Civil Commercial Imagery Evaluation Workshop

Growing Demand for VHR Commercial Imaging Satellites

Col. (Ret.) Rani Hellerman

ImageSat International

Owners and Operators of the EROS Family of High-resolution Imaging Satellites

- Since 1999, the launch of the first sub-meter commercial imaging satellite we have witnessed marked improvement in the variety and competitiveness of these satellites.

- The demand for Very High Resolution imaging satellites data is growing very fast. More and more potential customers for this data realized the cost effectiveness of the use of commercial sensors, in many cases also as addition to the national assets.

- While military and homeland security applications still account for the majority of commercial satellite data consumption, a vast civilian industry has emerged. Only now we are beginning to tap the potential of very high-resolution satellite imagery to address problems of managing our communities, our natural resources and environment .

The Mission

To have sufficient assured access to space-based capability to maximize and sustain military effectiveness across defense.

AND

To have sufficient assured access to space-based capability to maximize and sustain civilian applications effectiveness across the market.

"Dual Use"

We Need More
Sub-Meter
Satellite Imagery
9,000 RIDES
SCHEDULED BUT HOW
MANY ARE ACTUALLY
GIVEN?
DISABLED IN ACTION
NEW YORK
74
13 10:56 AM
THE
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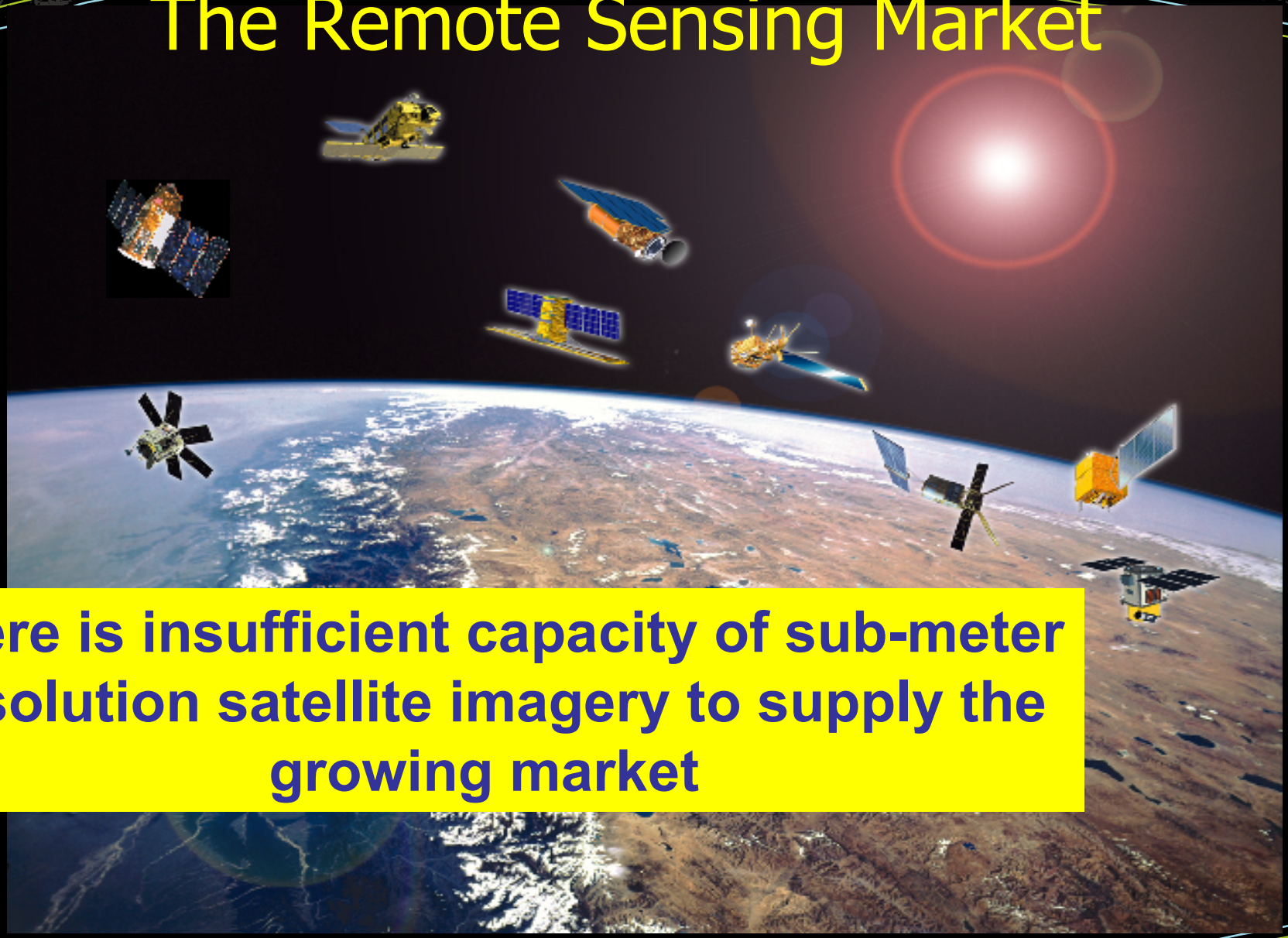
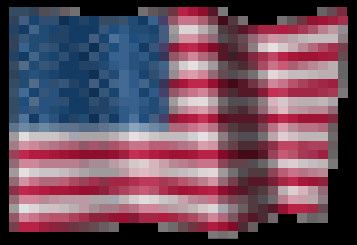
The Remote Sensing Market



There is insufficient capacity of sub-meter resolution satellite imagery to supply the growing market

Sub-Meter Commercial Imaging Suppliers



DIGITALGLOBE®

ImageSat® International

GeoEye®

- ~~The…. Biggest~~
- The…. Smallest (?)
- The ONLY Non American Sub-Meter Resolution Imaging Satellite !!

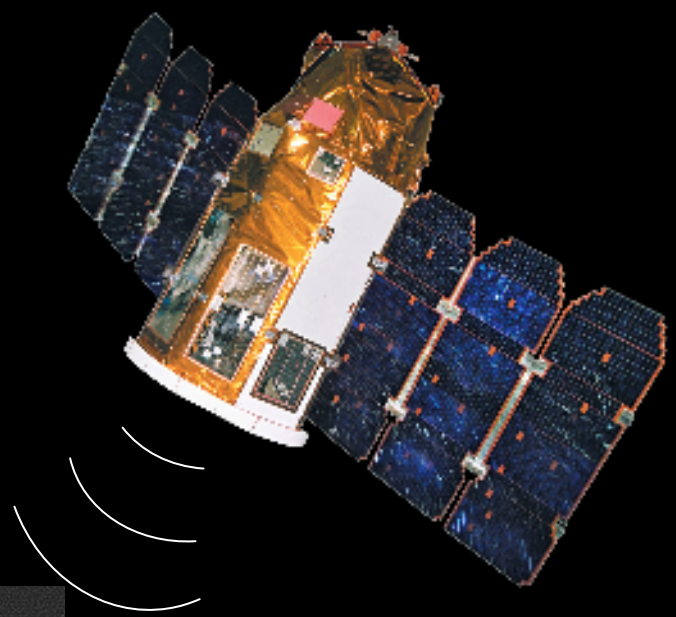
Classification

Group name	Wet Mass
Large satellite	>1000kg
Medium sized satellite	500-1000kg
Mini satellite	**100-500kg**
Micro satellite	**10-100kg**
Nano satellite	**1-10kg**
Pico satellite	**0.1-1kg**

Small Satellites

Small satellites have reached level of capability which are military relevant

EROS B – 70 cm Resolution

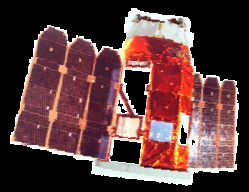


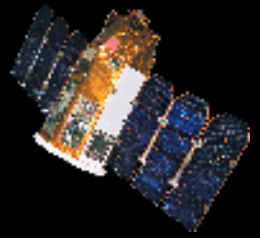
A launch of Small Satellite (EROS B)

- On April 25, 2006, ImageSat successfully deploy the second very high-resolution commercial imaging satellite – EROS B.

Russian START-1 Launcher

EROS SATELLITES AT A GLANCE





Parameter	EROS A	EROS B
Sun-synchronous Orbit	**~ 500 km**	**~ 500 km**
Spectral Bands	Panchromatic	Panchromatic
Swath	14 Km	7 Km
Resolution (m)	**1.9 m**	**0.7 m**
Weight	250 Kg	290 Kg
Launch/Life Expectancy	**2000-2012**	**2006-2018**
Descending time	**10:00**	**14:00**

EROS B Satellite – Imaging Capabilities
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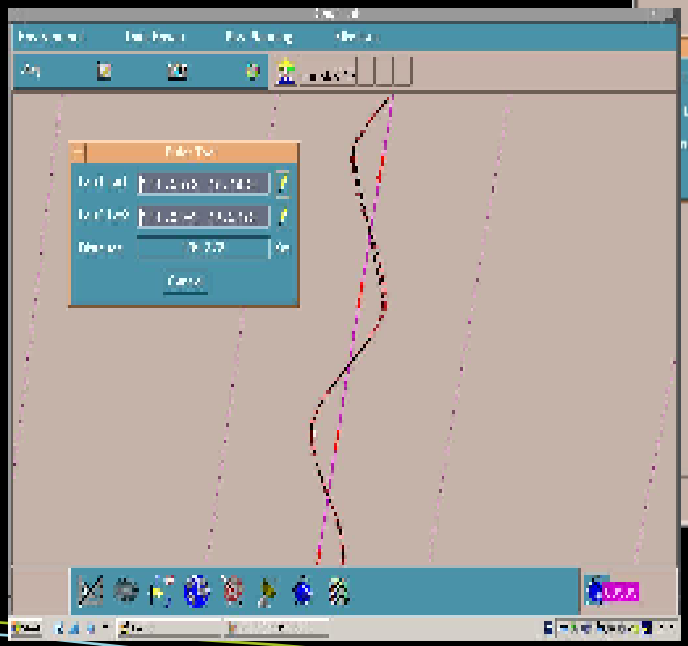
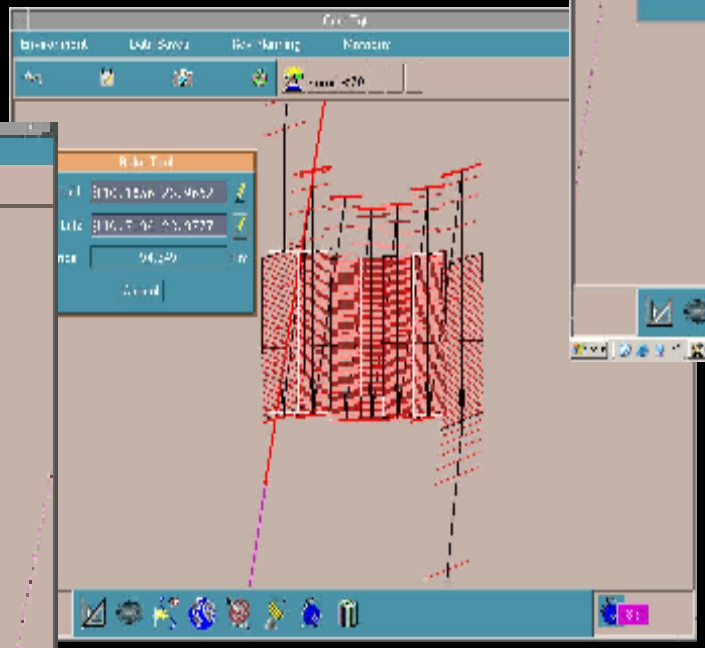
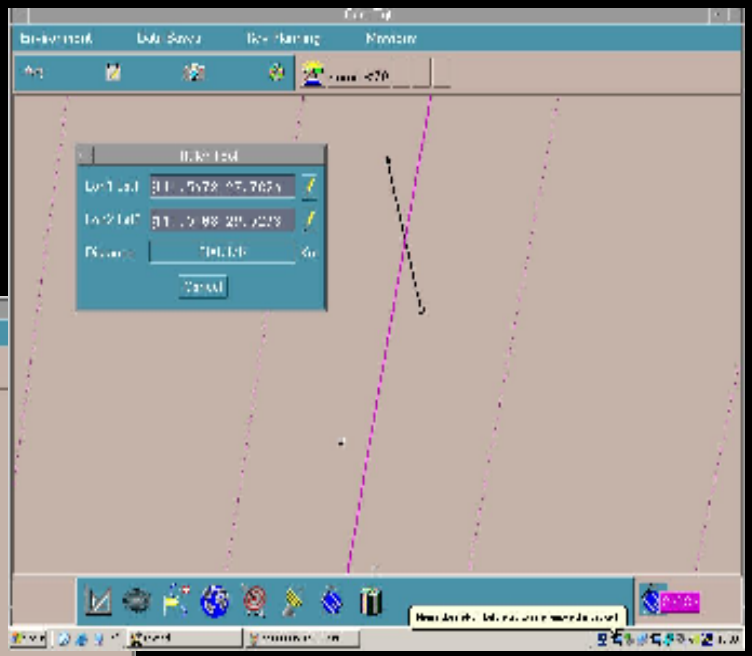
of High-resolution Imaging Satellites

