

Major Risks Management using
Space Tools:
The Algerian experience

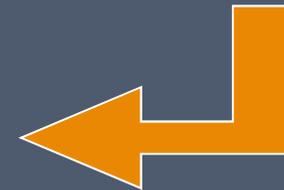


Algeria : exposed to natural disasters

Locust Invasions, Forest Fires,
Floods, Earthquakes,
Landslides,....

Occurrence of disasters → Threatens development efforts.

Strategic importance to master and
use space technologies for disaster
management.



Disaster Management : one of the **prior actions** for Algerian
Space Agency

Desert locust invasion

LOCUST CONTROL

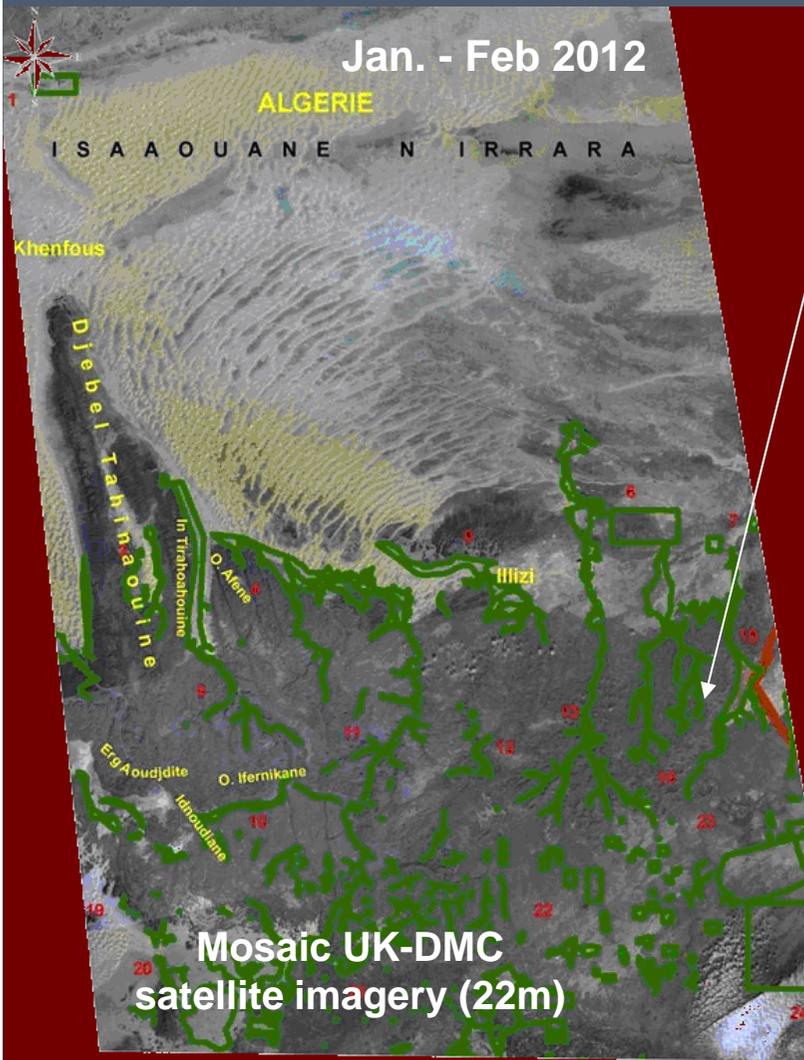


Since 2003, Collaboration ASAL - INPV

- * Providing **medium resolution satellite imagery**
- * Providing **expertise**

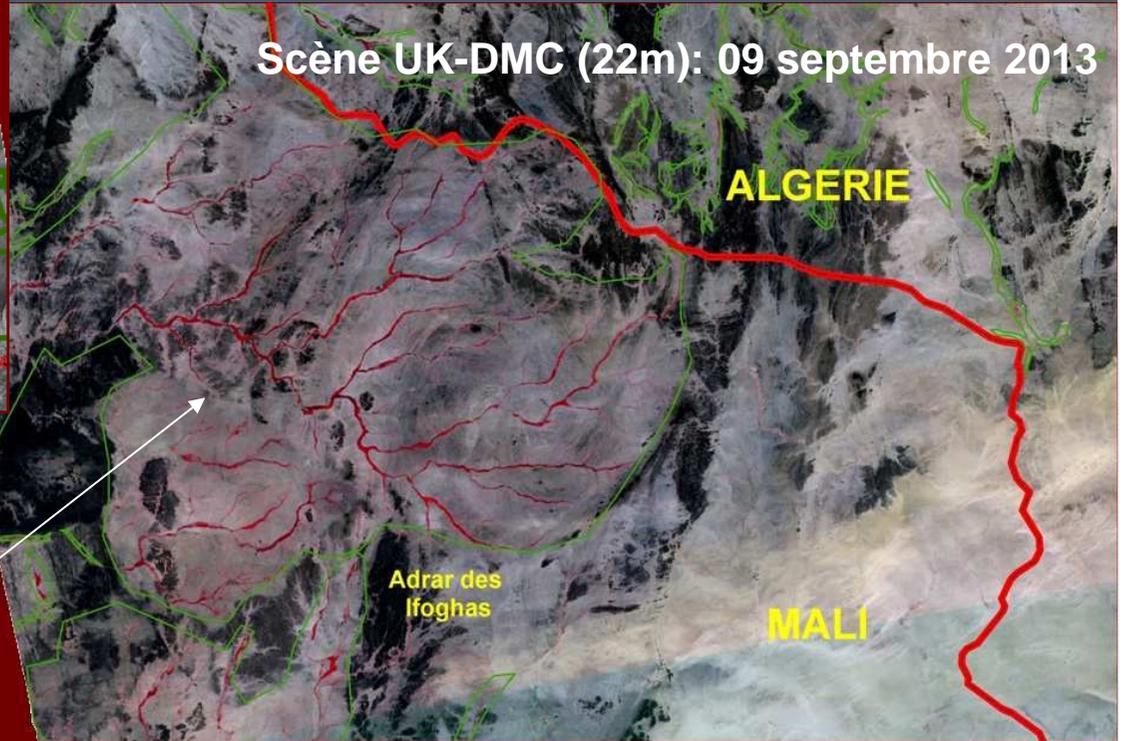
To identify **locust breeding areas** in Sahel & Saharan regions

Based on ecological conditions analysis by identifying zones on space imagery, with high chlorophyll activities, favorable to locust breeding and development



Mosaic UK-DMC satellite imagery (22m)

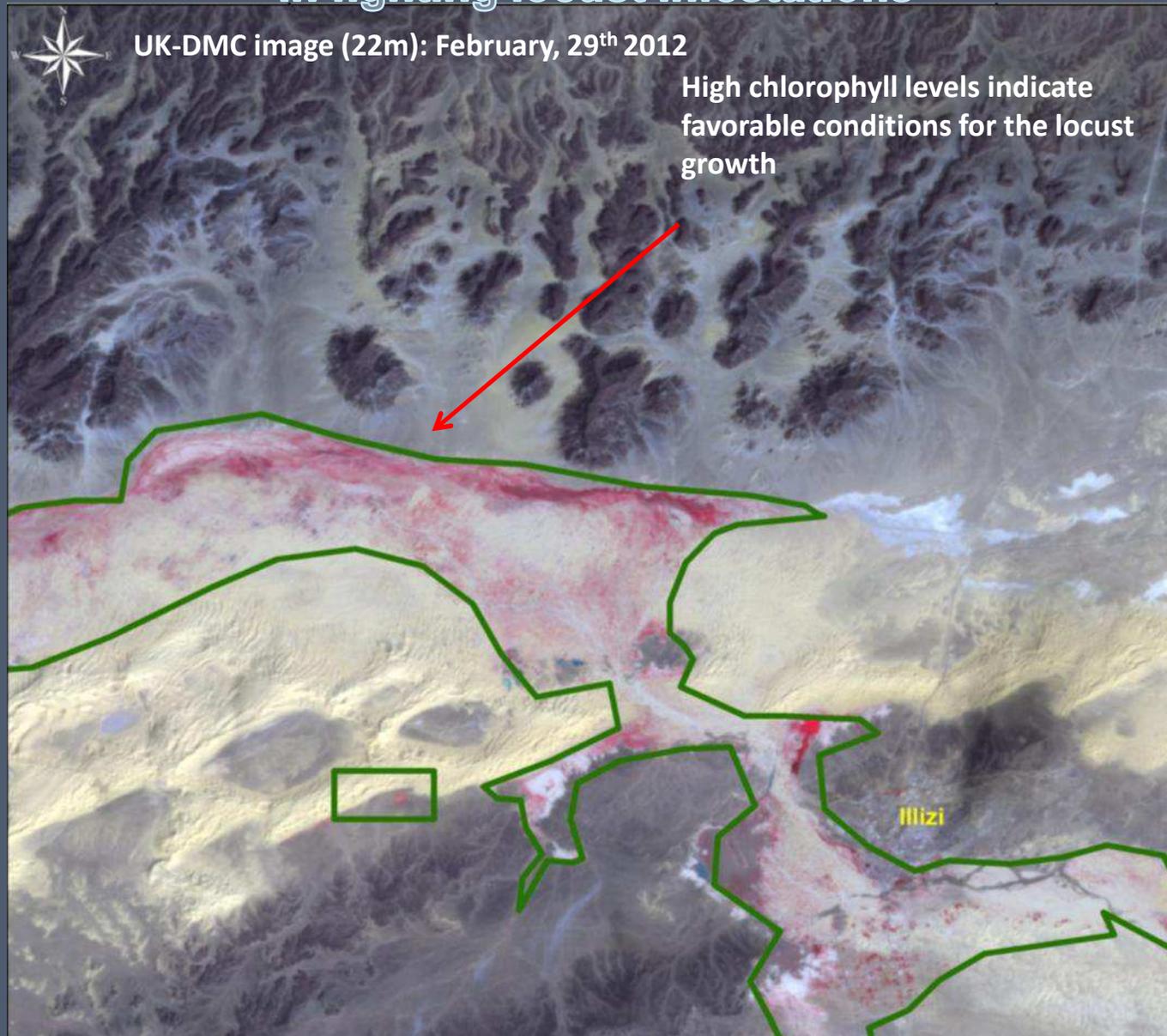
Identifying areas of locust breeding in the South Eastern Algeria & South West of Libya



