Presentation to OPTECH West

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Operations Research

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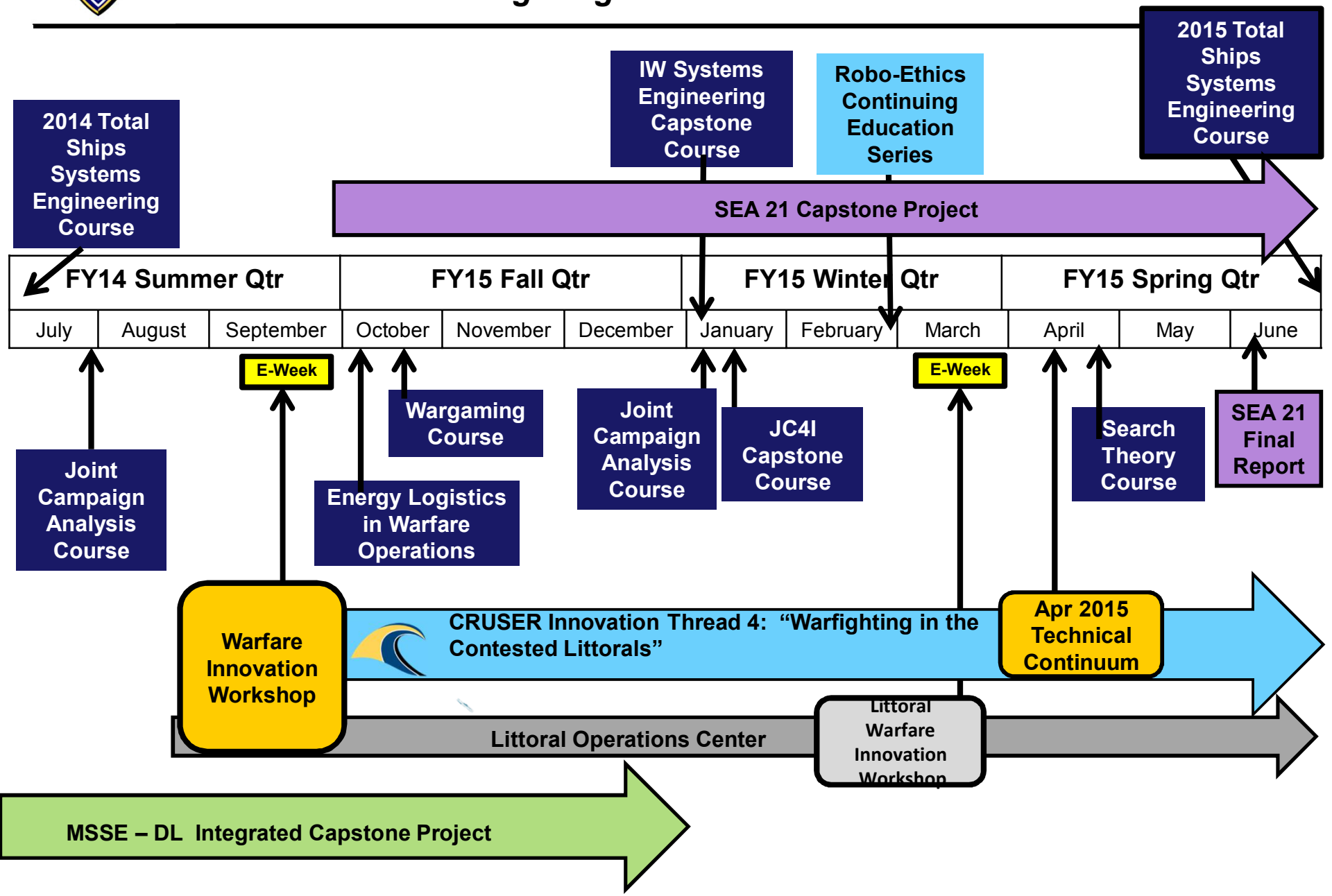
Current NPS Littoral Operations Studies

