



# *Instruments of Power Projection ...*

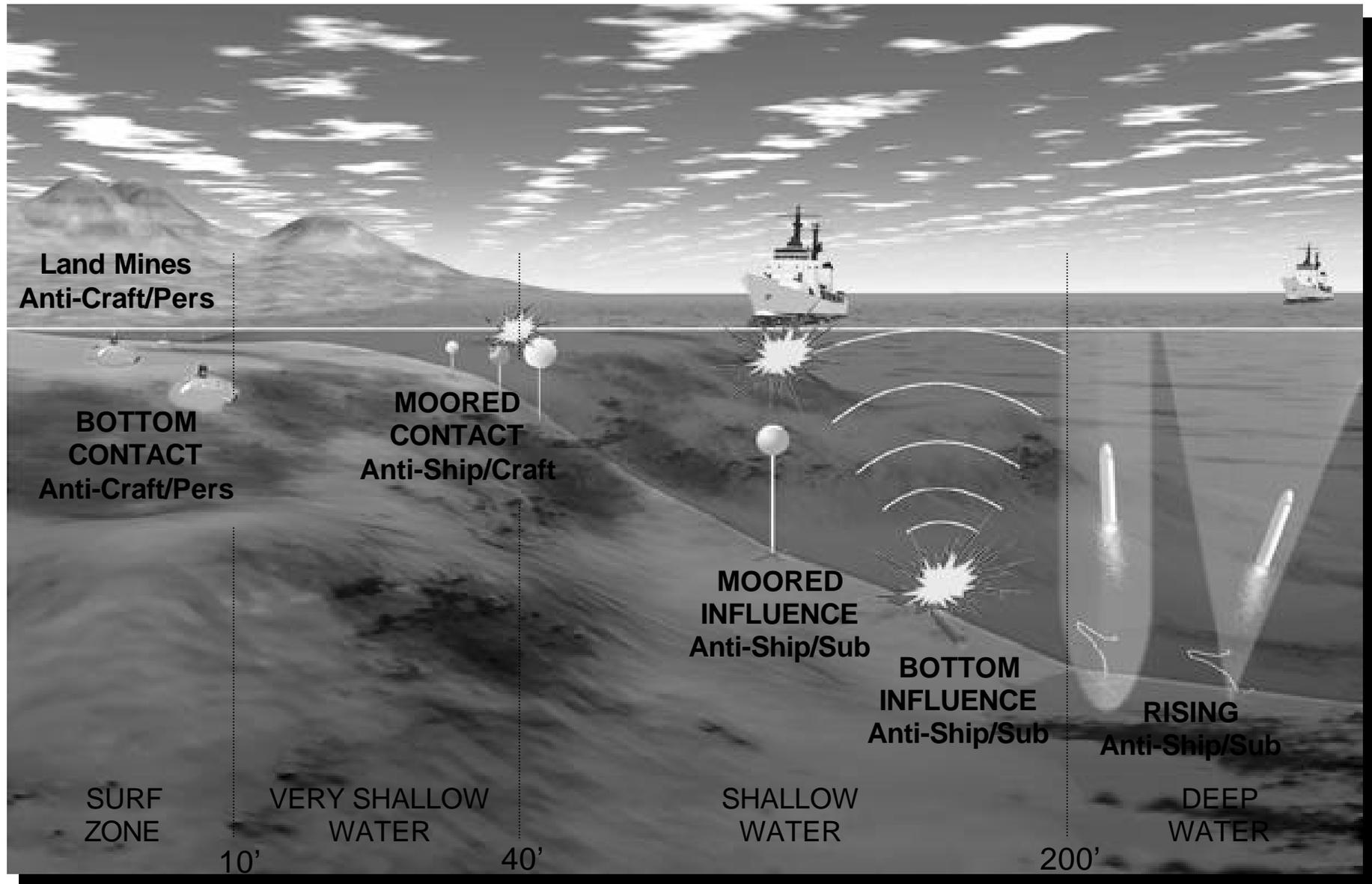
## Mine Warfare

**CAPT Tom Davilli, N752  
MIW & EOD Branch**

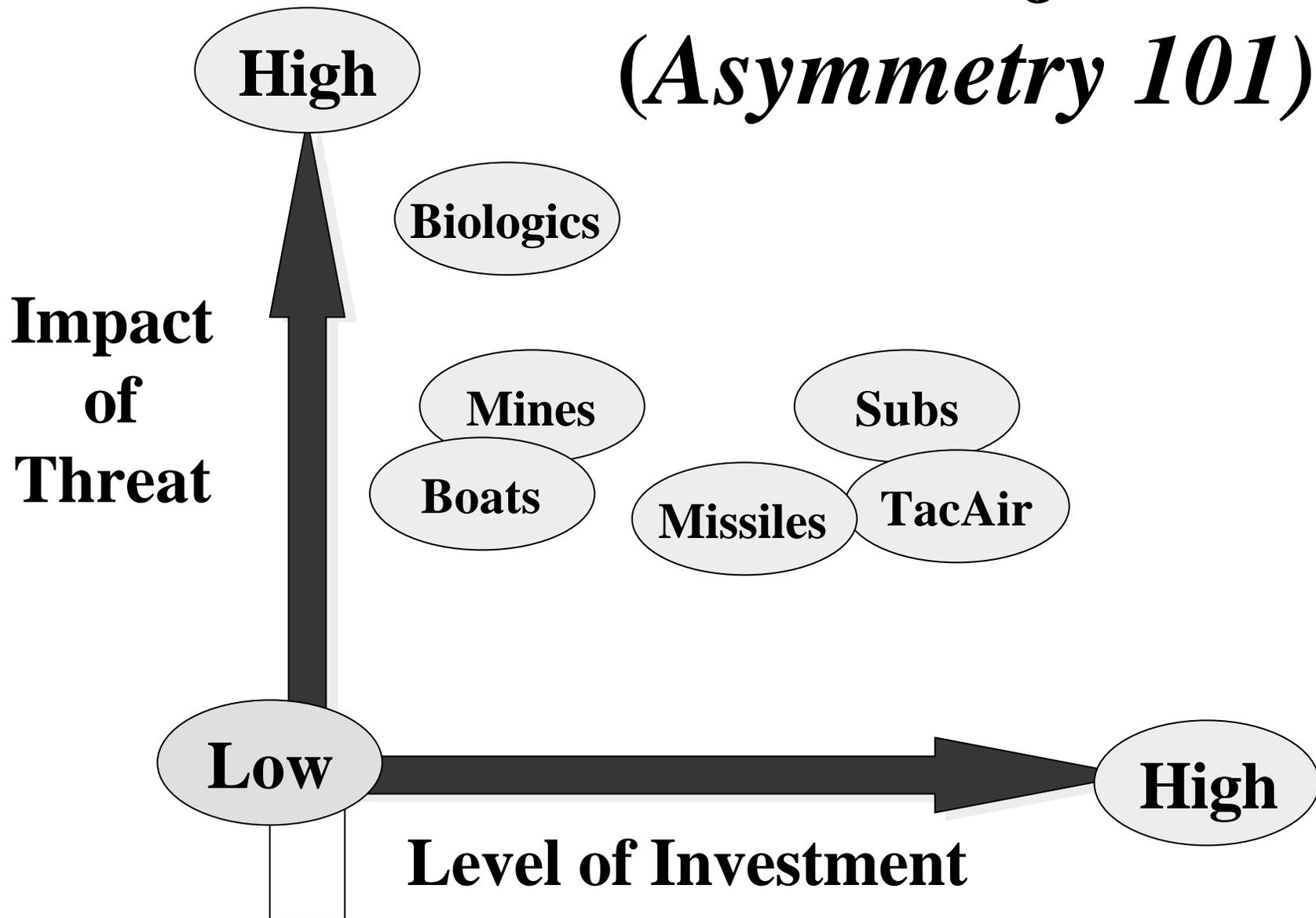
# Littoral Operations

- Strategic Interests
  - Nearly all world physical commerce flows here
- Global Engagement
  - 80% of all people live within 500NM
- Military Influence/Utility
  - Maximize reach of range limited assets
- Logistics
  - 95% of force flow comes to the fight by sea