Scène UK-DMC (22m): 09 septembre 2013

Areas of locust breeding in Ifoghas region (Northern Mali)

Contribution of the satellite images in fighting locust infestations



identification and location of breeding desert locust in the region of Illizi (Algerian Sahara)

Zones de reproduction du criquet pèlerin au niveau de oued Tamarasset

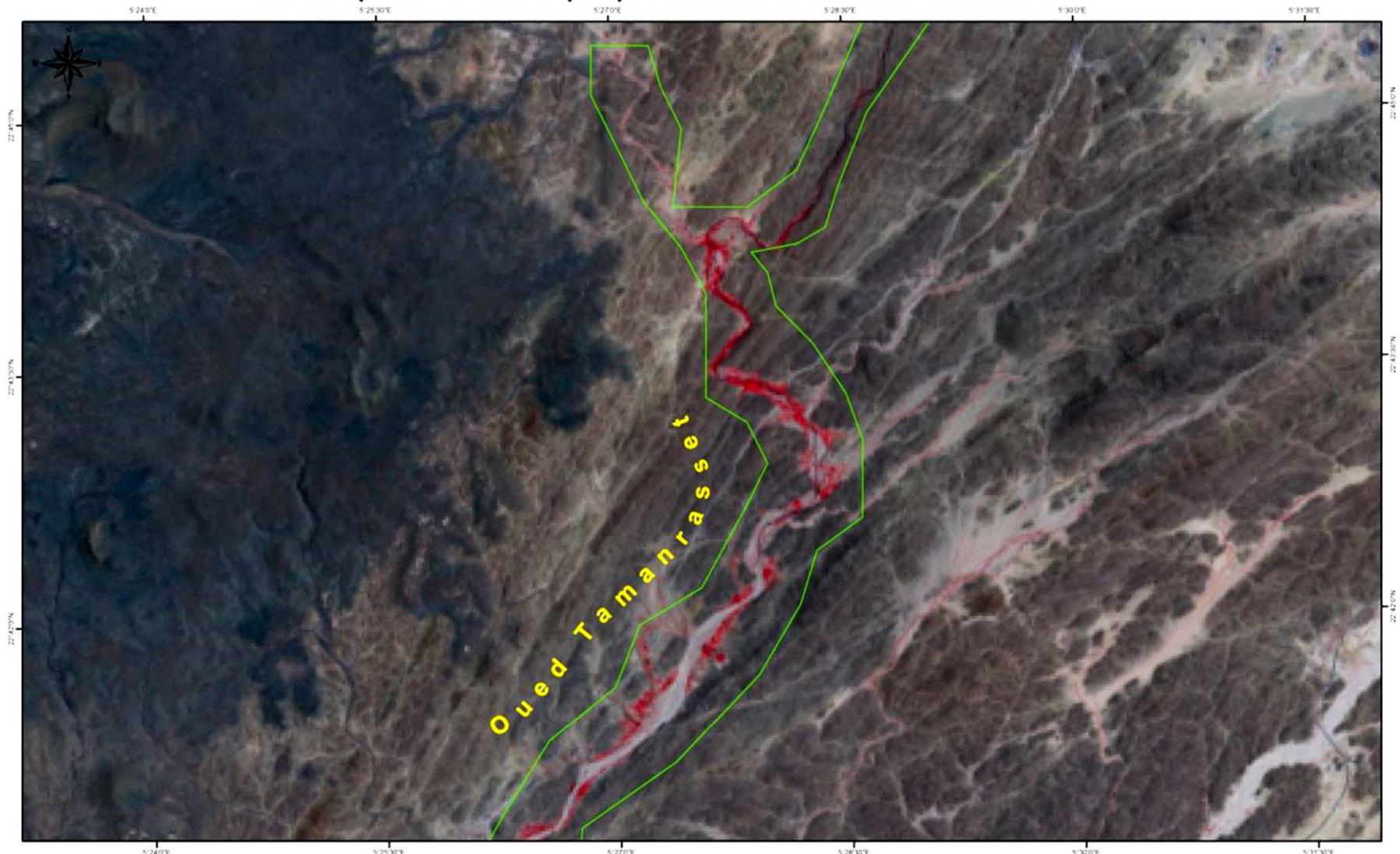


Image à moyenne résolution (30 m)
Date de prise de vue: 05 juillet 2014

Agence Spatiale Algérienne

0 1 2 4 Km

Légende:

