

Joint Interagency Field Experimentation (JIFX)

22-1

1 – 5 November 2021

Experiments at the
Sea Land Air Military Research (SLAMR)
Laboratory



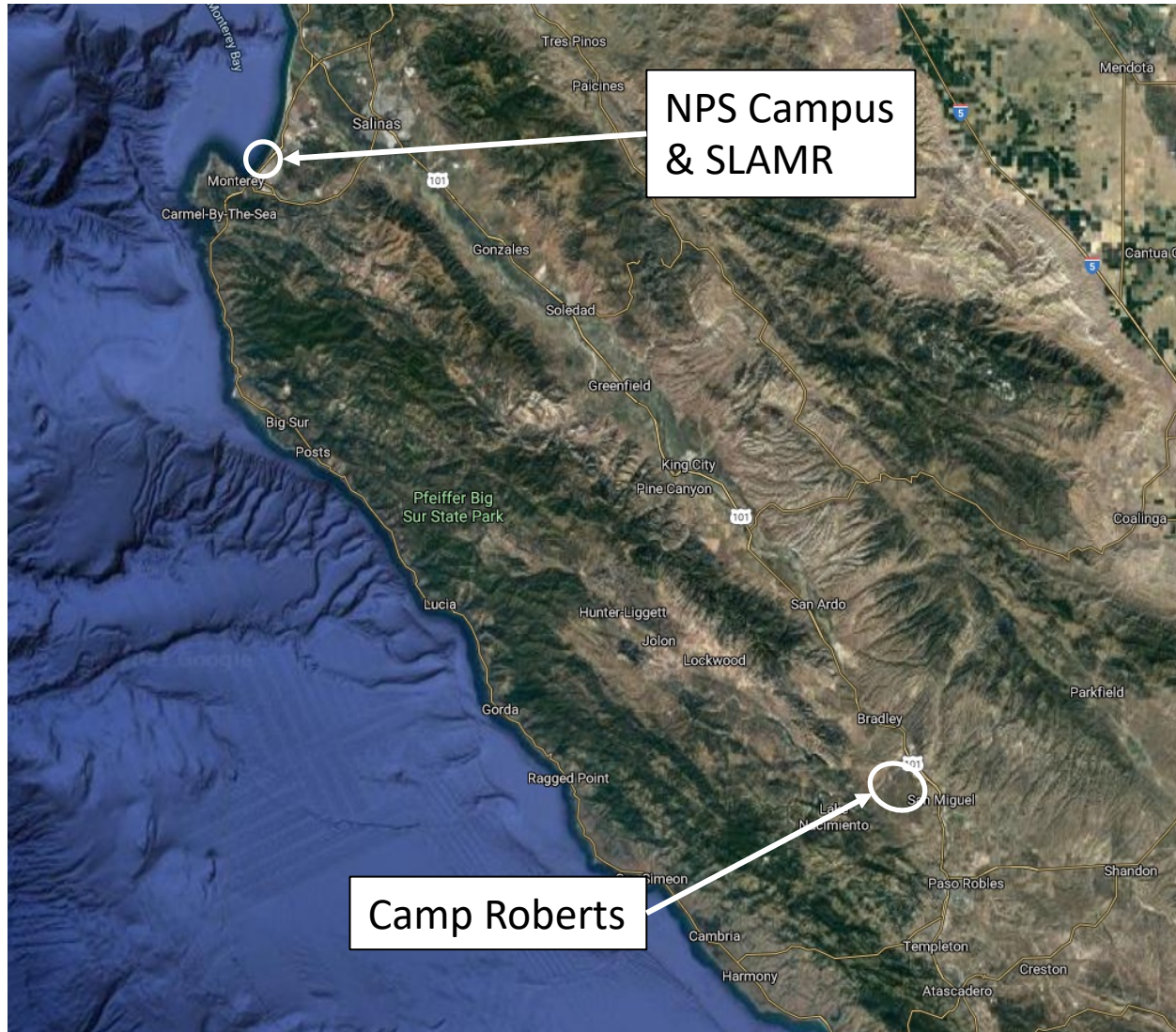
Prepared By:
Michael Richardson
JIFX Director
mrichard@nps.edu
As of: 19 October 2021





