

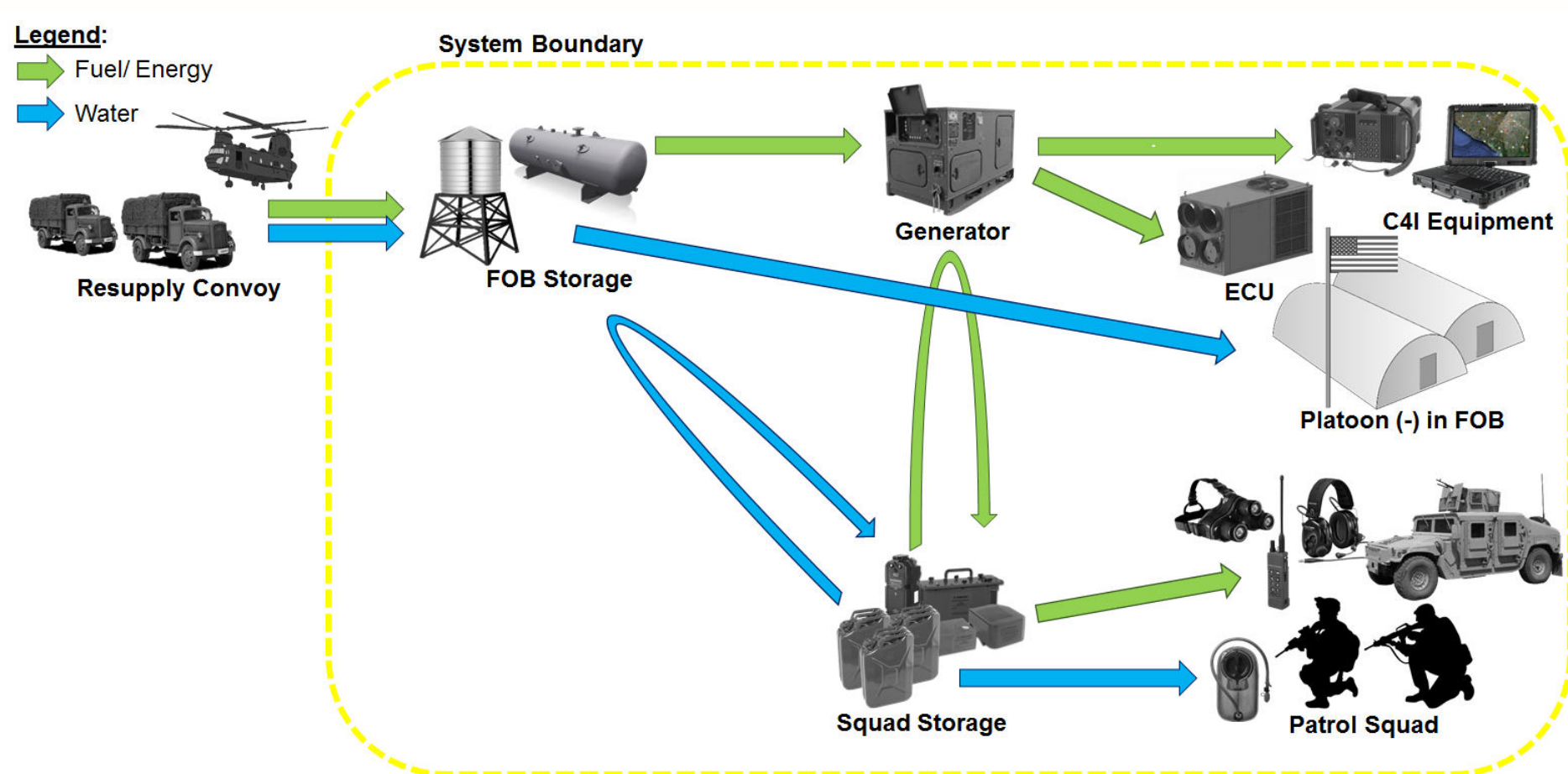
Engineering Resilience into the Marine Expeditionary Units Resupply System through Military Foraging

