



U.S. Navy Funding Goals for Future Mine Warfare Capability

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Date: 24 October 2011

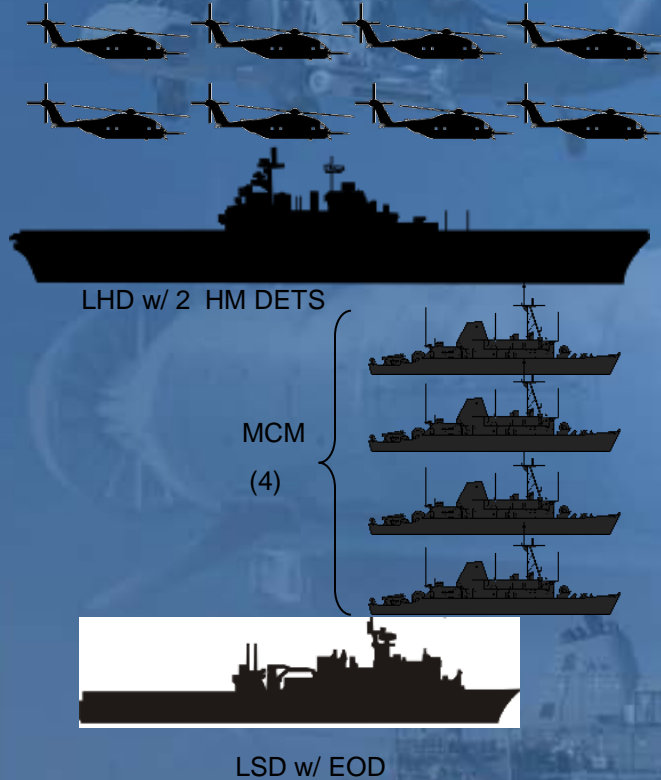


Bottom Line Up Front

- Navy committed to future MCM capability transition
- MIW resources are a small piece of the shrinking budgetary pie
- We can help with near-term initiatives – but can't do everything
- We need to prioritize getting the right capability to the fleet soonest

Mine Countermeasures Roadmap

Legacy Fleet MCM
Capability – Now Until 2020



LCS w/
MCM Mission Package
(Spiral Alpha) – 2020 and Beyond



Field a Common Set of Unmanned, Modular MCM Mission Package Systems Employable from LCS that can Quickly Counter the Spectrum of Mines to Enable Assured Access with Minimum Risk from Mines

Manpower ~ 2,300 Sailors

Modeled ACRS is comparable

Manpower ~ 390 Sailors

Right Mix of Man and Technology For Effective Operations

MCM + Mining = Mine Warfare

- The Mine Warfare Branch is responsible for both Mine Countermeasures(MCM) and Mining.
- Responsible for maintaining the current maritime mines in the Navy's inventory.



- Actively exploring future offensive mining concepts to use mines in offensive, protective, and defensive roles.



Transition Challenge: Competing Requirements

SEARCH

MH-53E, MCMs, AQS-24A, SQQ-32
(HFWB)



MH-60S, LCS, ALMDS, AQS-20A,
COBRA, UUV w/ LFBB, RMS, Mk18 UUV



NEUTRALIZE

MH-53E, MCMs, EMNS, EOD,
Marine Mammals



MH-60S, JABS, CMS, LCS,
AMNS



SWEEP

MH-53E, MCMs, Mk-105, Mk-
104, IAAG, AAG



MH-60S, LCS, USV, UISS, OASIS



vs.