JIFX Sites

Camp Roberts & SLAMR





SLAMR Facility Location

1951 Del Monte Avenue Monterey, California 93943



NPS Main Campus





JIFX 22-1 Experiment Schedule for SLAMR November 2021



- 31 October
 - Site Final Prep
- 1 November
 - 0800-1200: Experimenters Registration and Set Up
 - 1300: Inbrief
 - 1400-1700: Experimentation
 - 1700: Daily Experimenters Outbrief
- 2 – 4 November
 - 0800: Daily Ops Brief
 - 0900-1700: Experimentation
 - 1700: Daily Experimenters' Outbrief
- 5 November
 - 0800-1200: Site Clearance





B-01: AT&T Robodog



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)
NPS JIFX 22-1 | 1 – 5 November 2021 | SLAMR



PROJECT INFORMATION

Organization Name:	AT&T Public Sector Solutions
Principal Investigator:	Seth Henneman
Funding Source:	Internally
Research Area of Interest:	B) Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Capability Currently Used By:	US Military, Private Industry

PROPOSED EXPERIMENT OVERVIEW

AT&T will demonstrate the ability to remotely control a robot dog (i.e., quad-legged unmanned ground vehicle) over the AT&T LTE/5G mobility network. The demonstration will test the autonomy of the robot dog using navigation waypoints sent from the AT&T Integrated Command Center (ICC) over the AT&T network. It will also test the ability to stream video from the robot dog’s camera to the ICC over the AT&T network. Finally, the demonstration will test video object detection and alerting by the ICC application for objects such as human beings and suspicious packages detected from the robot dog’s video stream.

SYSTEM DESCRIPTION

AT&T’s demonstration will be composed of three primary system components: (1) The AT&T Integrated Command Center (ICC) is a single-pane-of-glass application that provides situational awareness and provides integrated command and control across multiple IoT solutions including remote sensing and near real-time alerts. (2) The Ghost Robotics Vision 60 is a quad-legged unmanned ground vehicle deployed as a persistent security robot. (3) The AT&T LTE/5G mobility network provides fast, reliable, and secure mobility service.

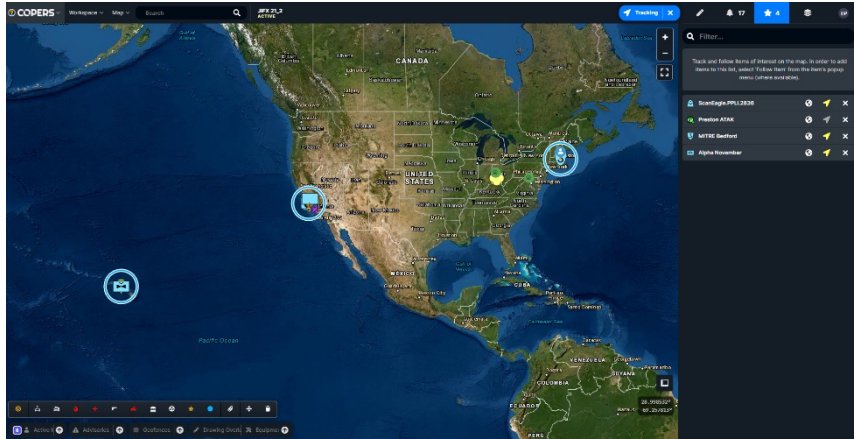




B-04: Multi-Institutional All Domain C2 for UXS



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)
NPS JIFX 21-3 | 1-5 November 2021 | SLAMR and Camp Roberts



PROJECT INFORMATION

Organization Name:	Naval Postgraduate School
Principal Investigator	Mr Steve Mullins
Funding Source	Federally
Research Area of Interest	Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Capability Currently Used By:	US Military, Government First Responder Organizations (federal, state, or local), Other federal entity (non-military, non-first responder)

PROPOSED EXPERIMENT OVERVIEW

Simultaneous Multi-Institutional, Multi-Domain COP Experiment

- Led by NPS and AFRL using the AFRL COPERs System
- Experiment will integrate position and activity information from multiple UxS platforms operated by different institutions (academic, government, and industry) into a shared Common Operational Picture system over globally significant distances

Objectives:

- Explore simultaneous input and display from multiple UxS/sensor nodes to a common COP viewed in a COCOM HQ environment.
- Identify barriers to information sharing related to the control and integrated situational awareness of multiple UXS systems owned by different institutions in multiple environments

TECHNICAL INFORMATION

AFRL COPERs system is the foundation for this experiment but there will be data ingested from UXS and sensor systems from various experiment platforms participating in JIFX 22-1 from various distributed locations.





