



# Military Geospatial Data and Data Distribution



**EV478**



# Lesson Objectives

- **Become familiar with the legacy and current mapping formats used by the military.**
- **Review the DIGEST and FACC concepts and understand their significance.**
- **Become familiar with digital geospatial data distribution at the strategic, operational and tactical levels of war.**
  - **Understand different data downlink capabilities.**
  - **Realize the security issues involved in protecting geospatial data fidelity**

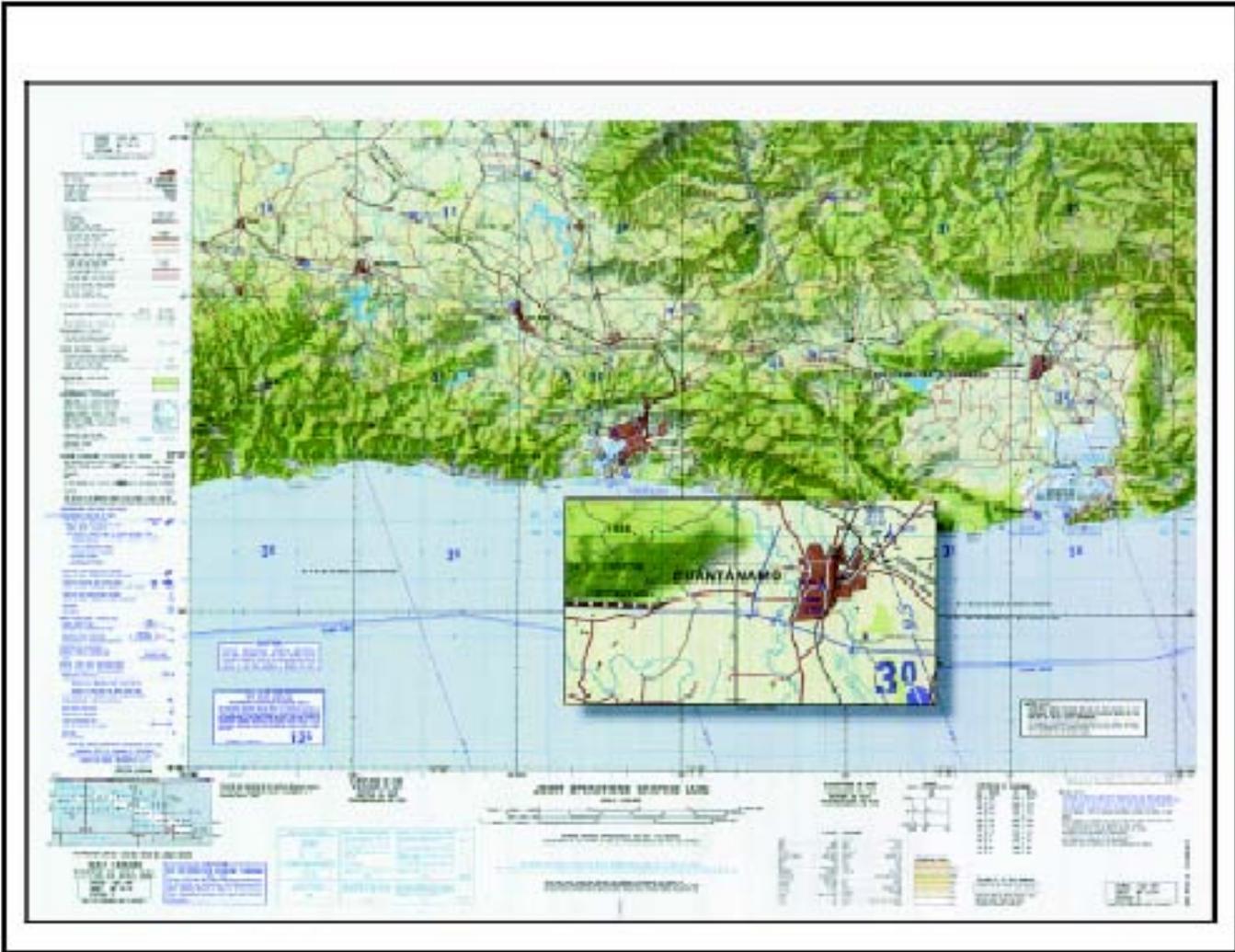


# Comparison of Raster and Vector Products

Raster Products	Vector Products
Standard map appearance (looks like the map)	User-defined appearance (look depends on coverage available)
Dumb map (no ability for automated analysis)	Smart map (allows very powerful automated analysis)
Inefficient storage	Efficient storage
Zoom function restricted by pixel size	Zoom function unrestricted
Easy, cheap, and quick to produce	Time- and manpower-intensive to produce



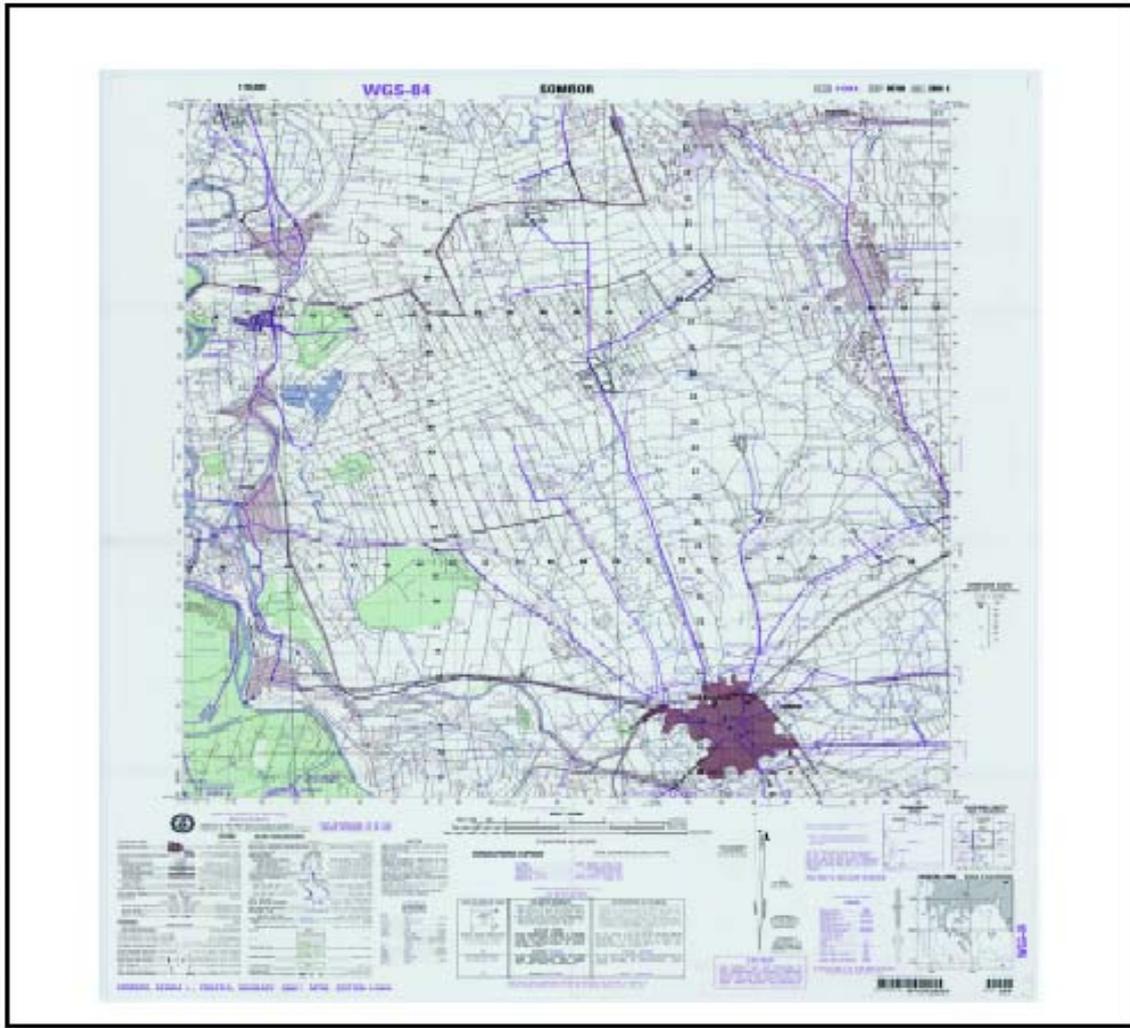
# JOG Map



1:250,000



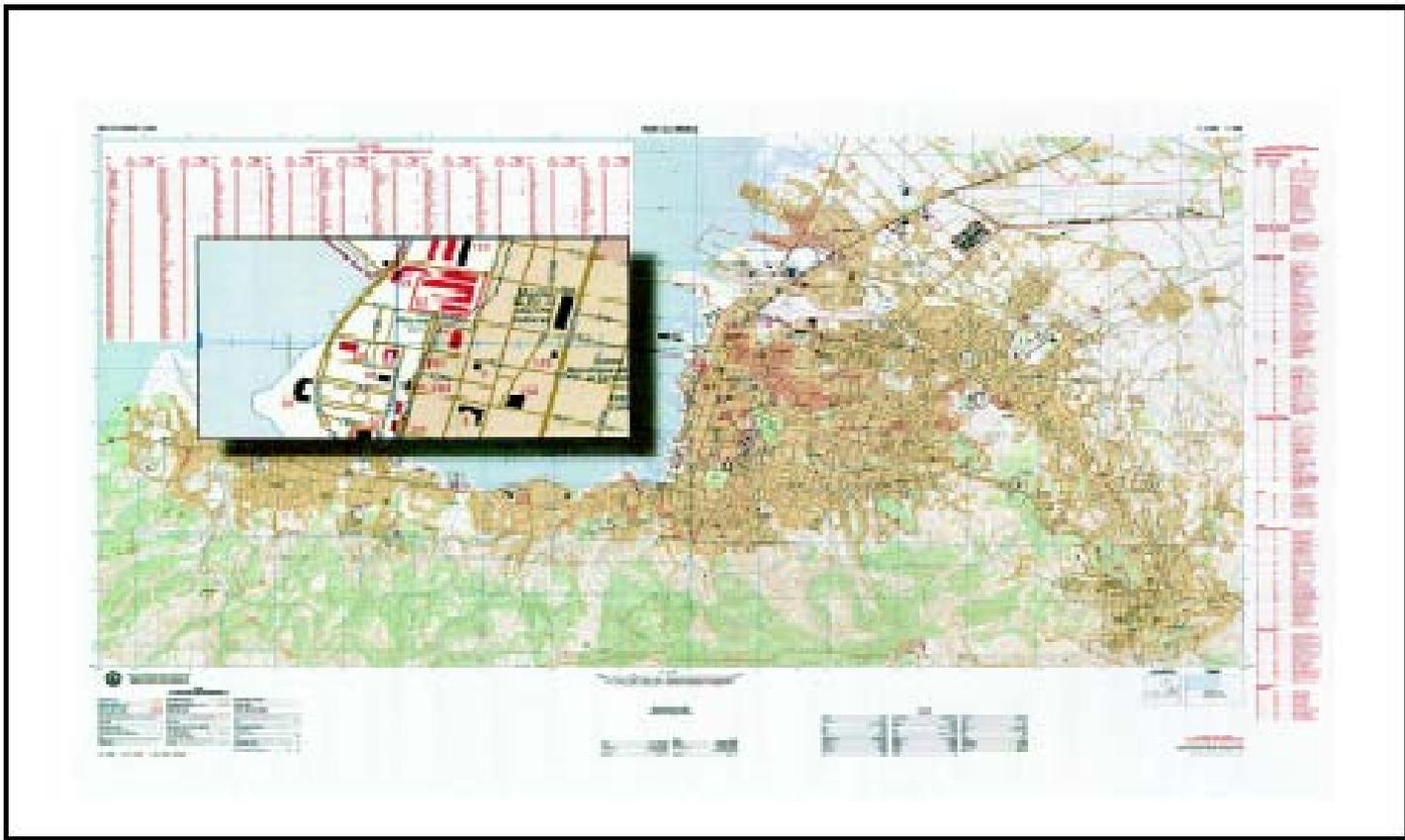
# Topographic Line Map (TLM)