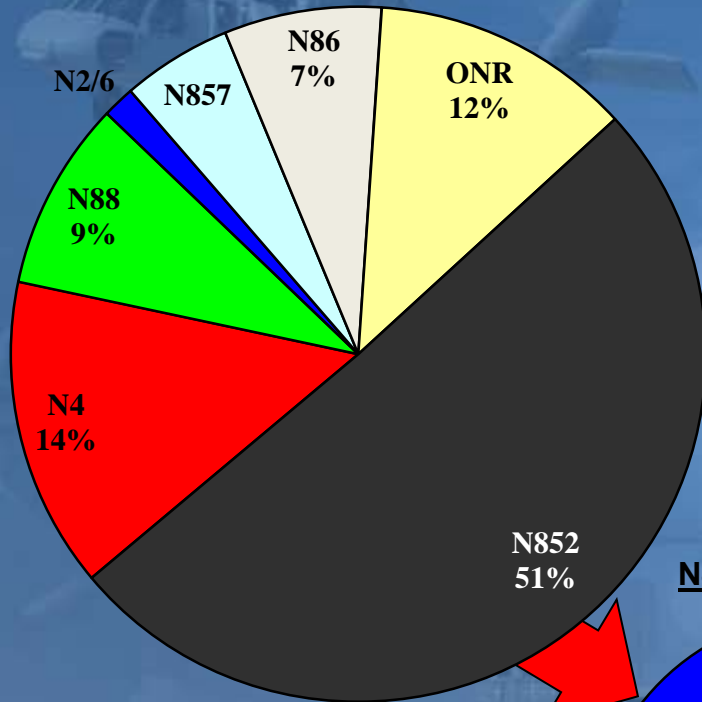
Current Resource Environment

- PB12 is currently on “The Hill”
- Navy PB12 TOA is \$161.4B – increase of \$0.8B from FY11
 - N85 slice of the pie is \$6.2B – 4% of overall budget
 - N852 budget is approx \$400M of N85’s budget
- Overall Mine Warfare budget is \$930M
 - Includes current readiness accounts
 - 0.6% of Navy TOA – LCS SCN account excluded
 - BMD budget is approximately five times larger*
 - ASW budget is approximately four times larger*
- Anticipate Continuing Resolution at start of FY12
 - Potential impact to FY12 development and testing schedule
 - CR until 18NOV and No New Starts
- Still have the “Super Committee’s” decision to deal with

PB-12 Fiscal Overview

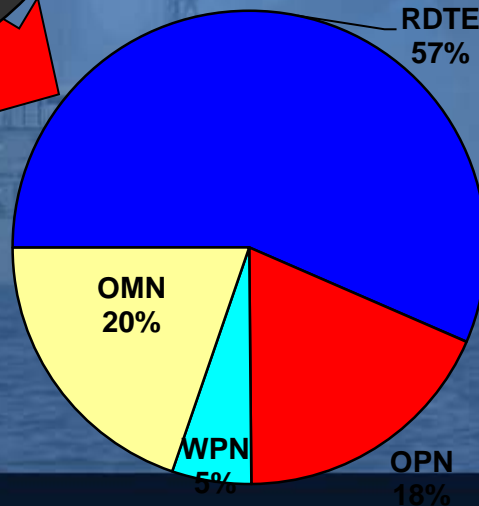
(Represents Funding Reported in FY12 MCM Certification Plan)

MIW Funding Ownership Breakout



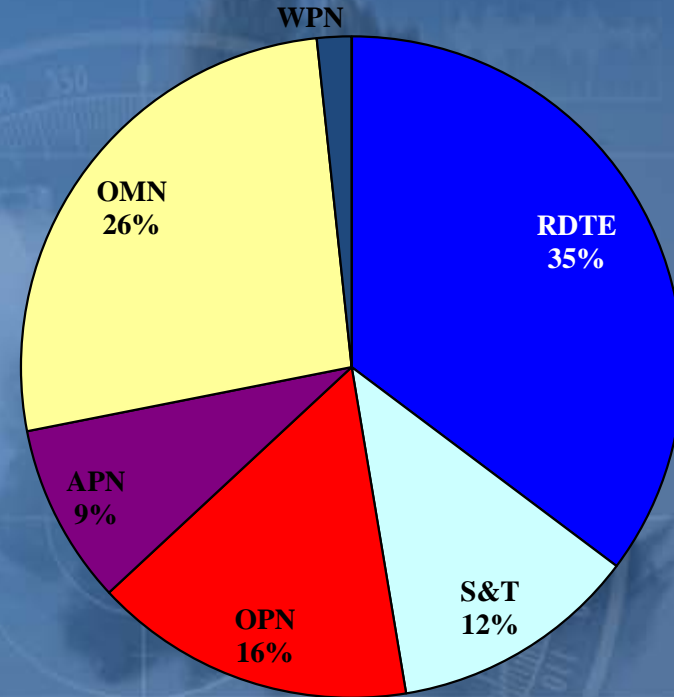
RS	\$M
N4	104.4
N852	366.1
N857	37.0
N86	52.8
N88	63.6
ONR	87.6
N2/6	10.8
Total	722.3

N852 APPN Breakout



- N4 – Readiness
- N88 – Air Warfare
- N857 – EOD
- N86 – Surface Warfare
- ONR – S&T Funds
- N852 – Mine Warfare
- N2/6 – Info Dominance

