

APPLYING FASTER WATER BOOMING TECHNIQUES to COASTAL ENVIRONMENTS

“BOOMING of BOLINAS LAGOON PRESERVE”



*Bolinas Sits on the Ground
by the Sea, Sky Overhead.
- R. Creeley*

***APPLYING FASTER WATER BOOMING TECHNIQUES
to COASTAL ENVIRONMENTS***

“BOOMING of BOLINAS LAGOON PRESERVE”

Presented by

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REASONS for CONCERN OVER BOLINAS LAGOON

- ***1971 COLLISION of the ARIZONA STANDARD
and the OREGON STANDARD***
(840,000 GALLONS SPILLED in SAN FRANCISCO BAY)
- ***2007 M/V COSCO BUSAN INCIDENT***
- ***RARE, THREATENED or ENDANGERED SPECIES***
- ***ECOLOGICAL VALUES***
- ***NARROW LAGOON MOUTH and FAST MOVING WATERS
CREATES VULNERABILITY***
- ***DIFFICULT to INTERPRET and IMPLEMENT
Area Contingency Plan for BOLINAS LAGOON***

JANUARY 19, 1971

COLLISION of the ARIZONA STANDARD and the OREGON STANDARD

At 2:00 am in Dense Fog

840,000 GALLONS SPILLED



***Barrier of
Boom and Hay***

***OIL CONTAINED USING BOOM,
LOGS, HAY AND CABLE
to CREATE a BARRIER
ACROSS the LAGOON MOUTH***

***INSTALLED
by
LOCAL
VOLUNTEERS***

***Bagged Hay
on Rope
Ready to
Be Deployed***



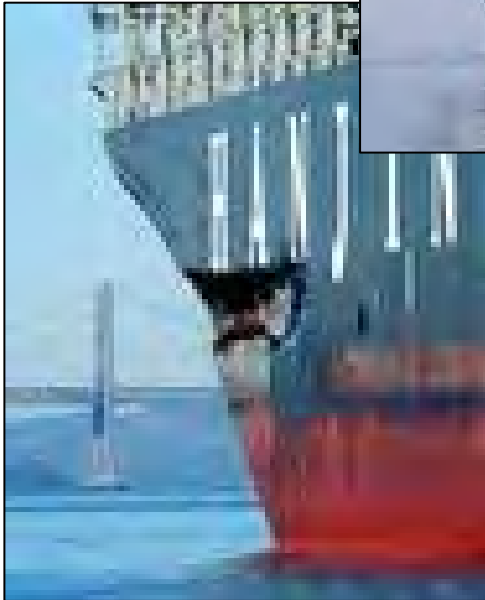
M/V COSCO BUSAN INCIDENT

November 7, 2007

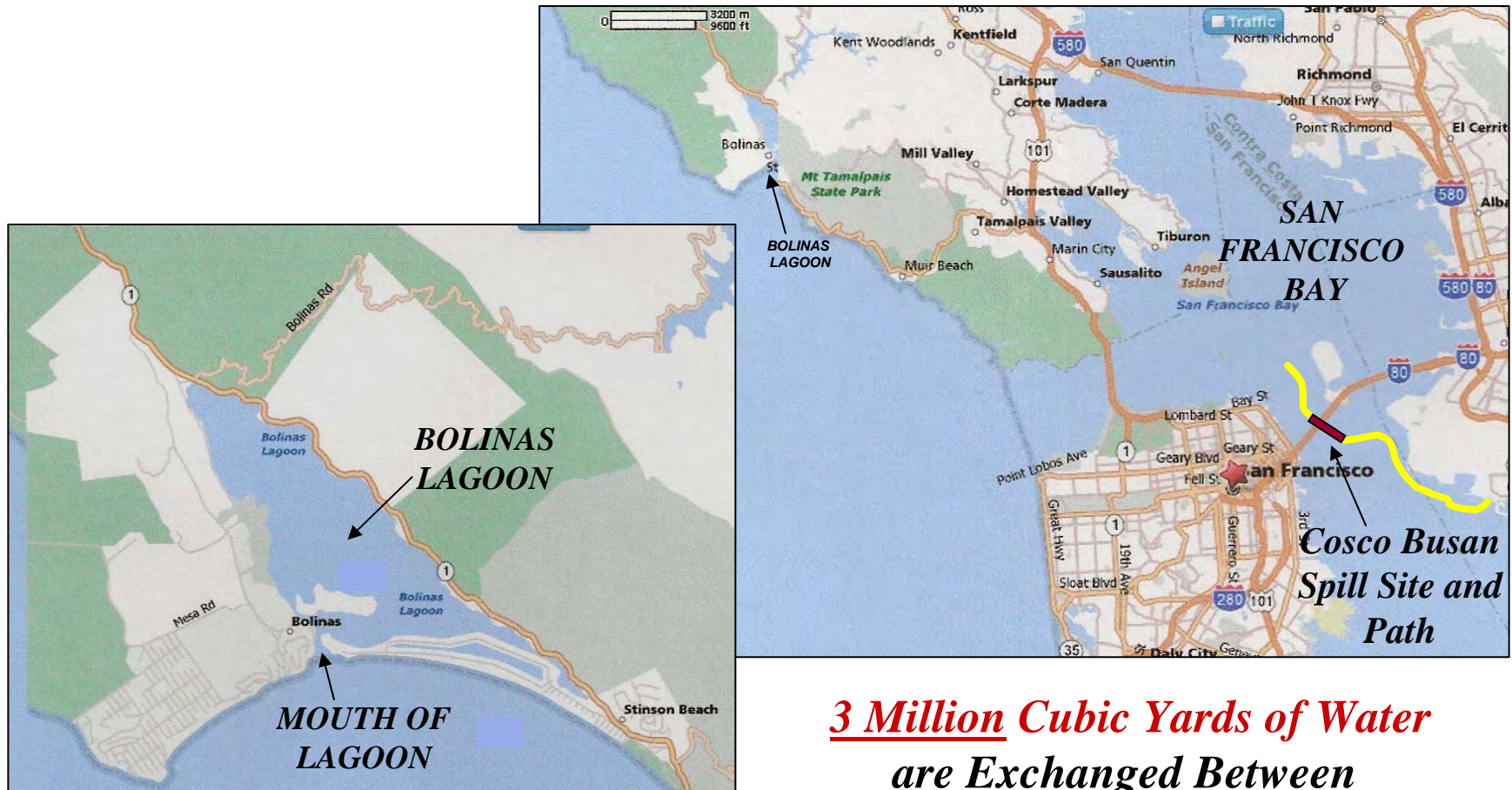
58,000 Gallons of Bunker Fuel in San Francisco Bay.

Struck the San Francisco - Oakland Bay Bridge

