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Carderock Division

Designing Future Small Surface Combatants

OpTech-West
"Technology in the Littorals“ Panel
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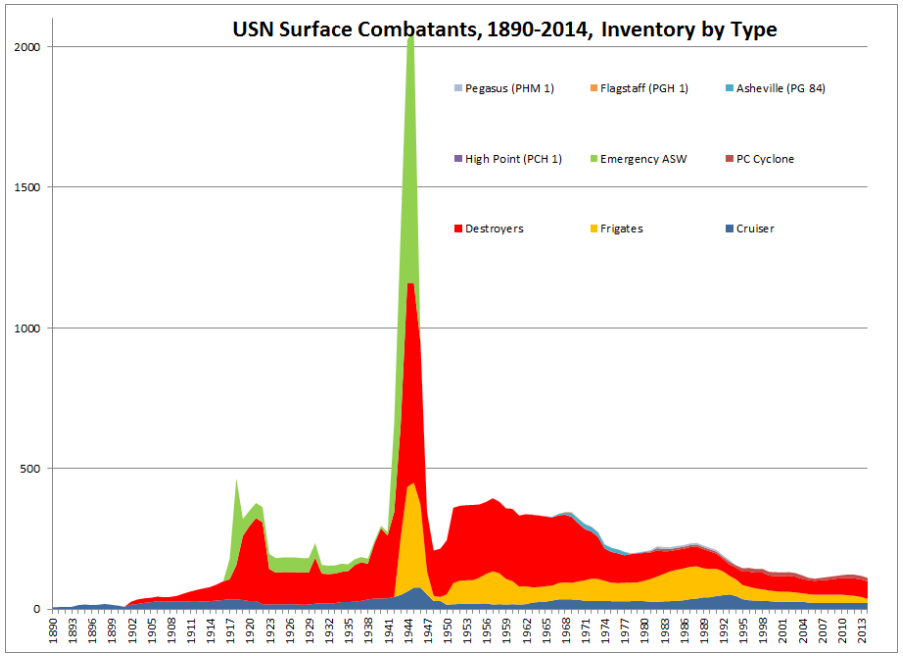
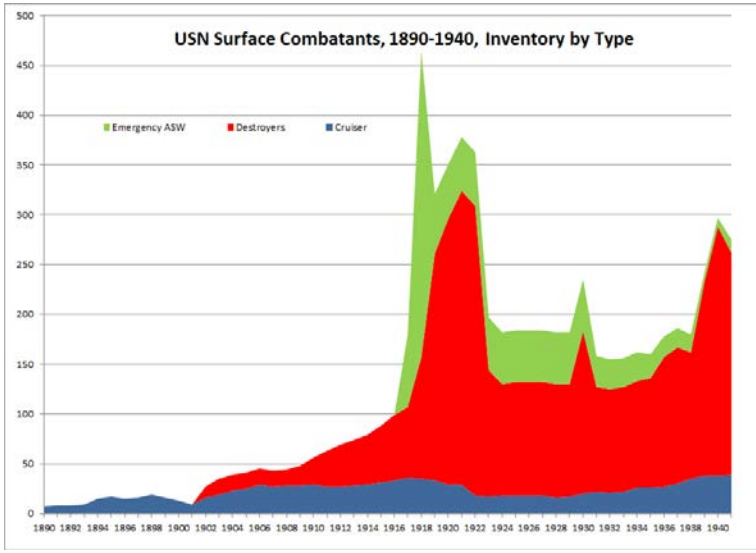
Small Surface Combatants in the USN Fleet

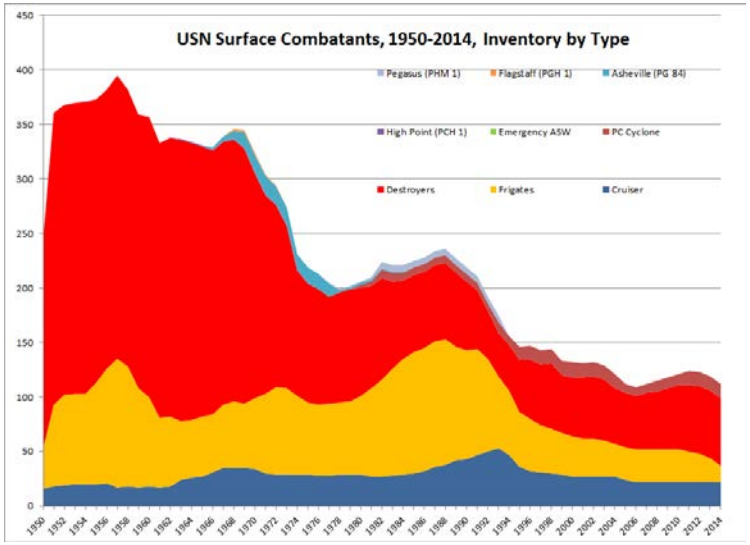
- USN surface combatant force structure
- Uses for US Navy compared to Allies