# Littoral Ops & Power Rejection

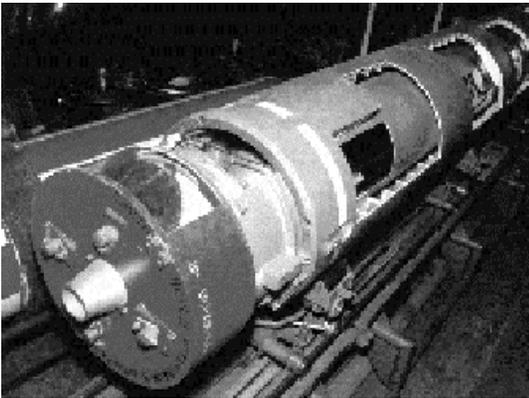


# Power Rejection (*Asymmetry 101*)



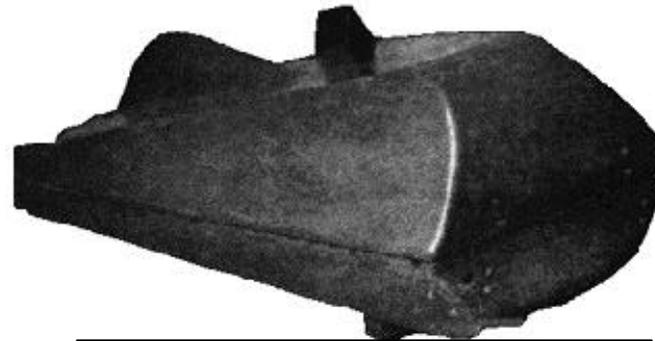
# Asymmetric Tool Kit

**Moored**



**RISING MINE (CHINA)**

**Bottom**