In Thick Fog.



M/V COSCO BUSAN INCIDENT



3 Million Cubic Yards of Water
are Exchanged Between
Bolinas Lagoon and the
Pacific Ocean with Each Tide.

San Pablo Bay

Point Reyes

Bolinas Lagoon

Long streak of sheen containing patches of brown oil.

Patches of silver sheen with tarballs.

Stinson Beach

Long streak of sheen containing brown oil.

Angel Island

Treasure Island

Long streaks of sheen containing patches of brown oil.

Long streak of sheen containing patches of brown oil.

Patches of silver sheen.

Long streak of sheen containing patches of brown oil.

Long streak of sheen containing patches of brown oil.

On the back side of the Berkley Marina patch of brown oil that appears recoverable. There are also ribbons of tarballs just off riprap.

Patches of silver sheens with tarballs.

Southern extent of oil is at 37° 42'N, 122° 19'W. Sheen containing tarballs and streaks of brown oil.

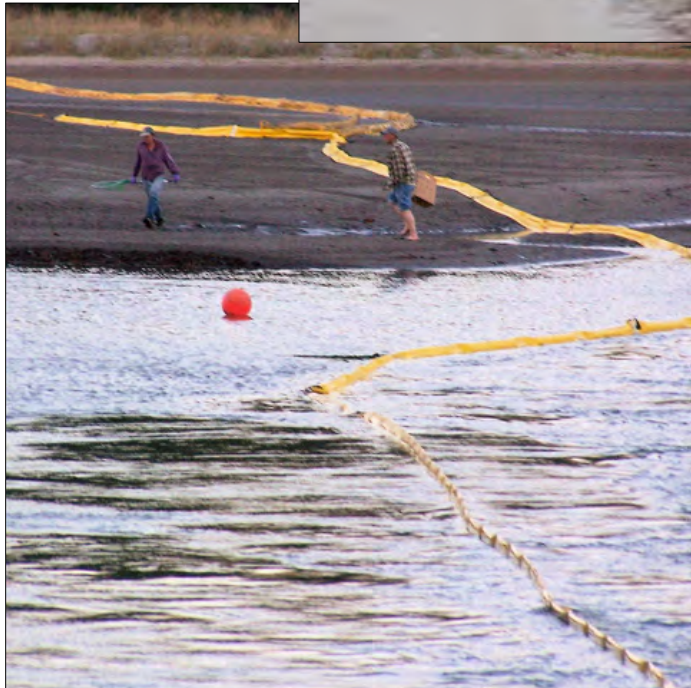
Hunters Point

San Francisco Bay

OIL PATH

Today's oil observations were difficult to map as the oil is very patchy and distributed over a large area. In general, the amount of observable oil has decreased. Much of the oil, tarballs, have collected along the edges of fronts (convergence zones) along with the flotsam and appear as a long linear features.