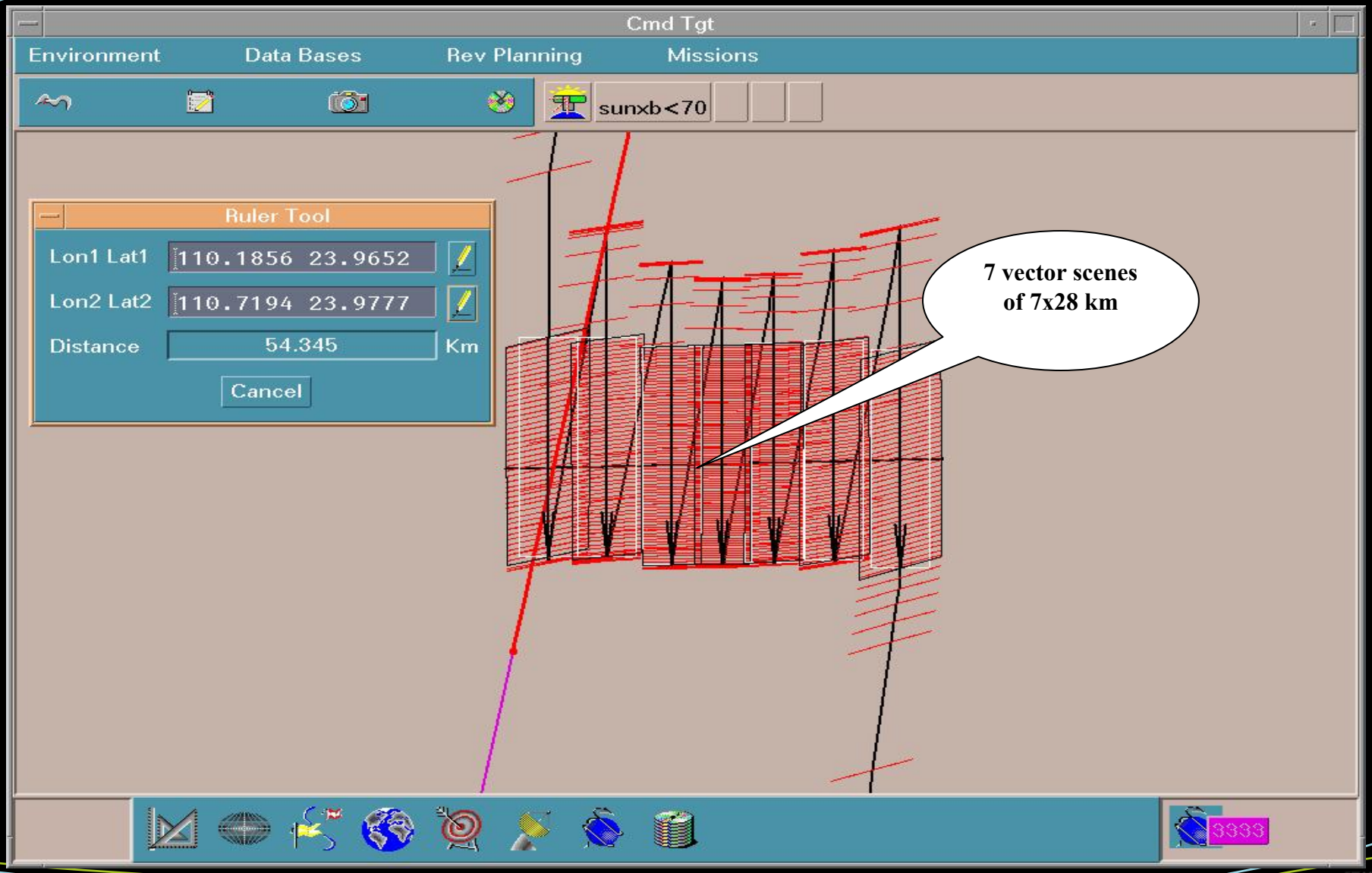
High Maneuverable and Agile Coverage Capability



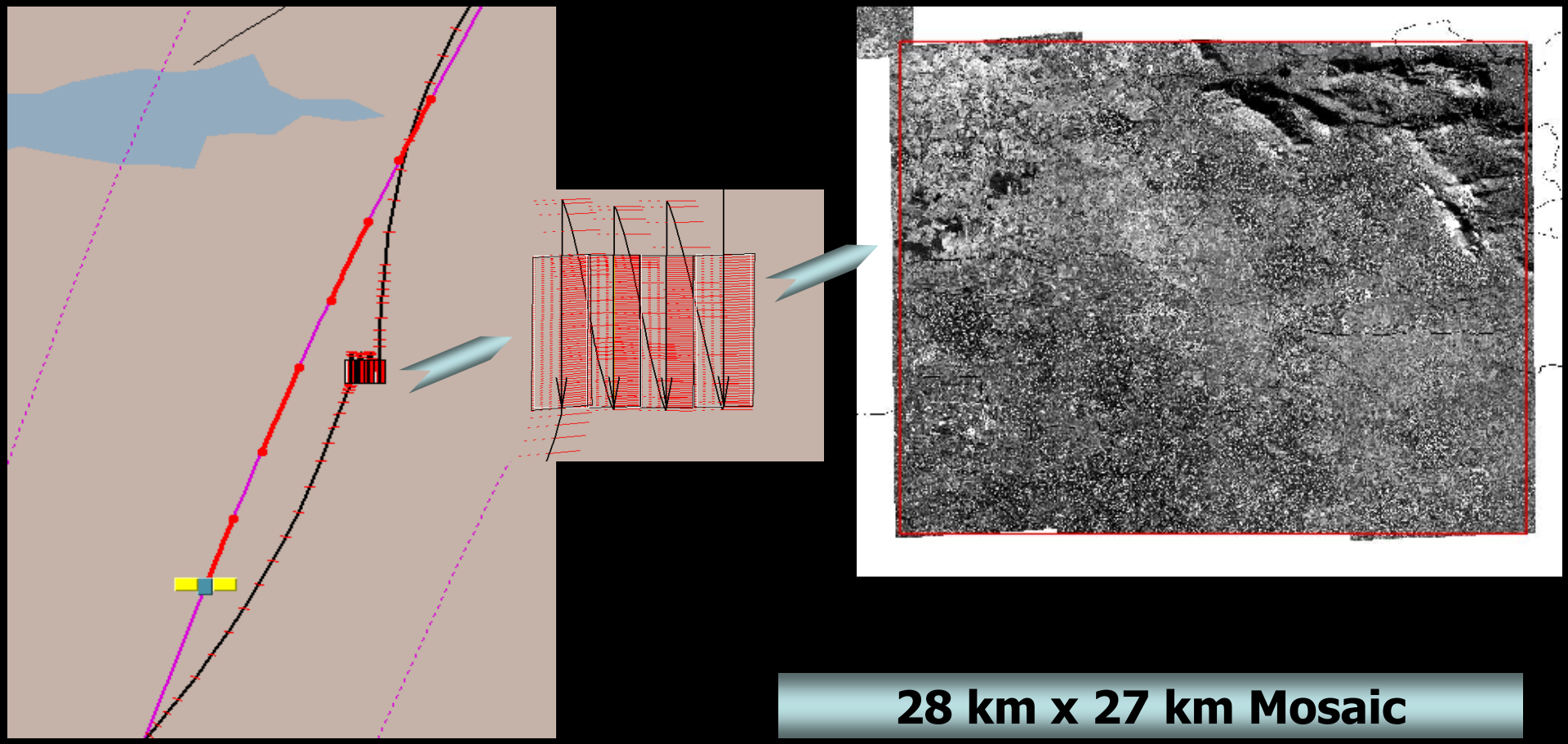




Mosaic- 28x50km (start angle: 45 , finish angle: -45)