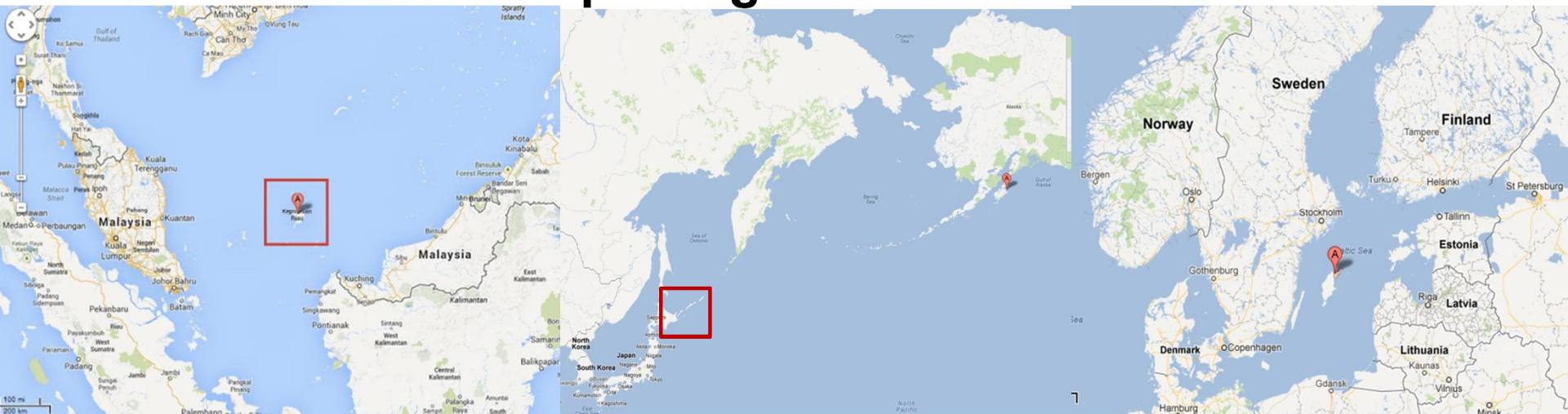
- **Warfare Innovation Continuum "Warfighting in the Contested Littorals" (Ongoing)**
- **Warfare innovation Workshop "Warfighting in the Contested Littorals" (Today)**
- **Baltic Example Joint Campaign Analysis Class Results (Just finished)**
- **NPS Wargaming and Energy Logistics (Fall)**

Warfare Innovation Continuum
"Warfighting in the Contested Littorals"



Littoral Conflicts 2025 Scenaros

- China established “control” over South China Sea and threatens invasion of Netuna Besar and Palawan
- Expansionist Russia tests international community by:
  - Threatening Baltic control by occupying Gotland Island
  - Reinforcing Kuril Islands across the Sea of Okhotsk for better Arctic passage control



NAVAL POSTGRADUATE SCHOOL

Warfare Innovation Workshop Mission

- Advance Concepts that will allow the U.S. and its allies to operate under a robust Anti-Access Area Denial Umbrella
  - on and over the sea,
  - in an emission controlled environment (both sides),
  - minimizing risk to high value units
  - Offering a creditable, deterrence

- Propose employment concepts (how would you use them), propose technologies like unmanned system to enhance them, and assess risk compared to the traditional fleet.

September Warfare Innovation Workshop

- **Over sixty participants:**
  - **Naval Postgraduate School Students (Naval, Army, and Air Force officers)**
  - **Junior Engineers (U.S. Navy Labs, System Commands, and U.S. Industry)**
  - **Old guys (Advisors, specialists, and Grey Beard team)**
- **Divided into six Innovation Teams**
- **Proposing technologies with concepts: "Panning for Gold"**

Summer 2014 example
Joint Campaign Analysis

“European Command Team”

Situation

- **Russian intensions:**
  - **Occupation of Gotland Island**
  - **Project power in Baltic Sea**
  - **Measure global response to Russian expansion**
- **Sweden response:**
  - **Intel reports attack imminent**
  - **Plan to use air, ground and sea defensive measures**
  - **Asked for US and other UN countries for assistance**
  - **Granted US flight rights over Baltic countries**

Russia Objective:
Mass Naval Presence – Complete Control of Baltic Sea

Sweden Objective:
Deter, prevent, counter Russian assault on Gotland

EUCOM Tasking and CONOPS

- Deter and prevent Russian occupation of Gotland
- Forceful retaking of Gotland
- Quantitative analysis (sea, air, land, sustainment)

Deterrence and prevention:

- Air: first on station
- Ground: occupy vital assets on Gotland (ports and airports)
- Swedish Naval Assets block key ports
- Show US commitment

Forceful retaking:

- Air/Surface/Subsurface domination
- TBMD
- Amphibious assault
- Indirect (blockade, allies, propaganda)