D-01: DuckLink Deployable Sensor and Communications Network



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)
NPS JIFX 22-1 | 1 – 5 November 2021 | SLAMR & Camp Roberts



PROJECT INFORMATION

Organization Name:	Project OWL
Principal Investigator:	Bryan Knouse
Funding Source:	Federally
Research Area of Interest:	D) Communication and Networking
Capability Currently Used By:	US Military, Private Industry, NonProfit Organizations (NPOs)

PROPOSED EXPERIMENT OVERVIEW

Project OWL wants to test several DuckLink devices in a professional environment with Department of Defense experts to observe and collect data on system efficacy in a complex environment.

This can be at NPS, in a dense urban location there, on water, a ship, or some combination thereof. This network will be set up to test 1) the time investment to setup a network of 20-30 mesh devices, 2) the data throughput of the network for communications, 3) the data throughput of the network for sensors, 4) the maximum achieved number of different sensors on a network, and 5) the scale of data (in kilobytes) collected in the cloud software platform. Project OWL will work with NPS to design the experiment in best alignment with Department of Defense.

SYSTEM DESCRIPTION

Project OWL's DuckLink device is a simple, cost-effective wireless hardware node that can deploy in networked clusters and automatically sync with other DuckLinks in the area. Many of these devices may be deployed to rapidly build mesh networks in austere locations. Project OWL has closed several Air Force SBIR/STTRs, including a recent Phase II STTR concluded with Columbia University sponsored by Air Force 724 STG. Project OWL can include a variety of sensors on these DuckLink devices to leverage the networks for either communications or sensing, depending on defense-focused need.





D-02: Seamless Integration of HF/VHF/LTE/Satcom

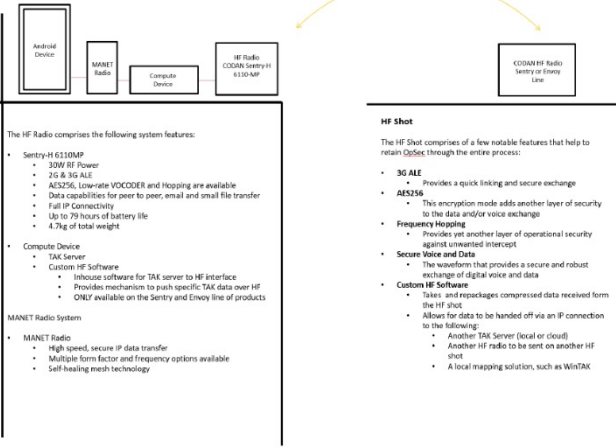


Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)

NPS JIFX 22-1 | 1 – 5 November 2021 | SLAMR & Camp Roberts

PROJECT INFORMATION

Organization Name:	NVIS Communications LLC
Principal Investigator:	Graham Kyle
Funding Source:	Internally
Research Area of Interest:	D) Communication and Networking
Capability Currently Used By:	US Military, Government First Responder Organizations (Federal, State, or Local), Other Federal Entities (Non-Military and Non-First Responder), Private Industry, On-Governmental Organizations (NGOs)



- Tactical Edge Services**
- ATK
 - Codan Xtends
- Tactical Edge:**
At the tactical edge, the following services are available to the warfighter:
- ATK (Android Tactical Awareness Kit)**
 - COT/PLI Data
 - Soldier to Soldier Voice, Data and Messaging
 - Tactical map display (cached to device)
 - Team Tracking
 - Codan Xtends**
 - HF Voice calling
 - Secure and Digital
 - Low VOCCODER rates, AES256 encryption and hopping are available
 - HF Text Messaging
 - Secure and Digital
 - HF to HF messaging platform

PROPOSED EXPERIMENT OVERVIEW

NVIS Communications principal goal is to show the efficacy of blending multiple RF pathways (using both COTS and MIL-STD equipment) into a scalable system design that is easy to use.