 Zone d'activité chloropyllienne

Forest fires

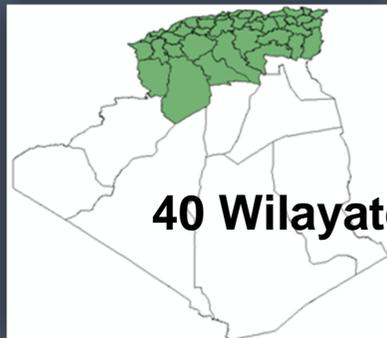


Forest Fires

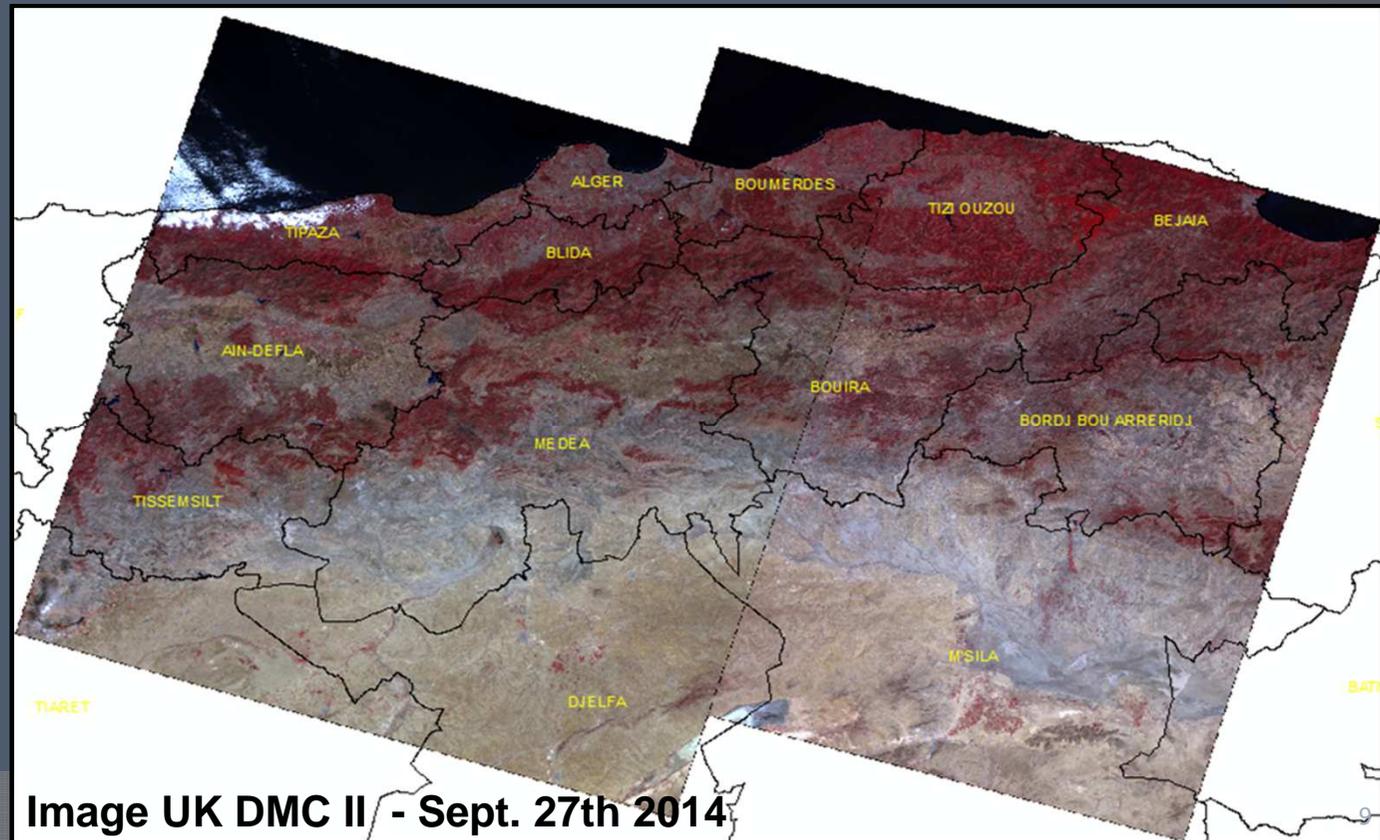


Collaboration ASAL – General Directorate of Forests

Annual Monitoring of forest fires by the use of satellite imagery



40 Wilayate



High spatial and spectral resolution of Alsat 2A images :

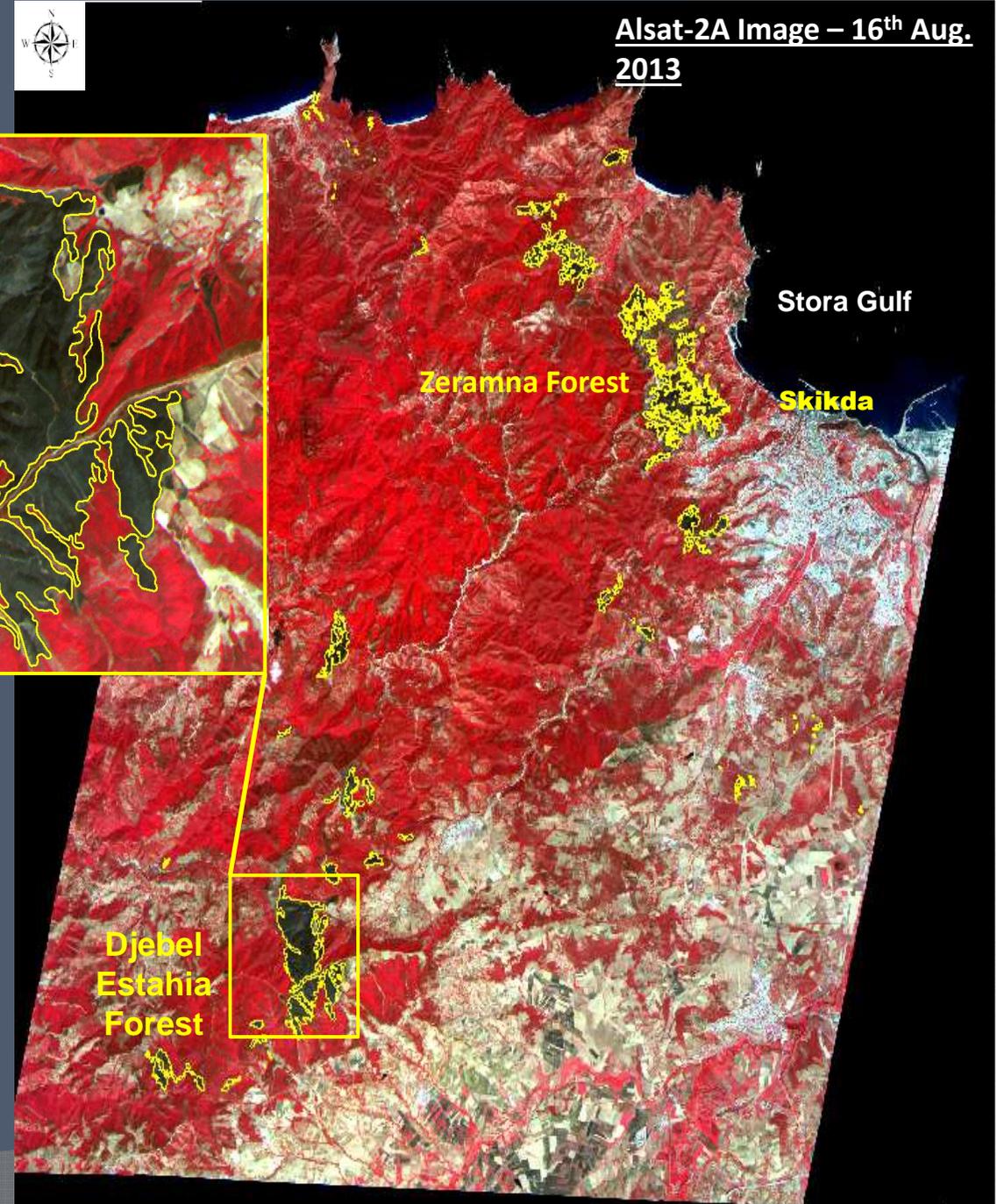
Refine delineation of forests affected by fire.



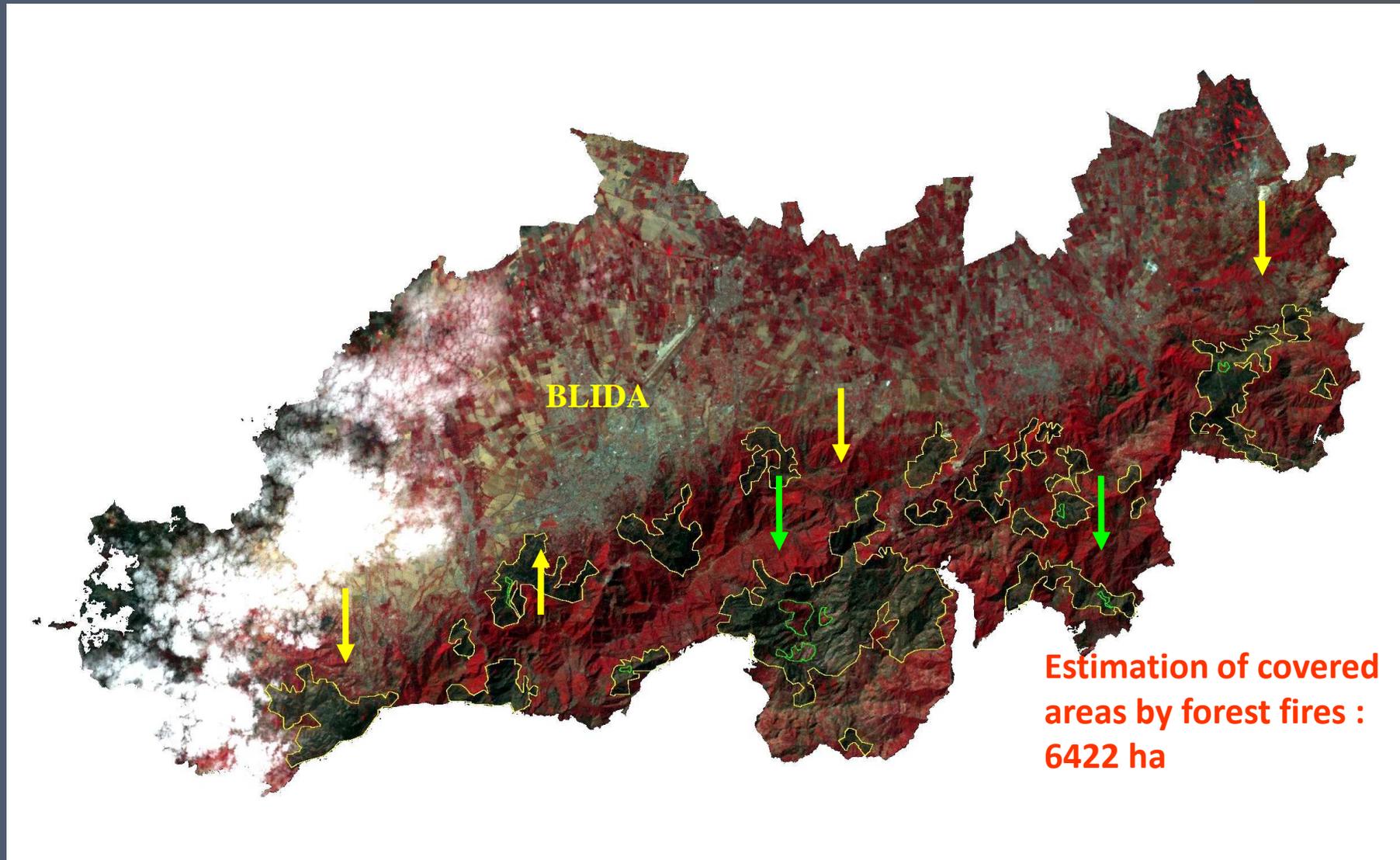
Statistical module of the Geographic Information System dedicated to the management and prevention of forest fires.