Pre- WWII



Post- WWII



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Design Drivers for Small Surface Combatants

- **Design Drivers**
  - What are the intended mission(s)?
  - What are the threats?
  - What is the employment concept(s)?
  - What is the force structure? And how do the ship(s) fit into it?
  - How long with the platform be in service?
    - Pace of technology
    - Industrial Base
- **Mission capabilities drive platform requirements**
  - SUW capabilities
  - ASW capabilities
  - AAW capabilities
  - MIW capabilities
- **Platform requirements drive hull form selection**
  - Speed
  - Range
  - Seakeeping
  - Maneuverability
  - Launch/ recovery (vehicles/sensors/weapons)
  - Susceptibility vs vulnerability

Then: determine what should be designed and built…

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Types of Small Surface Combatants

- **Monohull**
  - Displacement
  - Planning
- **Multi-hull**
  - Catamaran
  - Trimaran

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Types of Small Surface Combatants

- Surface Effect Ship (SES)
- Hydrofoil
- Air Cushion Vehicle (ACV)
- Wing-In-Ground (WIG)

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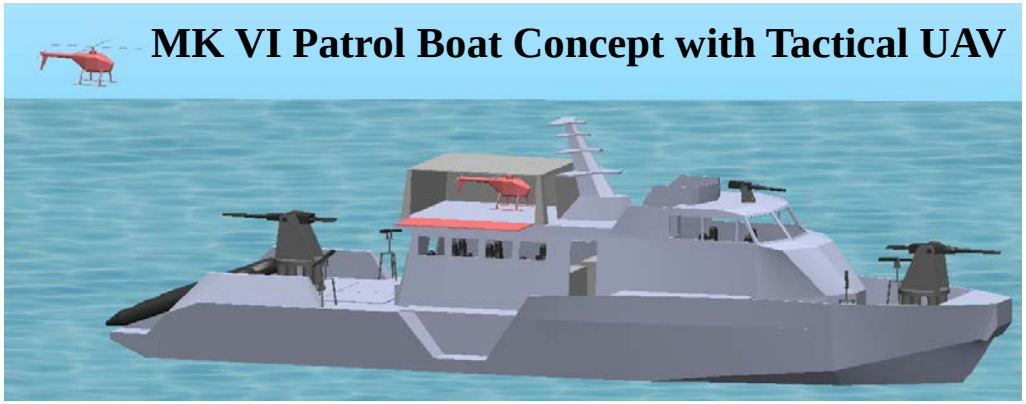
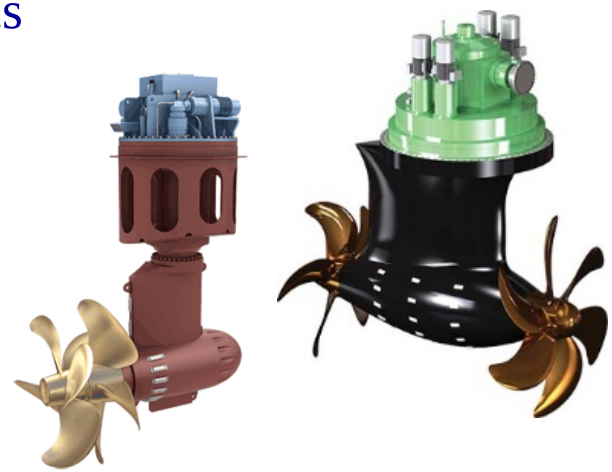
Future Technology Developments for Small Surface Combatants

- **"Over-The-Horizon" (OTH) ISR sensors**
  - Use of deployable unmanned vehicles
  - Offboard sensor networks
- **Short to mid-range weapons**
  - Self-defense to near Horizon transitions
  - Far Horizon to OTH transitions
- **Novel propulsion system concepts**
  - Balancing speed, maneuverability, and acoustics





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Future Technology Developments for Small Surface Combatants

- **Unmanned vehicles**
  - Deploying them from Small Surface Combatants to enhance mission capabilities
  - Performing which missions?
  - How to best integrate with the platform/mothership?
- **Hull form assessment methods/tools**
  - Performance prediction for novel/unconventional hull forms

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