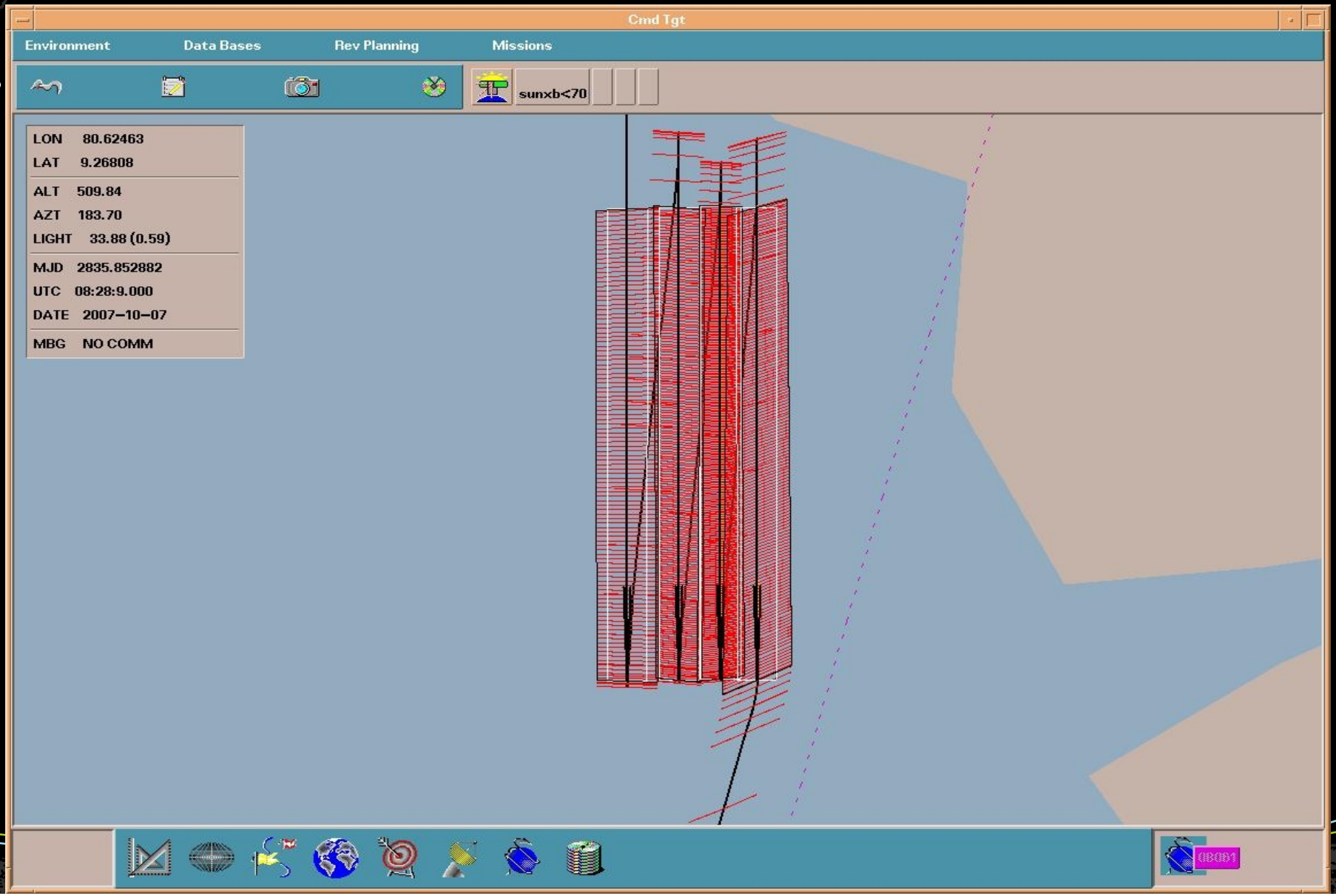


Mosaics

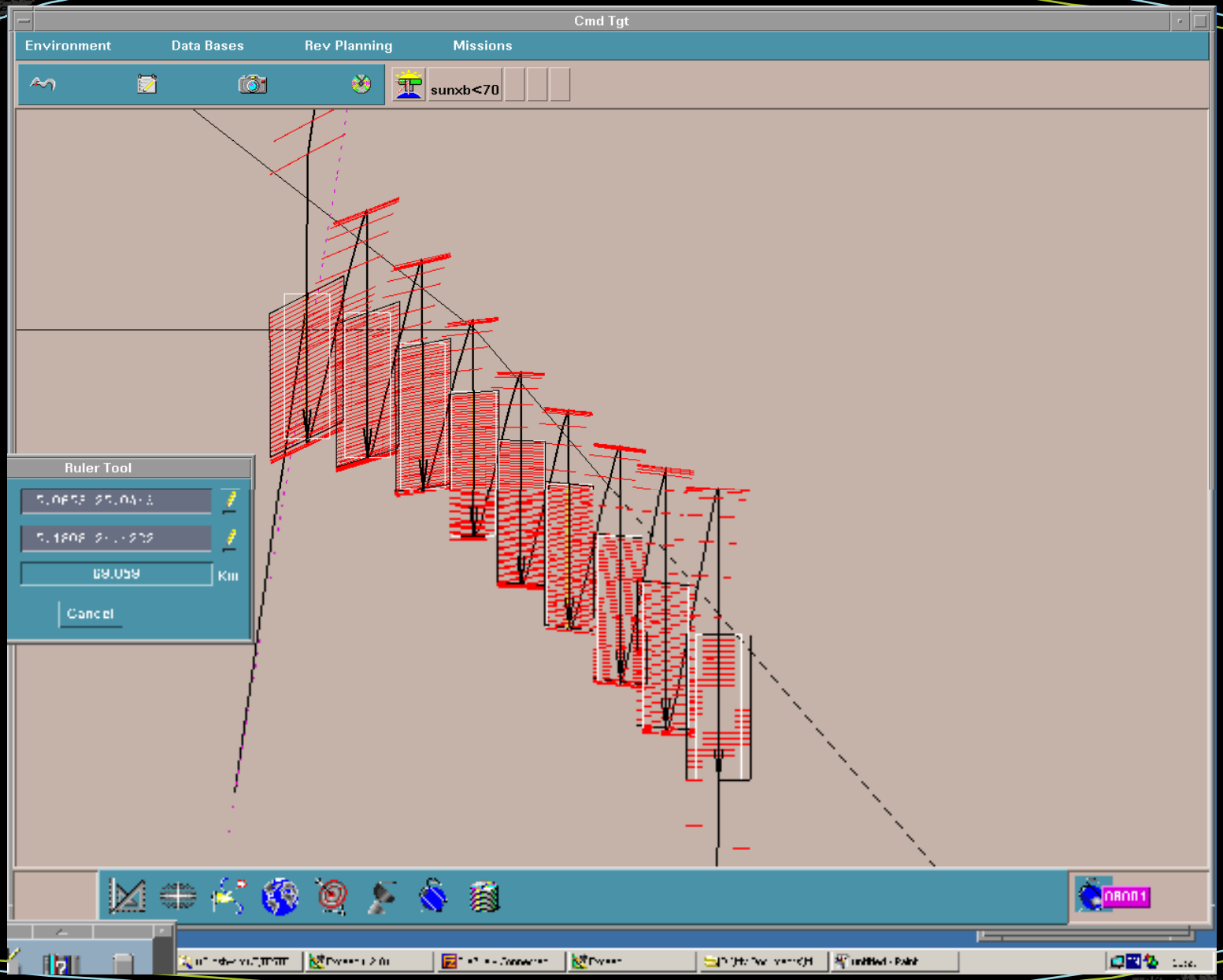


28 km x 27 km Mosaic

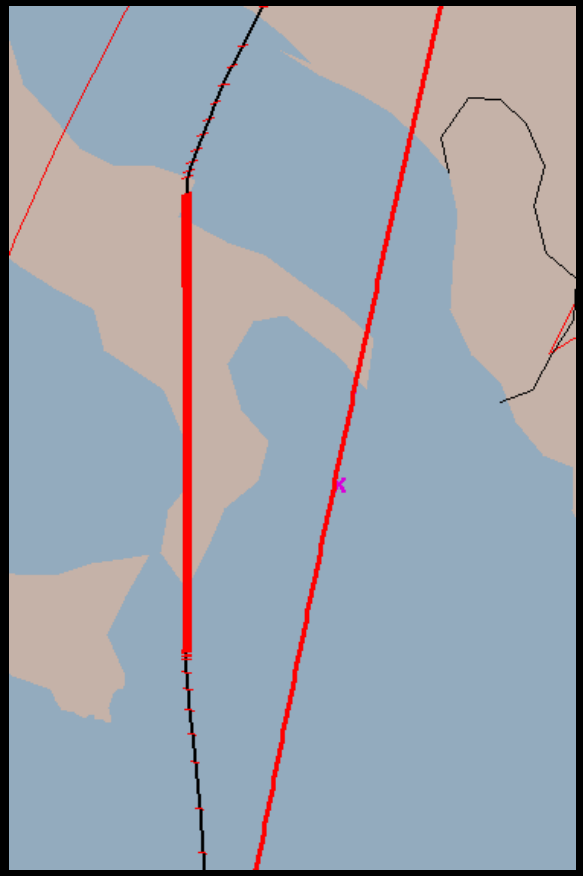
Mosaics- 100 km x 32-35 km Mosaic



Mosaics- 20 km x 9 Mosaic (start angle: 45 , finish angle: -45)



Long strip imaging



Italy - 480 km strip

Geolocation accuracy
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International
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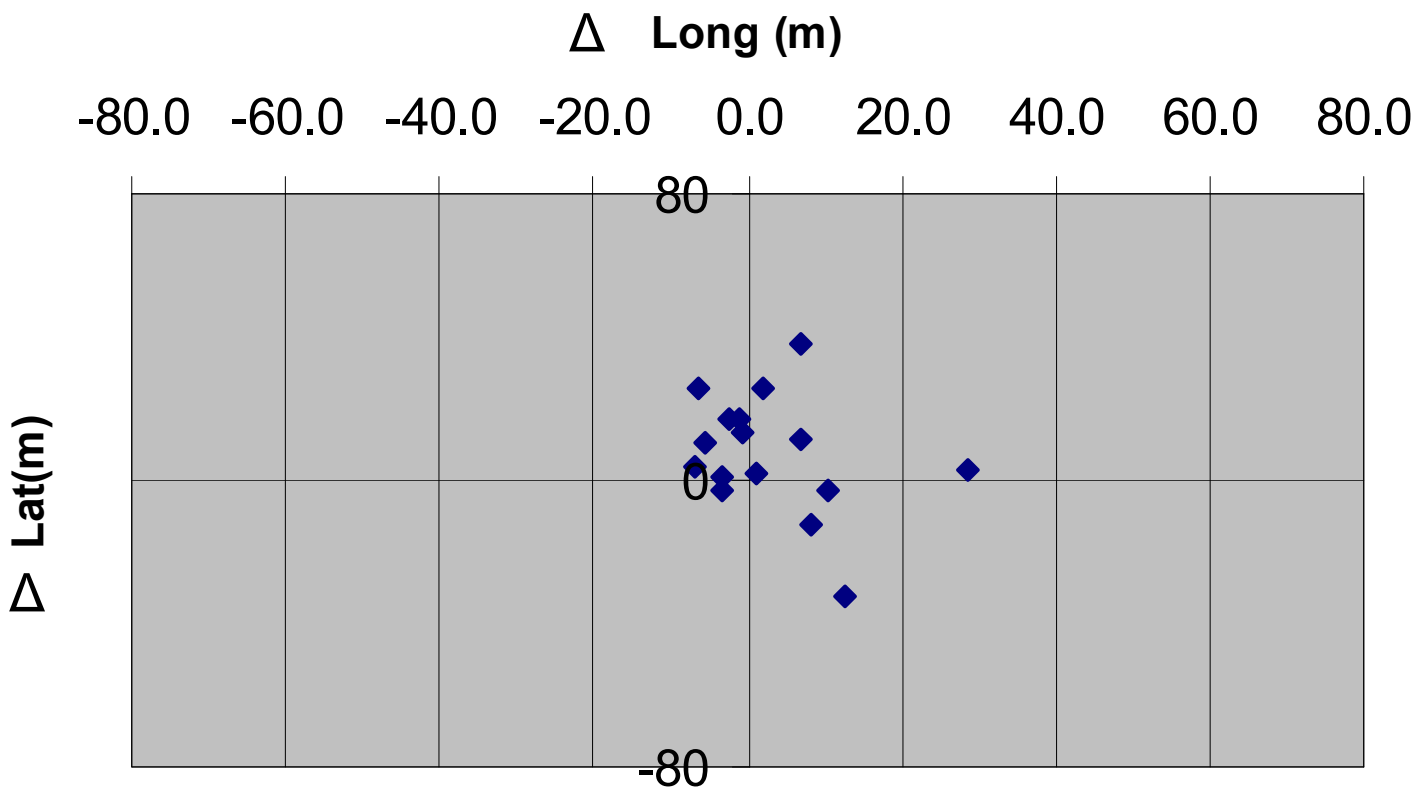
of High-resolution Imaging Satellites

Absolute Geolocation Accuracy

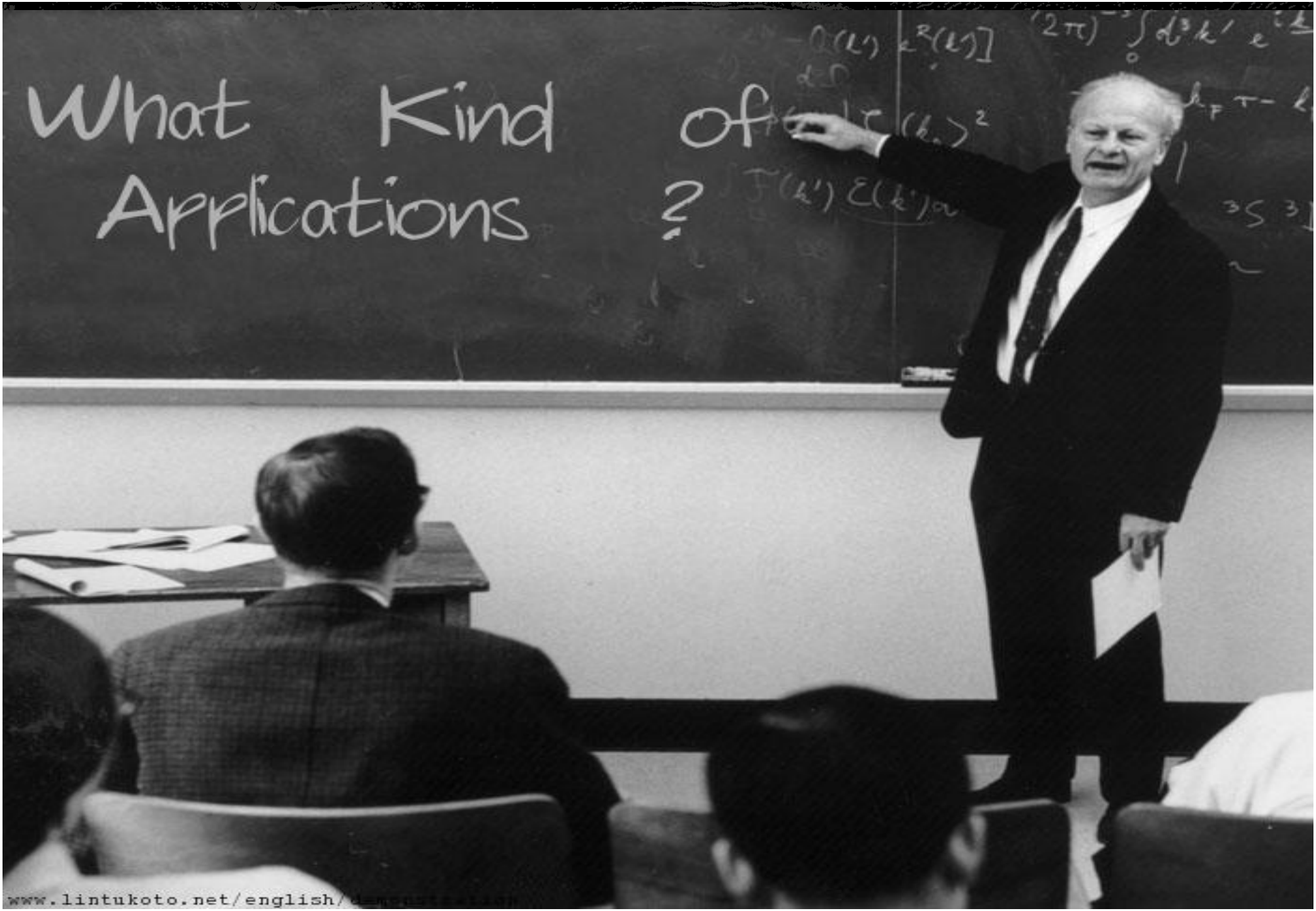


Mean-21.4 meter

Commercial SW Supports EROS B

BAE SYSTEMS ®SOCET SET 5.4.1

ERDAS IMAGINE LPS-9.2



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Imagery Applications

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- ***Applications***
  - ***National Security***
  - ***Homeland Security***
  - ***Environment Security***
  - ***Other Civilian***

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National Security

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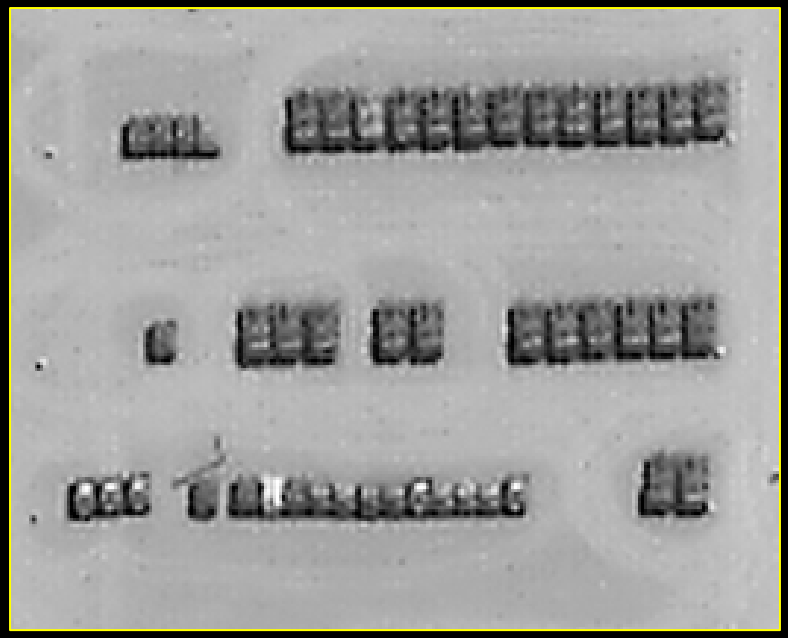
Ground forces



Navy

Air force

EROS B

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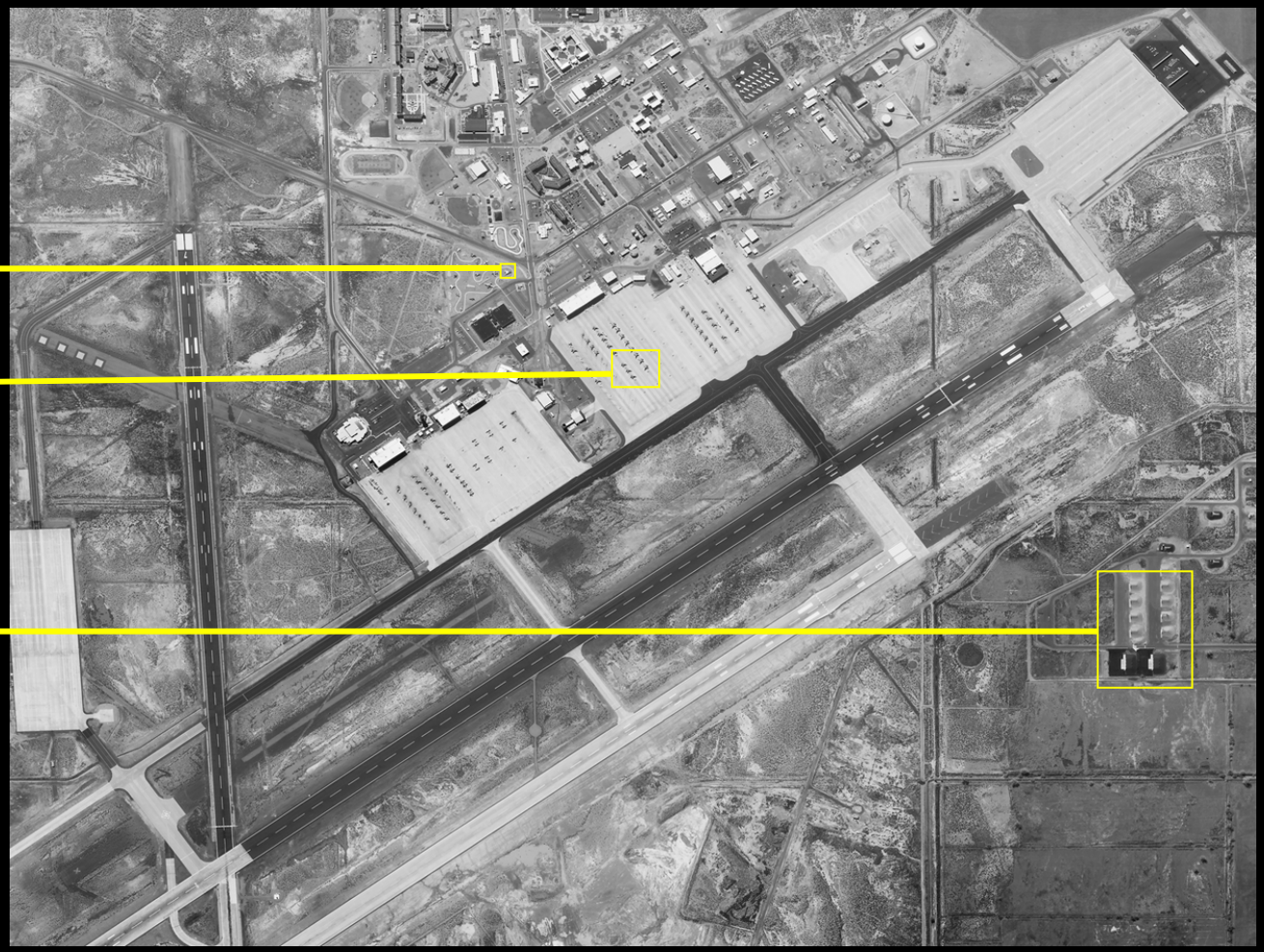
Airbase Facilities and Aircrafts