MIW Funding APPN Breakout



APPN	\$M
RDTEN	254.6
OPN	113.5
WPN	12.2
OMN	190.8
S&T	87.6
APN	63.6
Total	722.3

Near Future MCM Challenges

- Sensor and Processing False Alarms
 - High False Alarms mean longer PMA & higher False Classification by PMA Operator
- Single Pass Detect to Engage
 - High False Alarms requires multiple passes to identify
- Computer Aided Detection(CAD)/Classification(CAC) Improvements
 - Potential for real-time algorithms in the MCM Community
 - Fast and accurate CAD/CAC capability needed for all PMA
- Reliability
 - System Reliability needs to meet requirements
 - Meet Operational Availability (Ao)
 - Improve Mean Time Between Operational Mission Failure (MTBOMF)
 - Require modular, open architecture systems that are supportable long term
- Mining
 - Stand-off delivery of mines
 - Remote Command and Control of mines
 - Distributed network of sensors in support of command and control



Summary

- The mine threat is real and not getting easier.
- The transition to LCS-based MCM is challenging...*and innovative.*
- Decreasing TOA makes TOTAL OWNERSHIP COST a key driver
- But.....system suitability and effectiveness still most important

Got a solution?

Contact CAPT Brakke at Brian.Brakke@navy.mil



Questions

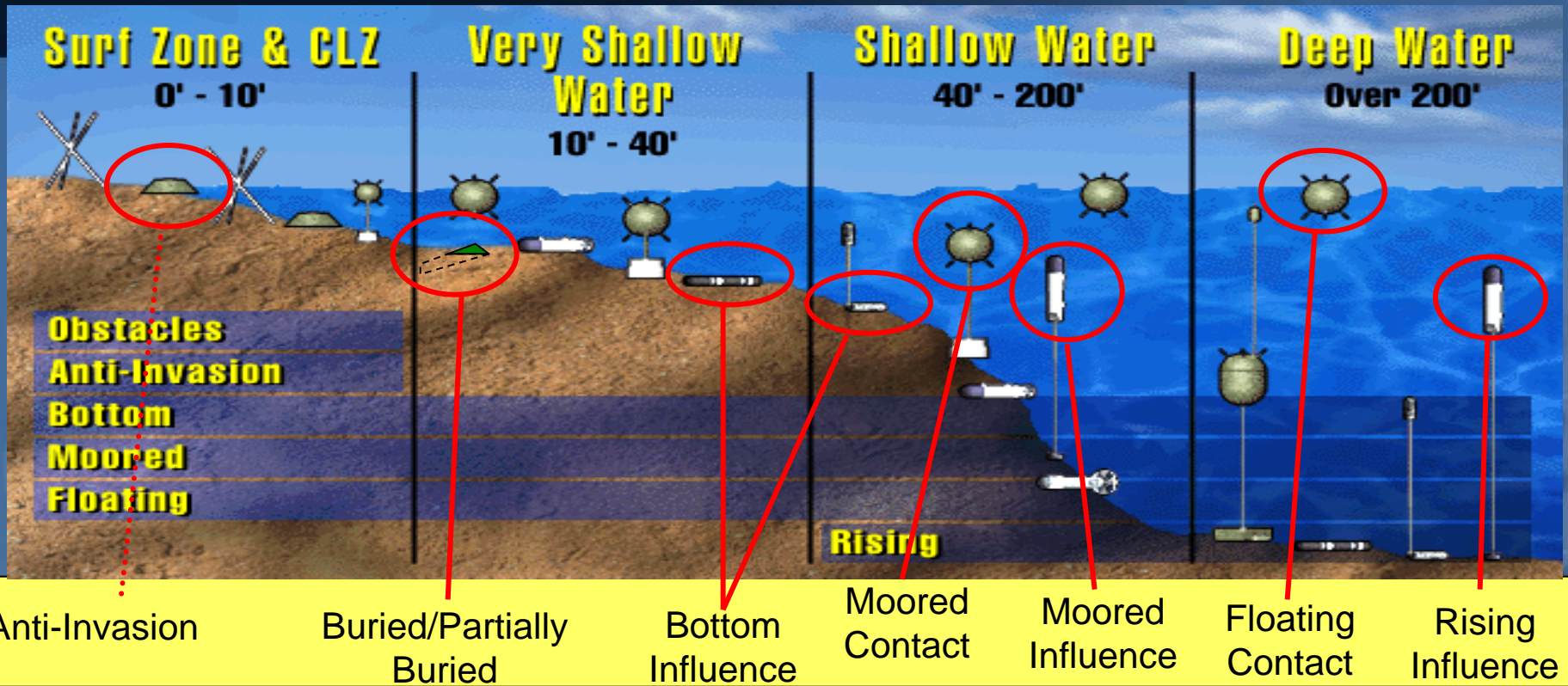
The Big Question: How good is good enough?