M/V COSCO BUSAN INCIDENT



***Local Citizens
Work to
Save Their
Lagoon Using
Borrowed
Boom***



M/V COSCO BUSAN INCIDENT



*On Day 2, US Coast Guard
positions 2 Skimming Vessels
2 – 3 miles offshore.*

*On Day 4, a Contractor
Attempts to
Boom Bolinas Lagoon.*

*They Gave Up after the
Fifth Boom broke.*



RARE,
THREATENED or ENDANGERED

3 Species of Amphibians
23 of Birds
3 of Mammals
that frequent Bolinas Lagoon



Great Blue Heron



*Black Crowned
Night Heron*

Marbled Murrelet



Water Egrets

Willetts



Brown Pelicans



ECOLOGICAL VALUES

*Breeding Ground for
Shellfish, Finfish,
Bottom Fish, and
Marine Organisms*

*Pupping Ground for
Harbor Seals*



Nesting Area for Herons, Egrets and other Wading Birds

*Stopover for Thousands of Migratory
Birds on the Pacific Flyway*



*Recreational
Resource
for Millions
of Citizens*

Surfer

*Harbor
Seals*



NARROW LAGOON MOUTH, FAST MOVING WATERS

Entrance to Bolinas Lagoon



Entrance to Bolinas Lagoon



DOWCAR INVOLVEMENT at BOLINAS LAGOON

***MULTIPLE BOOM DEPLOYMENT FAILURES in ATTEMPTS to
BOOM BOLINAS LAGOON DURING the COSCO BUSAN INCIDENT***

***US COAST GUARD Recommended DOWCAR
for FAST WATER BOOMING EXPERTISE***

***DOWCAR Contacted BY MARIN COUNTY
in DECEMBER, 2007***

***SITE VISIT Arranged to BOLINAS LAGOON
in APRIL, 2008***

***THREE DAY TRAINING and EXERCISE
Conducted in JULY, 2008***

UPON AGREEMENT WITH:

MARIN COUNTY OPEN SPACES

CALIFORNIA FISH & GAME - OFFICE of SPILL PREVENTION,

DOWCAR ENVIRONMENTAL MANAGEMENT, Inc.

Hired to Conduct 3 Day Oil Spill Response Course to

TEST LOCAL ACP for BOLINAS LAGOON

Using

FAST WATER BOOMING TECHNIQUES.

FAST WATER BOOMING TECHNIQUES

BANK to BANK ROPE ANCHOR SYSTEM

SHORTER, SMALLER BOOM

20° - 25° BOOM DEPLOYMENT ANGLE into WATER CURRENT

OVERLAPPING SEGMENTS

APPLICATION of TECHNIQUES for FAST WATER ENVIRONMENTS
(Such as Rivers)
to a
COASTAL ENVIRONMENT