1:50,000



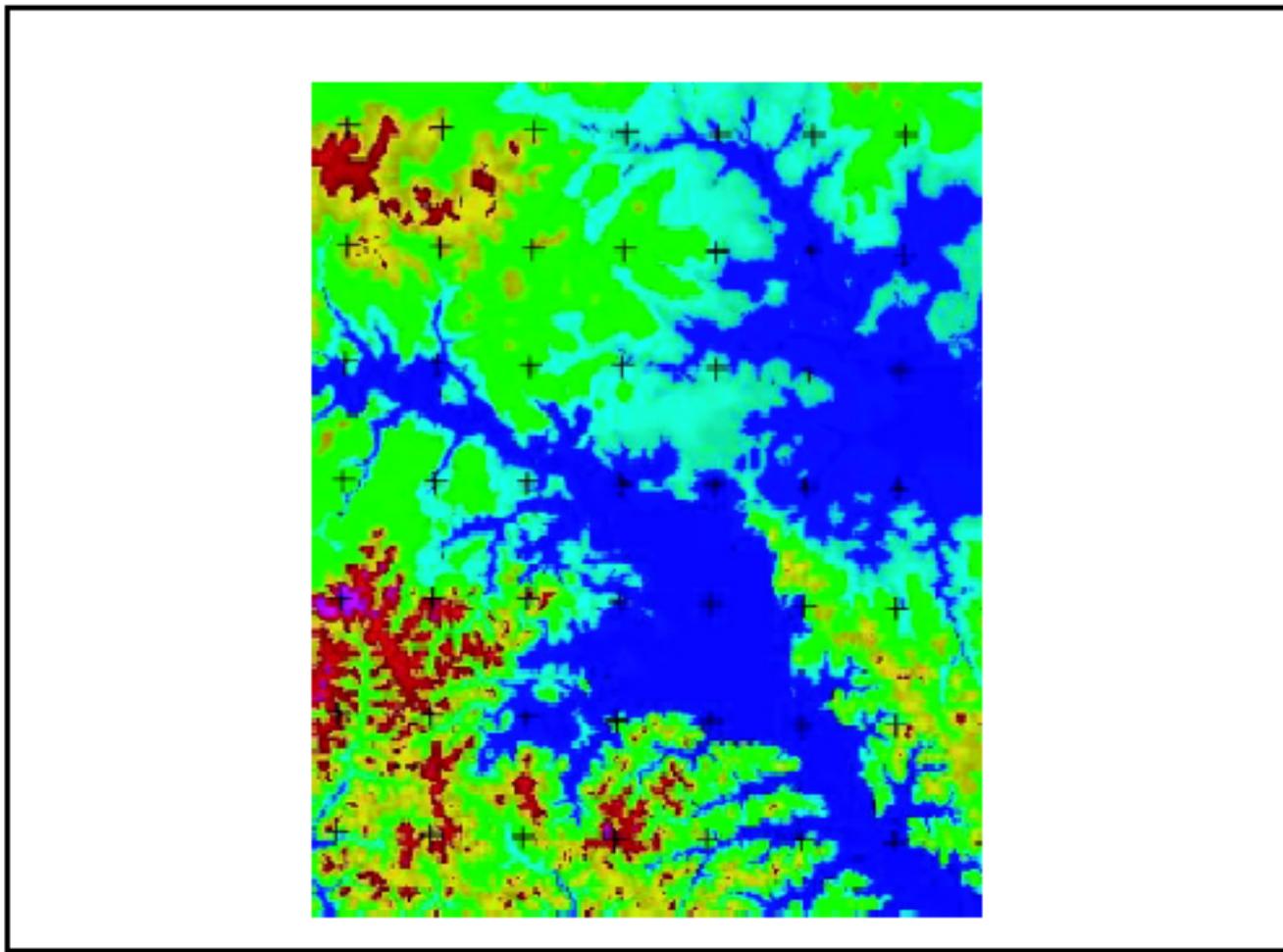
# City Graphic Map



1:2,500 to 1:25,000

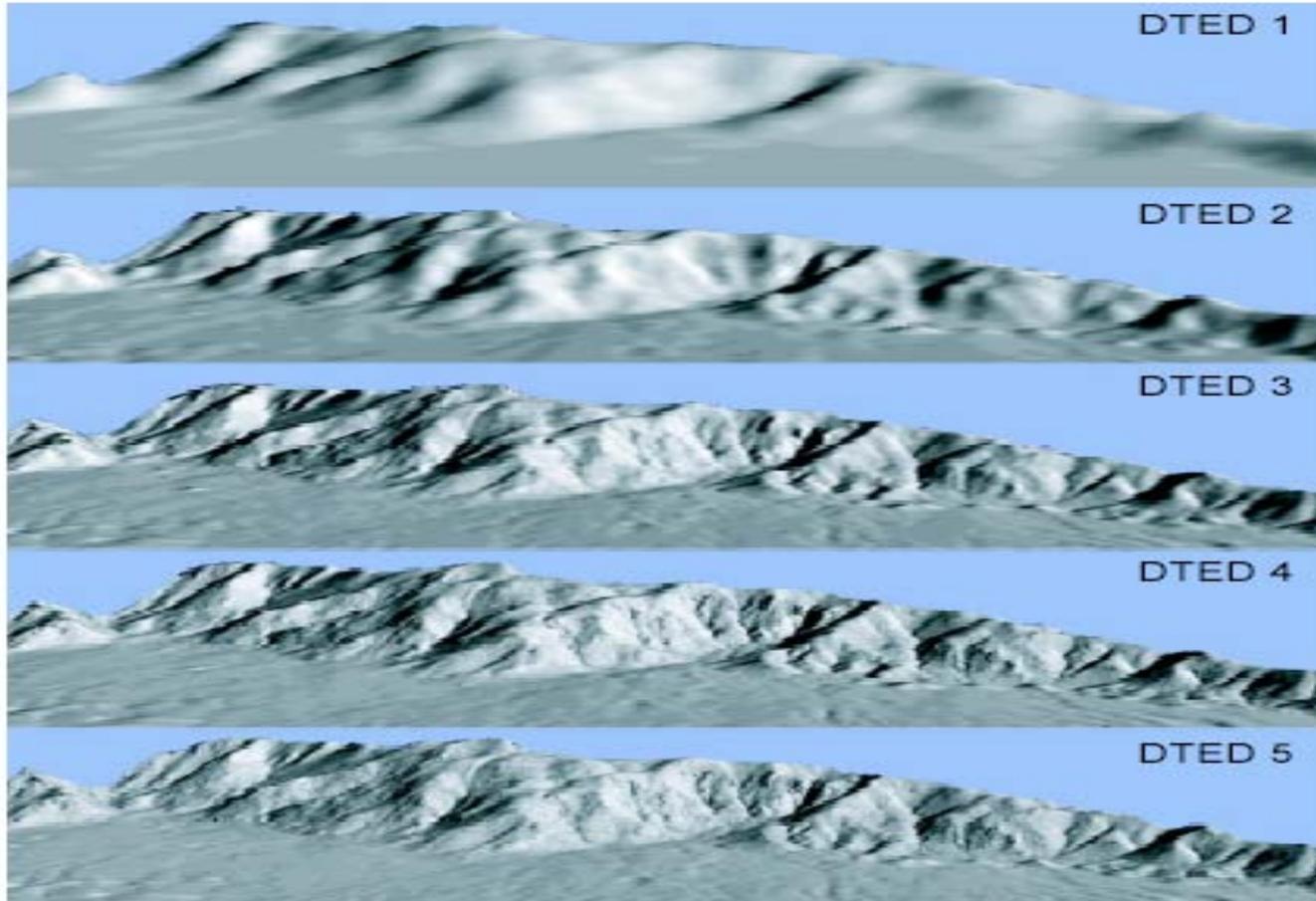


# Digital Terrain Elevation Data



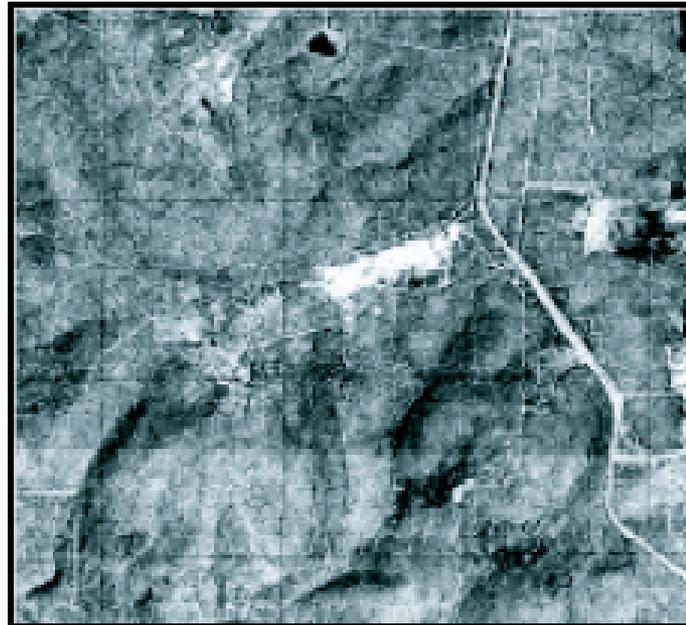


# Digital Terrain Elevation Data

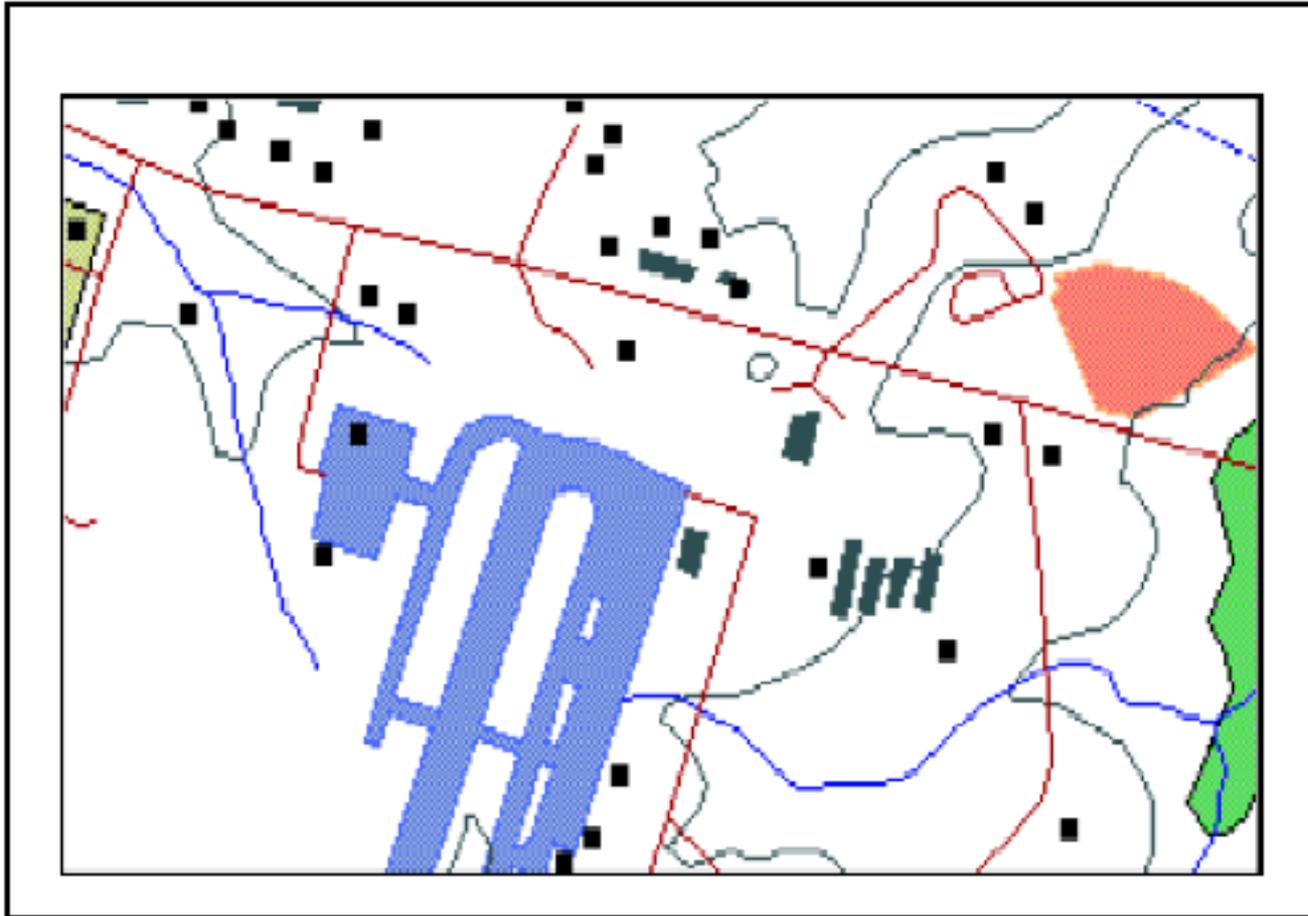




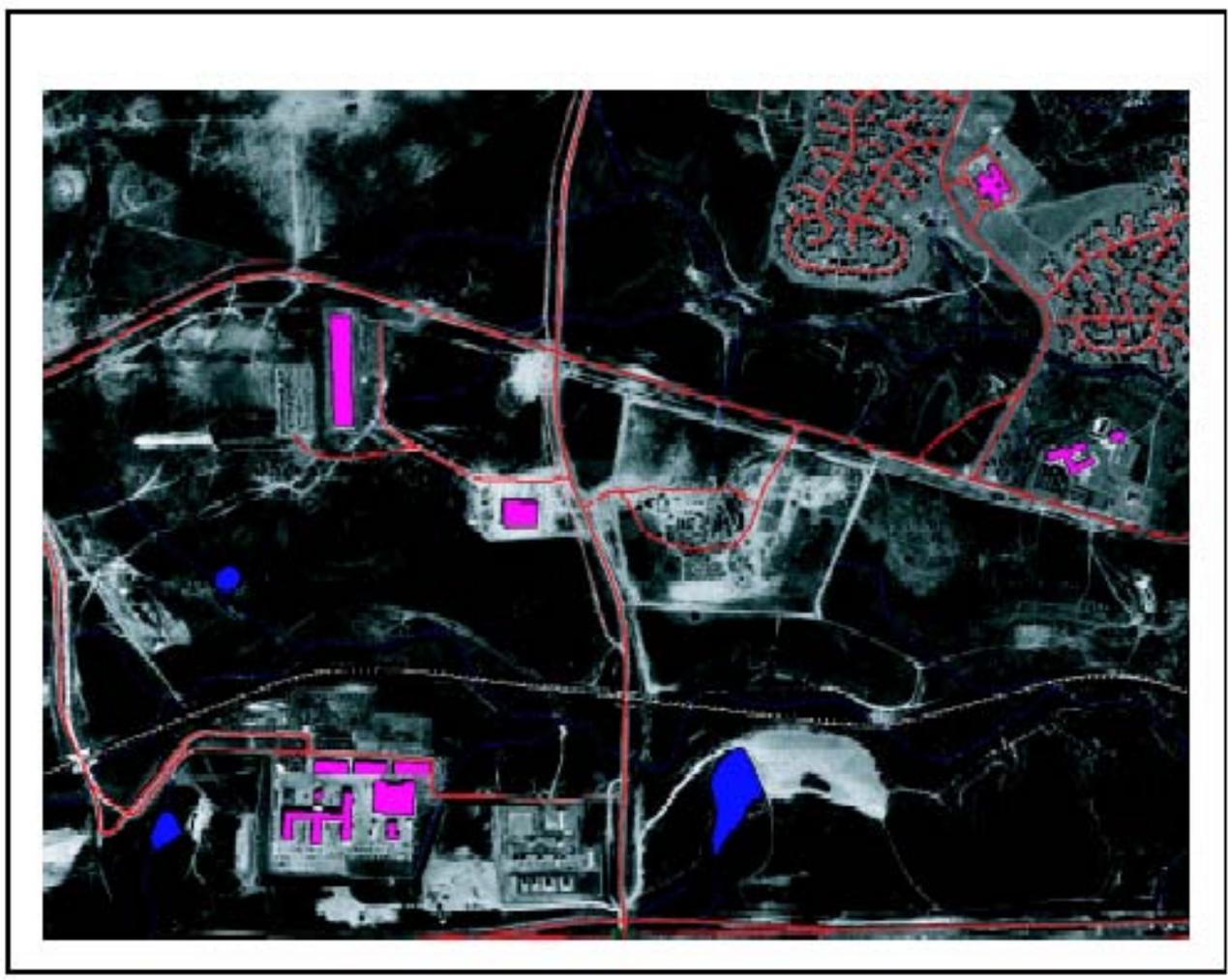
# Controlled Image Base (CIB)



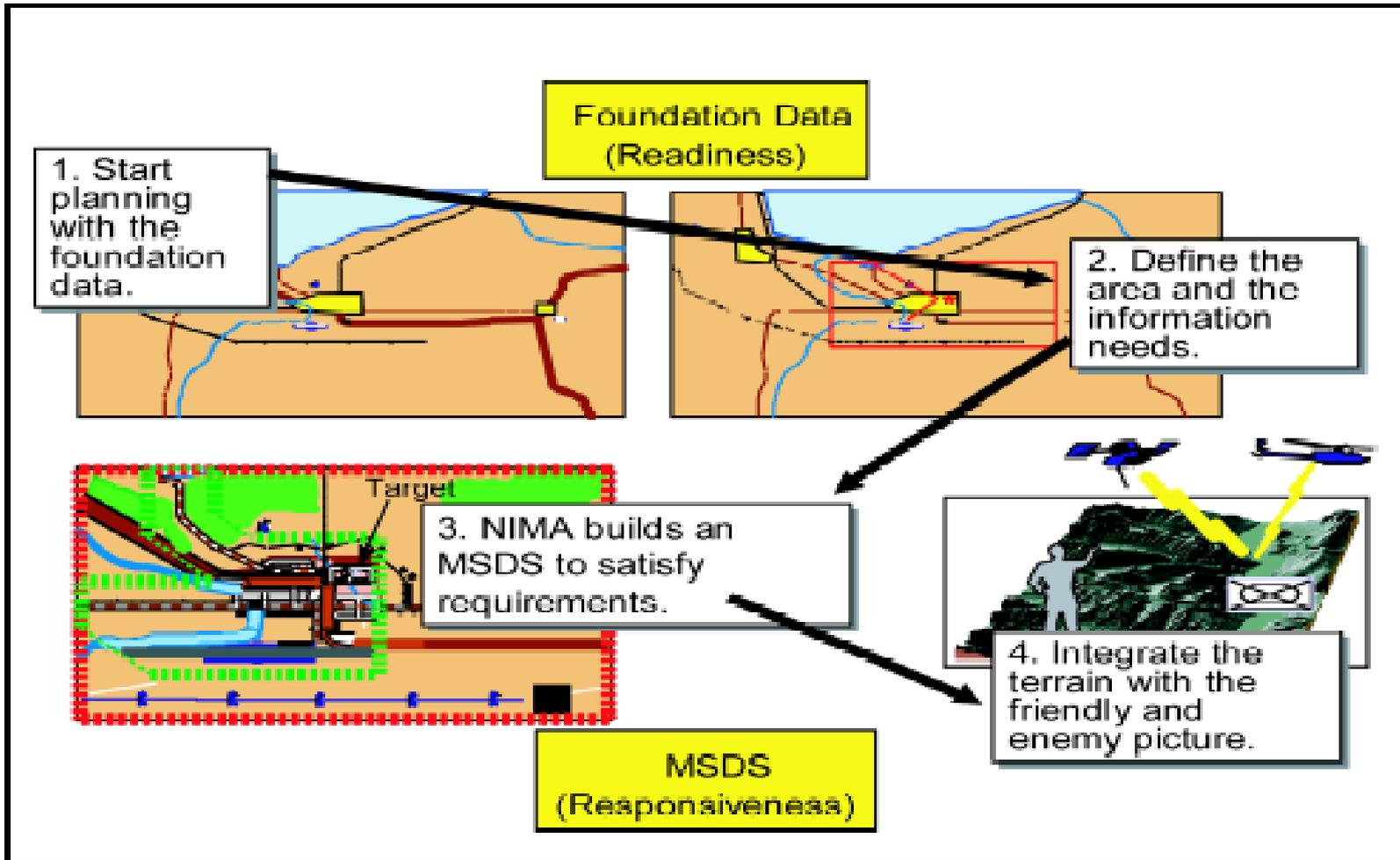
# Vector Feature Data



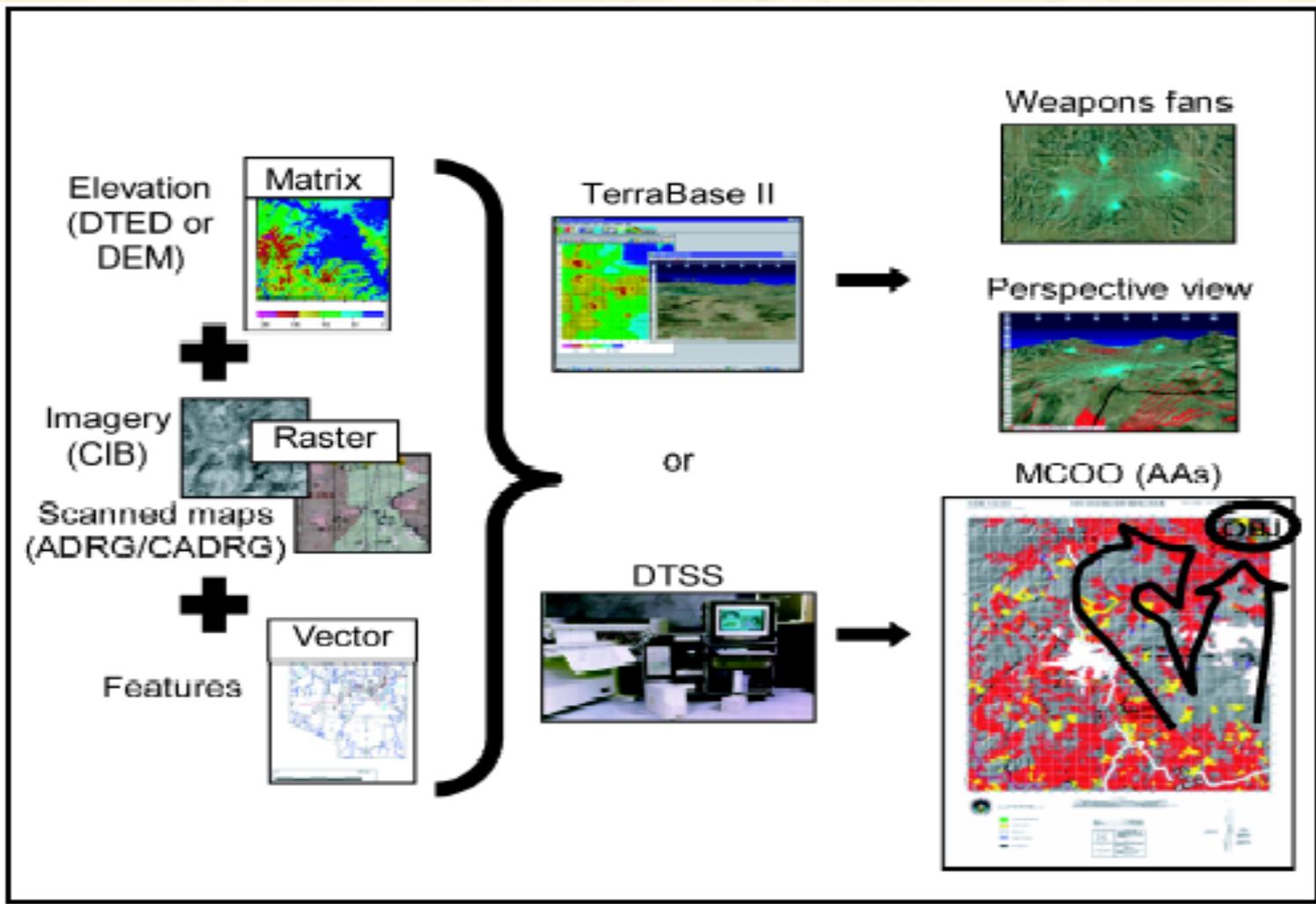
# Vector Image Map



# Mission Specific Data Sets (MSDS)



# Tailored Products





# Standard and Nonstandard Products

Standard Products	Nonstandard Products
City graphic map (1:25,000)	1:10,000 image map
1:50,000 TLM	MOUT study
1:250,000 JOG map	DZ/LZ product
FD base	Combined overlay
Catalog for operations	Database for operations
CIB	Trafficability study
CADRG	TDA
DTED	Special-request product



# GCCS

## What is the Global Command and Control System (GCCS)?

The Global Command and Control System (GCCS) provides friendly forces with an enhanced common operational picture, force status, intelligence support, enemy order of battle, related facility information, and air tasking orders. GCCS has replaced the World Wide Military Command and Control System.



