Eco-Dolphin I

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• Highly integrated and streamlined Autonomous Underwater-Vehicle (AUV) development.
Objectives

Phase I: Yellow Eco-dolphin

• Cruise autonomously 32 feet below the water, at 6.5 ft/sec.

Phase II: Buoy Control systems

• Communication with ground station via Buoy relay system.

Phase III: Blue and Red Eco-Dolphin

• Communication among a small fleet of AUV’s (3).
Vehicle Design

Yellow Eco-Dolphin

**Body:** Elliptic

**Weight:** 132lbs.

**Length:** 4ft.

**Width:** 1ft.

**Thrust:** 2 x 15 lbs
• Symmetry allows for equal and counteracting forces on top and bottom control surfaces, thus resulting in net-zero lift at zero angle of attack.
Propulsion Design

Yellow Eco-Dolphin

• 2 – Brushless/DC thrusters powered by two 22 volt Lithium-Polymer battery packs.
Ballast Design

Yellow Eco-Dolphin

• The pitch control design involves changing the Center of gravity instead of redirecting the thrust.
We will utilize the Non-linear Wave lab in the Lehman Building.
Buoy Control System

Phase 2

GPS –
Buoy Computer

Wireless (Buoy) –
Sonar (Buoy)

Sonar (Buoy) –
Sonar (Dolphin)

Wireless –
Ground station

• Pose and position determined through active sonar relay system.
Blue & Red Eco-Dolphin

Phase 3

• Cooperatively missions such as surveillance or environmental monitoring.

• Send and receive high volume message, including pictures through wireless network when it is surfaced.

• Communicating small volume messages, commands and status under water through acoustic sensor network.

• The fleet can relay message from ground station (Laptop) to surfaced AUV, then from surfaced AUV to submerged team members to fulfill mission cooperatively.
Conclusion

- AUV Research and Development
- Testing and Simulation
- Building a Cooperative fleet of AUV’s
- Mathematical modeling and underwater mapping
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