***Cascade Diversionary Boom Deployment
Truckee River - Truckee, CA***



***Cascade Diversionary Boom Deployment
American River - Sacramento, CA***



*Cascade Diversionary Boom Deployment
Missouri River - Great Falls, Montana*



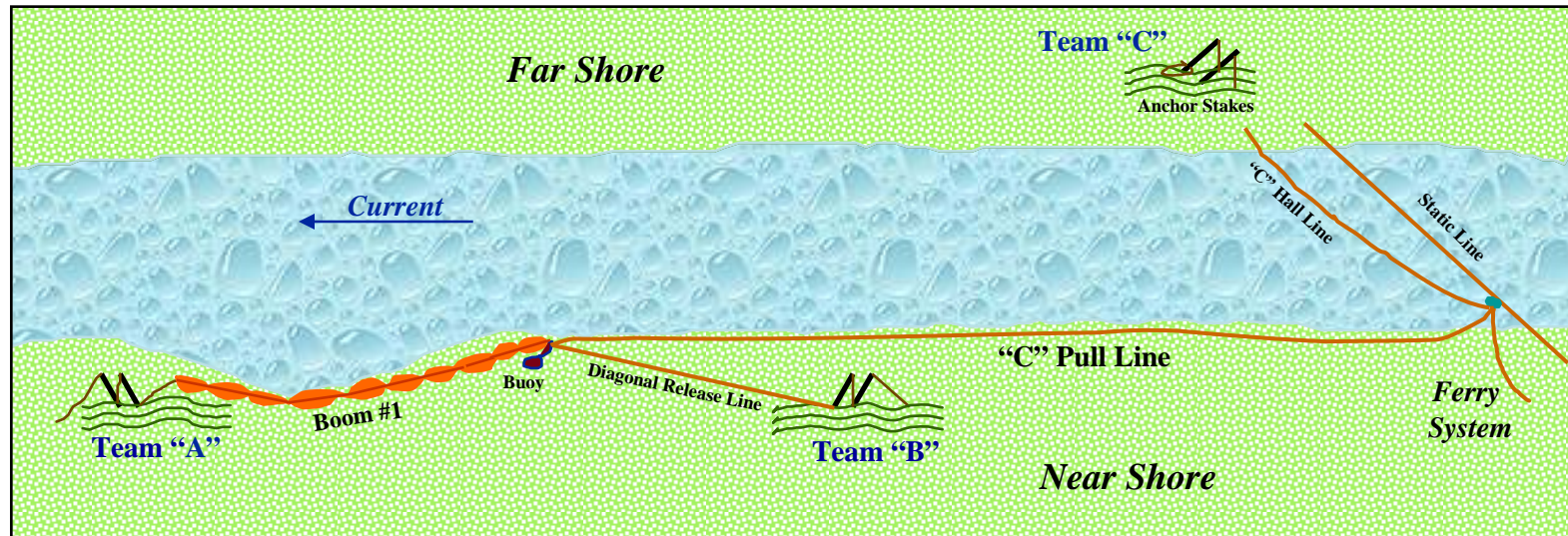
*Cascade Diversionary Boom Deployment
Colorado River - Laughlin, Nevada*



*Cascade Diversionary Boom Deployment with Shoreline Protection
Green River - La Barge, WY*

Fast River Boom Deployment

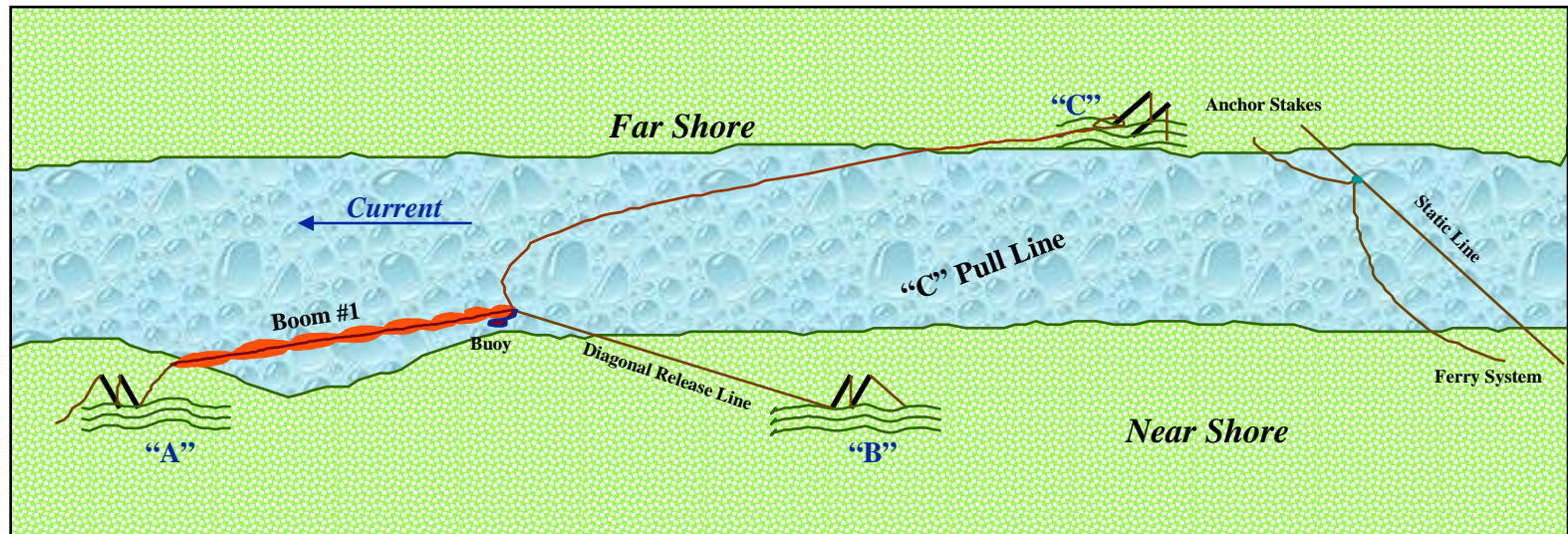
Step 1.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