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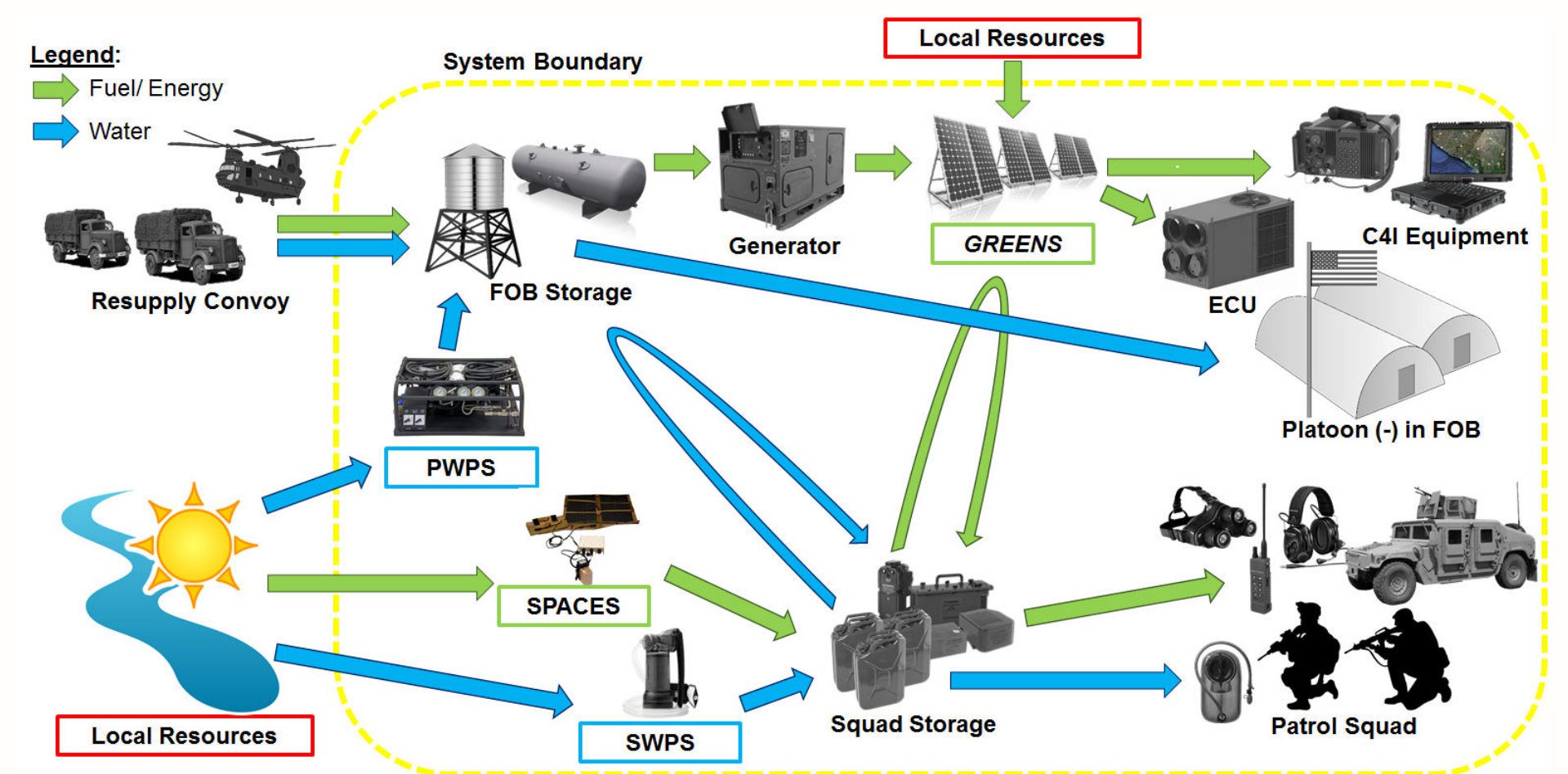
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Baseline Resupply System



- Support Marine Expeditionary Units (MEU) to deploy globally.
- High reliance on external resupply.
- Resupply system is vulnerable to disruptions.

Foraging-Augmented Resupply System



- Growing emphasis on distributed operations at the platoon and section level.
- Leverage on local resources via solar cells and water purification.
- Enhance resilience of resupply system.

Objective	MOE	MOP	Data Requirements
Sustain Mission for specified duration	Operational Reach	Self-Sufficiency Index (SI)	Amount of Foraged Resources; Amount of Consumed Resources
		Preparedness Index (PI)	No. of Days > Minimum Inventory Threshold; Total Mission Duration
Sustain Mission with resources and manpower	Operational Capacity	Assigned Manpower Index (AMI)	Total Time Assigned for Foraging; Total Mission Duration
		Fulfilled Resources Index (FRI)	Amount of Resupplied Resources; Amount of Foraged Resources; Amount of Demanded Resources
Sustain Mission after disruptive event	Resilience	Recovery Index (RI)	No. of Days > Minimum FRI Threshold; Total Disruption Duration
		Preparedness Index (PI)	Repeated, see above

Methodology

- Model baseline and foraging system using discrete-event simulation.
- Disrupt system under two different operational scenarios.
- Develop innovative MOEs and MOPs.
- Sensitivity analysis to determine most influential foraging parameters.

Conclusions

- Foraging shown to support independent operations of MEU platoons for longer durations, improve their capacity for action, and enhance their resilience to disruptions.
- Gained insights into equipping and employment of foraging systems.
- Starting point for further study into aggregated effects at higher echelons.