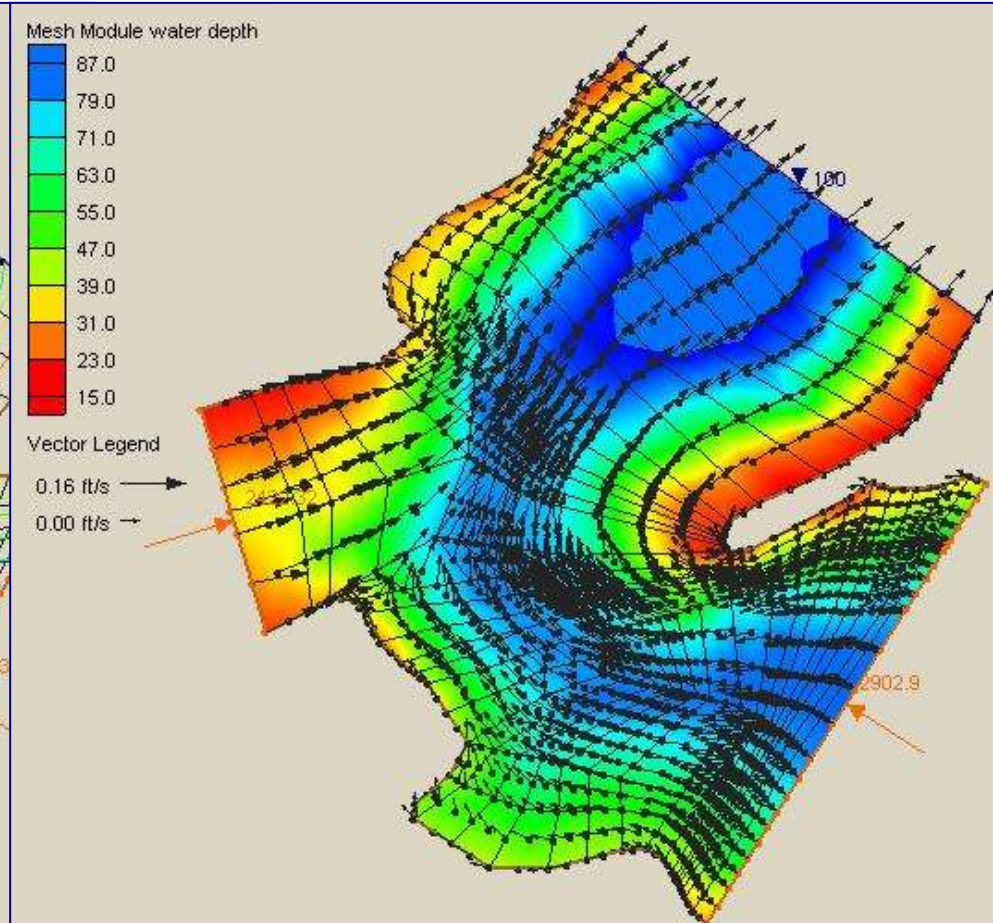
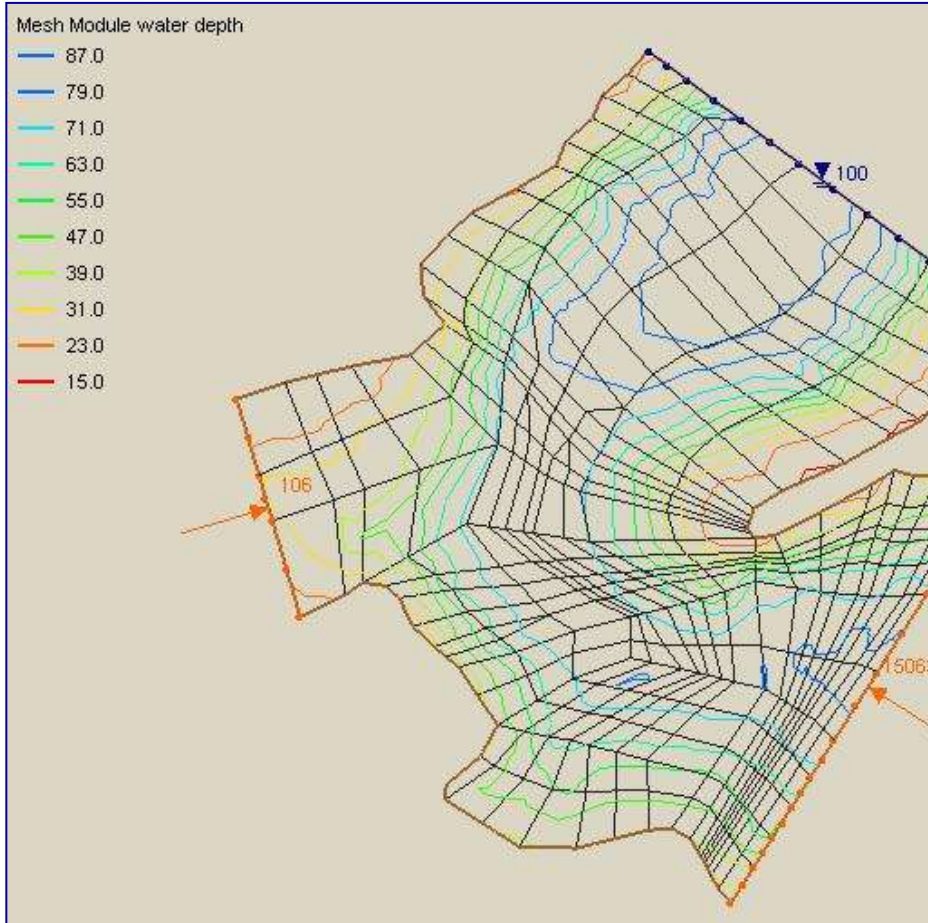
Correlation between TRMM and Ground station precipitation