CNO says: “90% is good enough, let’s get out of R&D and into the fleet!”

- How much better is the reduced performance future systems over present fielded systems?
 - Likely Performance of Future vs. Present Performance of Legacy
- Analyzing the present performance MCM MP systems to determine if they support Overarching LCS MCM MP KPPs.
 - Many Future MCM system requirements (ORDs) written well before LCS Concept—are they aligned?
 - Huge Effort, reliant on modeling (NMWS)
 - IF we are falling short in KPPs, namely Area Coverage Rate Sustained (ACRS), WHERE do we make improvements? (ROI)

N85 assessing traceability of system requirements to MCM MP requirements

The Threat to Assured Access



➤ The real goal of a minefield is Sea Denial, NOT the damage or destruction of a specific ship.

➤ The Sea is a maneuver area. Navy goal is to assure Access, support STOM/OMFTS, NOT counter every mine.

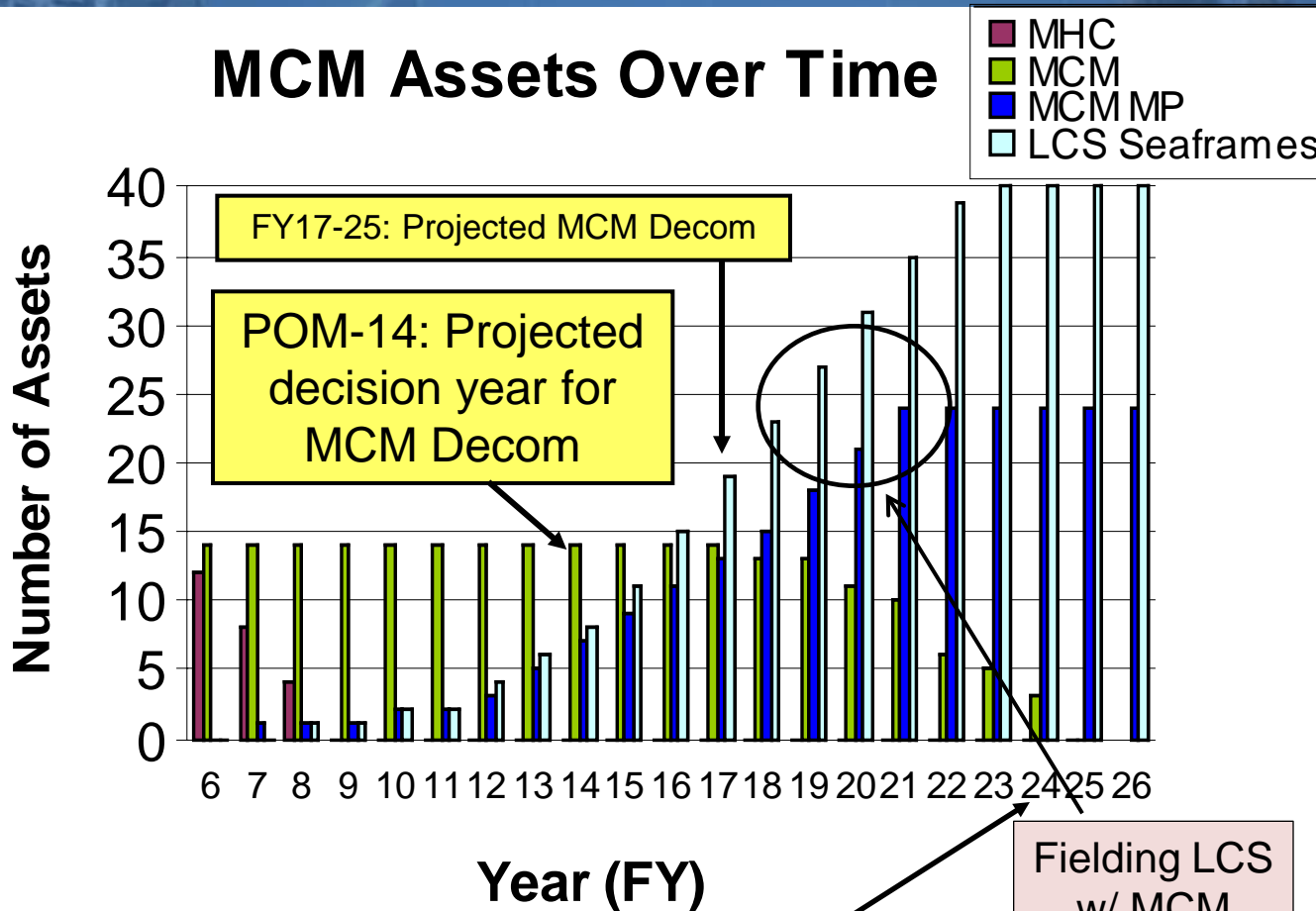
- Over 300 Mine Types
- Over 50 Countries Possess
- Low Cost but High effects
- Simple to Deploy
- Asymmetric