F-14

F-16

EROS A

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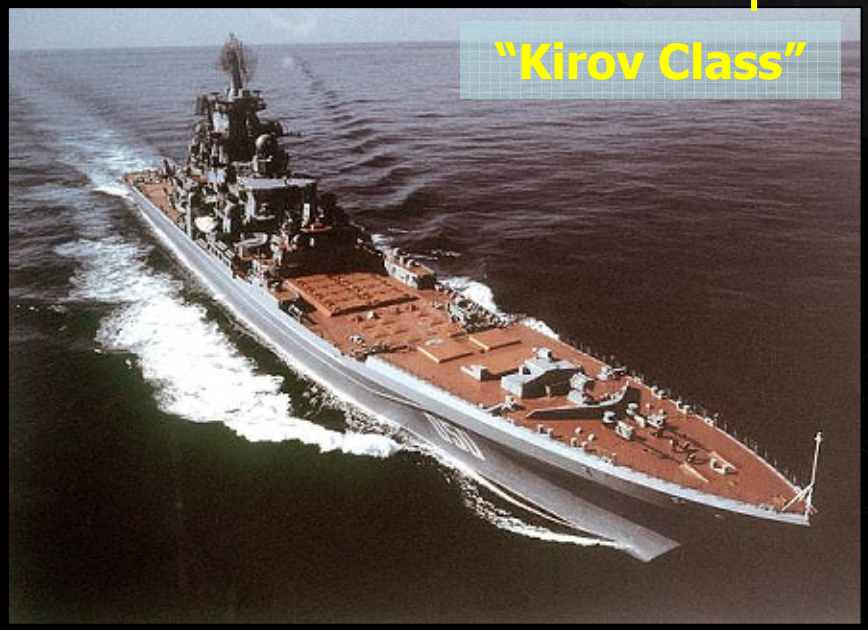
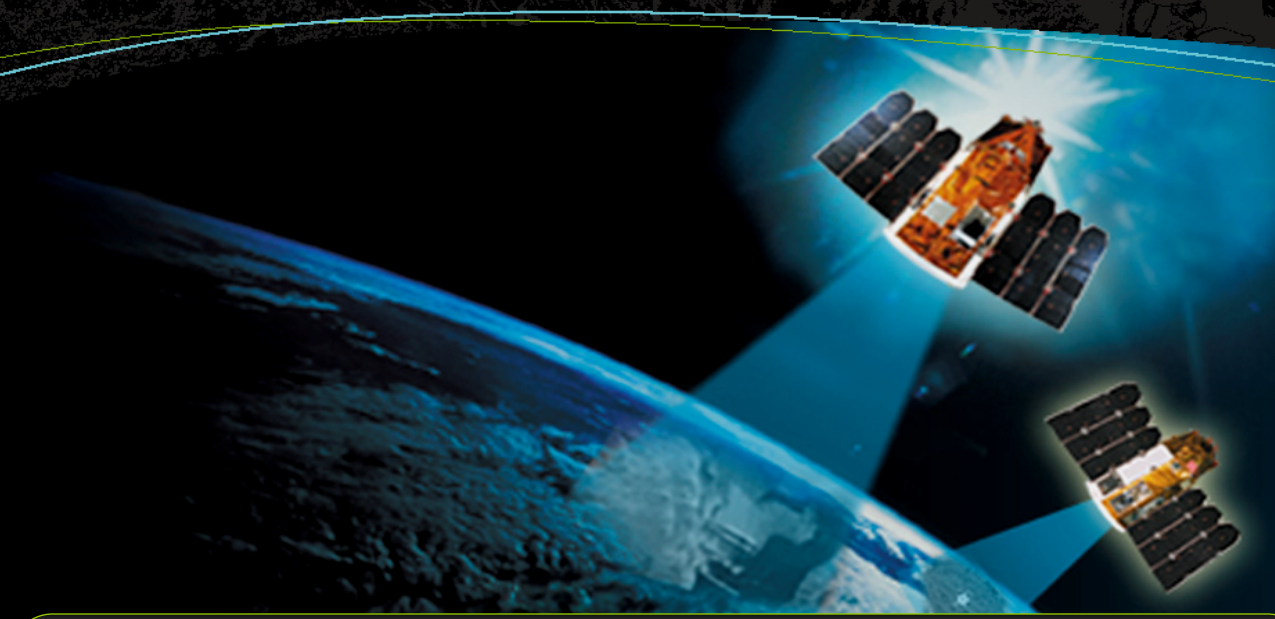
SEVEROMORSK, RUSSIA - NAVAL BASE





Homeland Security

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Terrorist Attacks

Natural Disasters

EROS B

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Collapsed I-35W Bridge, Minneapolis - Minnesota