Alsat-2A Image – 16th Aug. 2013

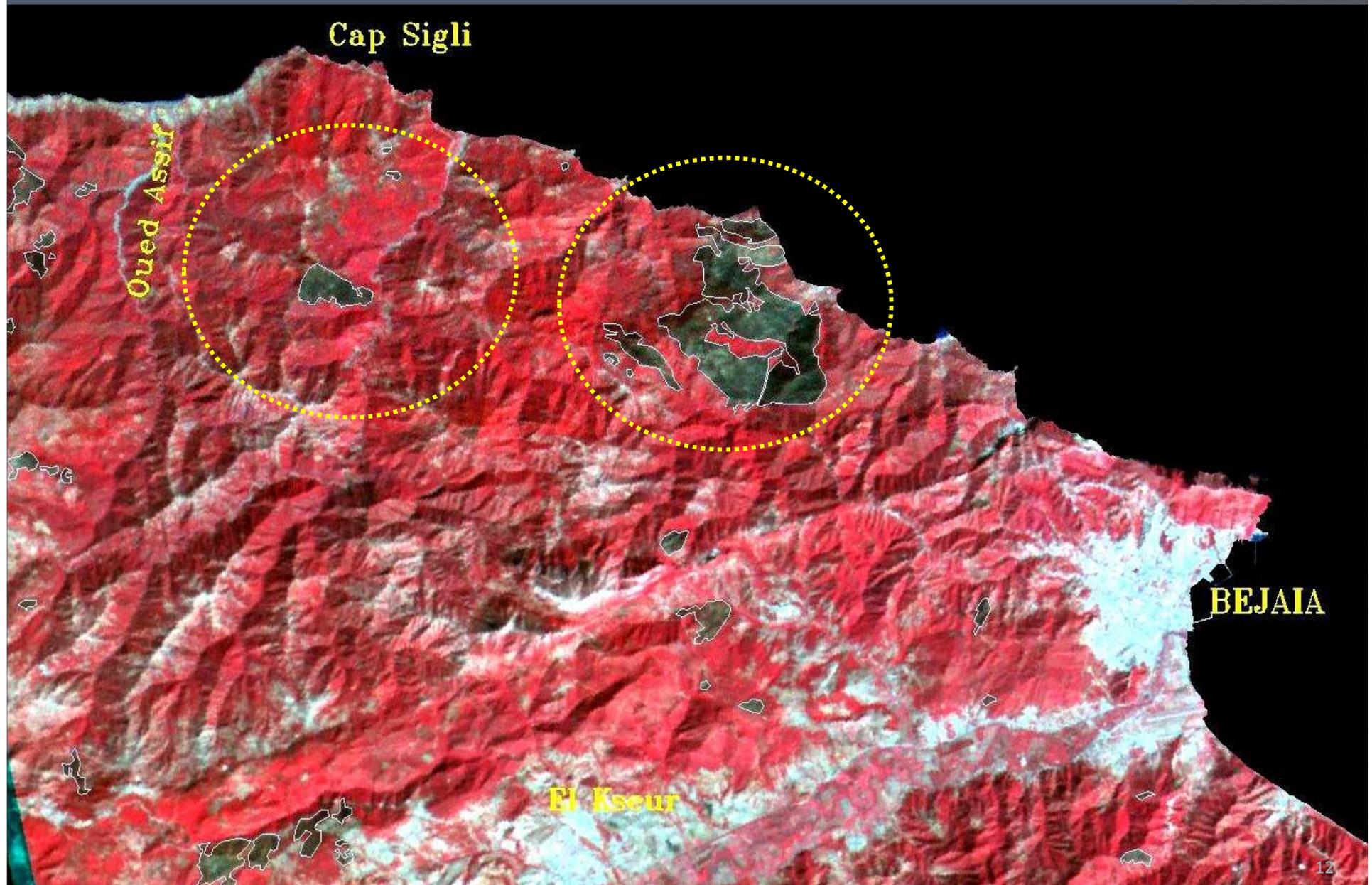


Monitoring of forest fires in collaboration with the Directorate General of Forest since 2003

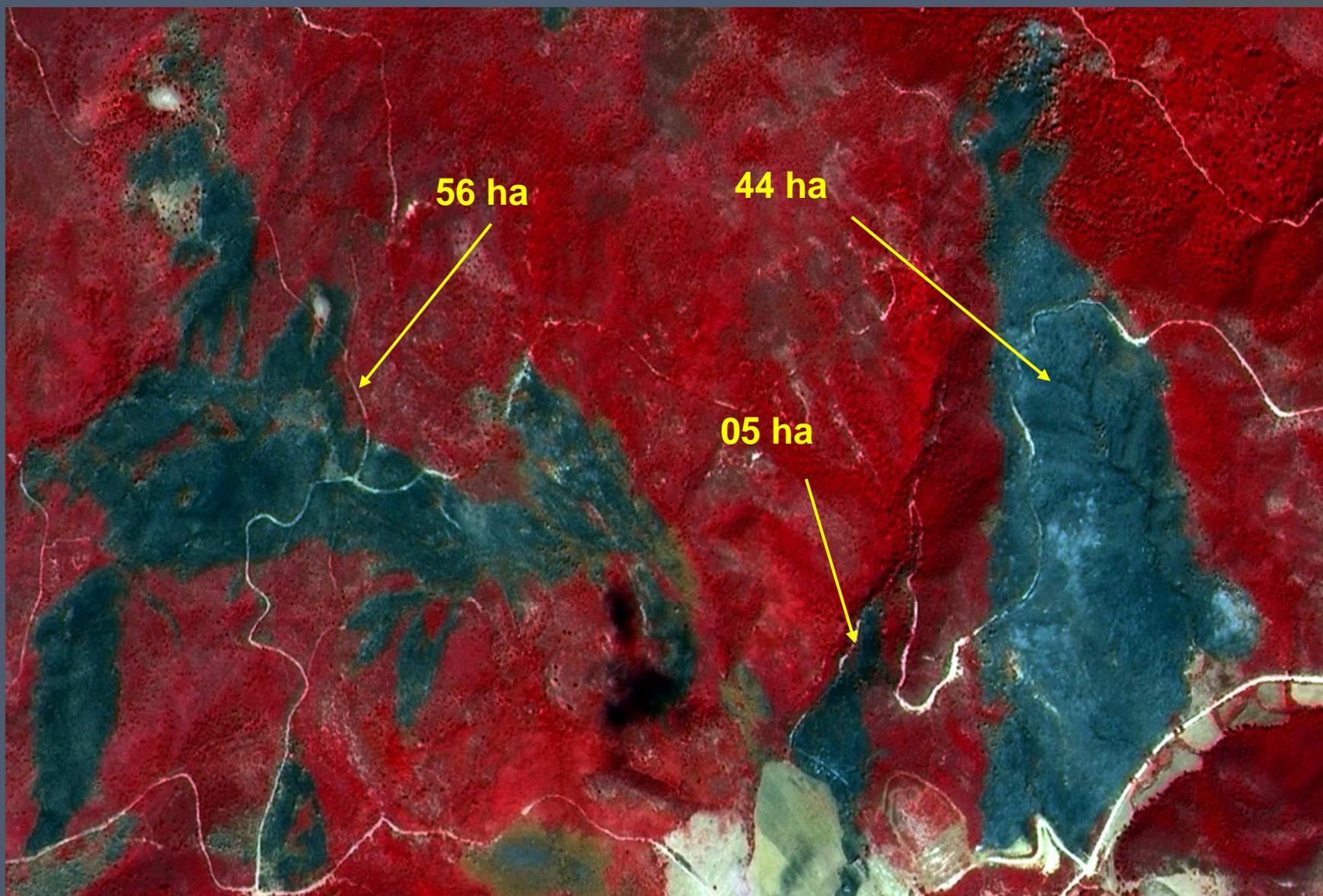


ALSAT-1 image of Blida province (wilaya) in 2007

Alsat-1 Image of Bejaia region, summer 2008



*Identification and delimitation of burned zones (Alsat-2A -06
September 2014- Oued Soudane Forest (W.Skikda)*



Estimation of burned area from May to September 2014
Region of Sidi Bel Abbas and Saida- Algeria