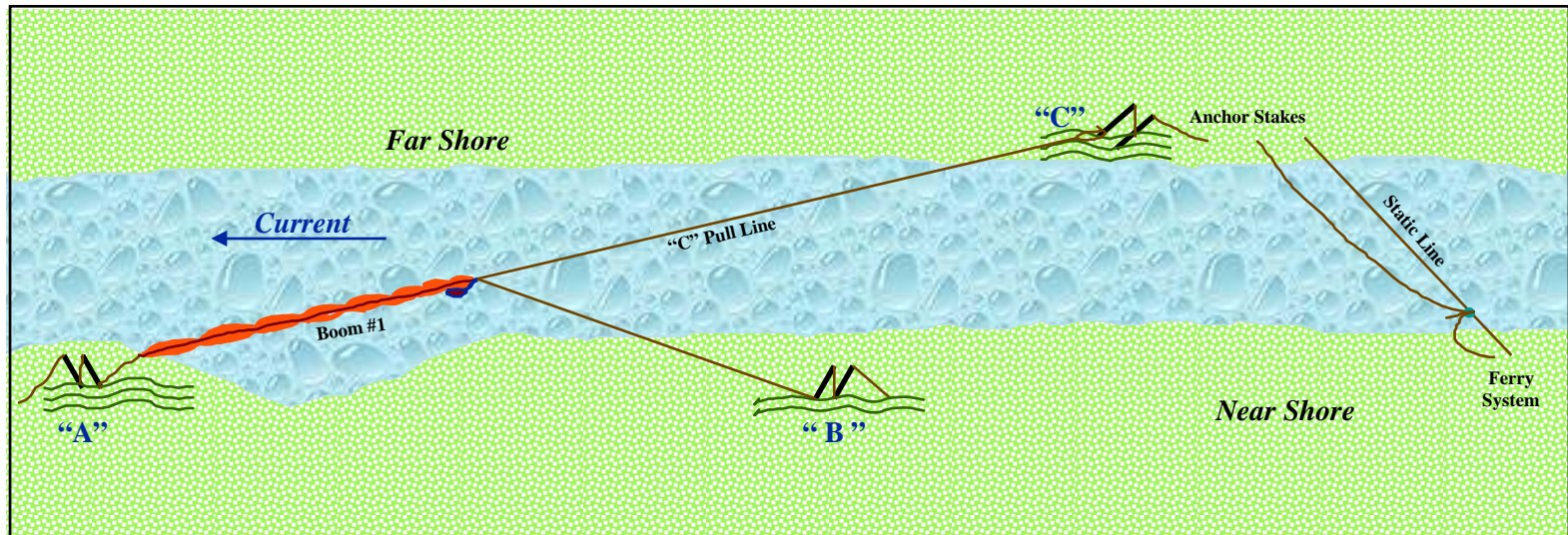
Step 2.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

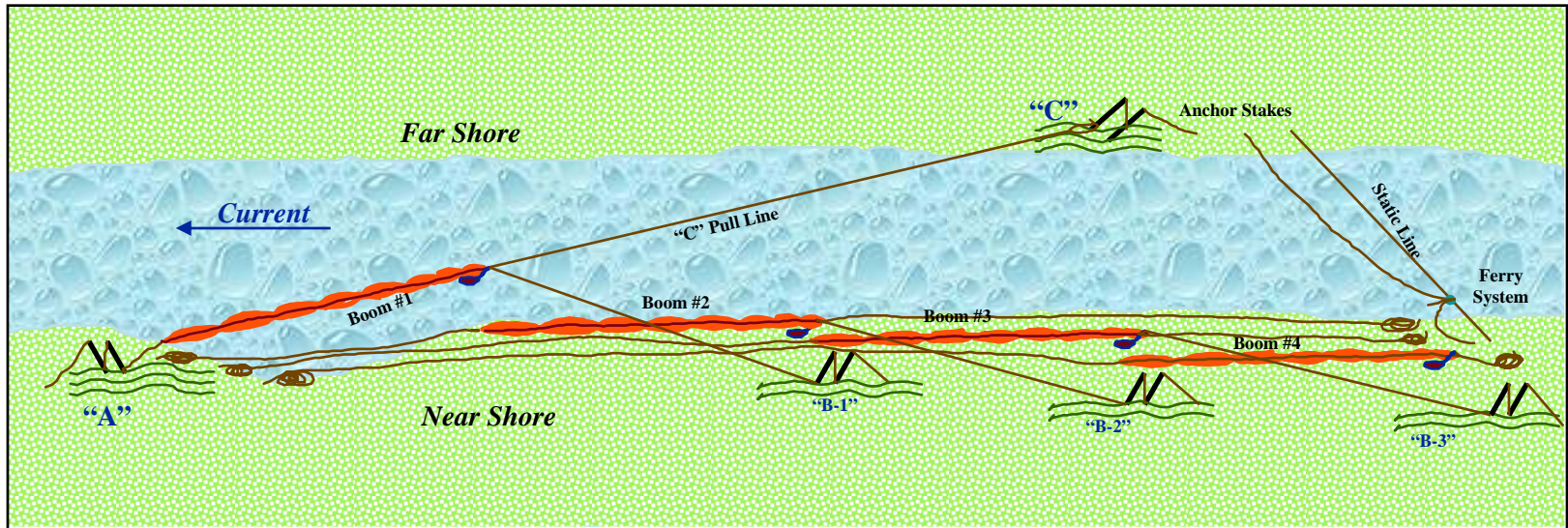
Step 3.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