EROS B

Tornado Damage, Lady Lake - Florida – USA

EROS A

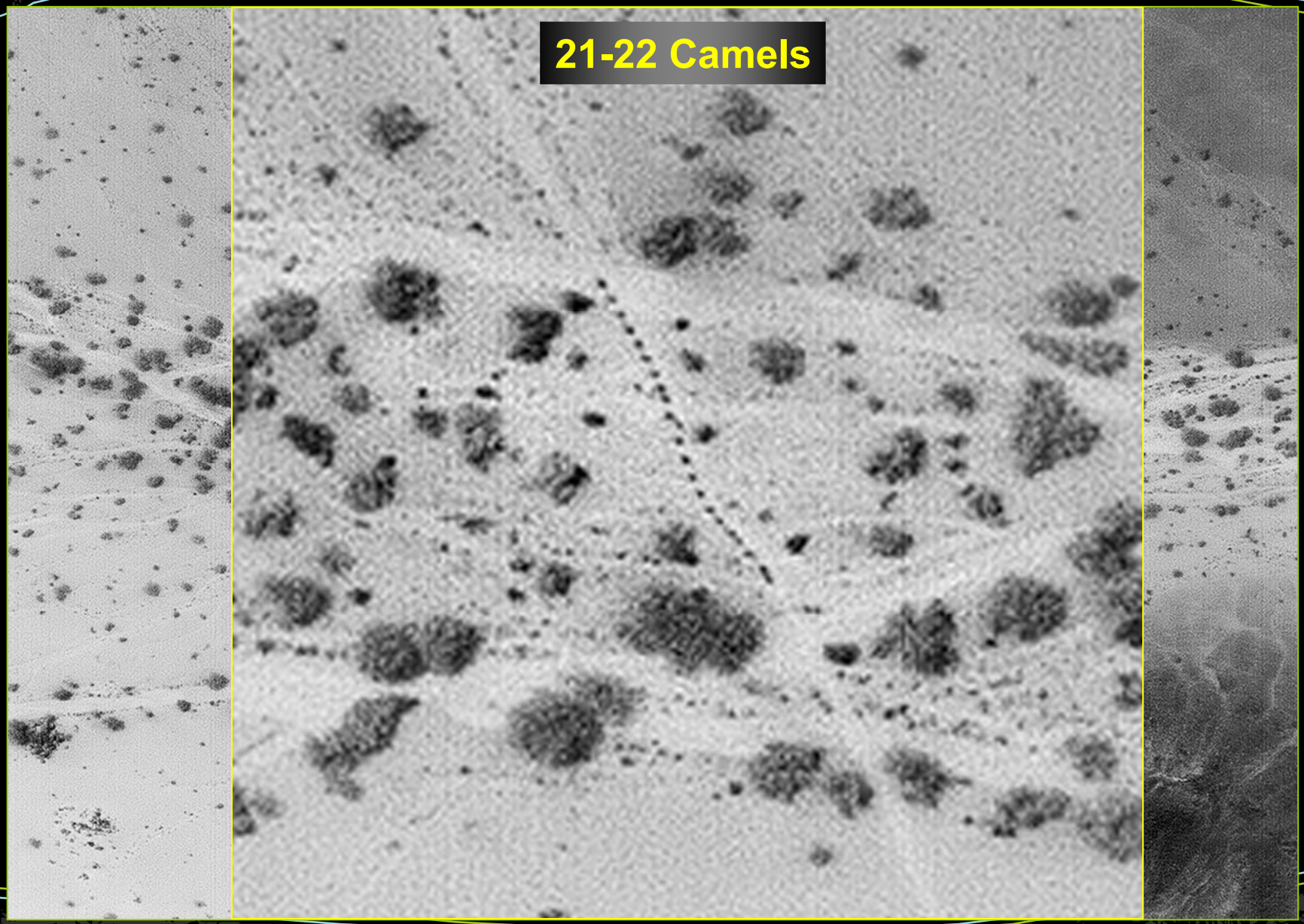
Flood Damage – Franklin, Virginia

EROS B

Soldiers lineup during sport period

EROS B

Camel Convoy, Abardokh – Niger



EROS B

COPPER MINE, CHILE – NATURAL RESOURCE MONITORING

Maritime Security

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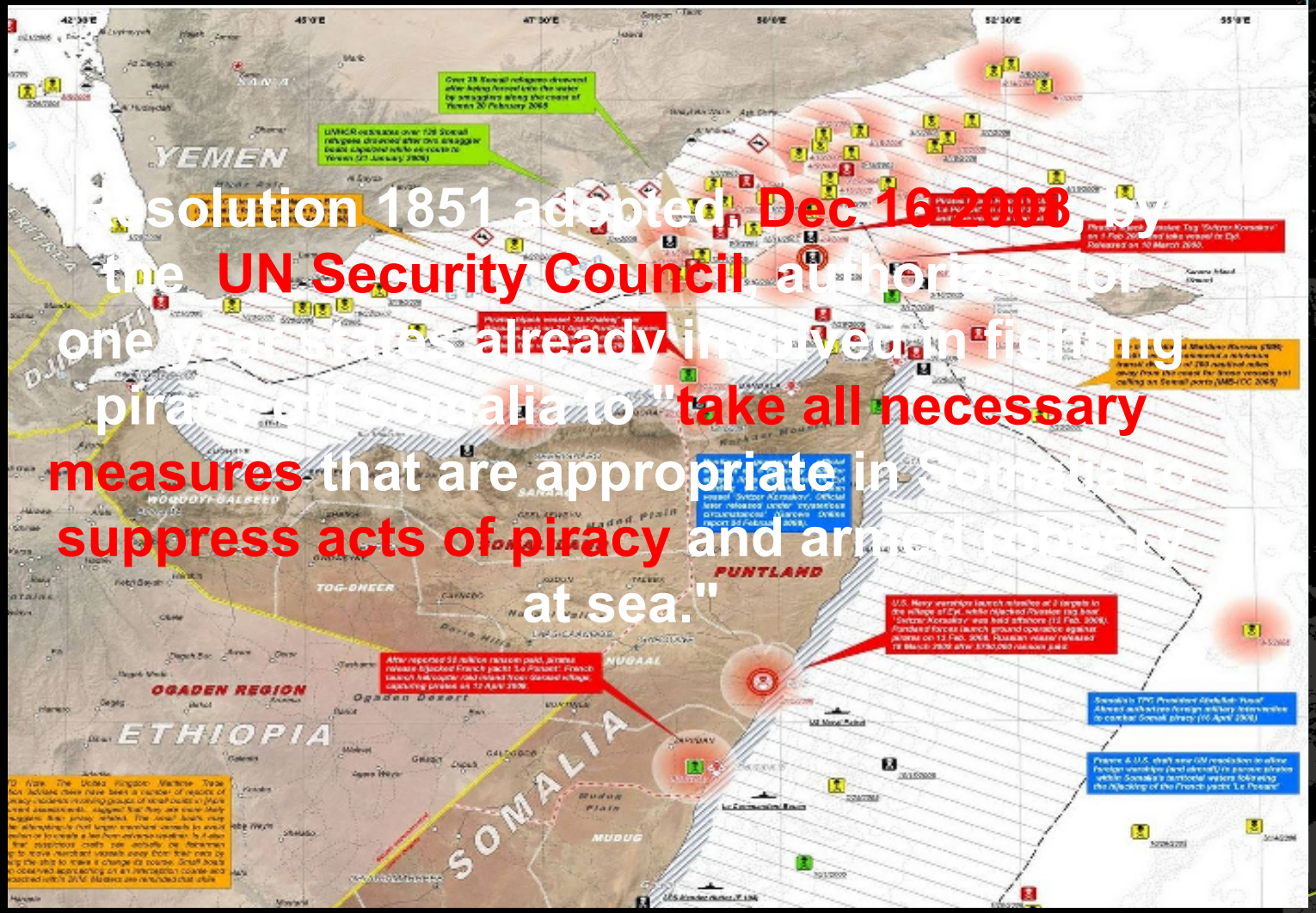
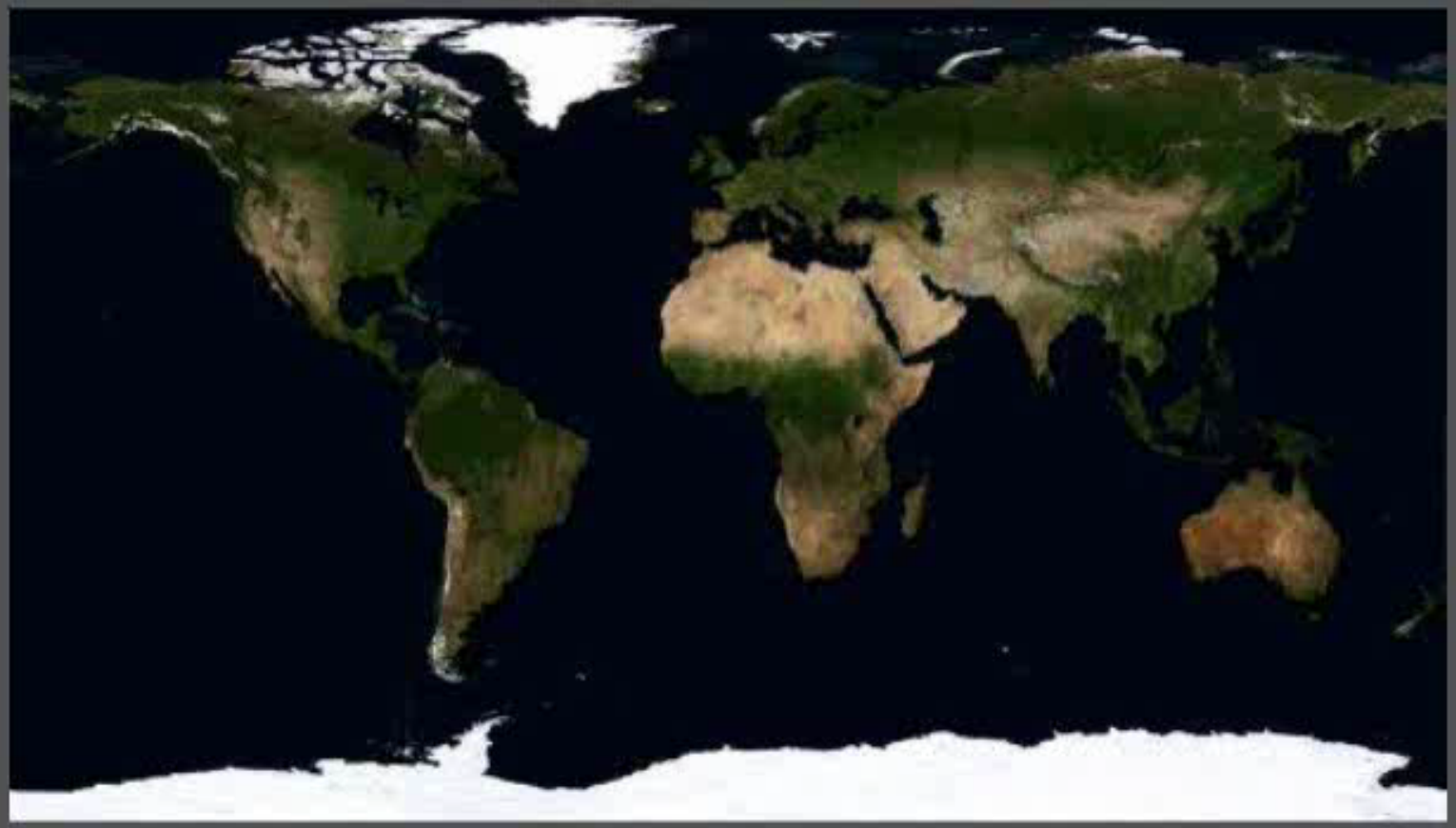
Reported Pirates Attacks Along the Somali Coast

ImageSat International

Somali pirates have enjoyed a bumper 2008, attacking more than 100 ships and raking in an estimated 120 million dollars in ransom money.



Resolution 1851 adopted, Dec 16 2008, by the UN Security Council, authorizes for one year, states already involved in fighting piracy off Somalia to "take all necessary measures that are appropriate in Somalia to suppress acts of piracy and armed robbery at sea."



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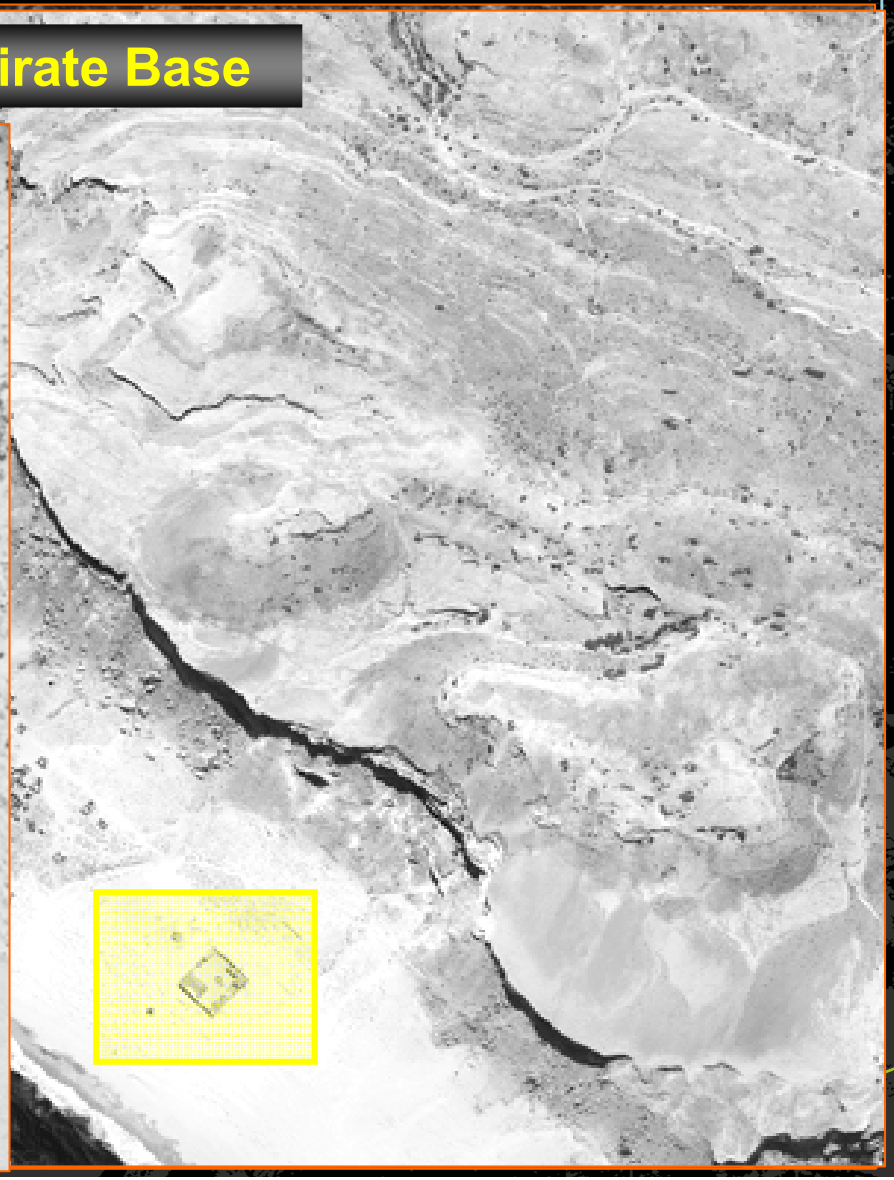
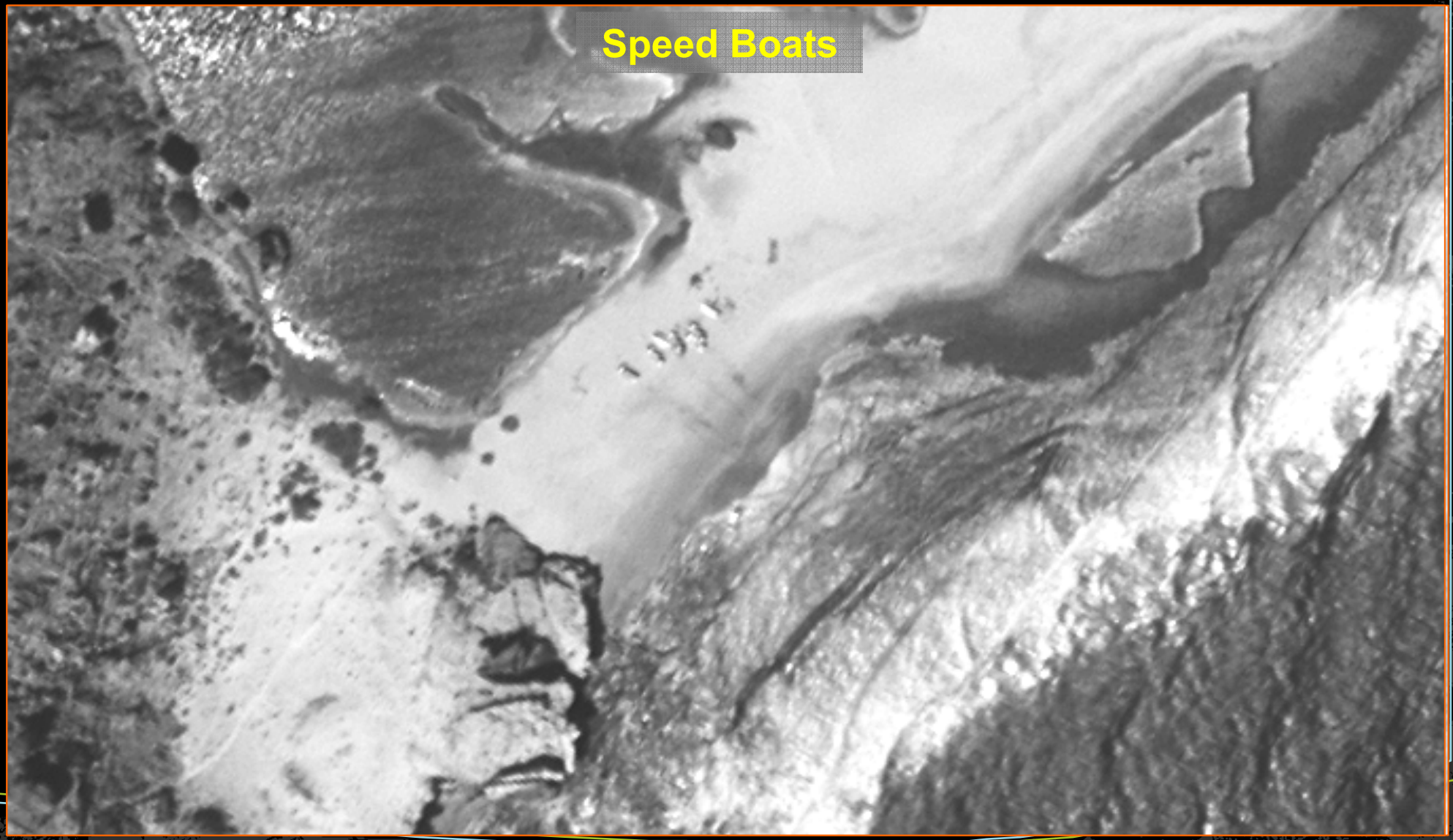
Hijacked Ship – Somalia Coast