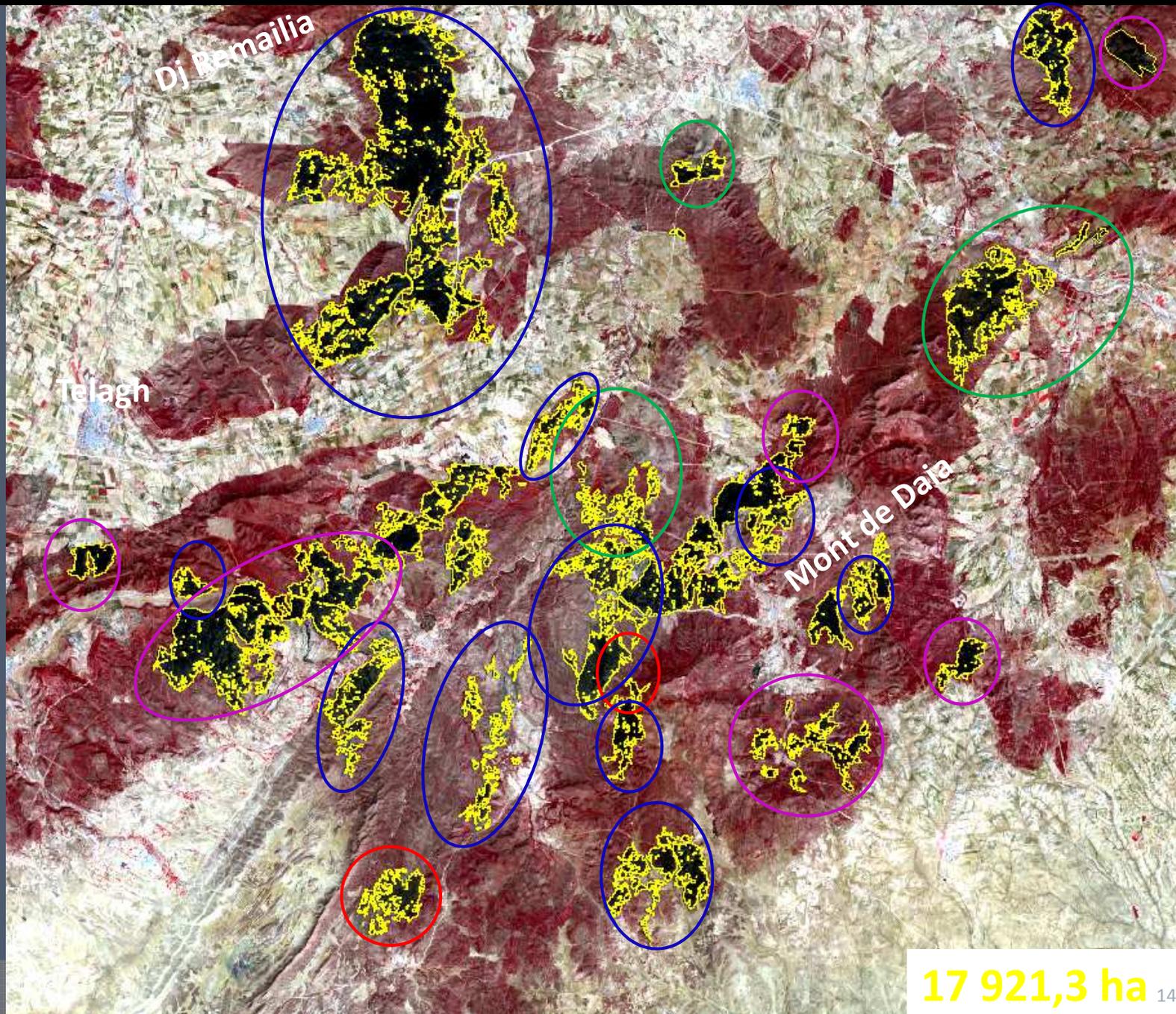
May 2014

Jun 2014

July 2014

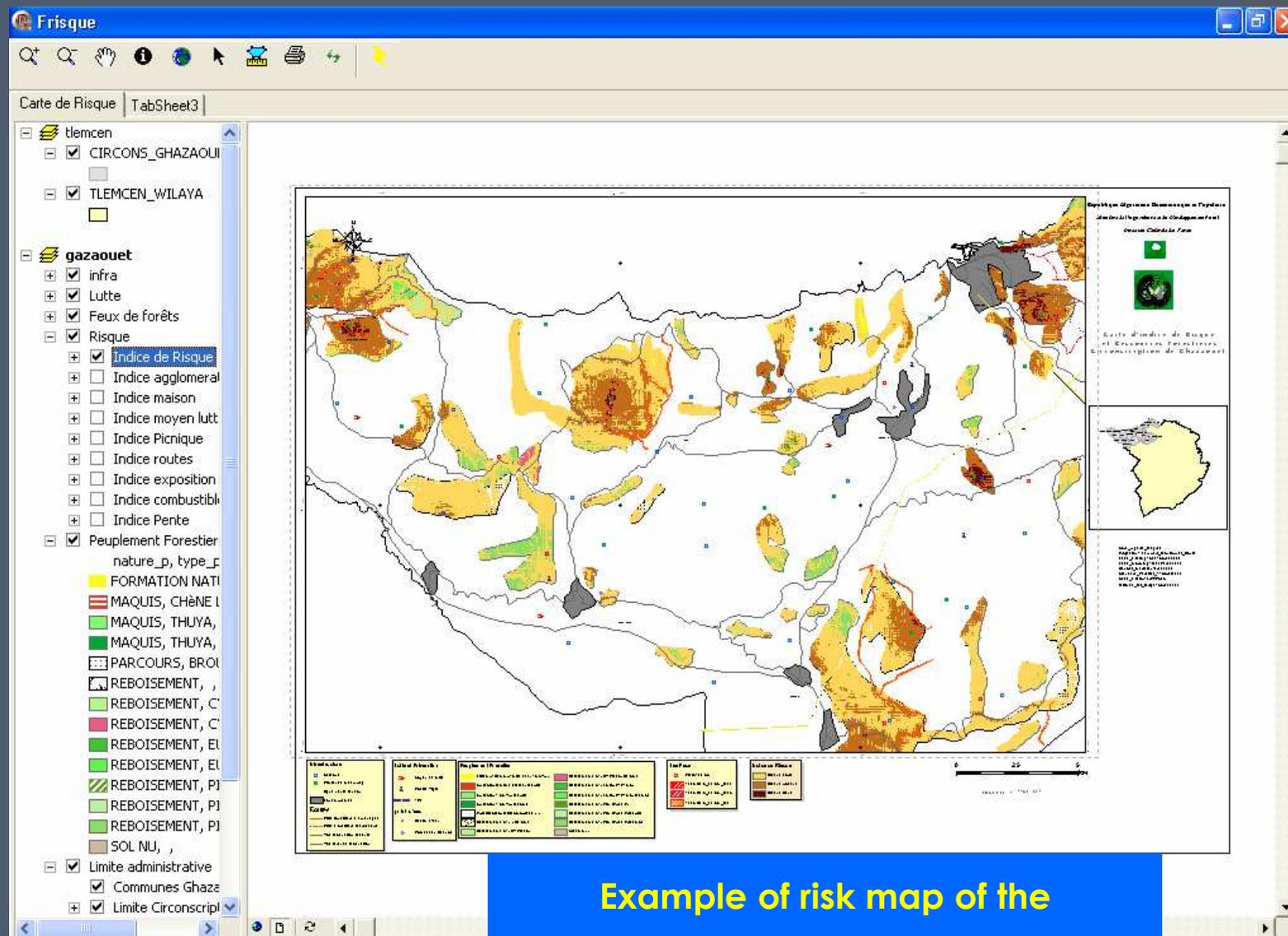
August 2014

September
2014



17 921,3 ha 14

Prototype of the Geographical Information System for prevention and management of Forest Fires