# BFT/BFSA Systems Overview

Multiple systems, sharing SA and C2 message information where possible, integrated together to produce the blue pictures

## MTS

Movement Tracking System

Provides Blue SA and Very limited C2 messaging. Primarily used by CSS/STAMIS

## Radiant Blue

Expeditionary Warfare Blue Force Tracking  
Integrate LOS generated BFT tracks with MMC and PACOM Top COP  
USN Concept

## GRENADIER BRAT

One way transmission system, GCCS Interface through ground station and SIPRNET, Provides Blue Force SA data

3000

## MTX

NRO controlled Low Earth Orbit Position Reporting Device

One way transmission system, GCCS Interface through ground station and SIPRNET, Provides Blue Force SA data. Primarily SOF users

## OmniTRACS

Qualcomm Commercial & Military Tracking System

Provides one way Blue SA  
Very limited C2 messaging  
Interfaces to GCCS

Used by commercial trucking industry  
> 400,000

## MDACT/C2PC

Mounted Data Automated Communications Terminal / Command and Control PC

Displays Red and Blue SA  
C2 messaging  
Interfaces to GCCS via L-band 18,000

## FBCB2

Force XXI Battle Command Brigade and Below

Blue SA, Red SA, Georef SA features-alerts, Full map, C2 messaging, Tactical planning features.

Used by Army Brigade and below

59,622 planned



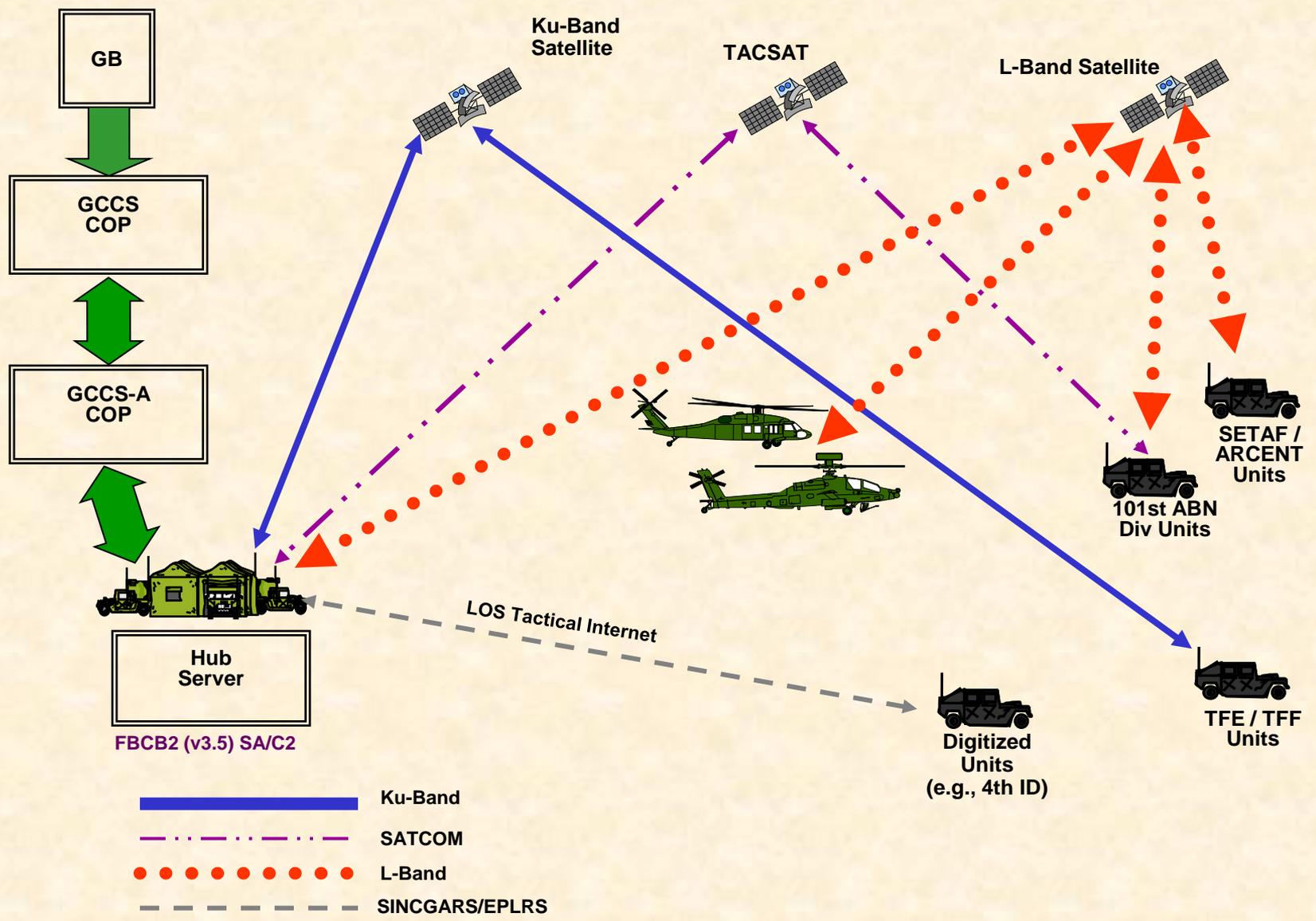


# BFSA Systems & Characteristics

<i>BFT System</i>	<i>Communications Type</i>	<i>Message Standards/Systems</i>	<i>Persistent SA</i>	<i>2 Way Messaging</i>	<i>Navigation Technology</i>	<i>LPI/LPD</i>	<i>Hub Required</i>
<b>FBCB2</b>		VMF ASCII OTH-6	Adjustable Update Rate	Yes	Military GPS		
<b>MTS</b>	L-band Commercial SATCOM	MTS MGS XML OTH-6 VMF		Yes		No	Yes
<b>OmniTRAC</b>	Ku band Commercial SATCOM	ASCII		Yes		No	Yes
<b>HF Tracker</b>	HF BLOS	JUMF TATS OTH-6	Operator Initiated	Test Messages Only	Military GPS and INS	No	
<b>USMC DACT</b>	EPLRS SINGARS Or HF	VMF GCCS	Adjustable Update Rate	Yes	Military GPS		
<b>Link 16</b>	LOS	TADIL-J ADSI GCCS		Yes	Time of Arrival (TOA)		
<b>GB</b>	UHF SATCOM	Brevity Codes Downgrade Guard USMTF OTH-6	Coarse Adjustable Update Rate	No	Military GPS	LPE	Yes
<b>MTX</b>	UHF SATCOM	Brevity Codes Downgrade Guard USMTF OTH-6	Coarse Adjustable Update Rate	No	Commercial GPS	LPE	
<b>CSEL</b>	UHF SATCOM	Brevity Codes Downgrade Guard USMTF OTH-6	No	No	Military GPS	LPE	Yes



# BFT Data Distro Concept



UNCLASSIFIED

Multiple Data Paths - Maximum Flexibility



# Security

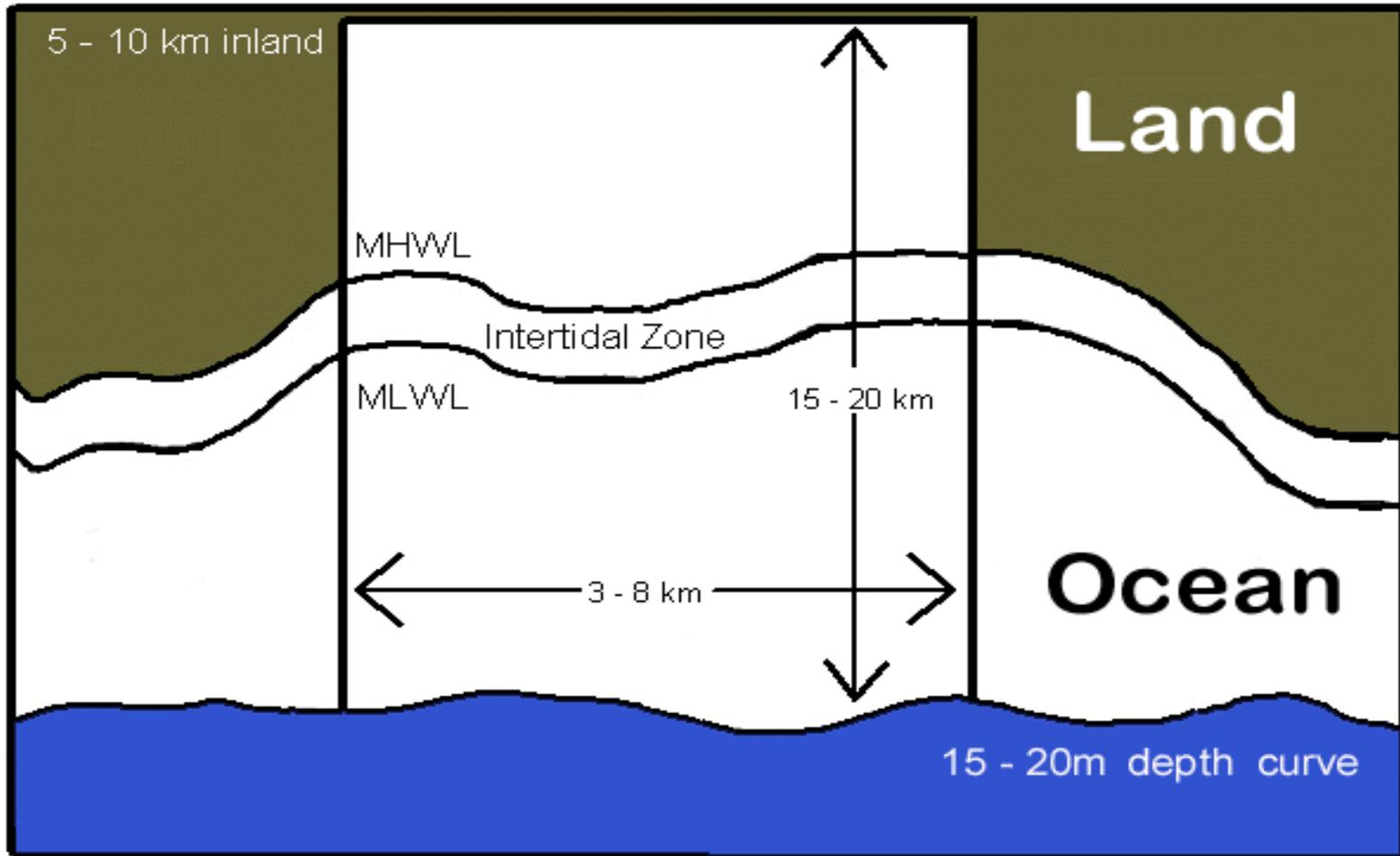
## What are Information Operations?

Information operations (IO) are actions taken across the entire conflict spectrum to affect adversary information and information systems while protecting one's own information and information systems. Information warfare is conducted during crisis or conflict to achieve specific objectives over an adversary. Information assurance protects and defends information and information systems by ensuring their availability, integrity, authenticity, and confidentiality.