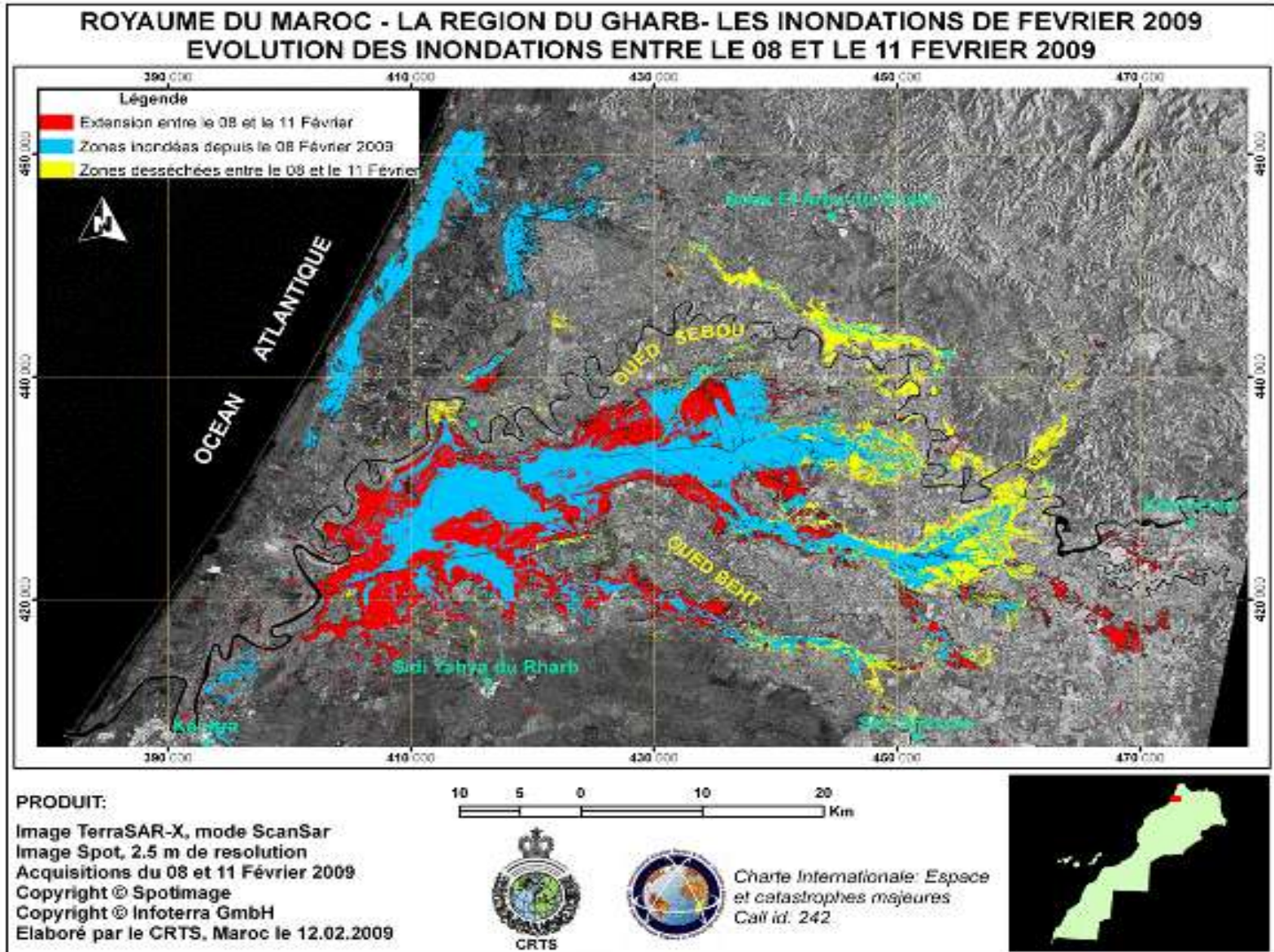


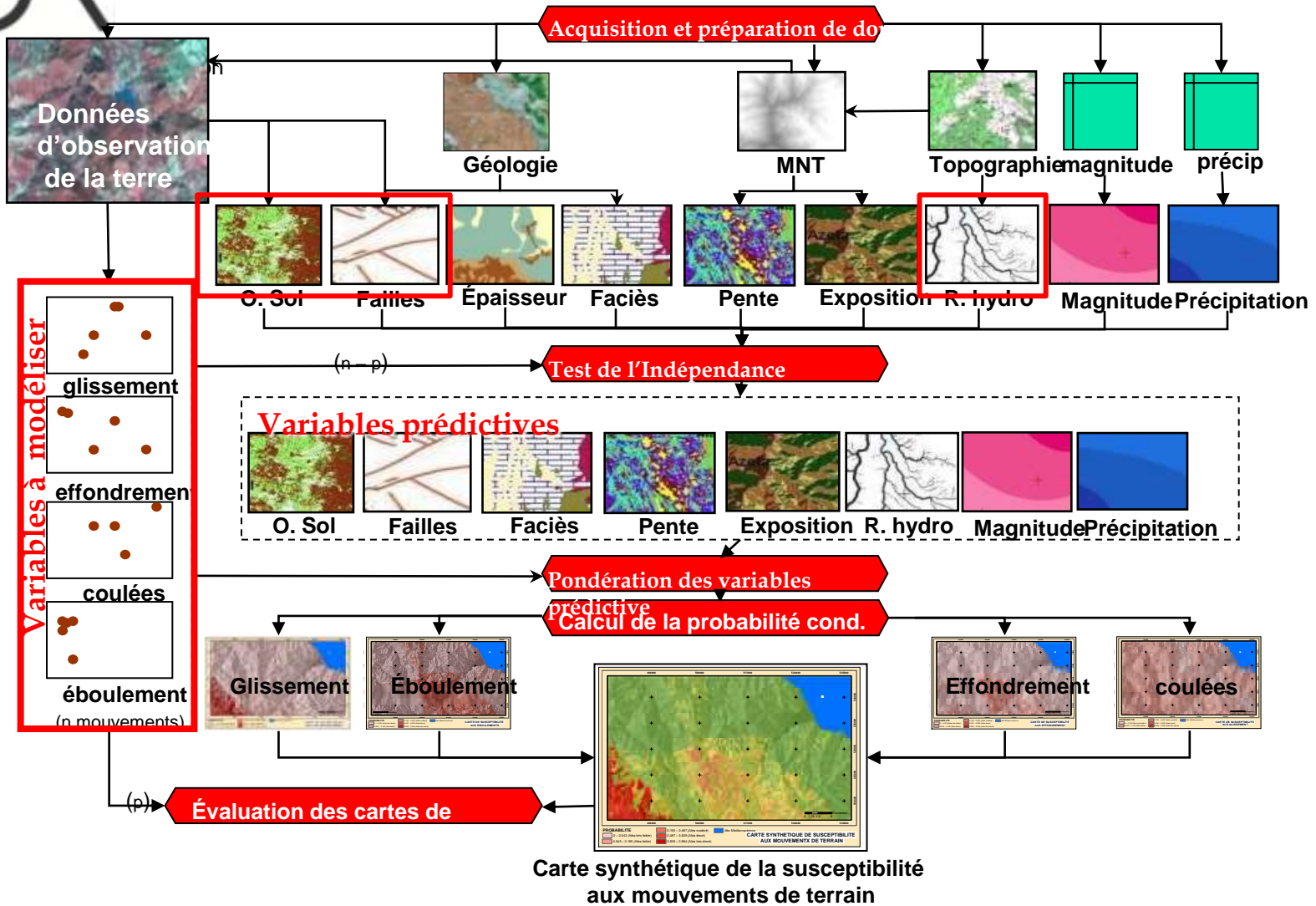
DROUGHT Drought Early Warning System

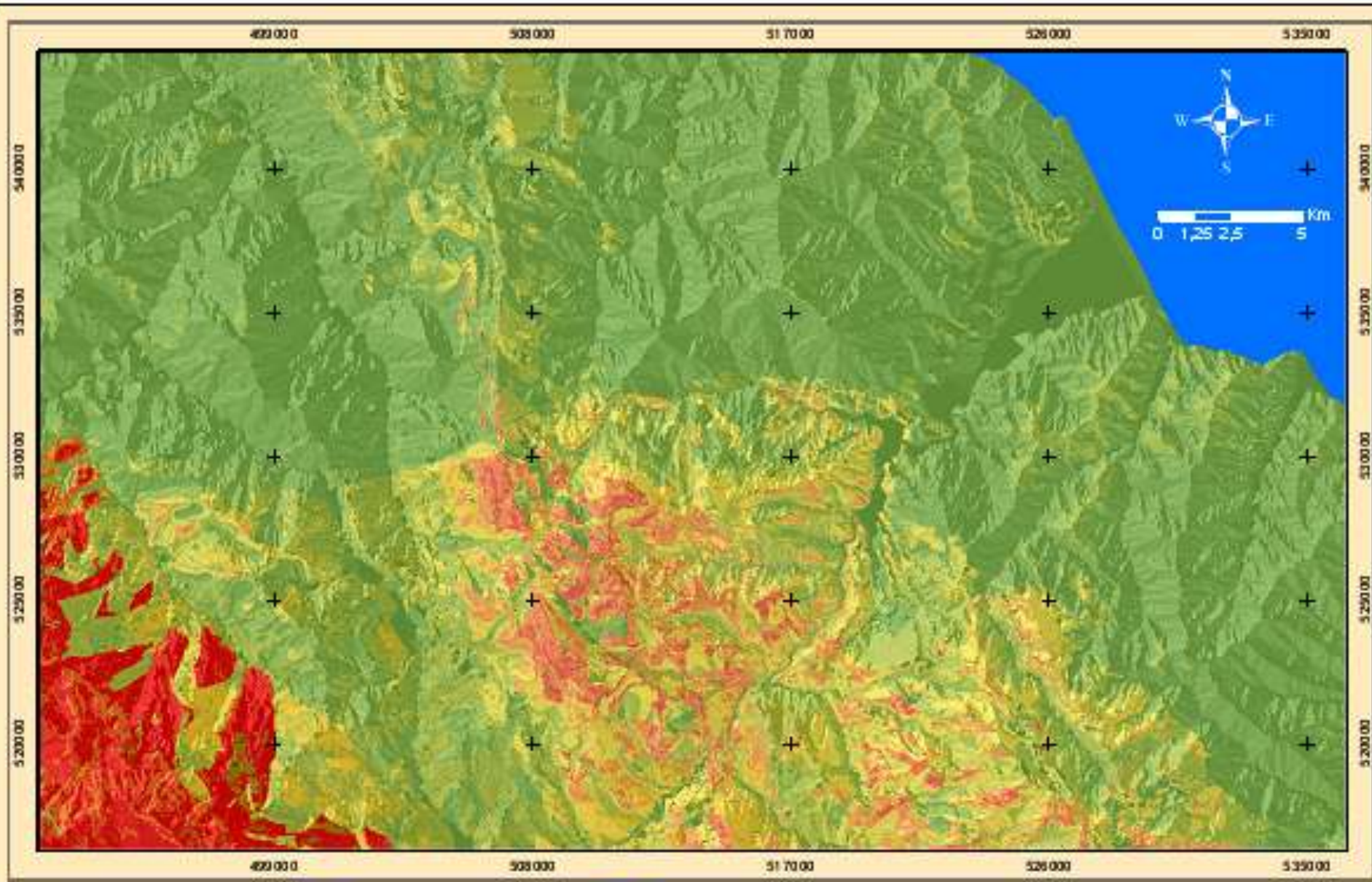


FLOOD Pre-Disaster: Hazard Assessment









- ALEA**
- Aléa très faible
 - Aléa faible
 - Aléa modéré
 - Aléa élevé
 - Aléa très élevé

Mer Méditerranéenne

**CARTE SYNTHETIQUE DE SUSCEPTIBILITE
AUX MOUVEMENTS DE TERRAIN**

Thank you



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