Summary of Results

- **Available Swedish forces are capable of deterring and preventing an invasion of Gotland against currently available Russian forces.**
  - **Maintain Air Superiority**
  - **Rapid mobilization**
  - **Secure the Gotland Strait**
- **Sweden will benefit from U.S. and/or EU assistance to retake Gotland in these supporting missions:**
  - **Strike Missions**
  - **Theater Ballistic Missile Defense**
  - **Airborne Antisubmarine Warfare**
  - **Amphibious Assault**
- **Russia cannot hold Gotland against combined Sweden/US/EU Force**

Methodology

- Time/distance analysis
  - Identify available Russian, Swedish and US recourses
  - Time to station/gain air superiority

Forecast Russian COA – Refine Swedish Timeline/CONOPS

- Air-to-Air (Beyond Visual Range) Combat Model
  - Binomial Missile Model
  - Linear law (Air-to-Air)
  - Break even analysis

Quantify Swedish Air Superiority

- Strike Campaign Model
  - Binomial Strike Model

Quantify US Strike Requirements

Swedish vs Russian Air Capacity

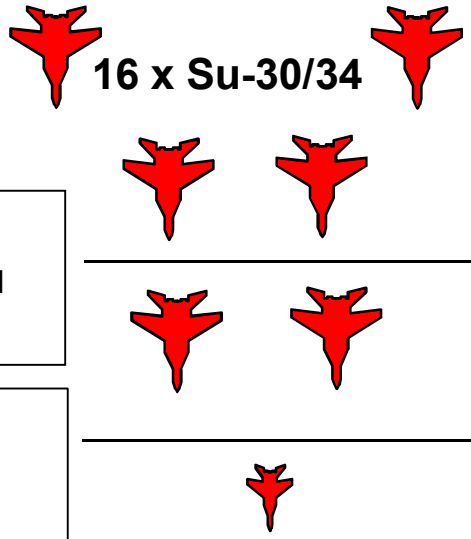
- **Swedish Capacity**
  - 16 x Gripen
    - 4 x Gripen CAP
      - 4 Hour Sorties, 8 Hour Mx/Refit
    - 12 x Gripen Scramble Ready
      - 2 Hour Sorties, 4 Hour Mx/Refit
  - 1 x 340 AEWCS
      - 6 Hour Sorties, 12 Hours Refit
- **Russian Capacity**
  - 8 x Su-30M/Su-34
    - 3 Hour Sorties, 6 Hour Mx
  - Possible surge to 16 x Su-30M/Su-34
    - Fleet security conducted by enroute/returning aircraft
- **Exchange Ratio:** 3:1 (Gripen:Su-30/Su-34)

Minimum Required Force – 16 Gripens

Gripen vs. Su-30/34 Capability Model

- JAS39 Gripen (50)
  - 4 Meteor Missiles
  - Missile Pk =.5
- Su-30/34 (40)
  - 12 R-77 Missiles
  - Missile Pk=.5

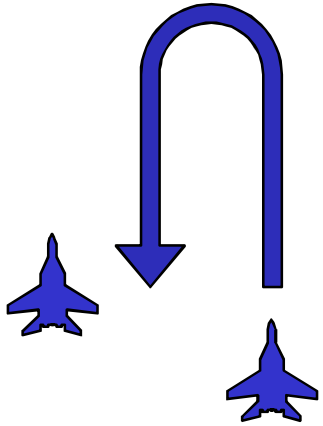
- Sweden's superior BVRAAM range allows 1st Gripen flight (4) to see, shoot and depart
- 2nd Gripen flight (4) able to see and shoot but is engaged by remaining Su-30/34s (2)
- Model provides 3:1 expected exchange ratio



Eng. 1:
16 Meteor vs 16 Su
= 8 Su Kills

Eng. 2:
16 Meteor vs 8 Su
= 6 Su Kills

Eng. 3:
24 R-77 vs 4 Gripen
= 4 Gripen Kills



8 x Gripen
4 evac after 1st Eng

"EUCOMs" Recommendations

- **Condition US support on immediate Swedish defensive preparation**
  - Mech INF Bn deployed to Gotland
  - Gripen CAP + Scramble ready
- **Immediate deployment of USMC INF Co demonstrates US commitment**
  - No winning scenarios for Russia
- **Continue to Invest in Standoff Capability**
  - Sweden/US success due to superior range
  - BVRAAMs, Strike vs SAM, ASM vs SAM
- **Increased Swedish Investment in SAM Capability**

Fall Events in Continuum

- **NPS Wargaming Class:**
  - **Address several new technologies from Warfare Innovation Workshop**
  - **Concerns: Maritime ISR and Expeditionary Operations**

- **NPS Energy Logistics Class:**
  - **Use Joint Campaign Analysis Baltic Concepts**
  - **Assess logistic requirements**