Transition to LCS-based MCM



MCM Assets Over Time



MCM Coverage in 2018

Minefield Detection and Neutralization



Assault Breaching System



EOD Mobile Unit ONE

Laser (Hunt)



Airborne Laser Mine Detection System

Airborne Mine Neutralization System



Propelled explosive charges (Kill)

Surf Zone & CLZ
0' - 10'

Very Shallow Water
10' - 40'

Shallow Water
40' - 200'

Deep Water
Over 200'

Obstacles
Anti-Invasion
Bottom
Moored
Floating

Rising

Surface MCM UUV and Low Frequency Broadband



Buried Mine Detection

Remote Minehunting System & MH-60S AN/AQS20A



Sonar (Hunt)

Airborne Mine Neutralization System



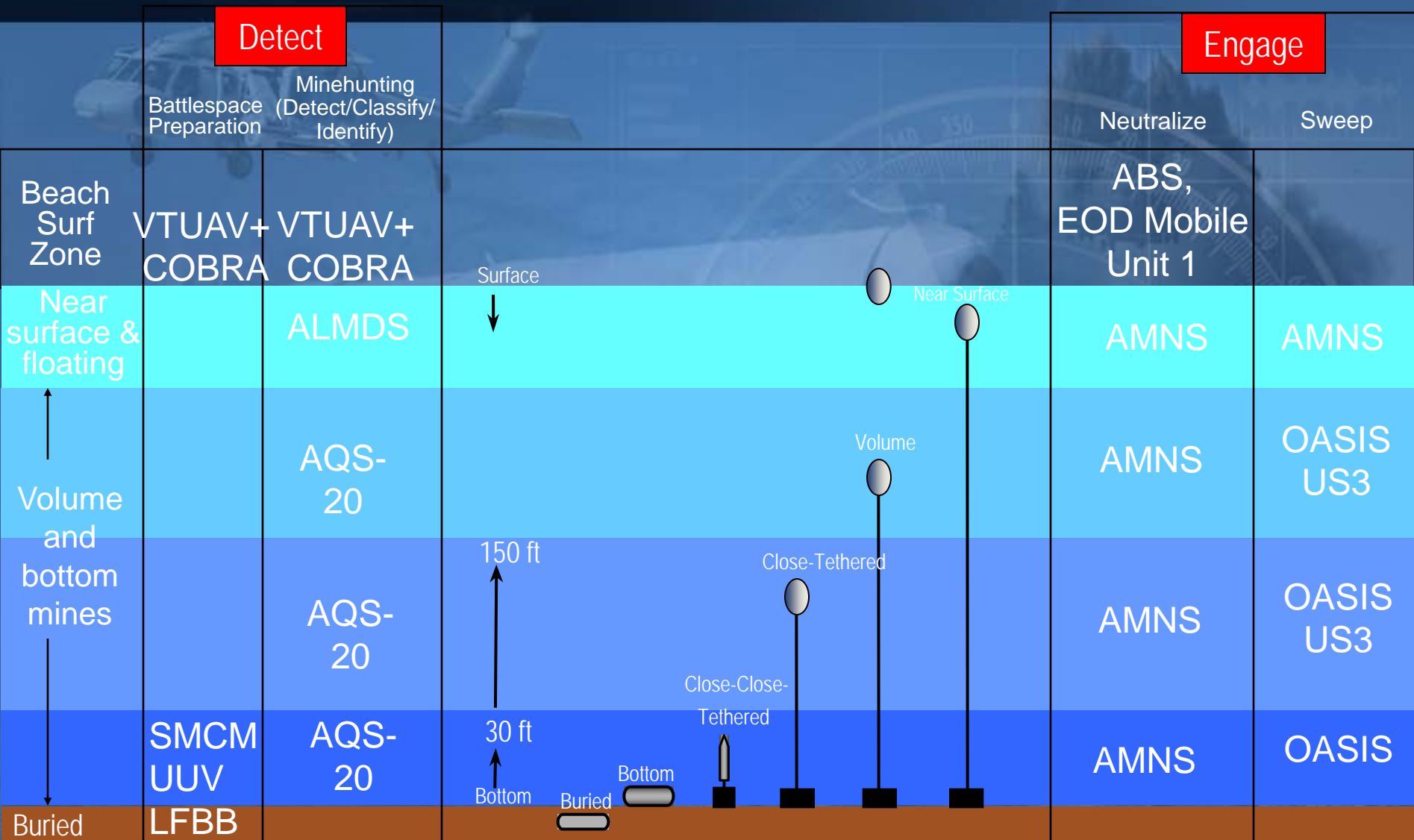
Propelled explosive charges (Kill)