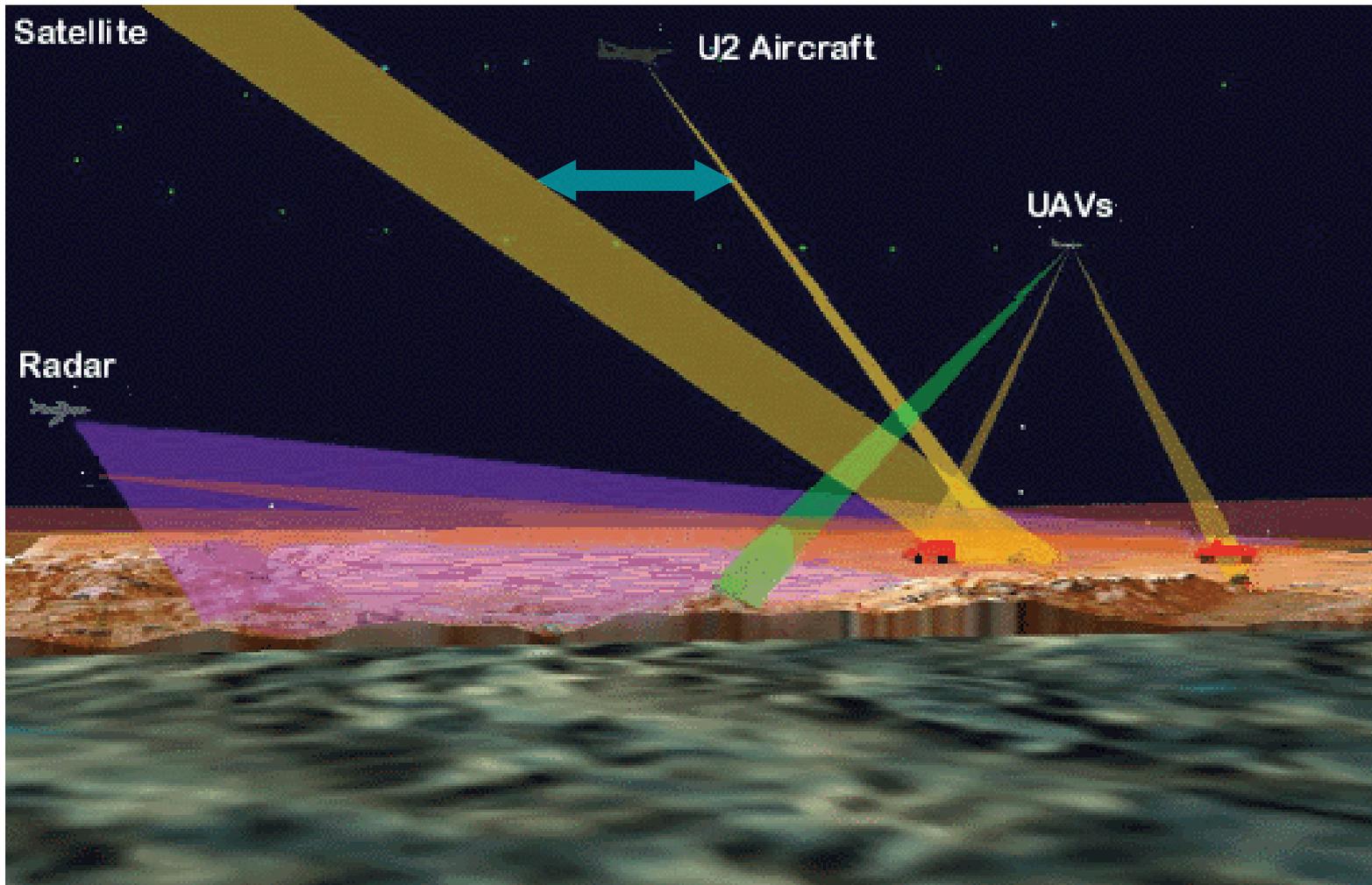
# Littoral Zone Case Study Camp Lejeune, NC

## A Non-Standard Mapping Product





# Integrating Multiple Sensors





**IKONOS Pan**

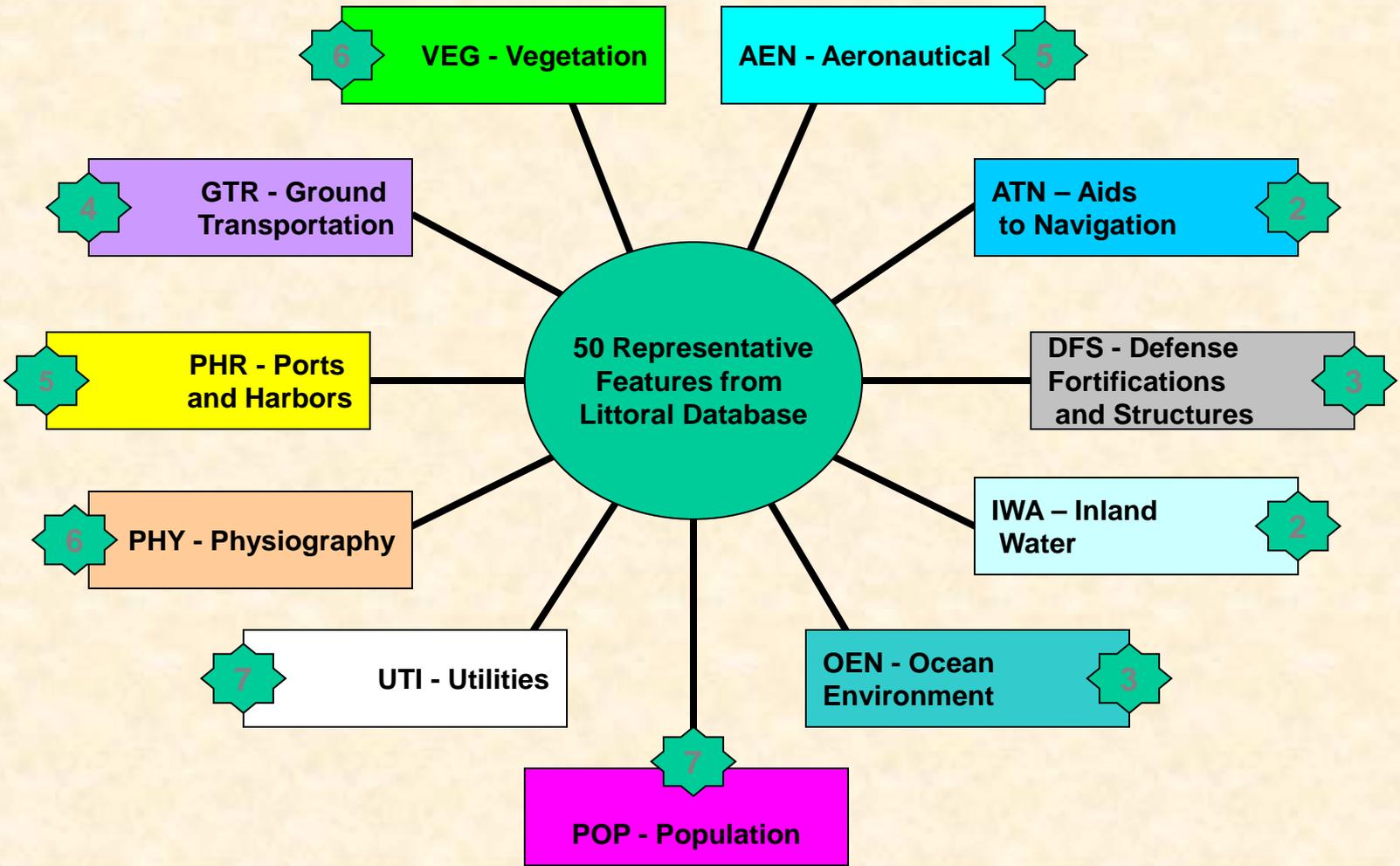


**CIR Aerial Photo**



**QuickBird Pan**

# Image Evaluation Features



# Example of Image Evaluation Procedure



ArcView GIS 3.2a

File Edit View Theme Analysis Surface Graphics Window Help

Scale 10,000 288,233.44 3,825,855.88

Image A: c:/nima/images/ik\_x.img

Image B: c:/nima/images/ik\_px.img

Image C: c:/nima/images/ik\_p.img

Feature Evaluation Form

Comments:

- Ikonos XS (4m) - Upper Left
- Ikonos Pan Sharpened (1m) - Upper Right
- Ikonos Pan (1m) - Lower Left

Limit to 255 characters!

Image evaluation tools: [Start] [Next] [Previous] [Stop]

Image A:  
 1 (High)  
 2  
 3 (Medium)  
 4  
 5 (Low)  
 No

Image B:  
 1 (High)  
 2  
 3 (Medium)  
 4  
 5 (Low)  
 No

Image C:  
 1 (High)  
 2  
 3 (Medium)  
 4  
 5 (Low)  
 No

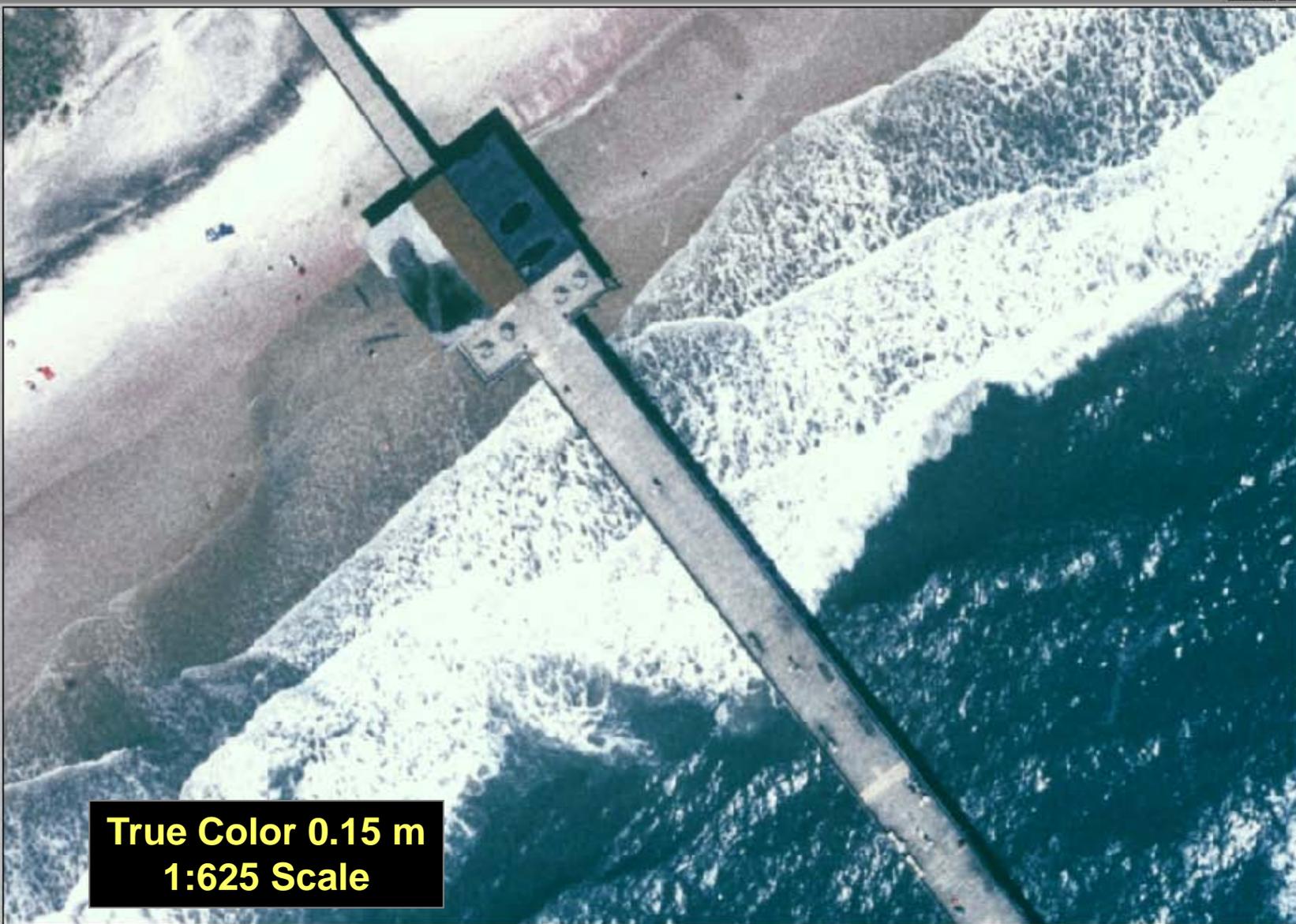
Display Feature

Image Assessment Panel

Start | NIMA | ArcView GIS 3.2a | 2:19 PM



- True\_wtower.img
- True\_trail.img
- True\_swamp.img
- True\_shoreline.img
- True\_road.img
- True\_helipad.img
- True\_ctower.img
- True\_building.img
- True\_parking.img
- True\_bridge.img
- Truecolor1.img
- Truecolor2.img
- Cir.img
- Doq.img
- lk\_p.img
- lk\_px.img
- lk\_x.img
- Spotp.img
- Tm\_p.img
- Tm\_px.img
- Tm\_spot\_px.img
- Tm\_x.img