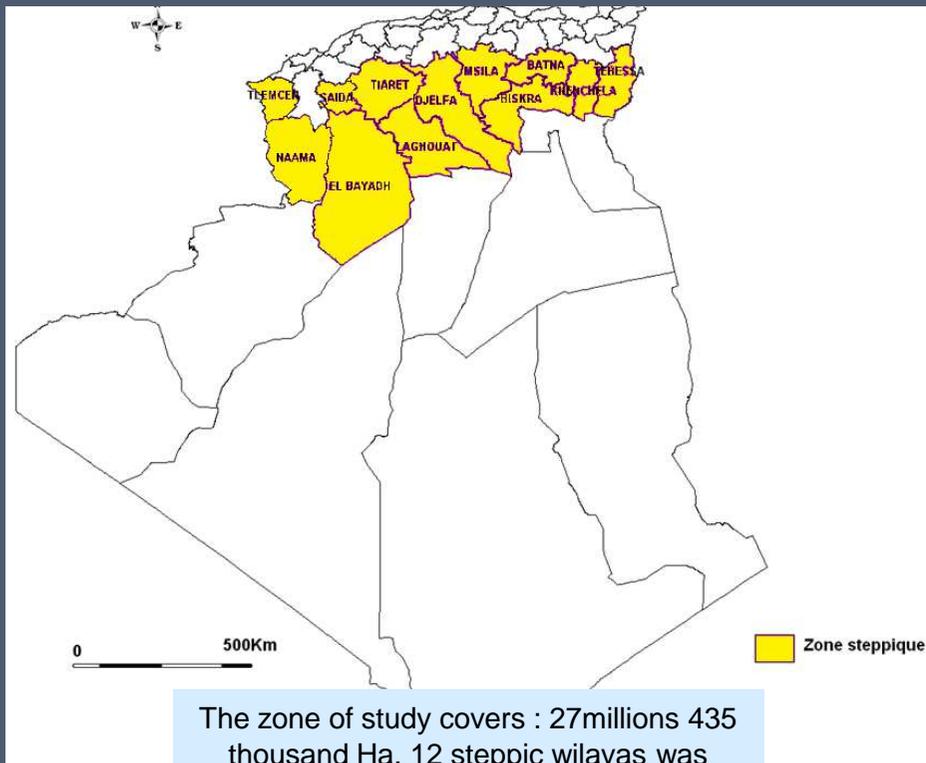


Example of risk map of the Ghazaouet region

Desertification

In Algeria, the most affected regions, are the ones of the steppic domain spreading out on more than 27 millions hectares and corresponding to isohyetes 400 mm / year in the North and 100 mm / year in the South, they constitute a privileged space of the extensive ovine breeding

DESERTIFICATION

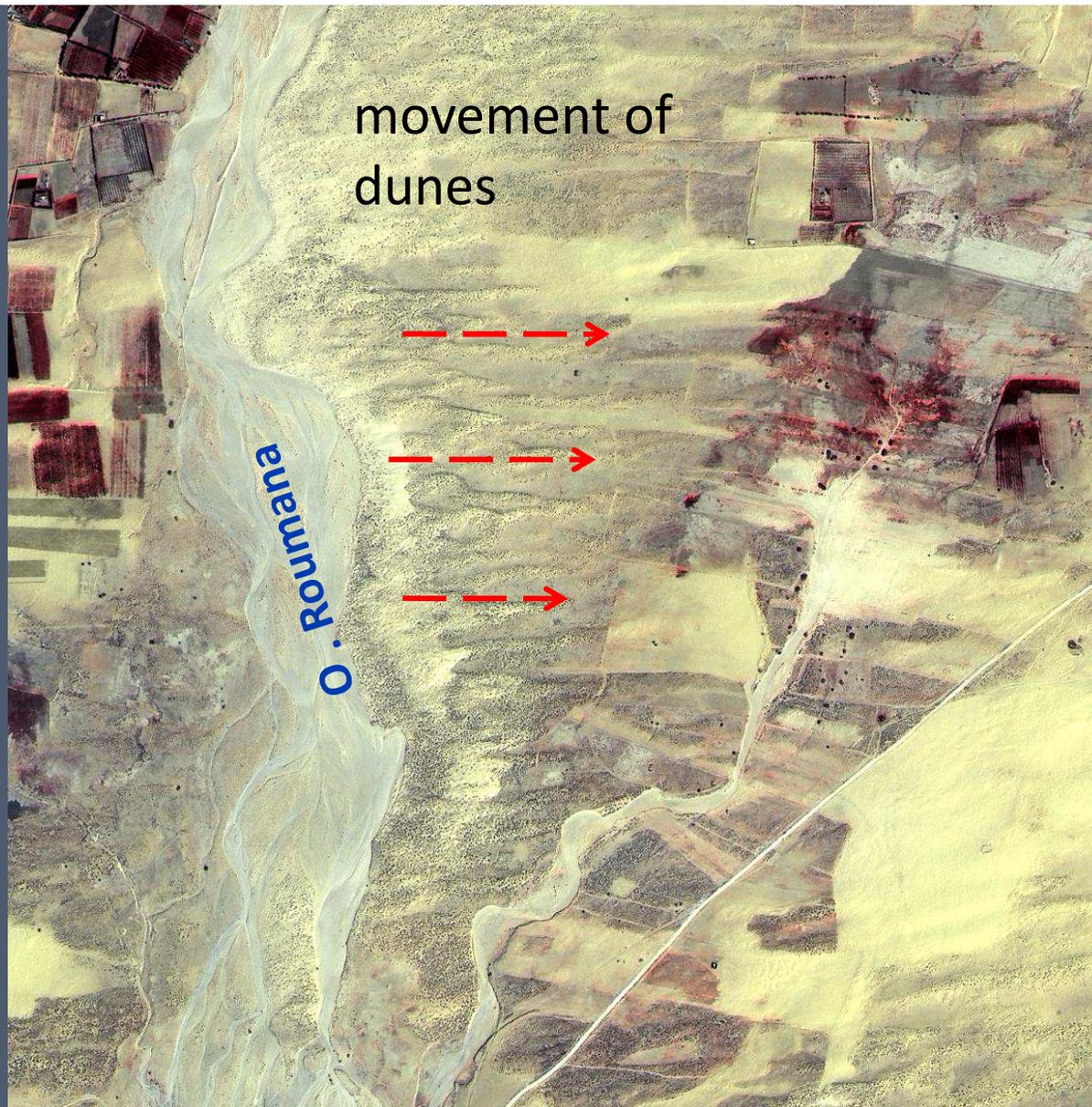


The zone of study covers : 27 millions 435 thousand Ha. 12 steppic wilayas was concerned: Naama, Tlemcen, El Bayadh, Saida, Tiaret, Laghouat, Djelfa, M'sila, Batna, Biskra, Khenchela, Tébessa.



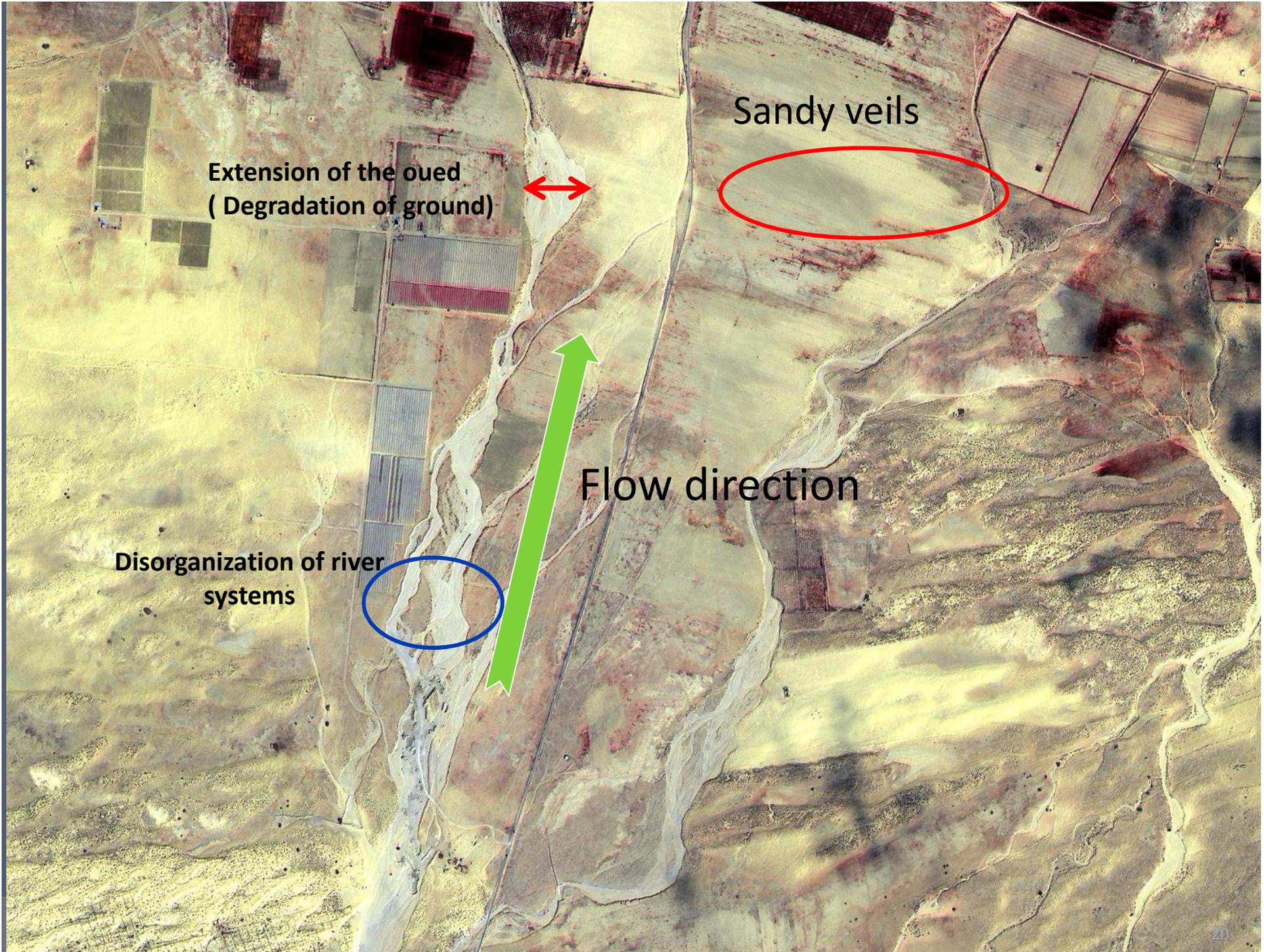


wind erosion phenomenon



The phenomenon hydro_eolian erosion:

- Overflowing of “oued” on farmlands (loss in ground);
- Farms invaded by the sand.