Unmanned Surface Vehicle / Organic Airborne and Surface Influence Sweep



Magnetic Acoustic Influence Sweep

LCS MCM Mission Package System Coverage



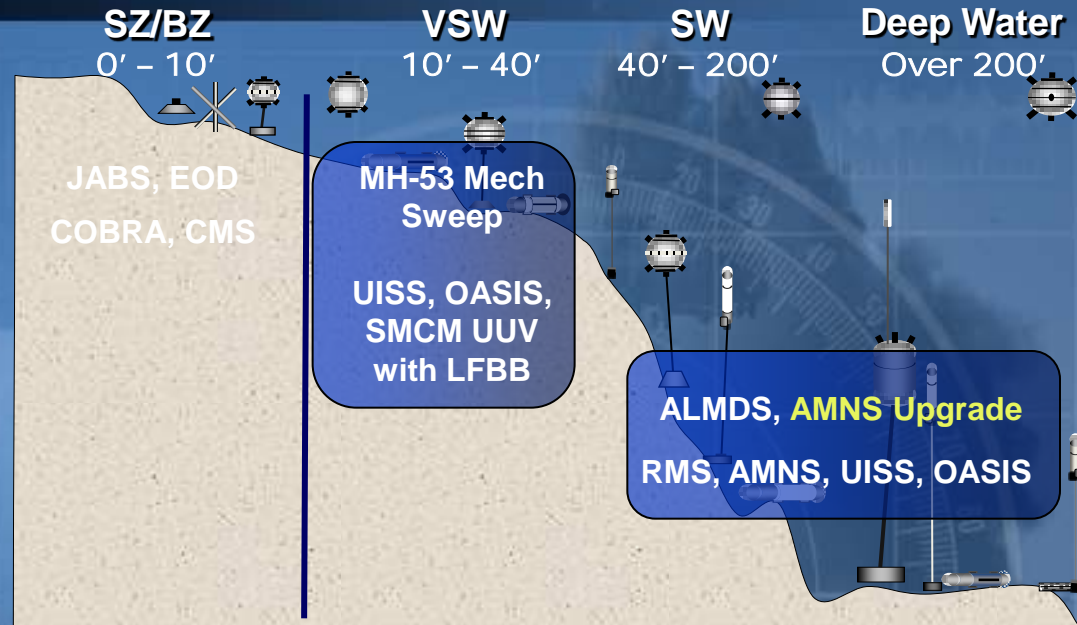
* NOTE : Depth Coverages Vary with System and Mine Type