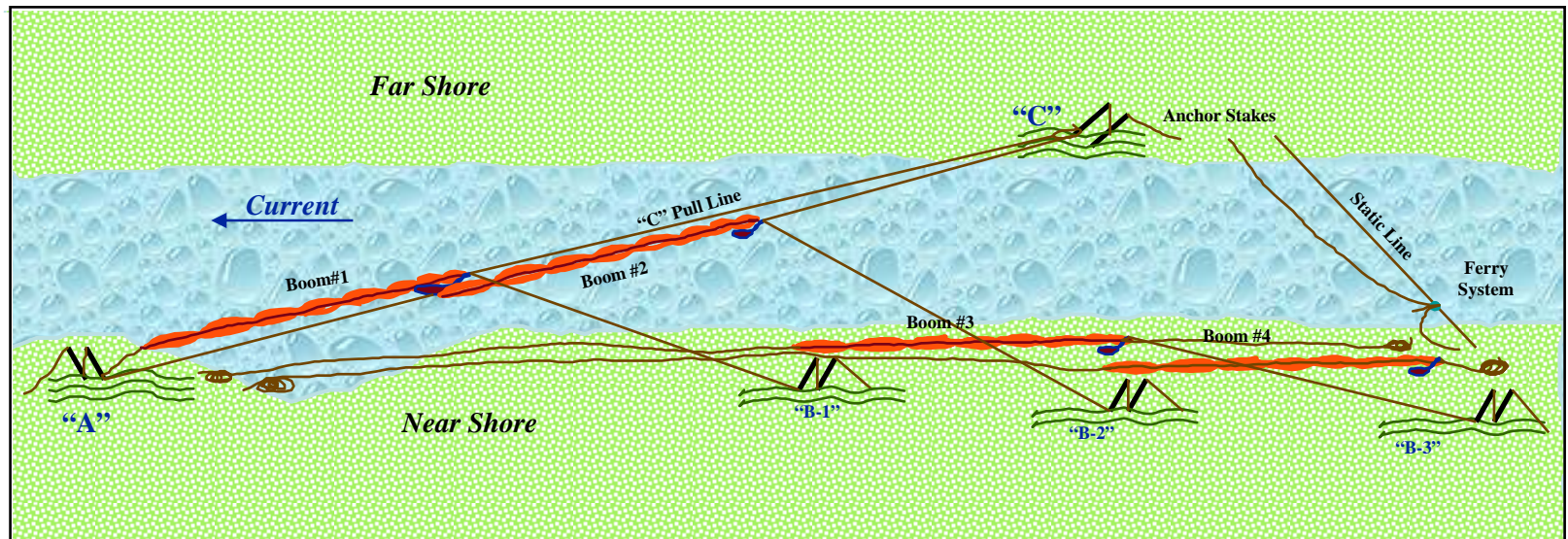
Step 4.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