Sandy veils

Extension of the oued
(Degradation of ground)

Flow direction

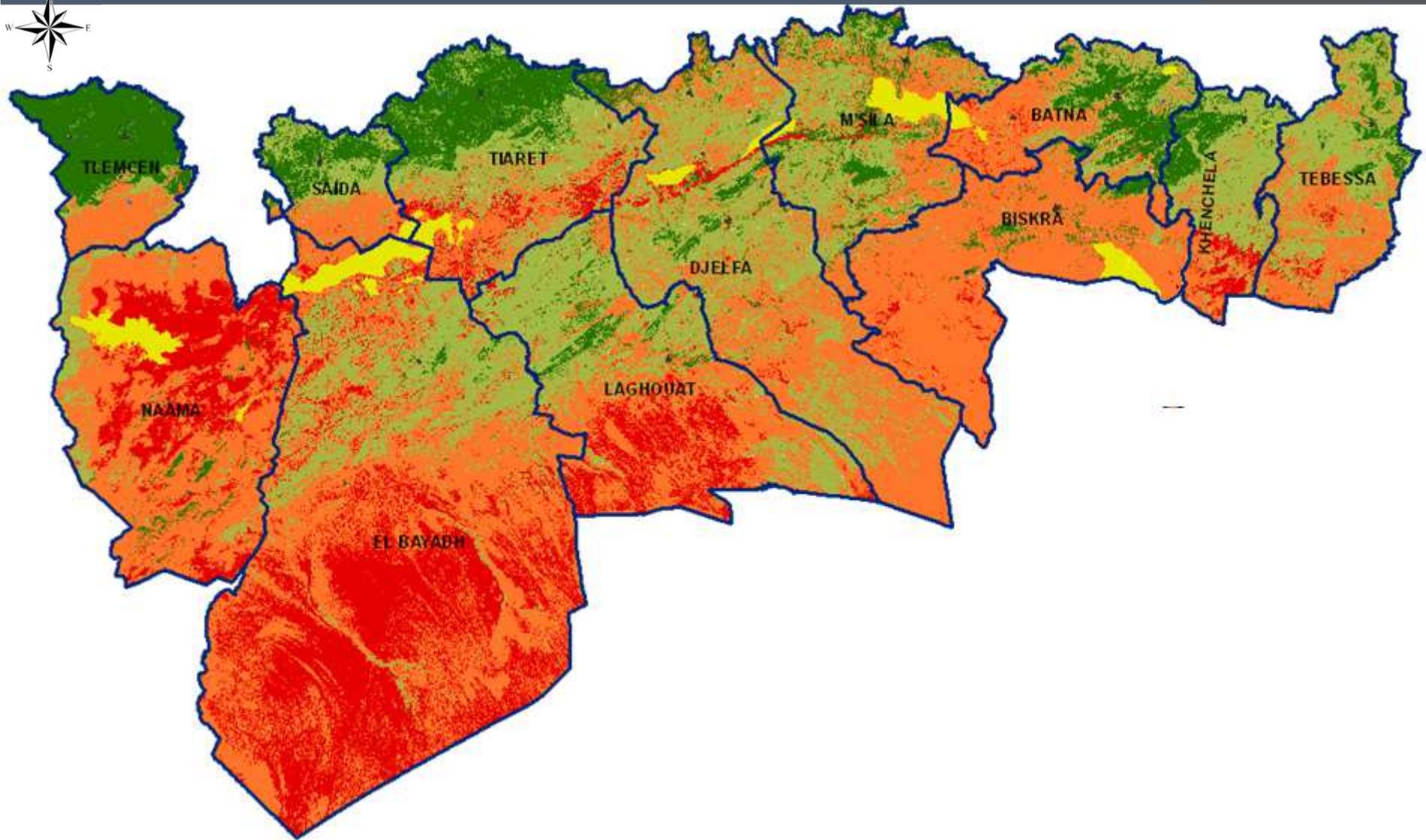
Disorganization of river
systems

**Biological fixation of dunes:
A covering of breezes wind.**



O. El Mehakoub

MAP OF DESERTIFICATION SENSITIVITY OF THE 12 WILAYA



Legend:



Not sensitive

Moderately sensitive



Sensitive

Very sensitive



Desertified



Agglomeration



Administration Boundaries

Floods

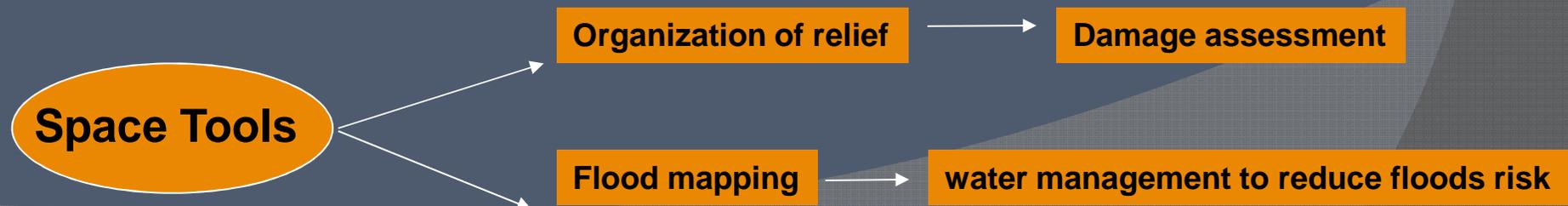
Floods



Floods frequently occurs in Algeria.

In the past, floods took place essentially along of major rivers, in **agricultural plains**. Since twenty years, they more affect **urban centers** where they caused many casualties and considerable property damage.

The predictable increase in frequency and in magnitude of **extreme weather events** makes it essential to mobilize all the technological resources to deal with this situation.





Flooded zones



El Tarf floods - Feb. 23th 2012



Front flood, Oct. 1st 2008

Collapse of dikes
(dams)