MCM System Investments

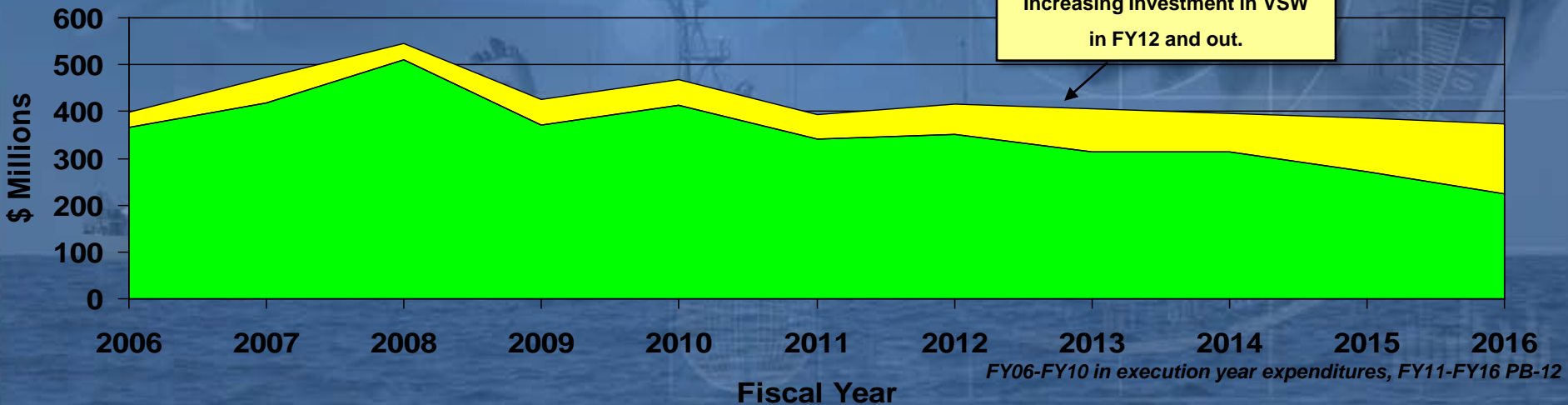
- **Greatest investment in the SW/DW**
 - 33% of FY11 budget allocated to legacy systems
 - Decreases to ~20% by FY16 as LCS-based systems fielded
- **Increased funding to the VSW zone**
 - JABS Upgrade
 - UUV with LFBB
 - Potential COTS solutions

• **Investments in SW/DW Sustain Legacy Force and Deliver the Future**

• **Initiatives to Solve the VSW Problem Are Underway**



Increasing Investment in VSW in FY12 and out.



MIW Near/Mid-Term Vision

- **LCS-based MCM vision is correct for the near & mid-term years** – *requires completion of testing and operational validation*
- **Legacy (dedicated) SMCM/AMCM forces healthy to 2020** – *planning on extended life service program (ELSP), if needed*
- **Major risks** – *integrating new systems to LCS and MH-60S, completing operational testing, and fielding revolutionary technology*
 - **Coordinate**: Balance LCS early capacity to bridge legacy systems divestiture.
 - **Control**: The cost of systems within the LCS MCM Mission Package are increasing due to technical challenges and pacing of the LCS and MCM MP's--extending development time and adjustments in procurement profile.
 - **Performance**: Majority of systems are approaching test phase... focused on KPPs for effectiveness and suitability requirements