**True Color 0.15 m  
1:625 Scale**

- Qb\_lejeune\_xs.img
- Qb\_lejeune\_p.img



**QuickBird Pan 0.6 m  
1:1,750 Scale**



Scale 1: 2,200

290,405.47  
3,826,448.61

View1

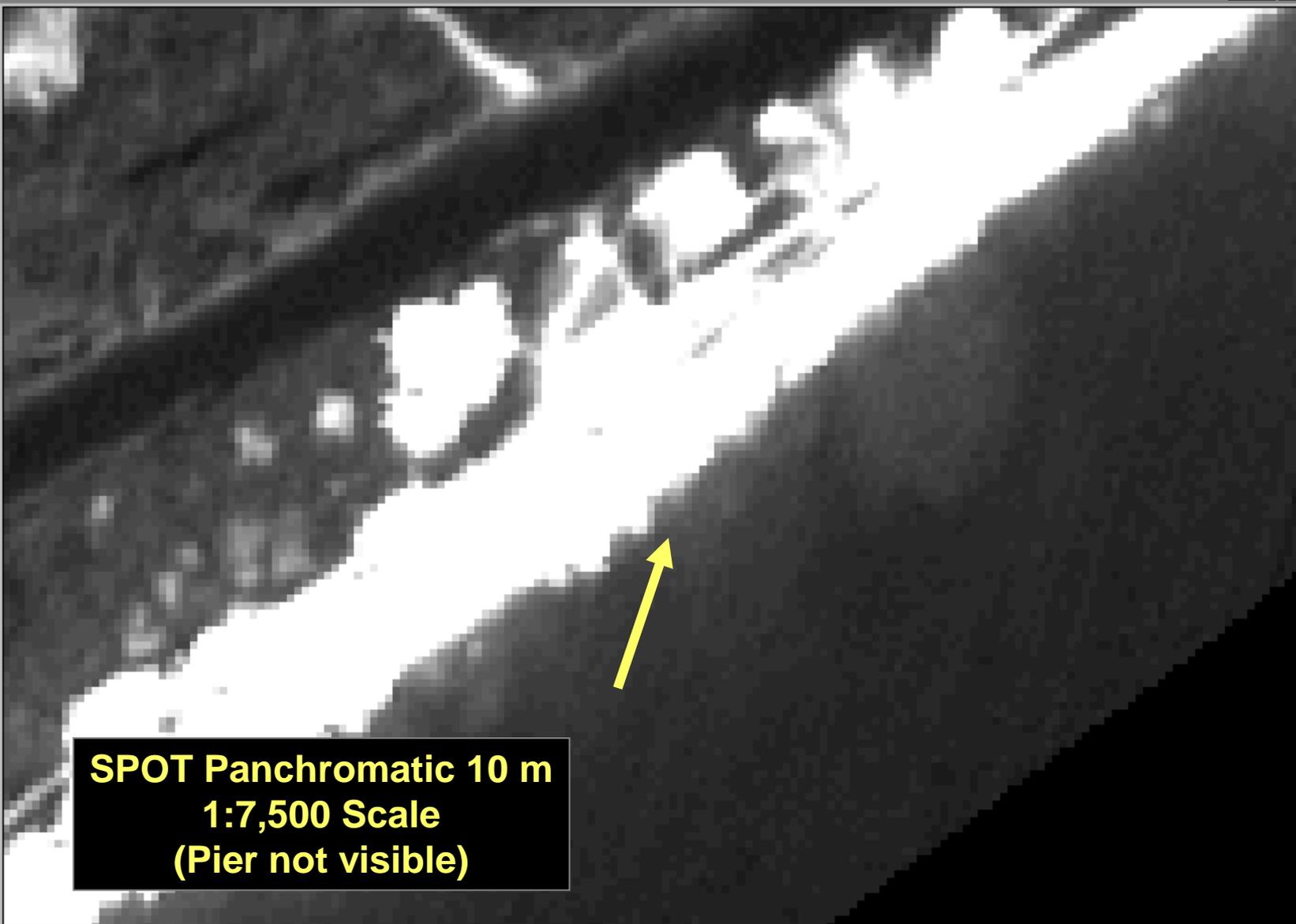
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- True\_pier.img
- Truecolor2.img
- Cir.img
- Doq.img
- Ik\_p.img
- Ik\_px.img
- Ik\_x.img
- Spotp.img
- Tm\_p.img
- Tm\_px.img
- Tm\_spot\_px.img
- Tm\_x.img



**IKONOS Pan 1.0 m  
1:2,200 Scale**



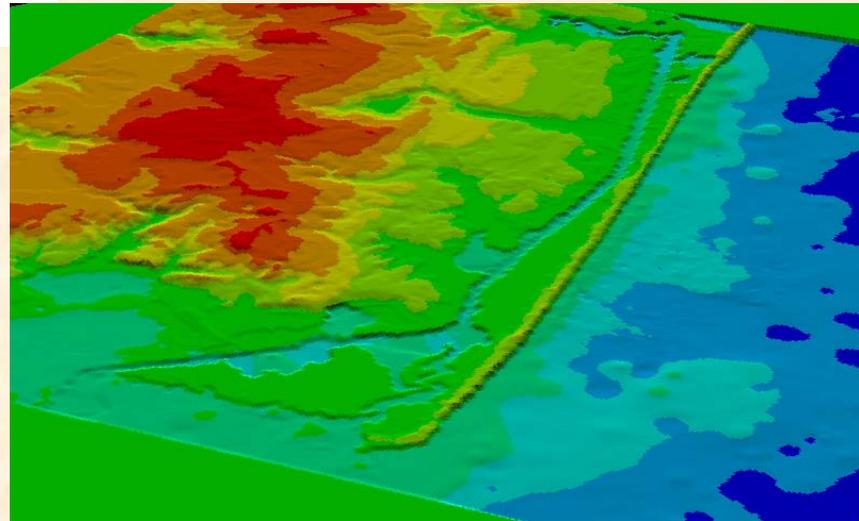
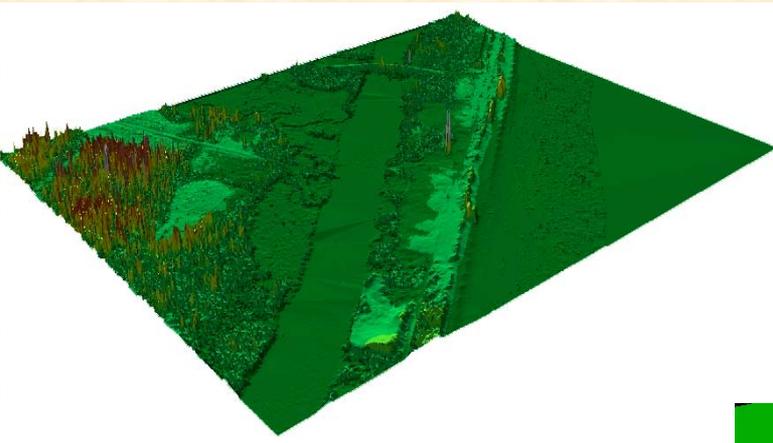
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- lk\_px.img
- lk\_x.img
- Spotp.img
- Tm\_p.img
- Tm\_px.img
- Tm\_spot\_px.img
- Tm\_x.img