Coastal Village – Pirate Base

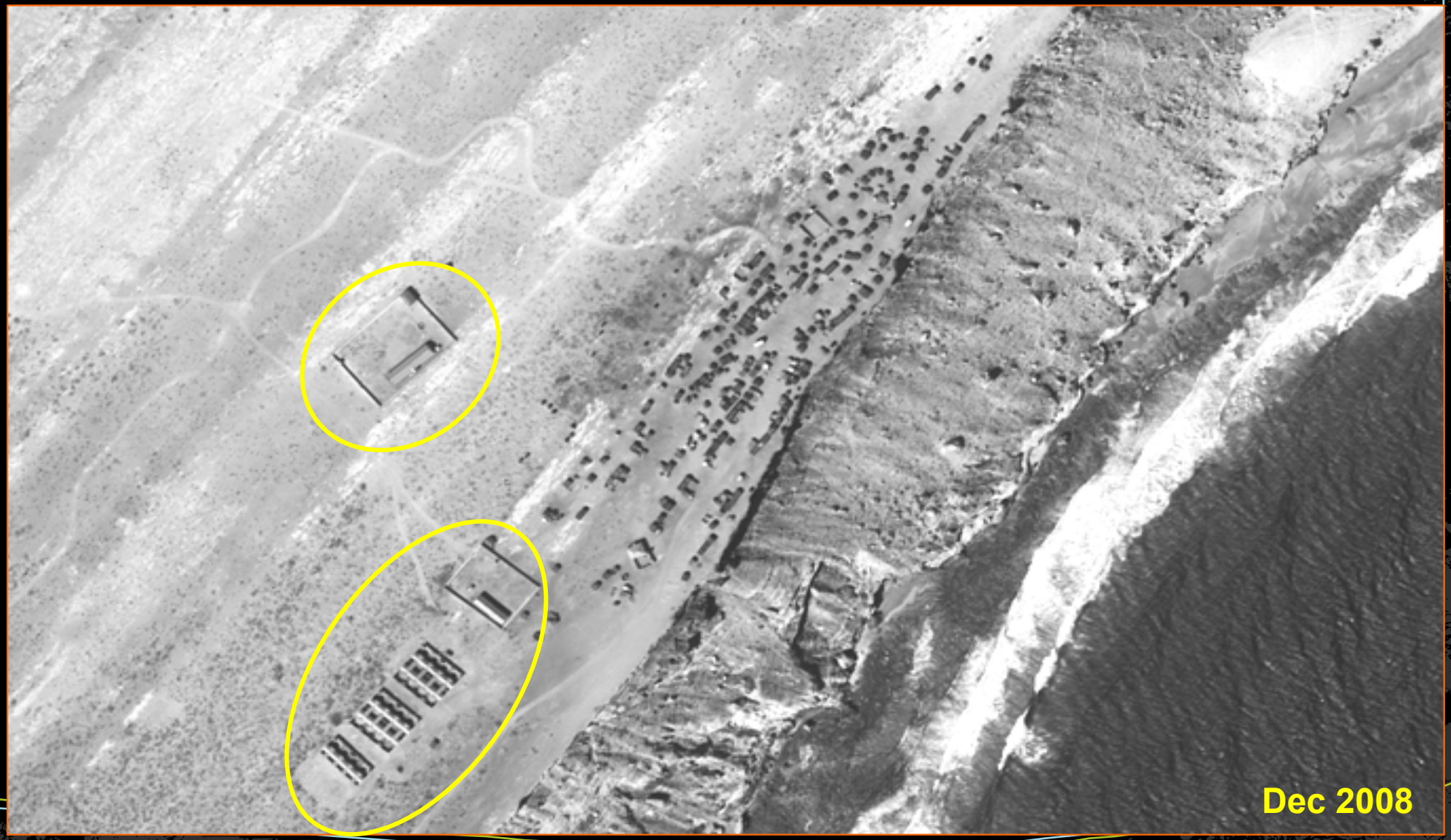


Hijacked Ship – Somalia Coast

Pirate Village – Somalia Coast



Pirate Village – Somalia Coast



Environment Security

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EROS B

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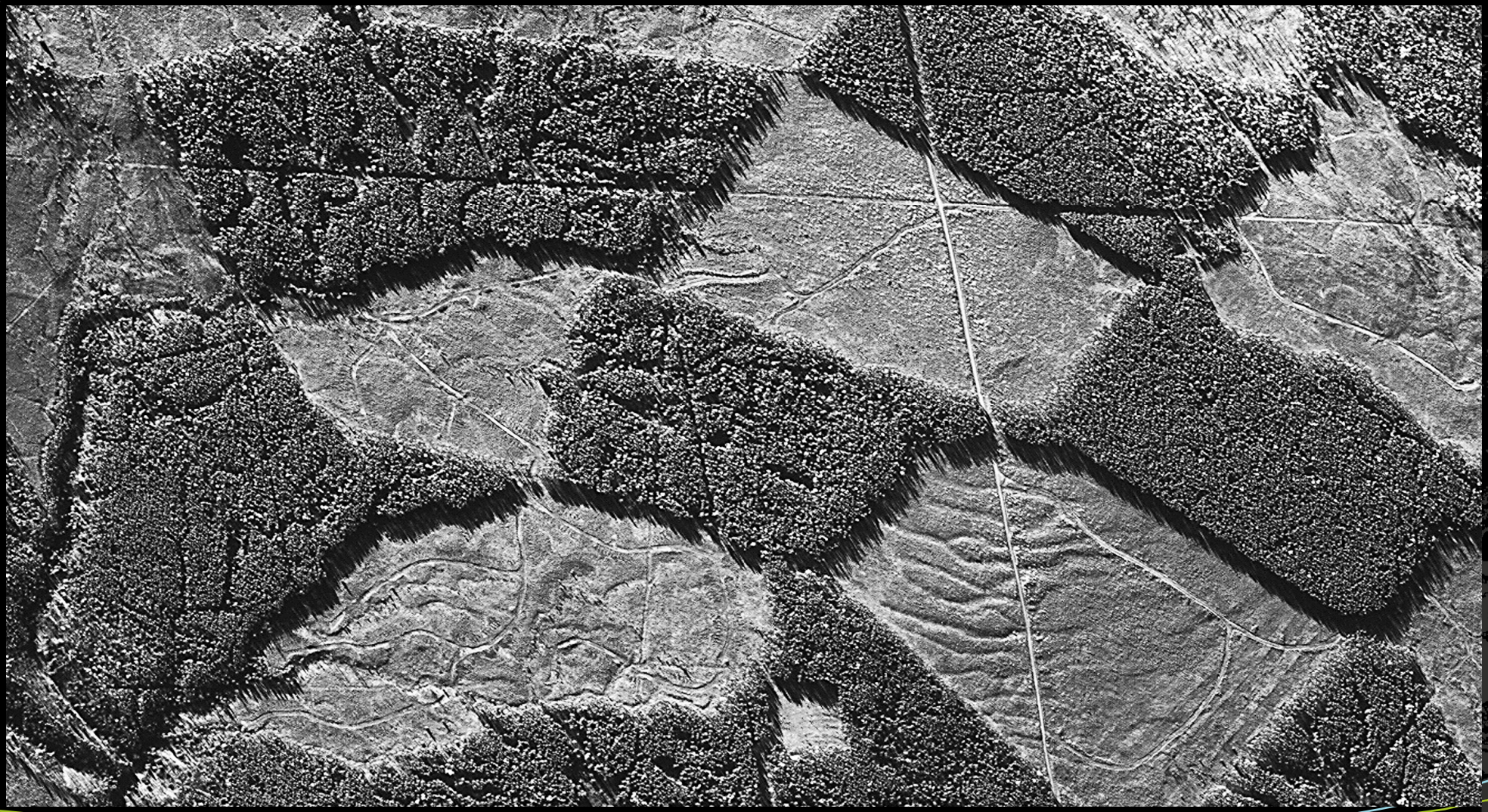
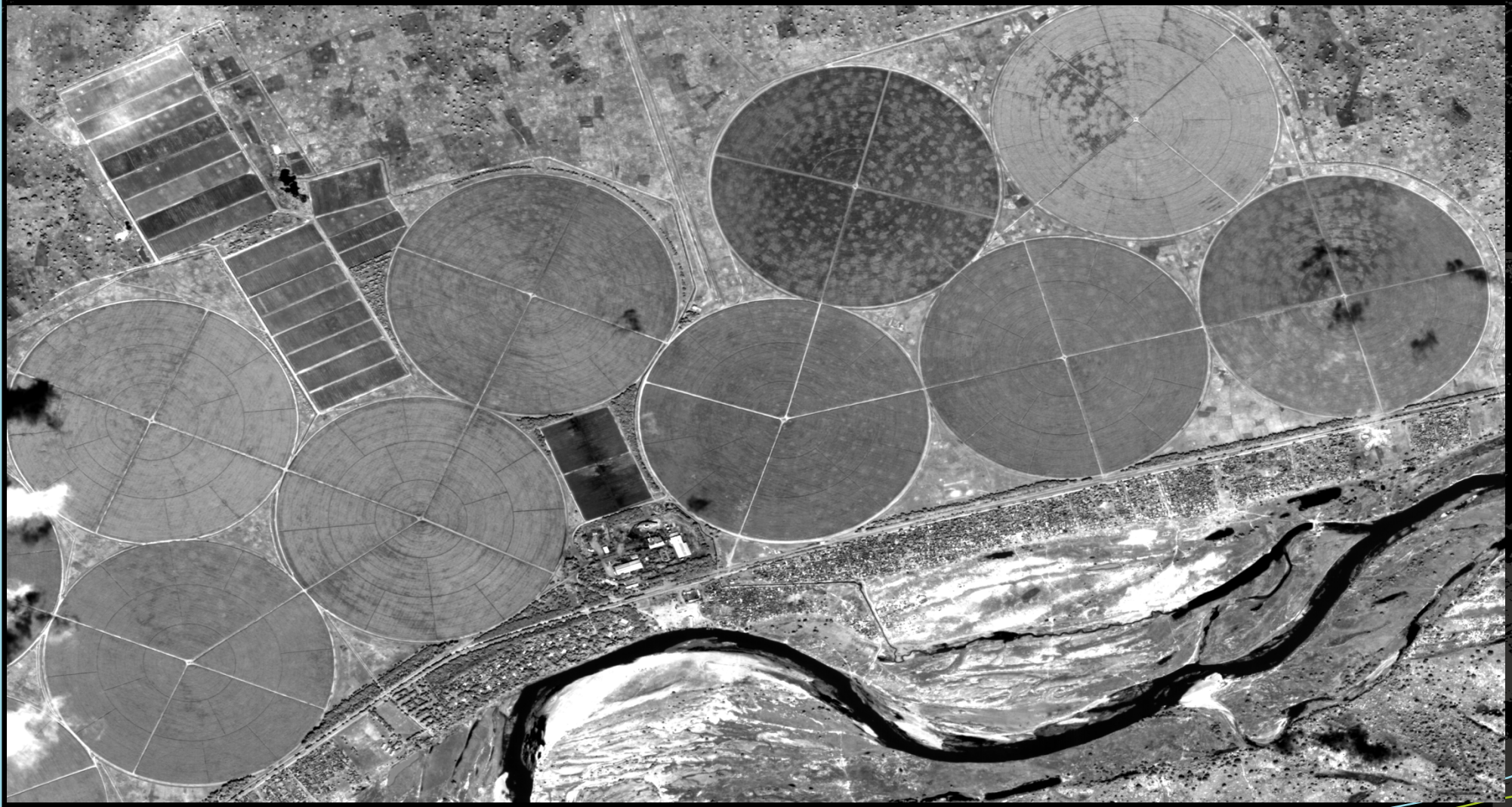
Forestry Planning & Monitoring