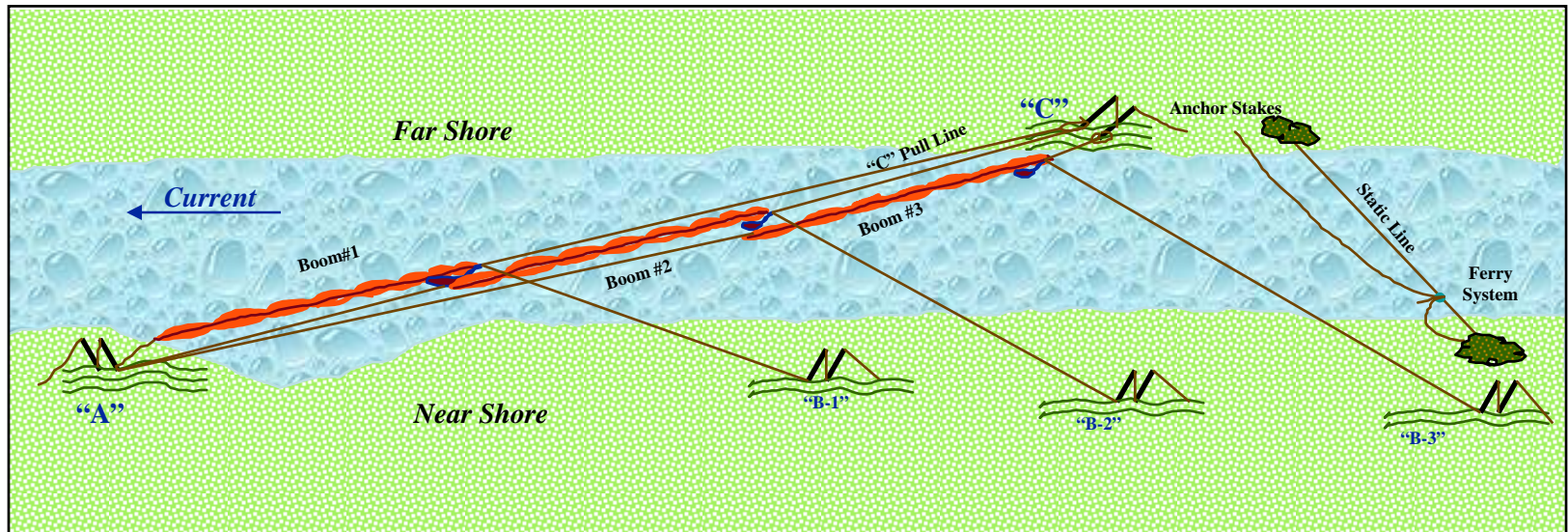
Step 5.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

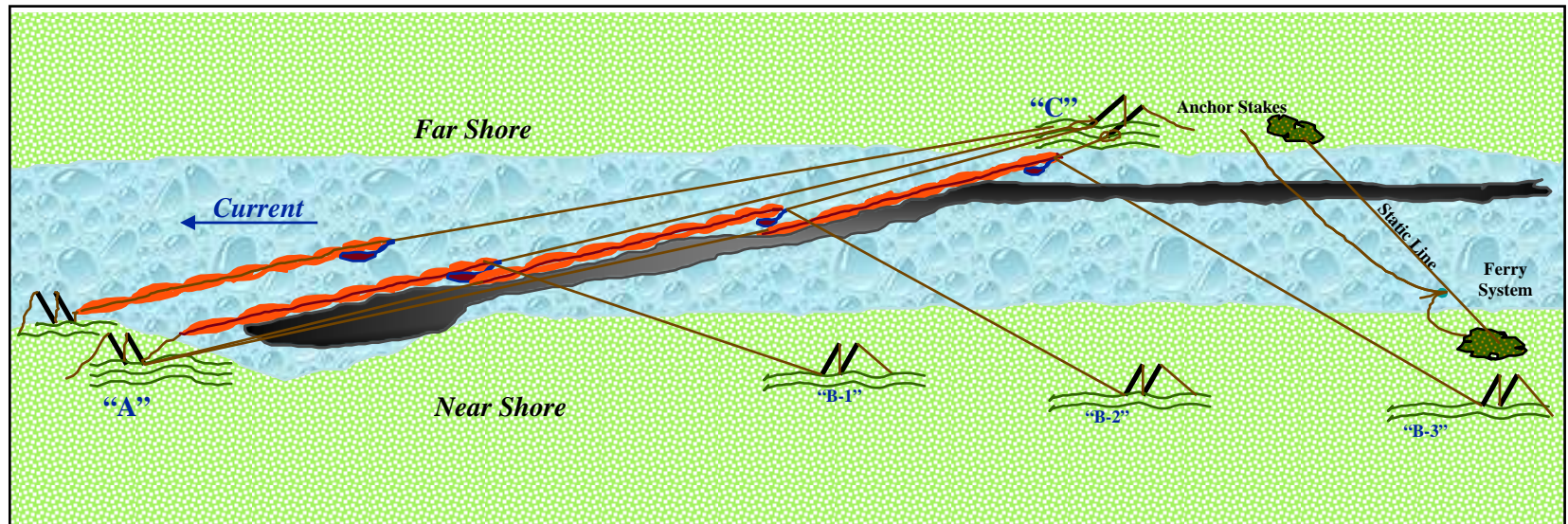
Step 6.