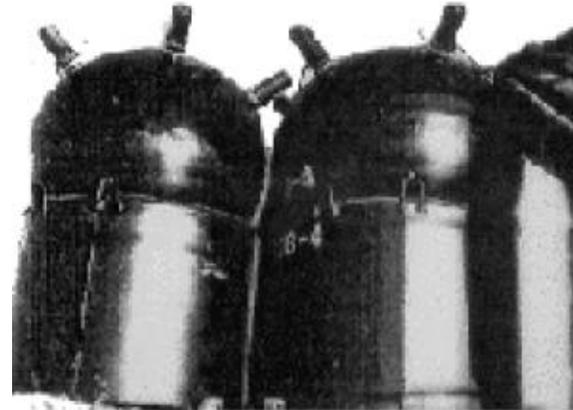


**ROCKAN (SWEDEN)**

**Anti-Invasion**



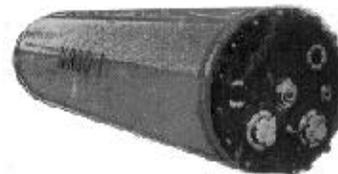
**TM-46 (FSU)**



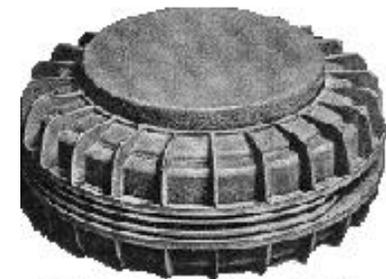
**M-08 (IRAN)**



**MANTA (ITALY)**

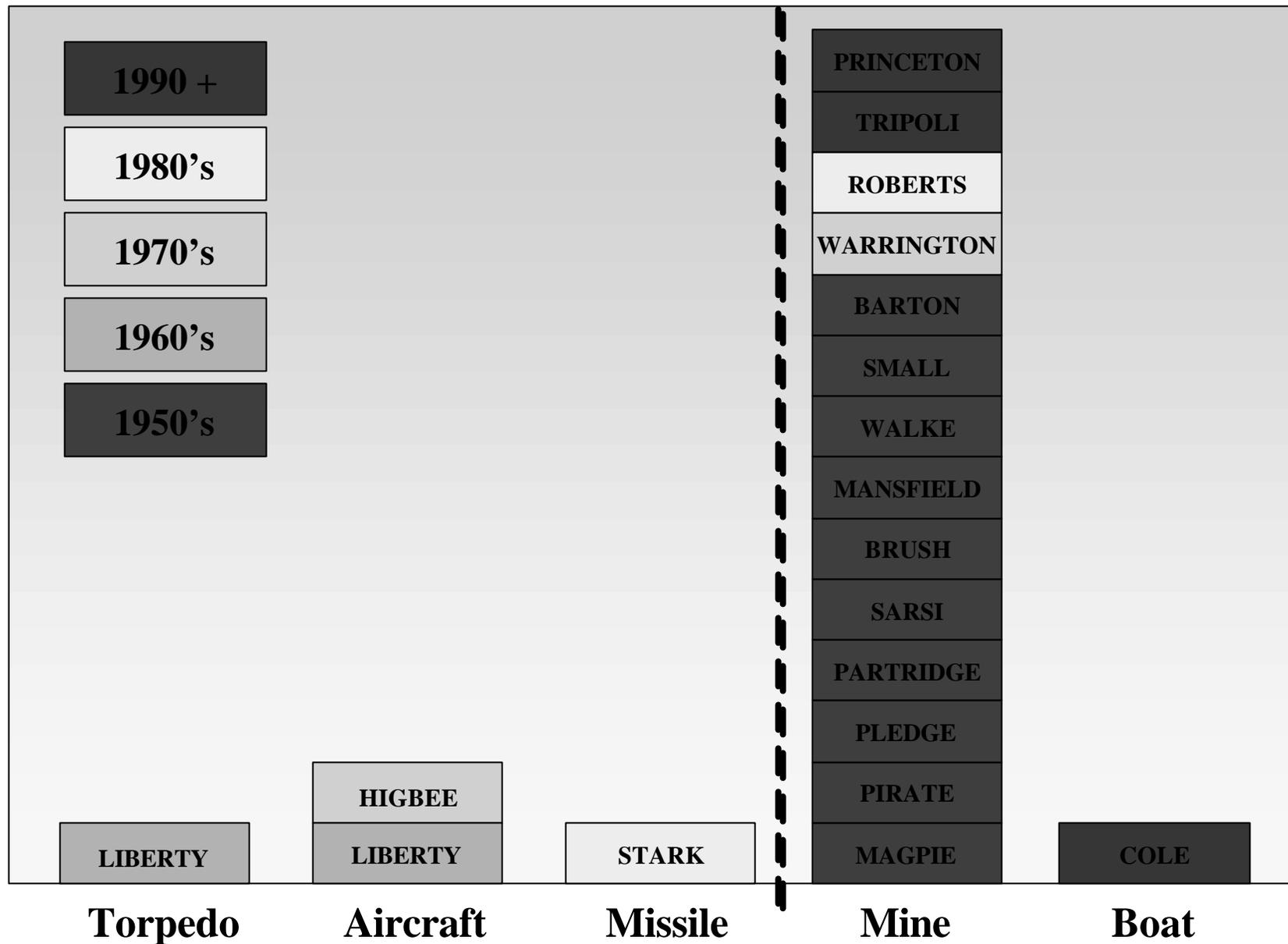