This design will accomplish three goals:

- Act as a gateway for a “bring your own device” paradigm, where foreign military, various; Federal, State & Local entities, and even various military services branches can come together in commonality. This gateway will provide voice, data, limited NIPR network and ATK data capabilities, locally. As well as multi-pathway, long distance back-haul solution.
- Provide the ability to drop, restrict or remote kill device access when OpSec has been compromised.
- Be seamless and easy to use to the end user so that they may concentrate on the mission and/or task at hand.

SYSTEM DESCRIPTION

This integrated solution contains multiple RF platforms that are interconnected via IP. The following pathways have been integrated to reinforce the idea of scalability: MANET mesh, Private LTE, NIPR, V/UHF (P25), HF (3G ALE, Digital Data & Voice) and SATCOM (Iridium Certus).

The key is that each device provides secured voice & data products and TAK integration.





G-01: Overhead Threat Detection and Classification Using a Hosted Payload Buoy Network

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)

NPS JIFX 22-1 | 1 – 5 November 2021 | SLAMR



PROJECT INFORMATION

Organization Name:	HyperKelp, Inc.
Principal Investigator:	Costas Solar
Funding Source:	Internally
Research Area of Interest:	G) Situational Awareness
Capability Currently Used By:	The capabilities being explored are not yet fielded

PROPOSED EXPERIMENT OVERVIEW

We will deploy a mesh network of four HyperKelp supersonic detection buoys in the outdoor SLAMR facility. As a sound source (speaker assembly) is moved to several locations near the sensing buoys, the HyperKelp network will automatically detect, track, and report on the source's position. This speaker assembly will produce various simulated sonic booms and other aircraft signatures. Aircraft signatures will be classified by onboard processors, and this process will trigger an alert to be relayed back to a command center. Data containing the sound source's location, speed, and bearing will be transmitted to our cloud server using existing satellite constellations. Key experimental capabilities include the ability to track mobile overhead threats with high precision, categorize different varieties of overhead threats in situ, and relay relevant data from the edge to a command center.

SYSTEM DESCRIPTION

HyperKelp's system consists of a network of satellite-connected buoys. Each contains an onboard computer, satellite communication module, and multiple sensors used to detect, characterize, and classify overhead threats. The systems onboard computers allow for on-edge data processing, which triggers alerts that are sent to a command center. In situ sensing and processing enable minimal use of communications pathways because the bulk of data generated by HyperKelp's sensors is analyzed automatically and on site. This allows HyperKelp to only transmit key, high value information to the command center.





G-04: Modelspace Live: a digital platform for Special Operations



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)
NPS JIFX 22-1 | 1 – 5 November 2021 | SLAMR



PROJECT INFORMATION

Organization Name:	Modelspace Incorporated
Principal Investigator:	John Kolb
Funding Source:	Internally
Research Area of Interest:	G) Situational Awareness
Capability Currently Used By:	The capabilities being explored are not yet fielded

PROPOSED EXPERIMENT OVERVIEW

The team at modelspace will show JIFX a novel approach to military mission planning. Our experiment will look at the overall processes of planning an operation, collecting mission critical information, and curating an element/service specific machine readable data set. We will do this faster, with better accuracy and through data-driven procedures than the current state.

SYSTEM DESCRIPTION

modelspace Live is a software solution aimed at providing a data-driven backbone to the military mission command process. Live Plan, is an automated mission planning program, intent on retooling the mission planning process. Live Plan will allow service members to collaborate across elements and services, efficiently and with more accuracy create approval-ready products, and curate a machine-readable database allowing for novel analysis of operations.





G-05: Automatic Identification System integration into Situational Awareness Platforms