ECOLOGICAL MONITORING
FORESTRY CLEAR CUTTING, CANADA

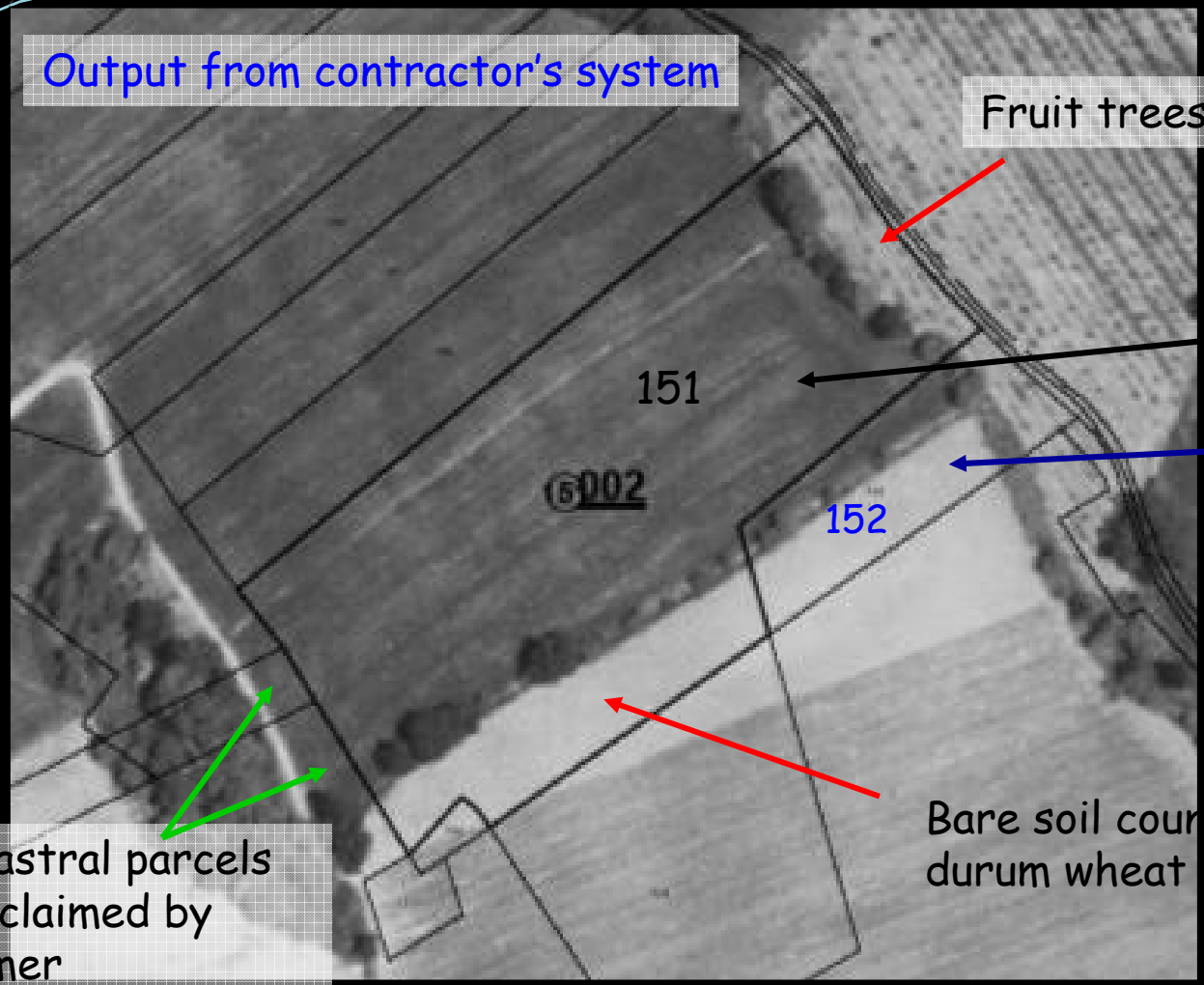


CHAD – AGRICULTURE PLANNING & MONITORING



Irrigation System

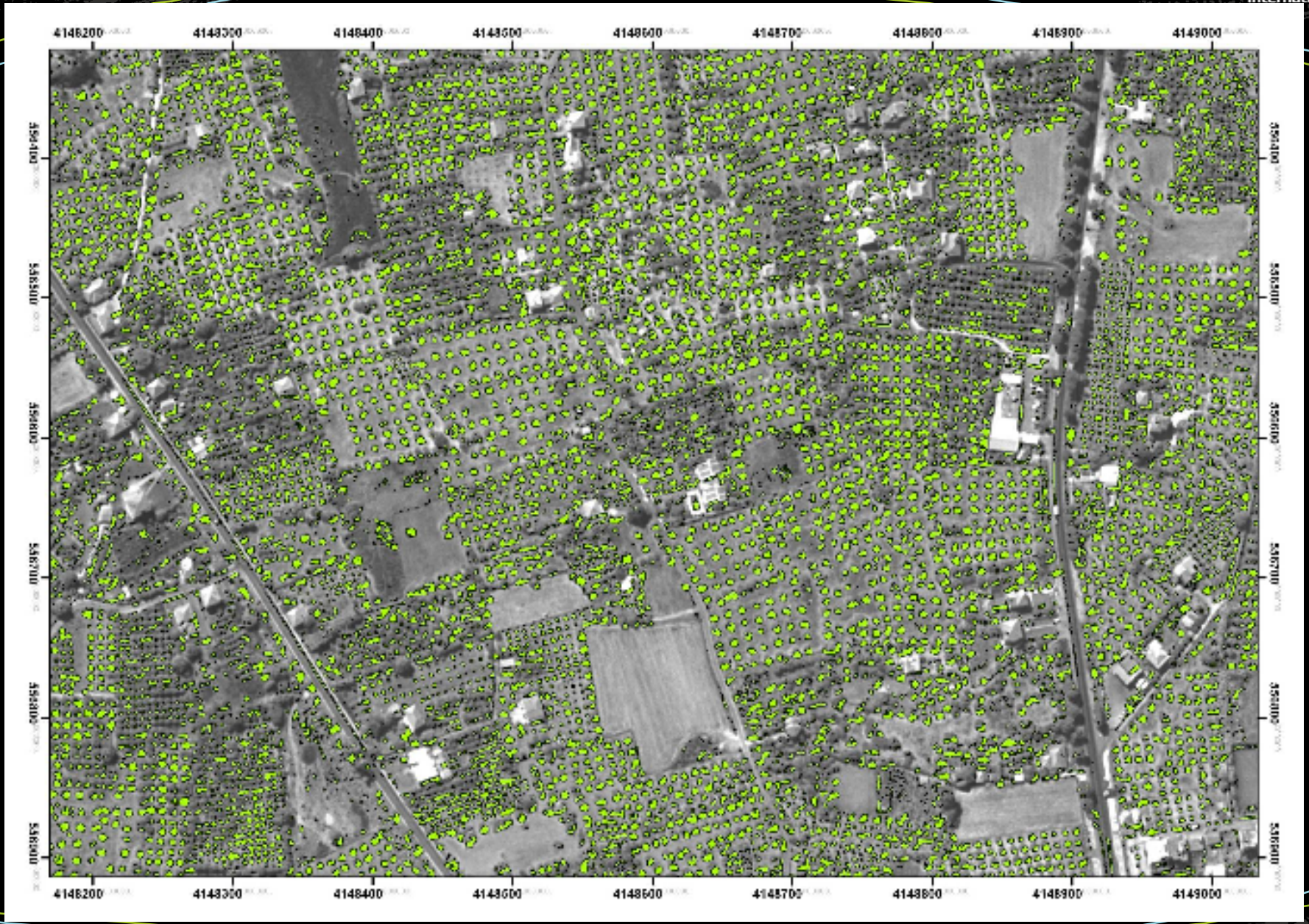
Contractor's measurement



In contrast with parcel 152 (ortho shift of 29 m to the west) which was fully declared for 0.34 ha of durum wheat and accepted

Discrepancy with QC as a result of inaccuracies (excess & omission of area)
For parcel 151, contractor's area = 2.01 ha > QC area = 1.84 ha

Olive trees counts



EROS-A Pan Sharpened

EROS B Pan Sharpened

Prudhoe Bay oil field -Alaska

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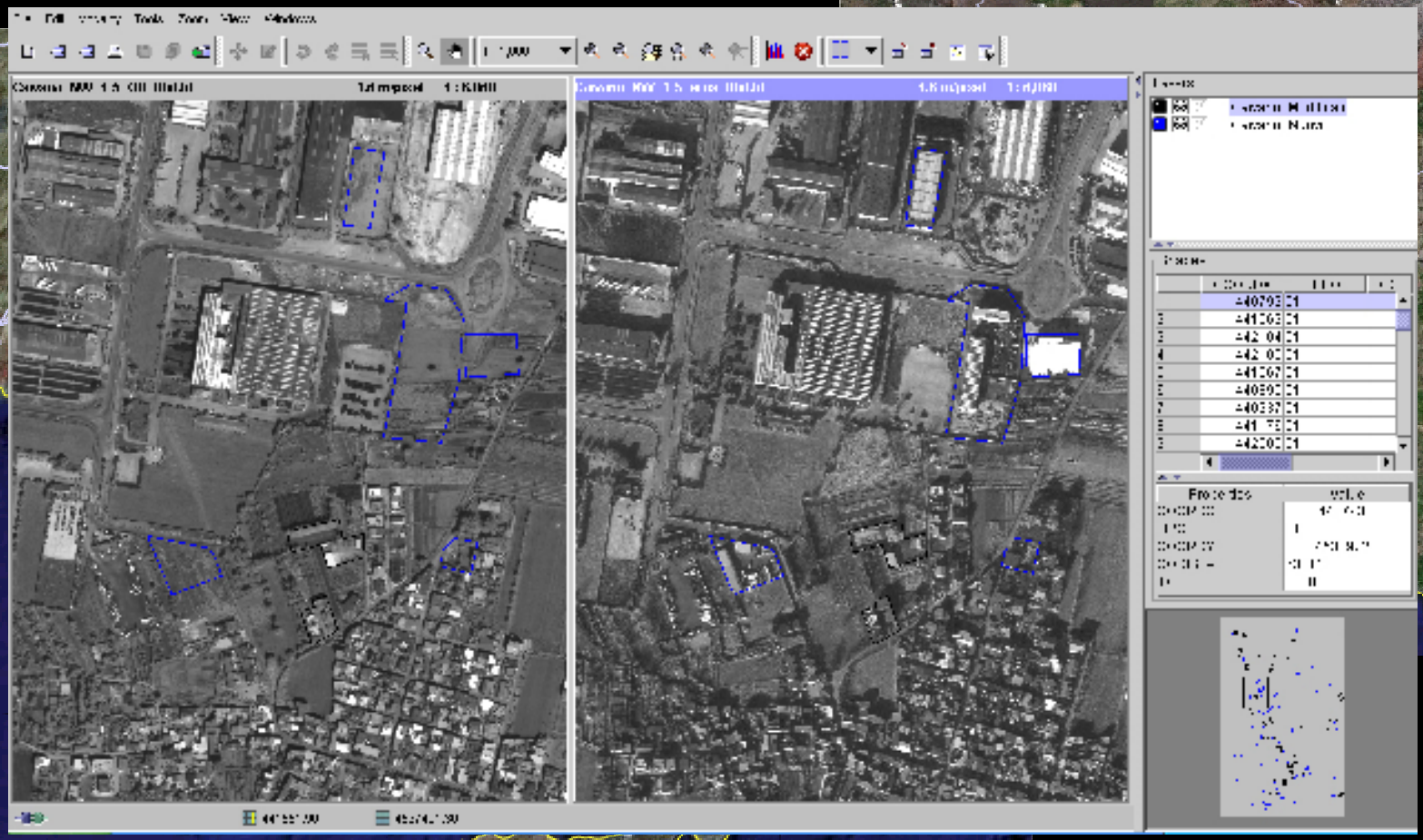
Italy-Campania Region Monitoring System

Location of monitored area



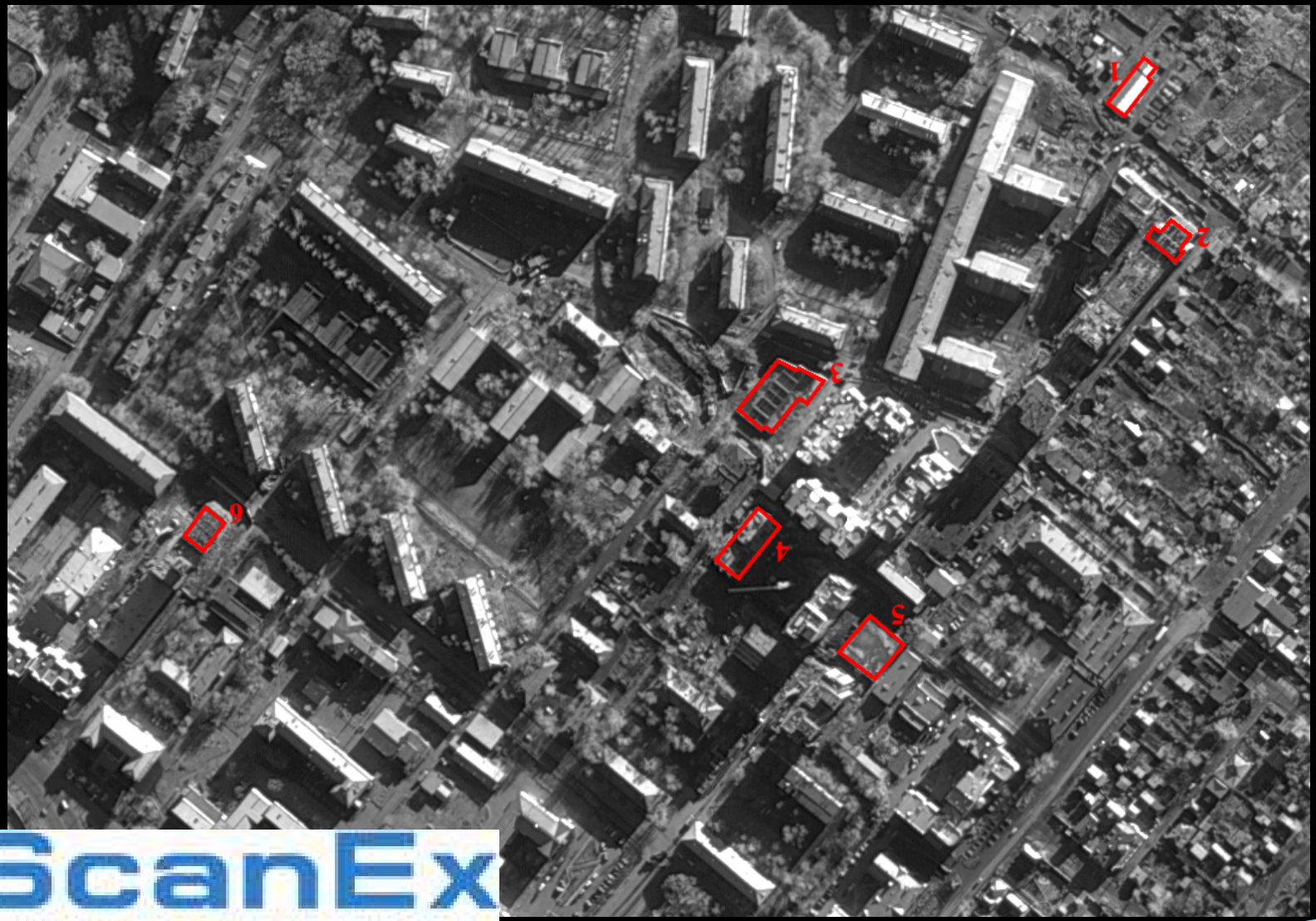
MISTRALS

Monitoraggio da Immagini Satellitari del Territorio
per la Rilevazione di Abusi su Larga Scala

REGIONE CAMPANIA

sono evidenti ora gli spazi liberati dagli edifici ab

Illegal building in Urban Area



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ScanEx
RESEARCH AND DEVELOPMENT CENTER

Services Overview
ImageSat International
Owners and Operators of the EROS Family
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ImageSat Services