**MR-80 (ITALY)**



**VS 1.6 (IRAN)**

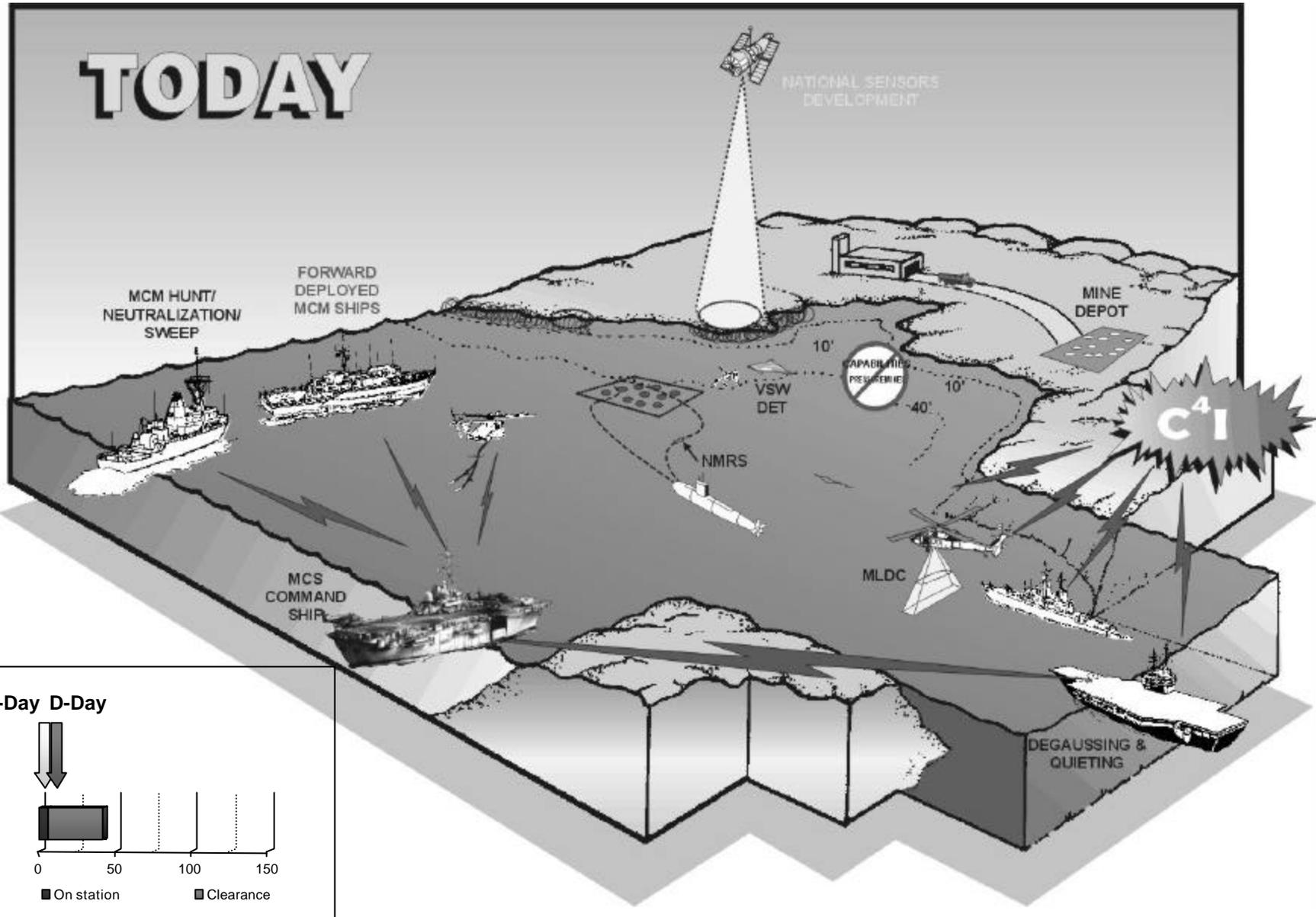
# Asymmetric Damage



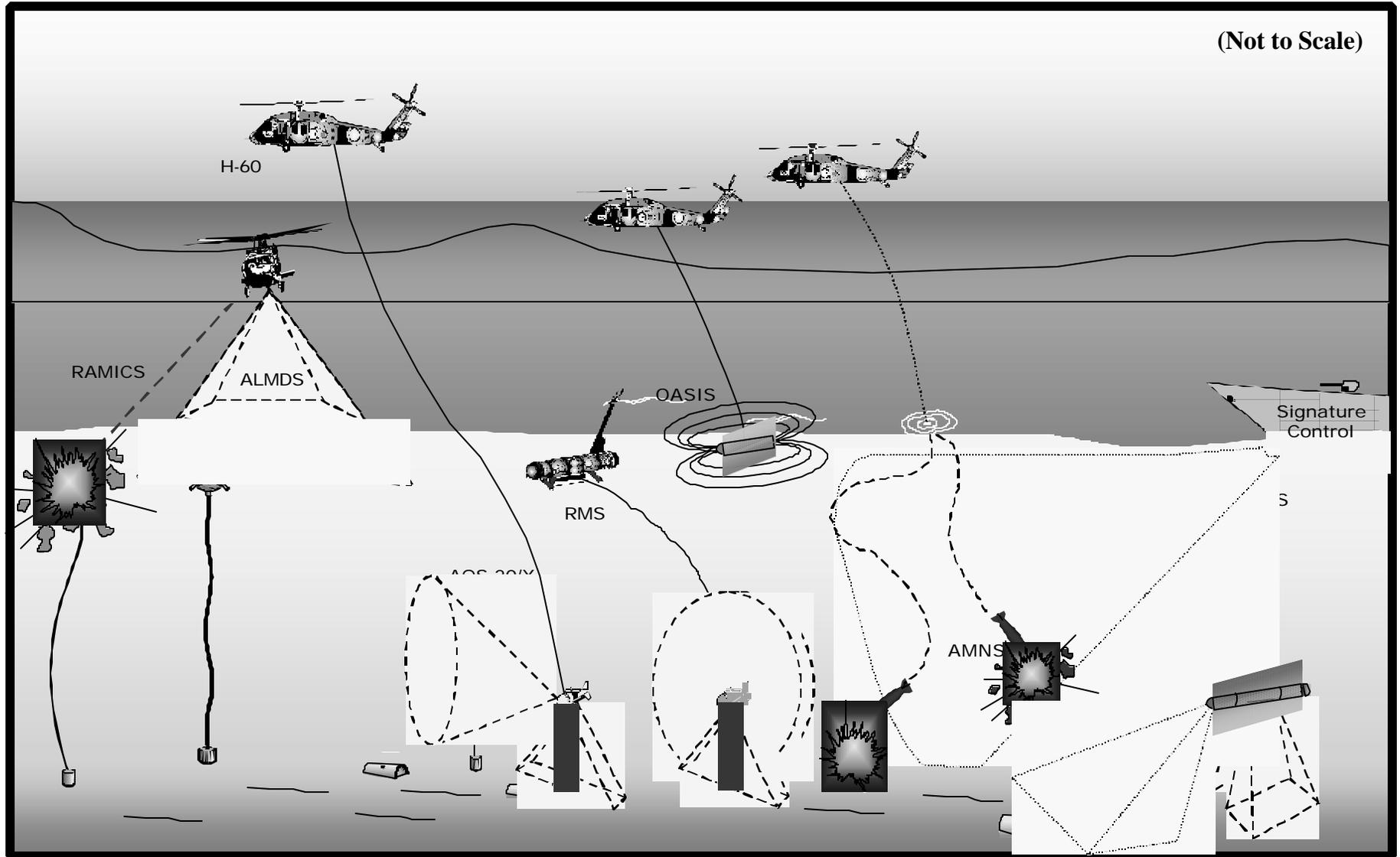
# MCM Vision

- **Accelerated Operational Timelines**
- **Man out of the minefield**
  - Near Term
    - Enhance existing Dedicated Forces
    - Develop Organic game pieces
  - Mid Term
    - Sustain Dedicated Force
    - Field Organic Forces
  - Far Term
    - Unmanned & standoff systems