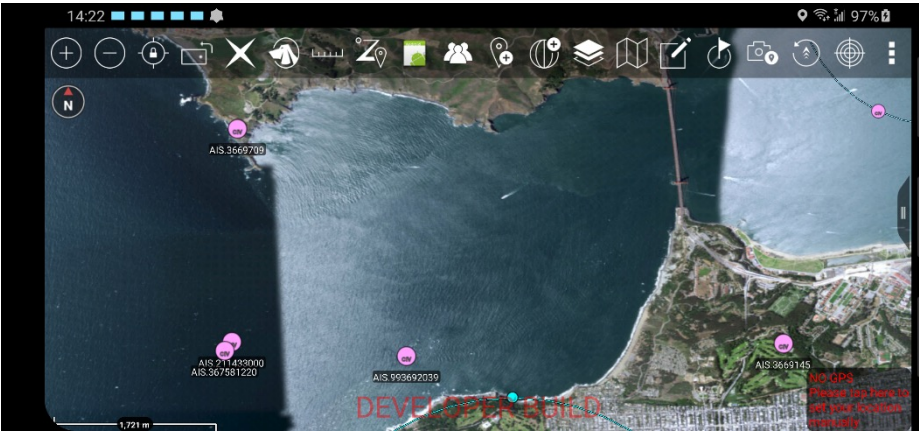
Naval Postgraduate School Joint Interagency Field Experimentation (JIFX)

NPS JIFX 22-1 | 1 – 5 November 2021 | SLAMR



PROJECT INFORMATION

Organization Name:	San Francisco Wireless Emergency Mesh
Principal Investigator:	Greg Albrecht
Funding Source:	Non-Profit
Research Area of Interest:	F) Intelligence, Surveillance, and Reconnaissance (ISR)
Capability Currently Used By:	Government First Responder Organizations (Federal, State, or Local), Nonprofit Organizations (NPOs), Non-Governmental Organizations (NGOs)



PROPOSED EXPERIMENT OVERVIEW

Solutions that field this capability today tend to rely on proprietary "GOTS" technology. This experiment tests the ability to replicate this capability for a wider audience, including Civil Authorities and Partner Organizations, using "COTS" components and Open Source technologies.

SYSTEM DESCRIPTION

The system under test will utilize commercial-off-the-shelf "COTS" radios in both the HF and Microwave radio-bands to bridge last-mile and long-haul connections between an End-User Device "EUD" and another EUD, or an EUD with a Situational Awareness sharing platform. Primarily the software utilized in each of these roles is one of ATAK, WinTAK, TAK Server or other similar "Cursor-on-Target"-based products.





Where It's Happening On Site



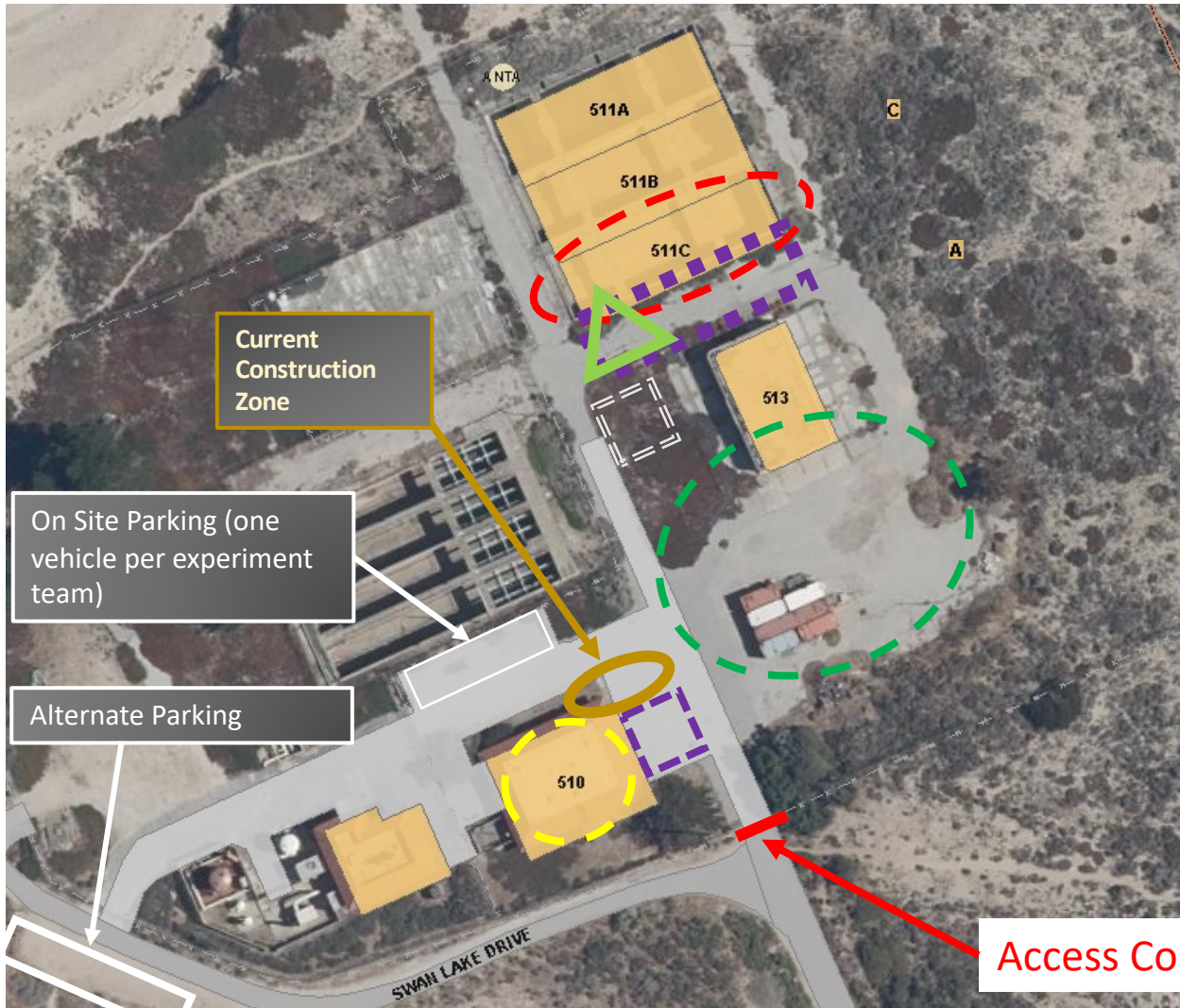
Bldg 511C (AE1)
G-01, Buoy Network, *Hyper Kelp*