**SPOT Panchromatic 10 m  
1:7,500 Scale  
(Pier not visible)**



# Sea / Land DEM Generation

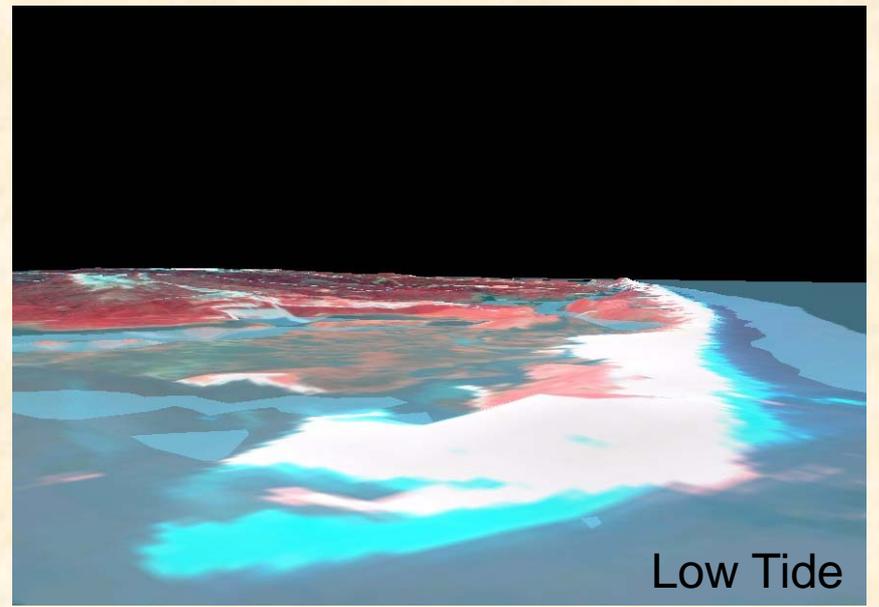


# SEA - Modeling Shorelines

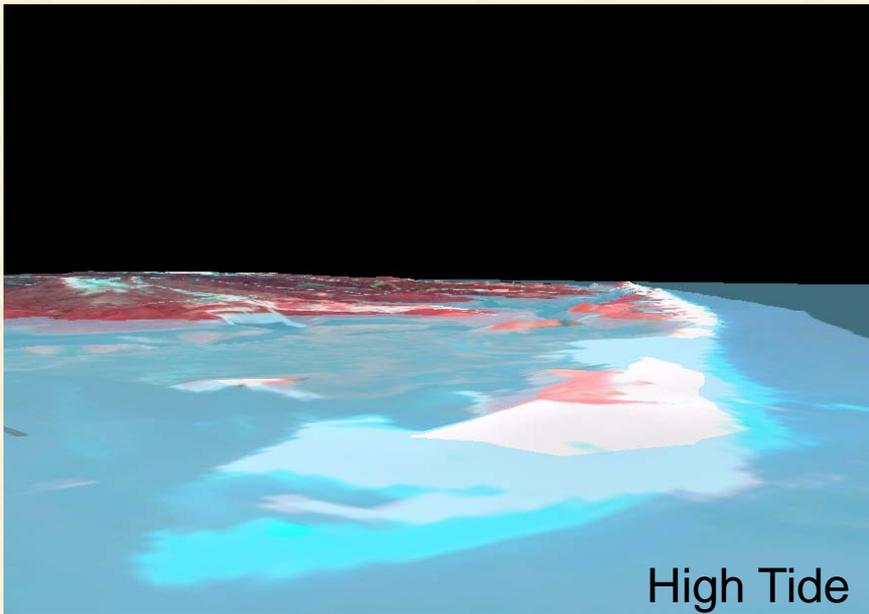




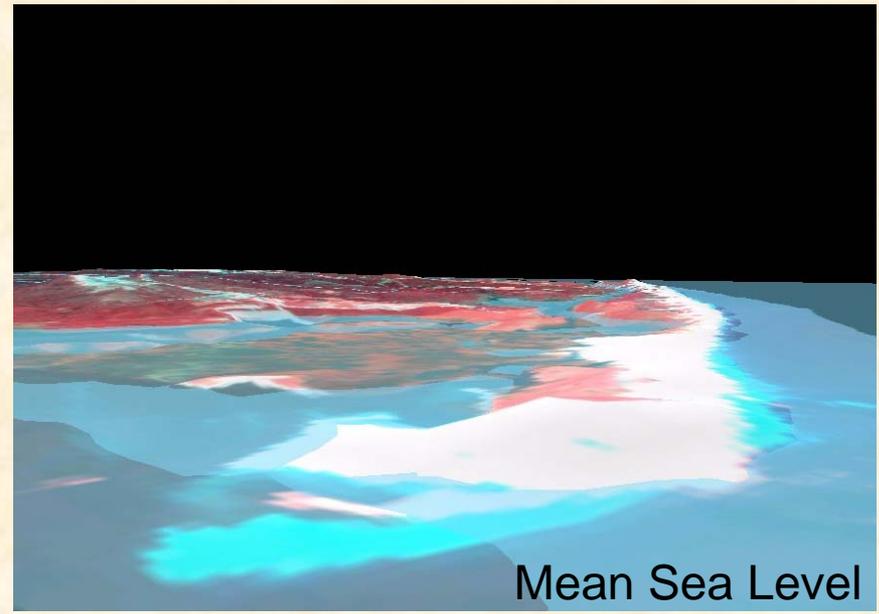
# SEA - Modeling Shorelines



Low Tide



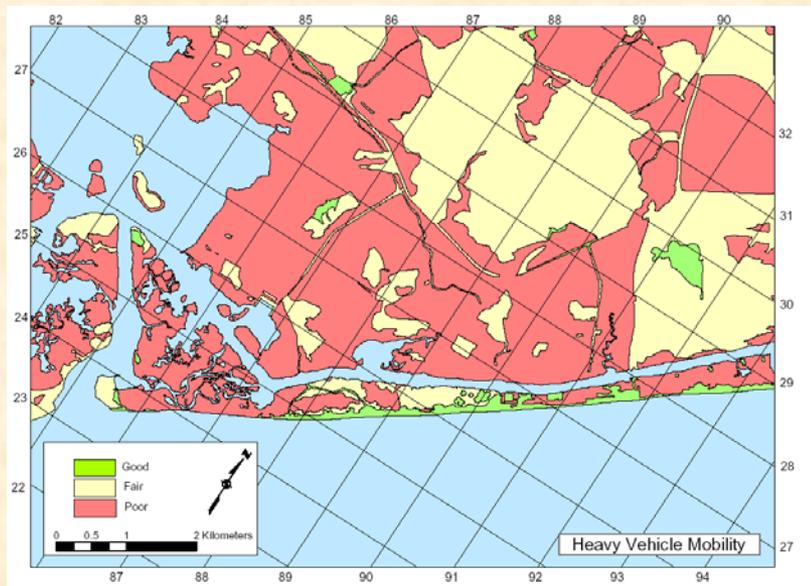
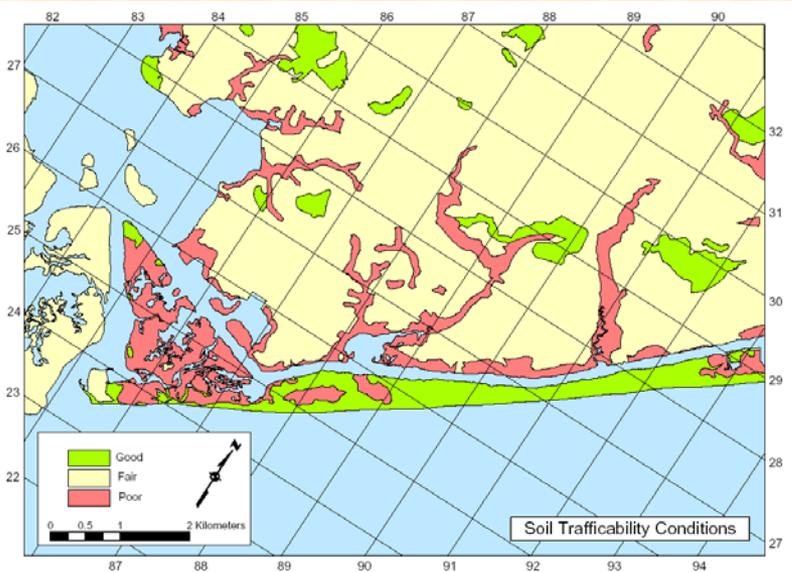
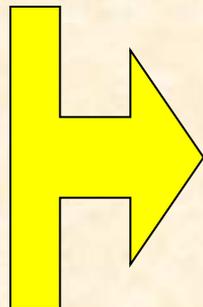
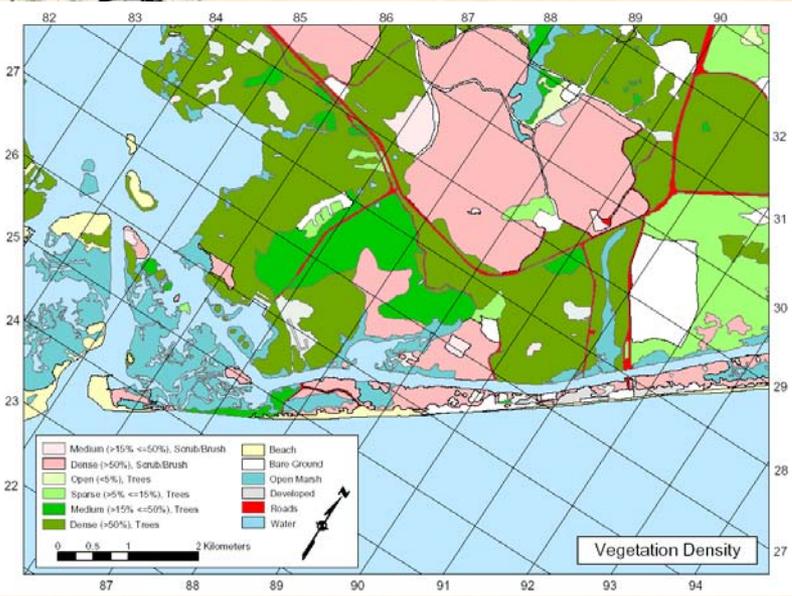
High Tide