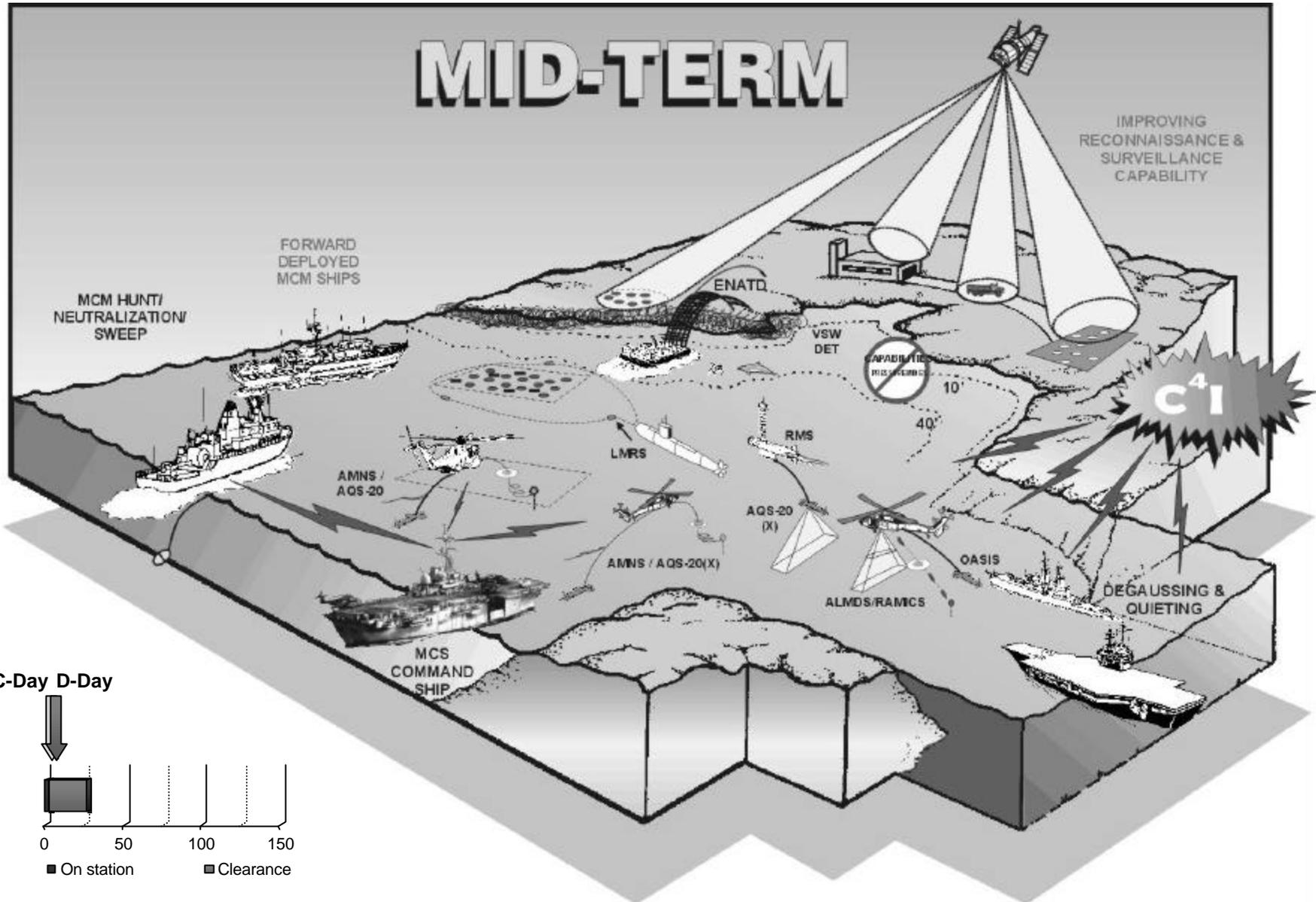
# Present Capabilities



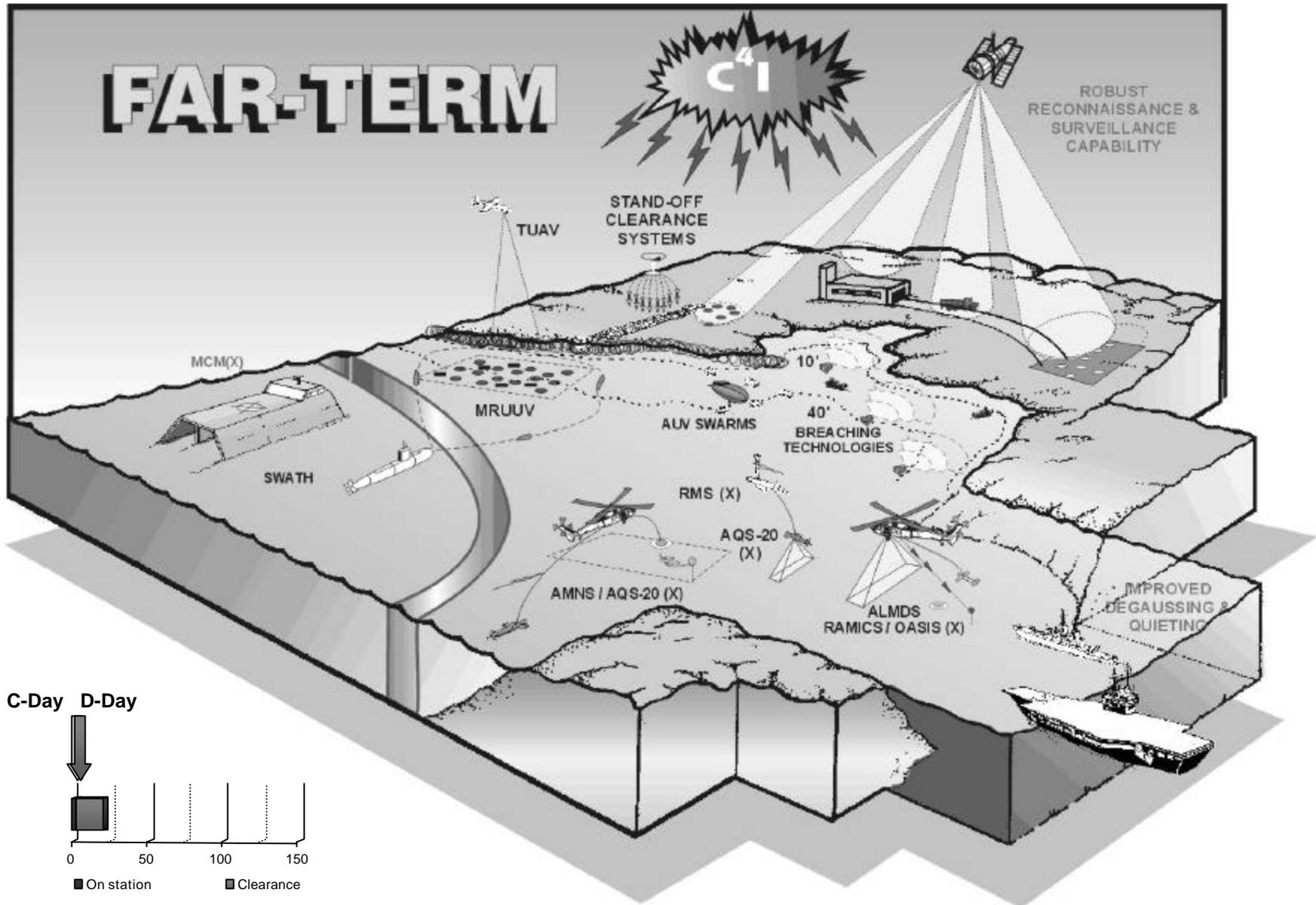
# Adding Organic Capability



# Programmed Capabilities



# Future Capabilities



# Improvements Must Address the Entire MCM Continuum

1. Intelligence / Environmental Data Bases
2. Surveillance
3. Interdiction
4. Self-Protection
5. Exploration / Reconnaissance
6. Avoidance
7. Clearance: Hunt, or Sweep

# Future MCM Capabilities: Issues

- C4I
  - Data fusion / Distributed Data Base Management
  - Connectivity
- Environmental Awareness
  - Bottom Mapping & Change Detection
  - Real time in-situ oceanography (currents, turbidity, etc)
- Surveillance / Recon
  - Wide Area Surveillance
  - Effective Recon; both Clandestine & Rapid Overt
  - Distributed Detection Systems

# Future MCM Capabilities: Issues

- Buried Mine Detection
- Navigation
  - Very Accurate Geo-Positioning
  - Precise Maneuvering
- Land/Sea Interface - the VSW & Surf Zone problem
  - VSW / Surf Zone Recon & Mine Detection
  - VSW / SZ Mine & Obstacle Breaching/Destruction
- Standoff Neutralization / Breaching

# Future MCM Capabilities: Issues

- Unmanned Autonomous Systems
  - Hunting / Mapping
  - Neutralization
  - Sweeping

# Not So Future MCM Capabilities

- Existing Technologies: Today's Hi & Low tech
  - Answers to today's issues?
- COTS - e.g. SQQ-32 Power Supplies
- DGPS - reduce error circle by a factor of 10
- Diesel Engine Bearings / Piston Rings - readiness!

Lastly, the current focus on things,

what about business practices?

communications, logistics, training, etc