After flood Oct. 1st 2008

Palm grove of Ghardaïa – Floods Oct. 2008

El Bayadh floods - Oct. 1st, 2011

Intact footbridge
Length : 38 m



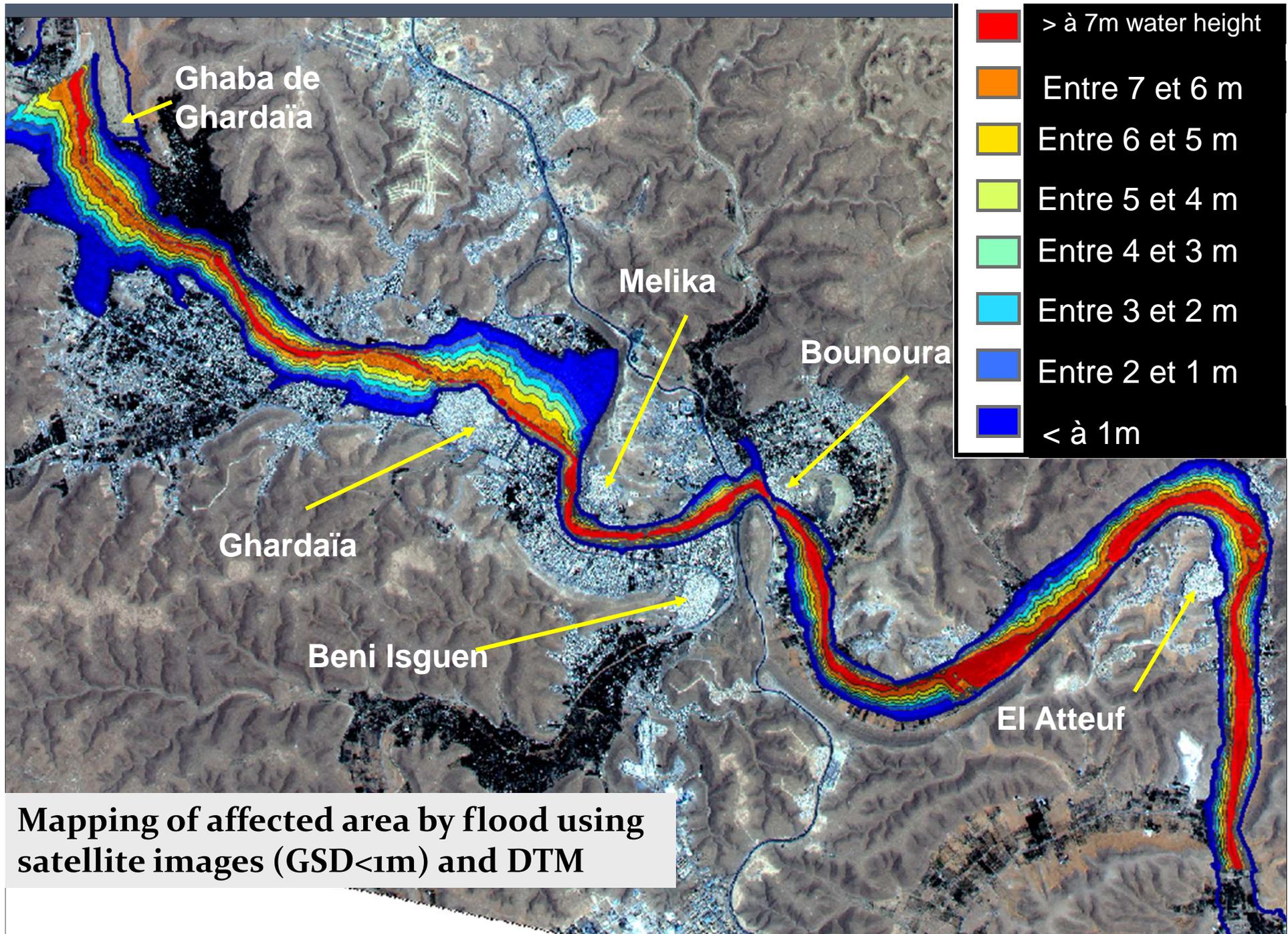
ALSAT-2A image – Jul. 21th, 2011

Fragment of footbridge

Destroyed footbridge



ALSAT-2A image – Oct. 12th, 2011



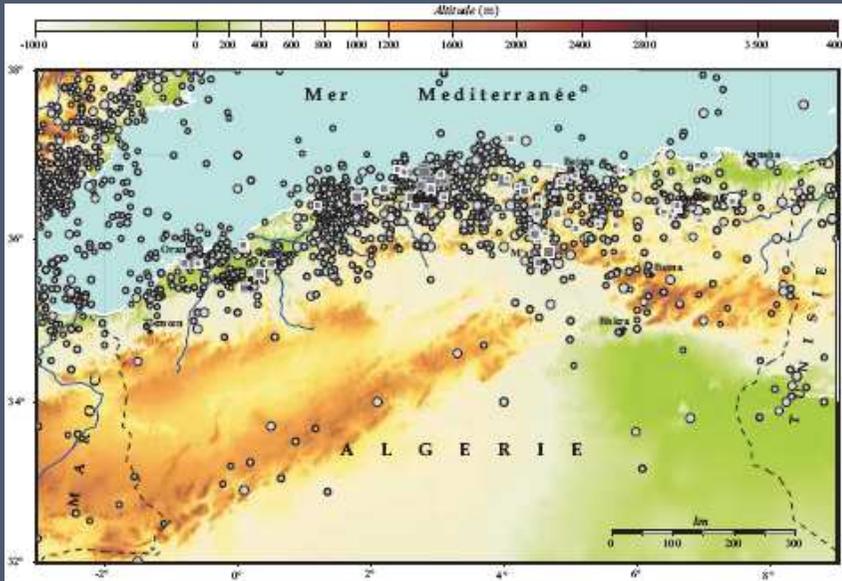
Mapping of affected area by flood using satellite images (GSD<1m) and DTM

Earthquakes

Earthquakes

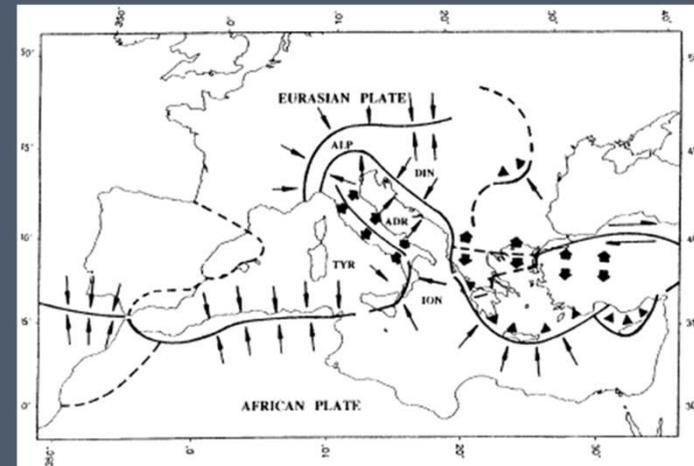
Algeria, a Mediterranean country with seismic risk

Deformation of Earth's crust (Geodynamics)

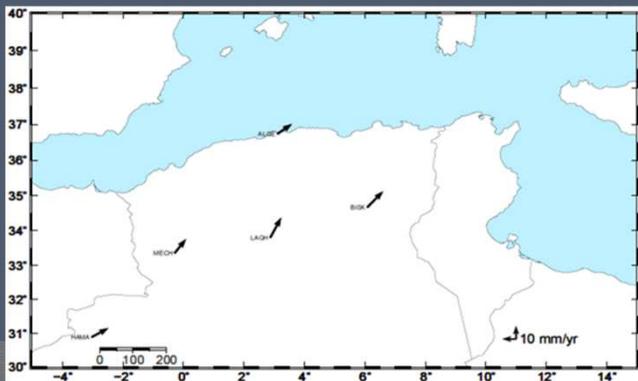


Seismicity in the Tellian Atlas

Use of precise satellite positioning (GPS)

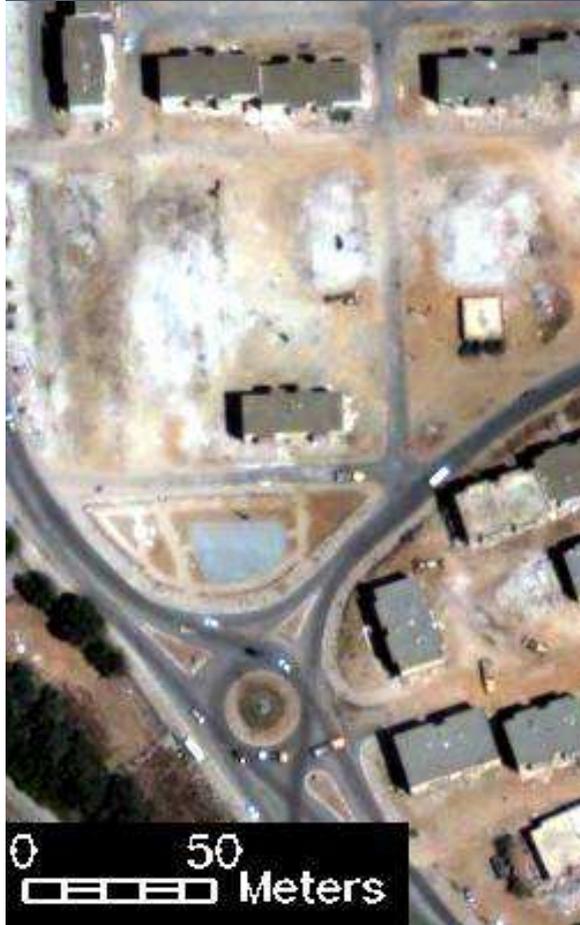


Boundaries of Eurasian and African plates



Velocities measured at the GPS stations between 2001 and 2005 (ALGEONET: Algerian network)

Contribution of the high resolution satellite images in the management of natural disasters: The case of Boumerdes earthquake on May 21st, 2003



After: June 2003



After: Ma 23rd, 2003



Before: April 2002

International Cooperation

International Cooperation

Promoting and developing the use of space technologies for disaster management : not only at national level

ALSAT-1

Disaster Monitoring Constellation



Algeria, Nigeria, Turkey, United Kingdom, Spain, China

Providing emergency Earth imaging for disaster relief under the International Charter for Space and Major Disasters, which the DMC formally joined in November 2005

UN-SPIDER
Program

Algiers Regional Support Office for North
Africa and Sahel region

*UN Platform for Space-
based Information for
Disaster Management
and Emergency
Response*

Thank you
for your kind attention