Mean Sea Level

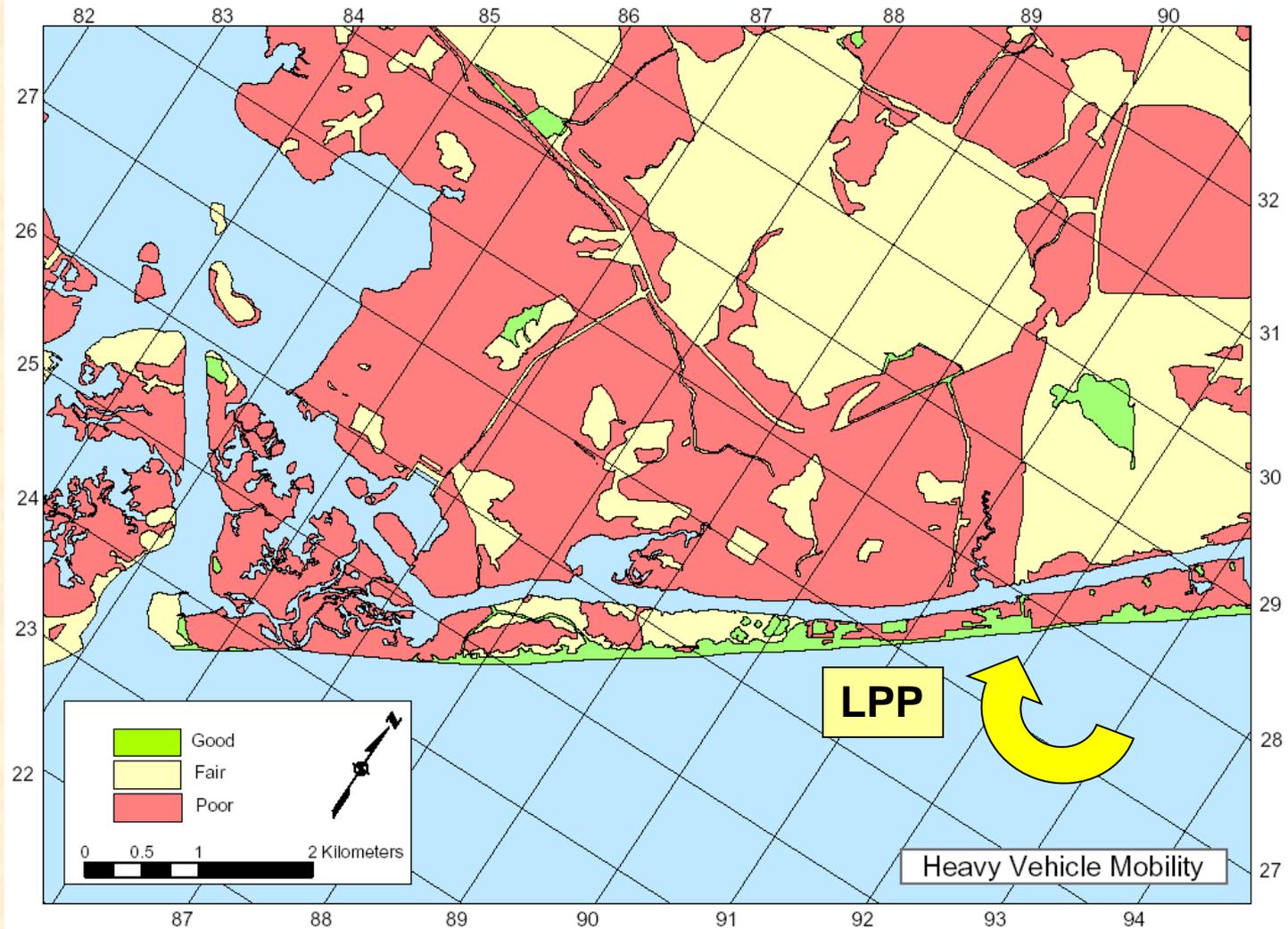


# LAND - ArcGIS Model Builder Application

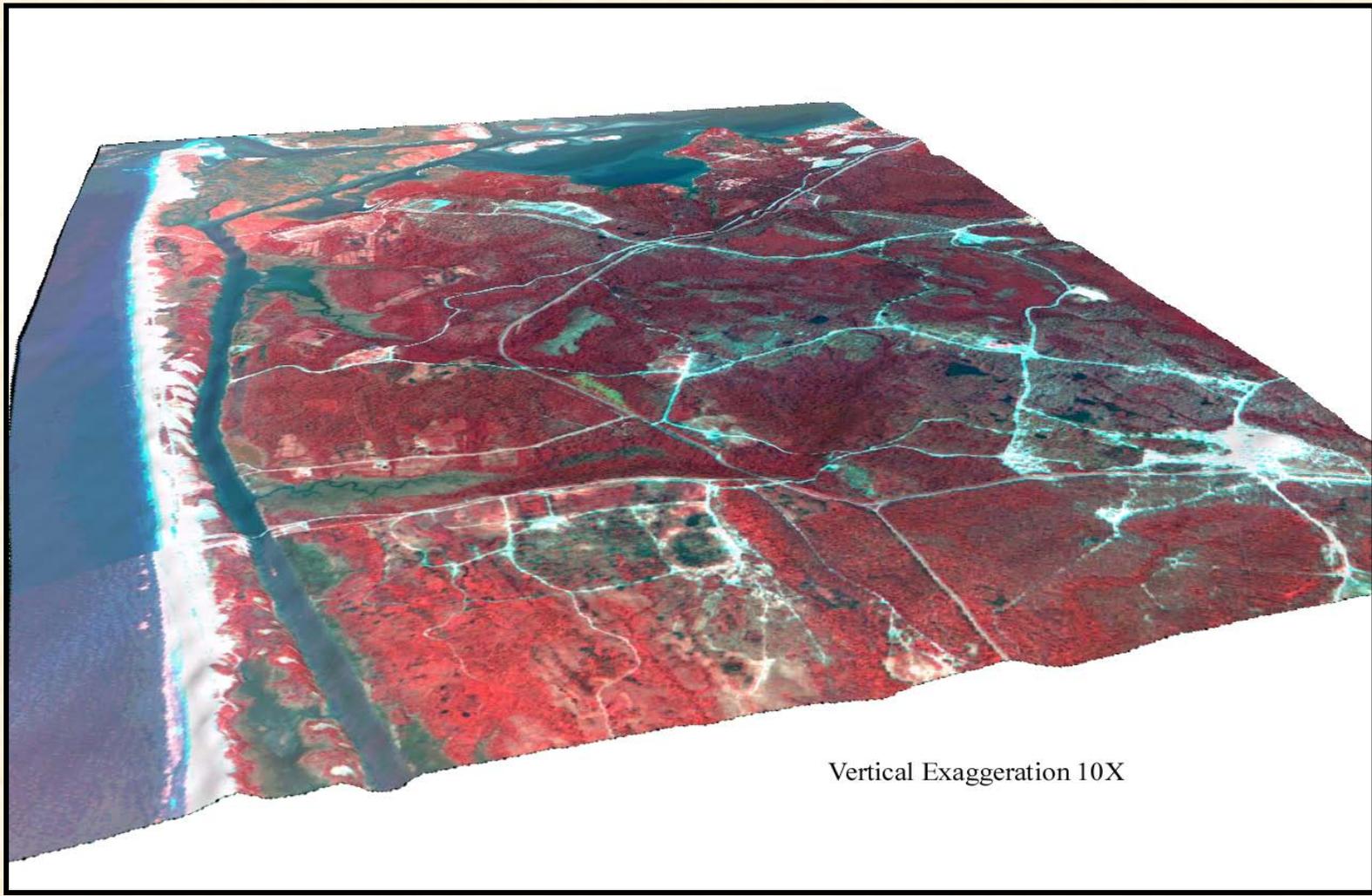




# LAND - Vehicle Mobility Modeling



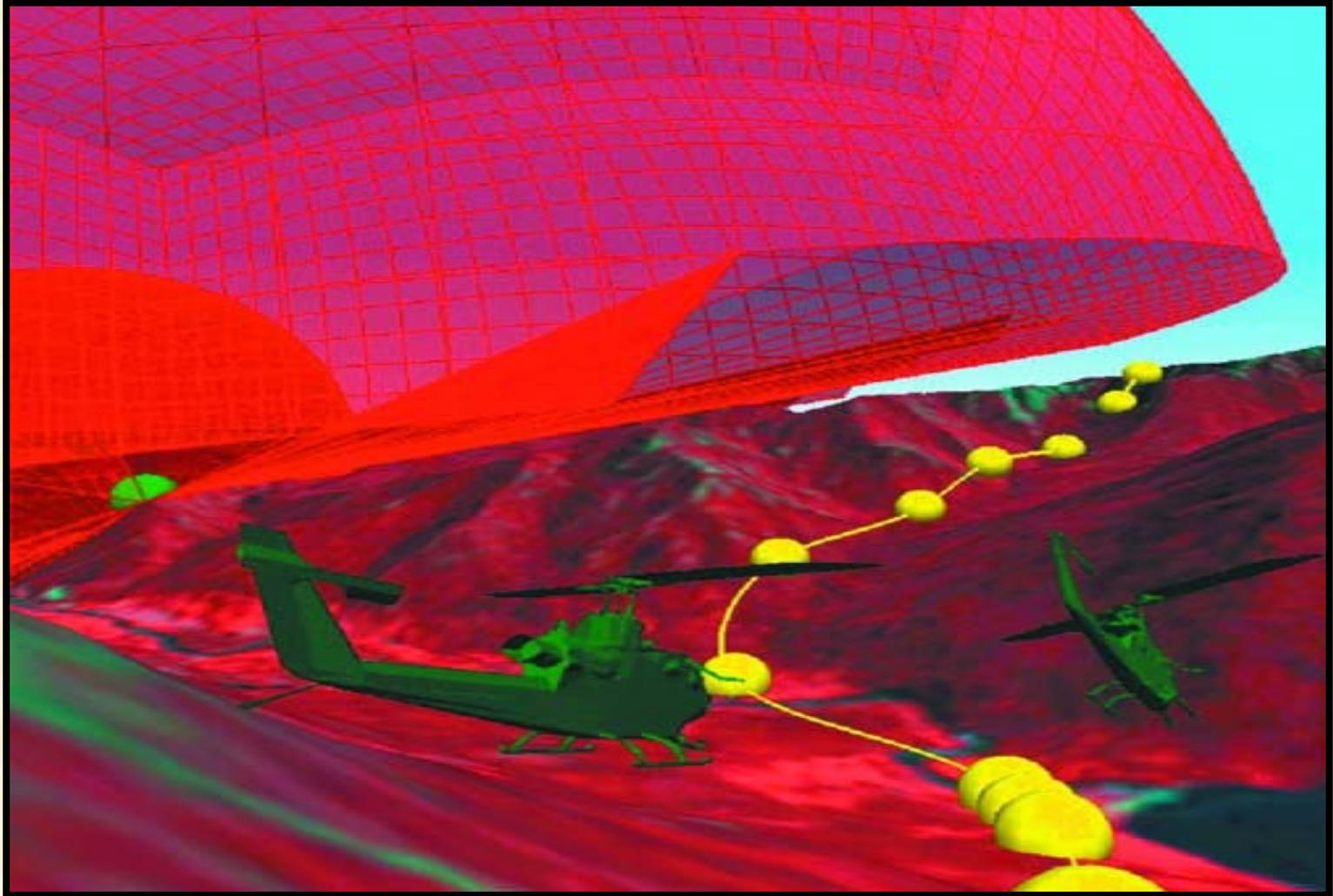
# AIR - Perspective Scene Generation



Vertical Exaggeration 10X

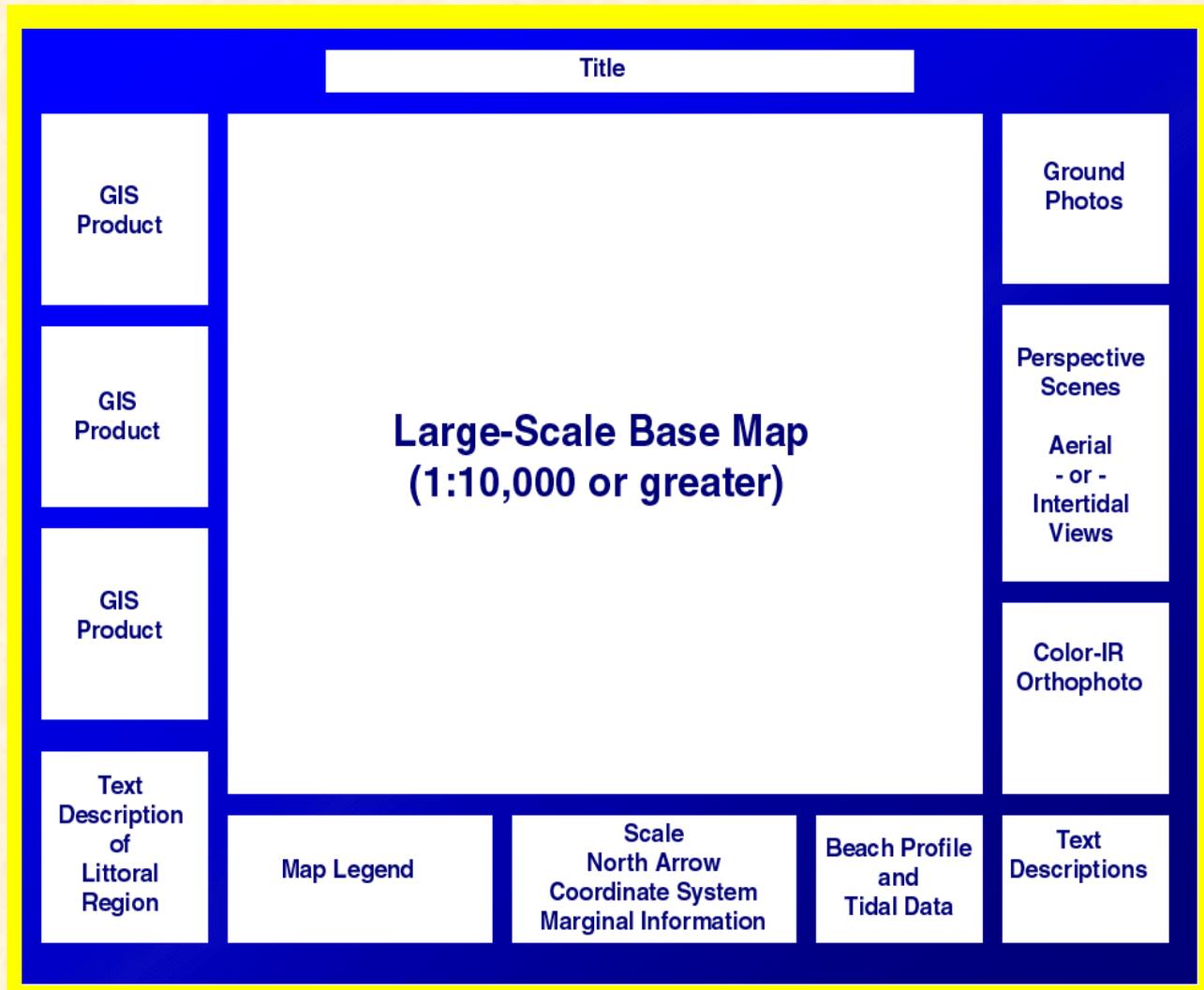


# AIR : Fly-Thru Modeling

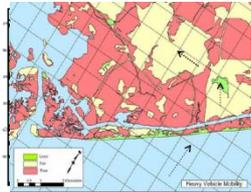




# Combat Chart Product Design



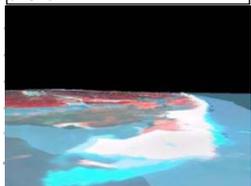
# Prototype Littoral Tactical Map Product



**MAP OF THE STUDY AREA**  
 This map shows the location of the Camp Lejeune Study Area within the larger context of the Camp Lejeune Military Reservation. The map includes the names of the major roads and water bodies in the area.



**MAP INFORMATION**  
 This map was prepared by the Department of Geography and Environmental Information Systems, United States Marine Corps, Camp Lejeune, North Carolina. The map is intended for use as a tactical map for the purpose of planning and conducting operations in the littoral zone.



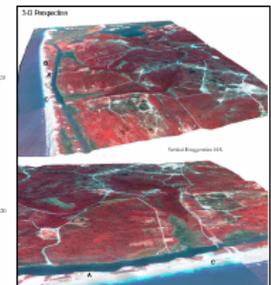
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**Camp Lejeune, North Carolina**  
 This map is designed to provide a common set of symbols and codes for use in the littoral zone tactical map. The map is intended for use as a tactical map for the purpose of planning and conducting operations in the littoral zone.

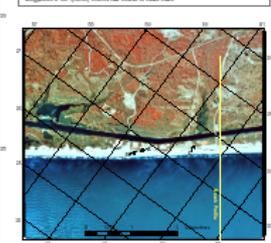
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**MAP INFORMATION**  
 This photograph shows the location of the red buoy in the water near the beach. The buoy is used for navigation and is a key feature on the map.



**MAP INFORMATION**  
 This aerial photograph shows the location of the Camp Lejeune Study Area. The map is intended for use as a tactical map for the purpose of planning and conducting operations in the littoral zone.



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