Prioritize getting the right capability to the fleet soonest

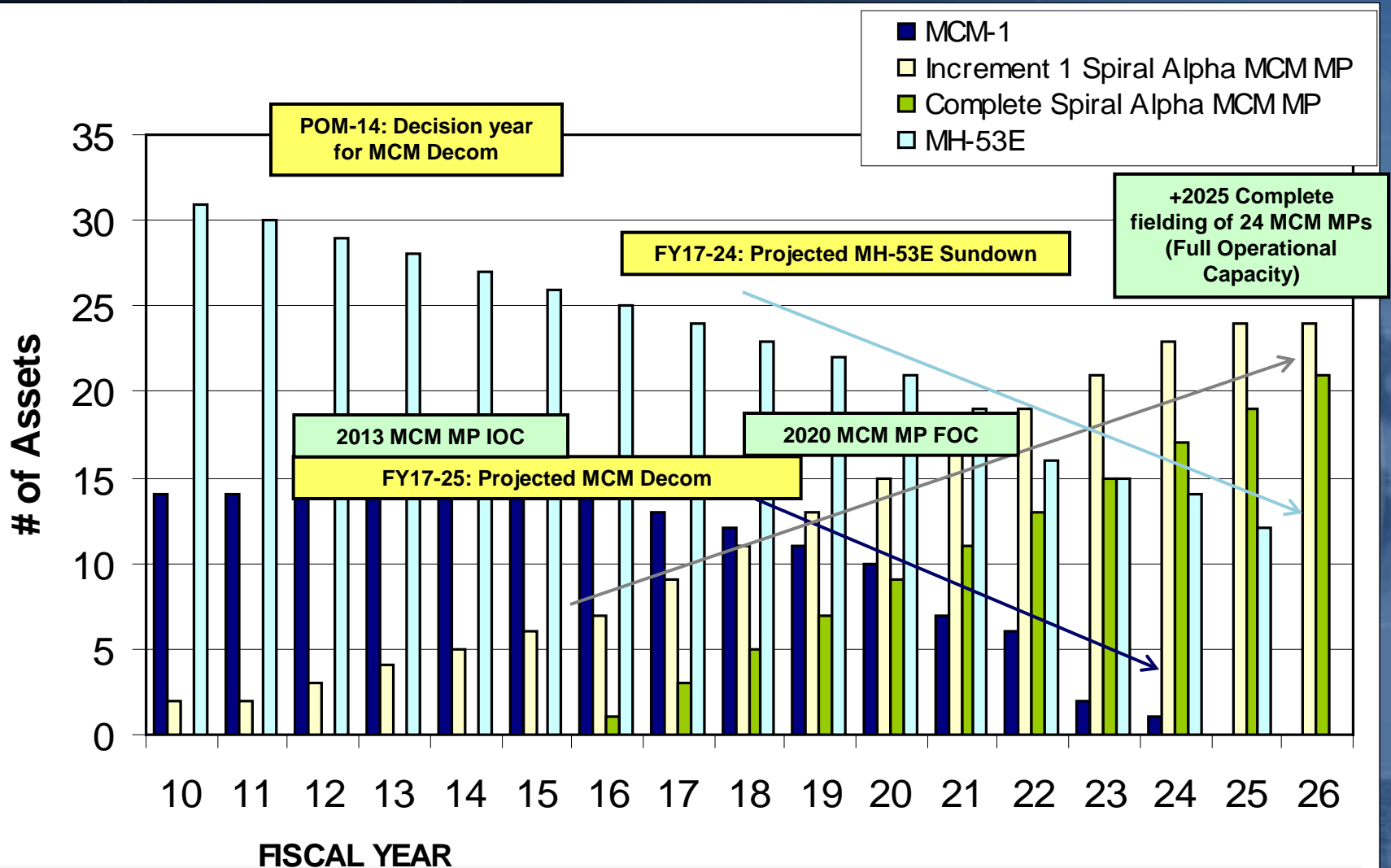


MIW Far-Term Vision

- **Stop doing things “the old way”**
 - Increased passive MCM through ISR, satellites, and IPOE
- **Utilize Unmanned Undersea Vehicles (UUVs) and Unmanned Surface Vehicles (USVs)**
 - Comms, endurance, and power generation/management issues inherent with UUVs/USVs must be resolved
 - Flexible, adaptable, open architecture design. Stovepipes removed.
 - Idea: A common powered-section that can be fitted with a mission-specific “front end” (e.g., minehunting, neutralization, or even minelaying)
 - Idea: Air-dropped UUVs for rapid reaction. Need robust design while adhering to weight & aircraft/helo integration
- **Multiple, networked UUVs/USVs operating autonomously in suspected mine danger area**
 - Full Detect-to-Engage capability in a single pass

Far-Term => Autonomous, Networked UUVs and Advanced Underwater Weapons

Transition from Legacy to Future



MCM program maintains current capacity without MCM-1 ELSP and supports LCS-based MCM to relieve forward deployed forces by 2020.

Major PB-12 Adjustments

Program ADDS

RMS Add to OSD CAPE Estimate	\$ 101.7
EOD UUV (MK 18 UUV)	\$ 76.0
AMCM SDLM Add	\$ 38.4
ALMDS Add (Field Inc.1, Dev Inc II)	\$ 31.7
AMNS Add (RDTEN & OPN)	\$ 31.2

Program TAKES

MCM MP Reduction	-\$ 166.1
AMNS WPN Reduction (EMNS)	-\$ 110.1
RAMICS Vertical Kill	-\$ 82.1
CMS WPN Reduction	-\$ 54.9
EMNS Vertical Kill	-\$ 49.8
SMCM UUV Reduction	-\$ 32.9

- Aligns resources (LCS ships and MP system)
- Slowed procurement and quantities of CN's
- SMCM was bill payer for other MCM programs