Exclusive services

Tailor made services

SOP

EPOD

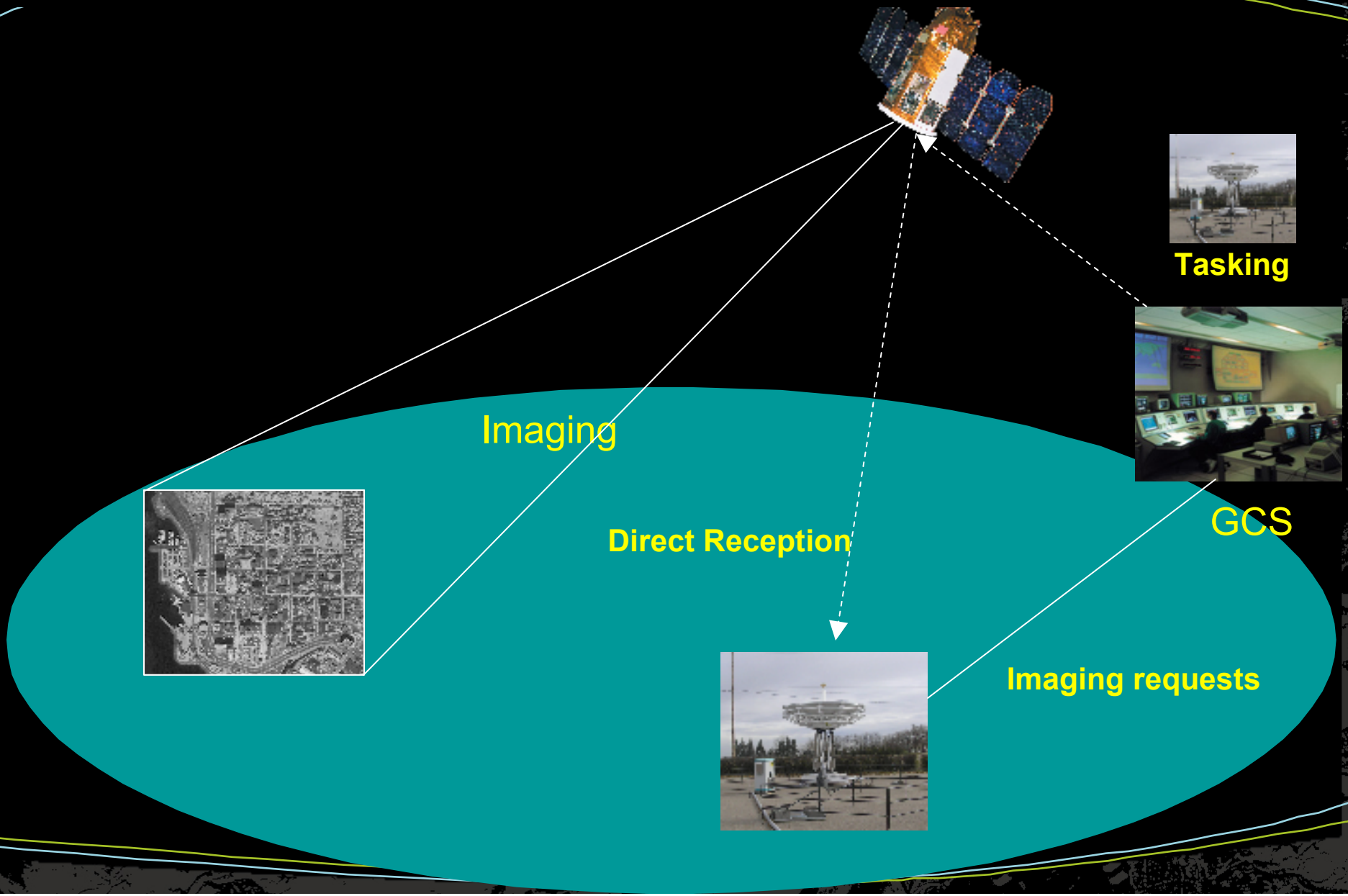
PAS

New acquisitions

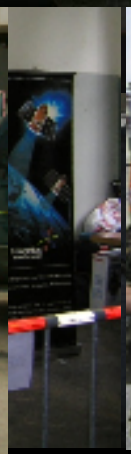
Archive

Direct Reception

PAS-Priority Acquisition Services

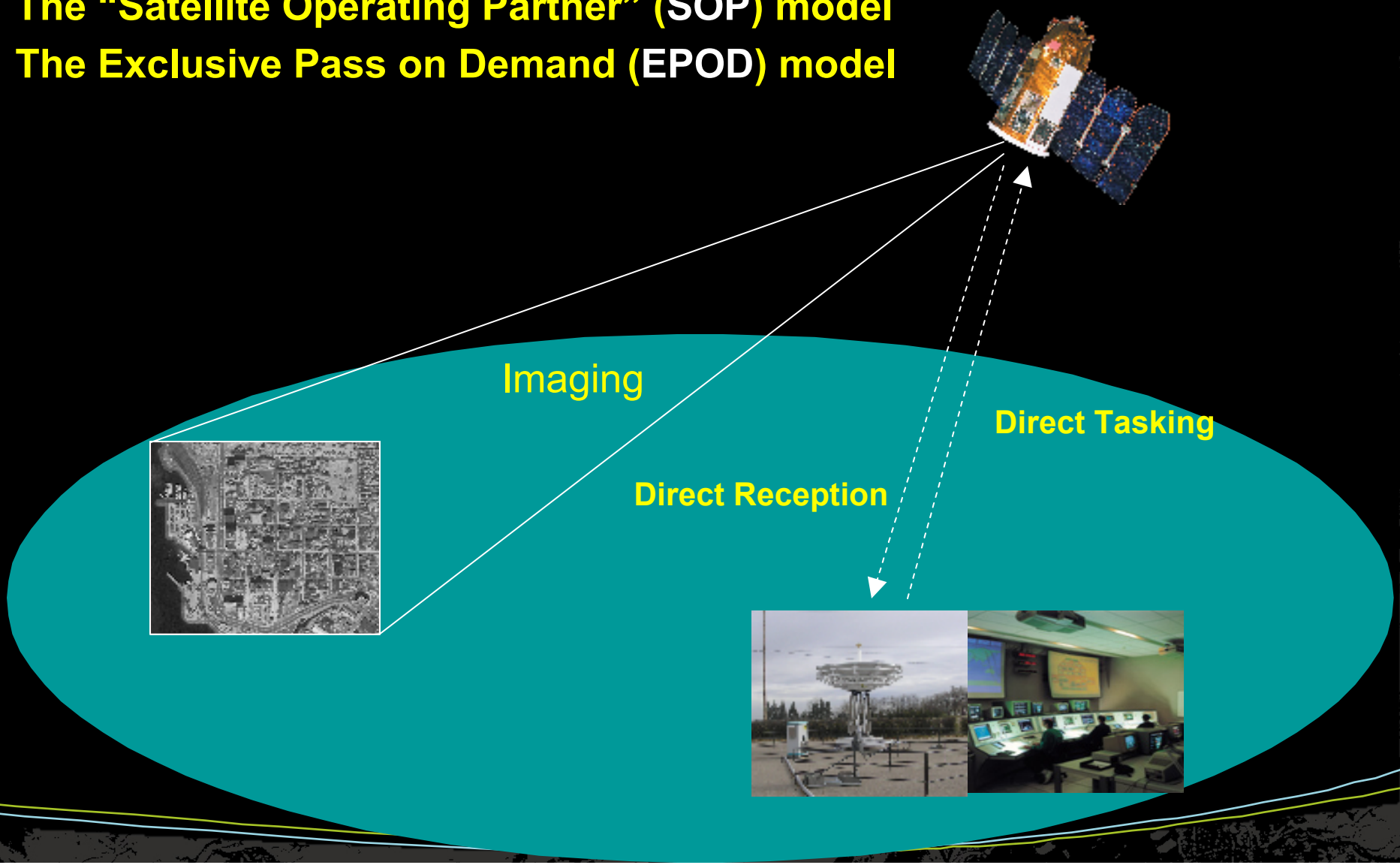


Deployable GRS For Real Time Data

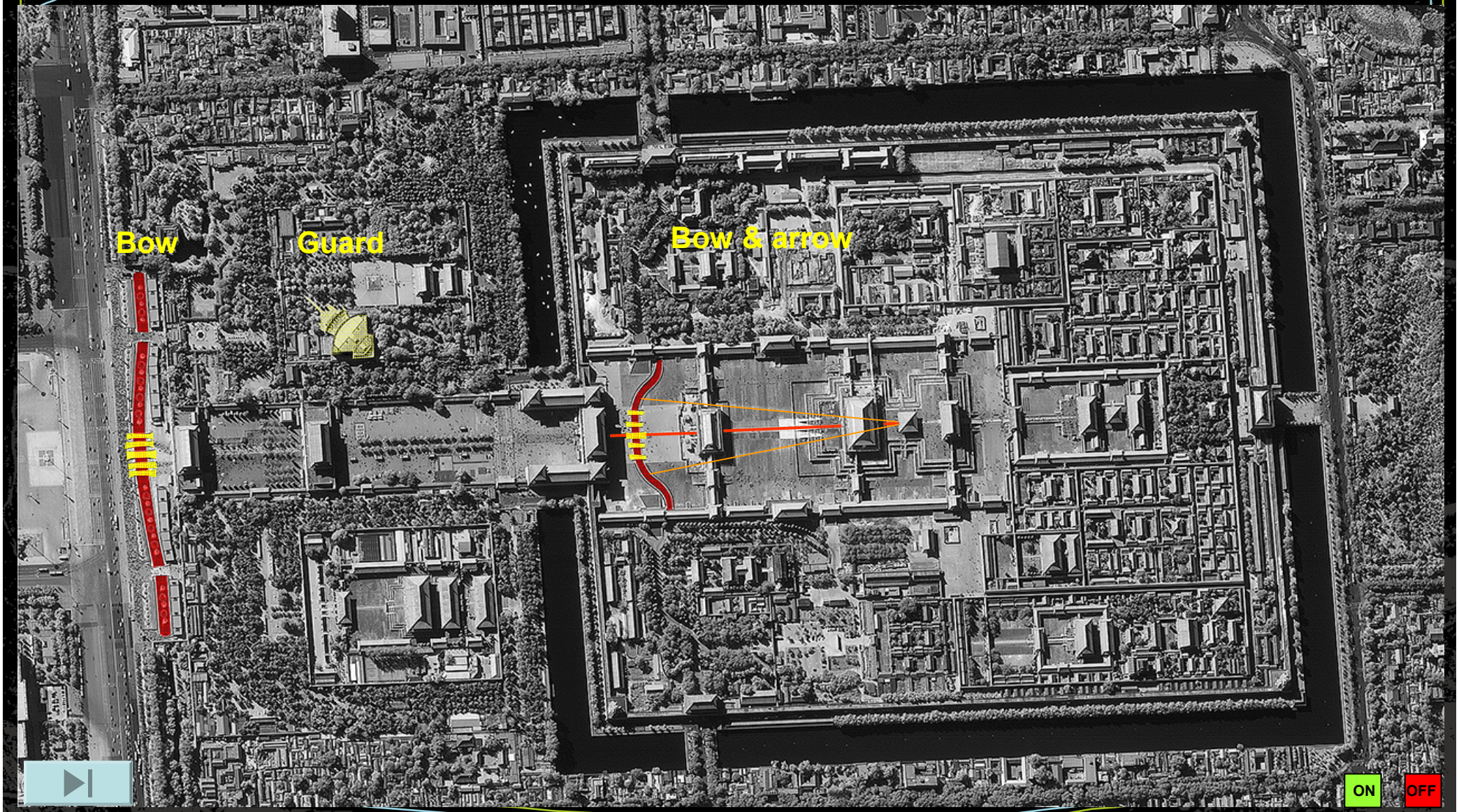


Direct Tasking

- The "Satellite Operating Partner" (SOP) model
- The Exclusive Pass on Demand (EPOD) model



The Secret of High Resolution



ON OFF

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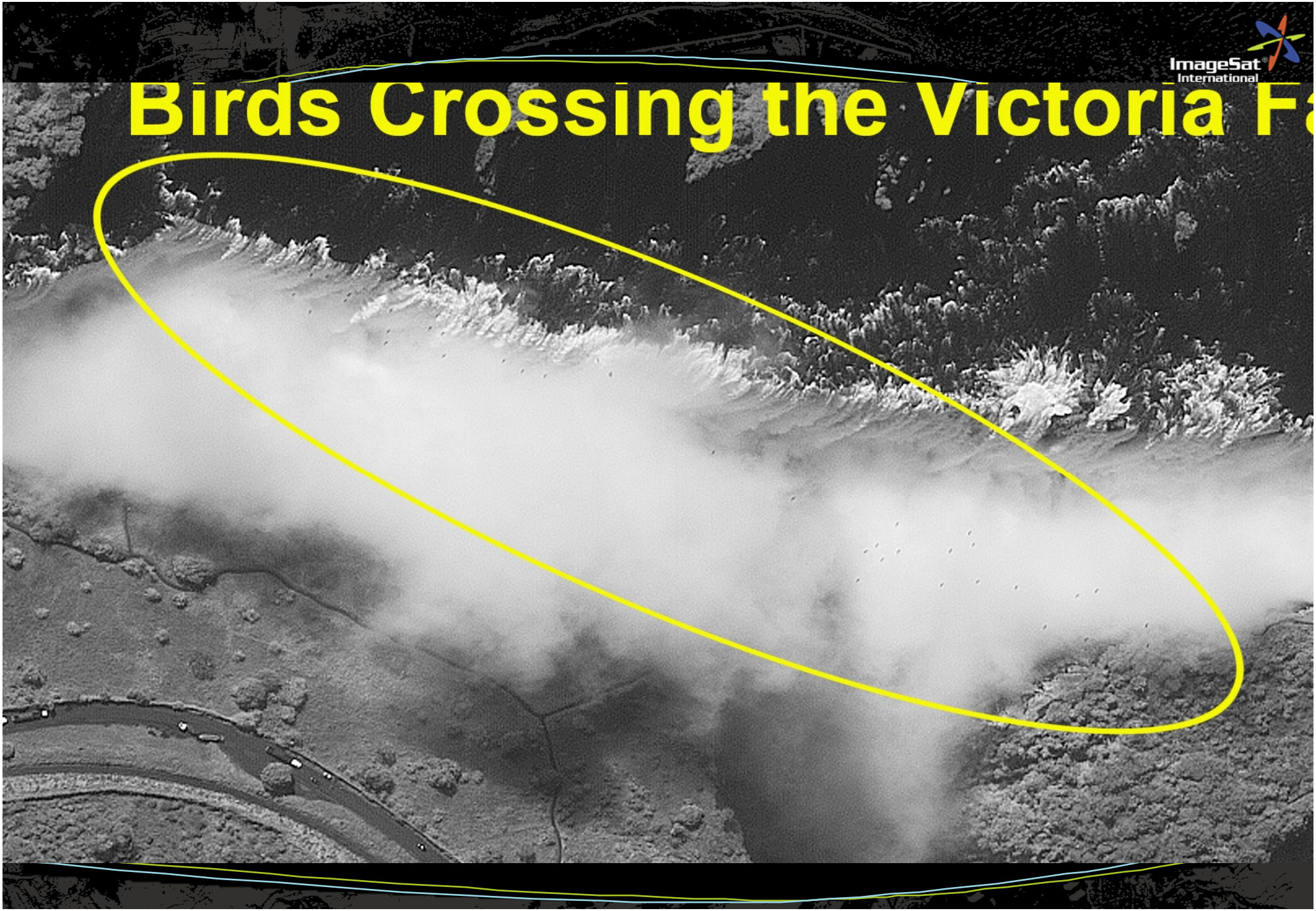
Birds Crossing the Victoria Falls


Birds Crossing the Victoria Fa
ImageSat International

Summary

- Approved performance of satellite in space – 70 cm resolution
  - Tailor made services
  - Accessibility - Direct tasking and reception
  - Flexibility

ImageSat International

THANK YOU

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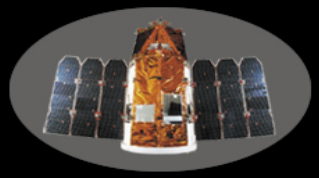
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