Tent adjacent to AE1
B-04, COPERS, AFRL + NPS

Aquatic Environment 1

Adjacent to Bldg 513
B-01: Robodog, AT&T
D-01, Sensor & Comms, *Project OWL*
G-04, modelSpace, *ModelSpace, Inc.*
G-05, Auto ID for SA, *SF Wireless*

JIFX at SLAMR Site Plan



JIFX Ops and Support



JIFX Registration & Site Ops



Temp Latrine & Hand Wash Station



JIFX Experiment Support Site



Tent

Site for Virtual Briefings with Camp Roberts Experimenters

513

Garage

Experimenters



511C

G-01, Buoy Network, *Hyper Kelp*
B-04, COPERS, AFRL + NPS



513

Asphalt Pad

Adjacent to Bldg 513
B-01: Robodog, AT&T
D-01, Sensor & Comms, *Project OWL*
G-04, modelSpace, *ModelSpace, Inc.*
G-05, Auto ID for SA, *SF Wireless*

Access Control

Current Construction Zone

On Site Parking (one vehicle per experiment team)

Alternate Parking

SWAN LAKE DRIVE

JIFX at SLAMR Site Plan

- Power Outlet
- TOC (Tent)
- Generator
- Porta-John
- Platform & Alt Launch
- Stairs





SLAMR Site Orientation



Aquatic Environment (AQE)

Entry

To NPS





Aquatic Environment #1 (AE1)





Primary Launch & Recovery





Alternate Launch & Recovery





SLAMR Facility Location

1951 Del Monte Avenue Monterey, California 93943





Directions To the SLAMR Facility



- Most direct approach from HWY 1 is to exit on Casa Verde Way and turn to the West (towards the water) towards Del Monte Avenue, then left onto Del Monte Avenue at the light.
- Facility is only approachable from the North on Del Monte Avenue
- It will be a right turn (road 1951) as you are opposite Del Monte Lake (on the left) just past the Naval Postgraduate School facility sign on the left.
- Immediately after turn there is a STOP sign for the Monterey Peninsula Recreation Trail – Please exercise caution as pedestrian/bike traffic can be inattentive to vehicles.
- After STOP continue straight and the SLAMR gate will be in front of you. Proceed in and park in designated space. If no space available park in alternate lot as directed by JIFX site representative. Do not block the gate, driveway through site or any doors.
- If gate locked, contact your JIFX POC for access.