Bank to Bank Rope Anchor System

Fast River Boom Deployment

Step 7.



Bank to Bank Rope Anchor System

NARROW ENTRANCE to BOLINAS LAGOON is SIMILAR to FAST RIVERS

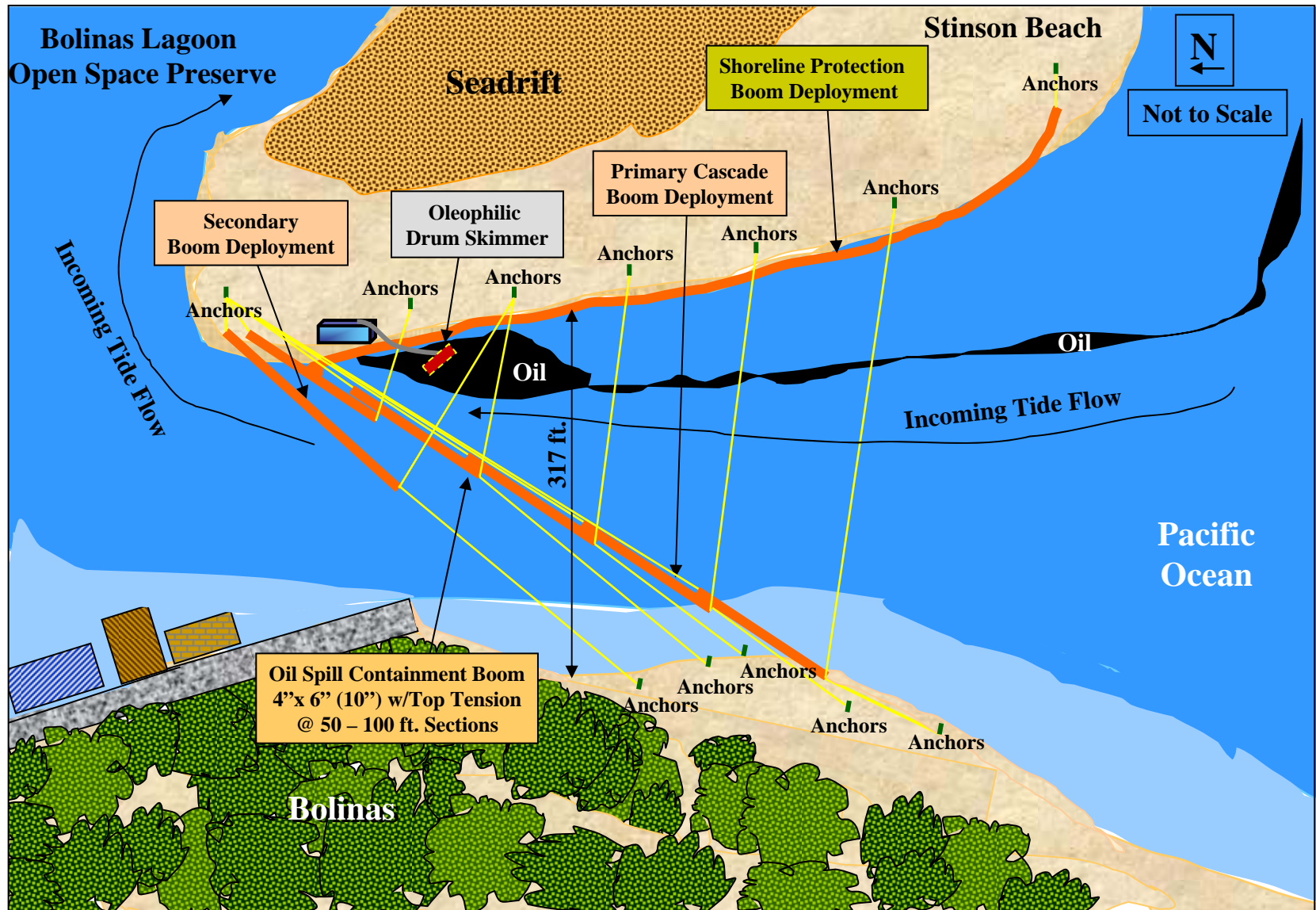


STRATEGY for BOOMING ENTRY to BOLINAS LAGOON

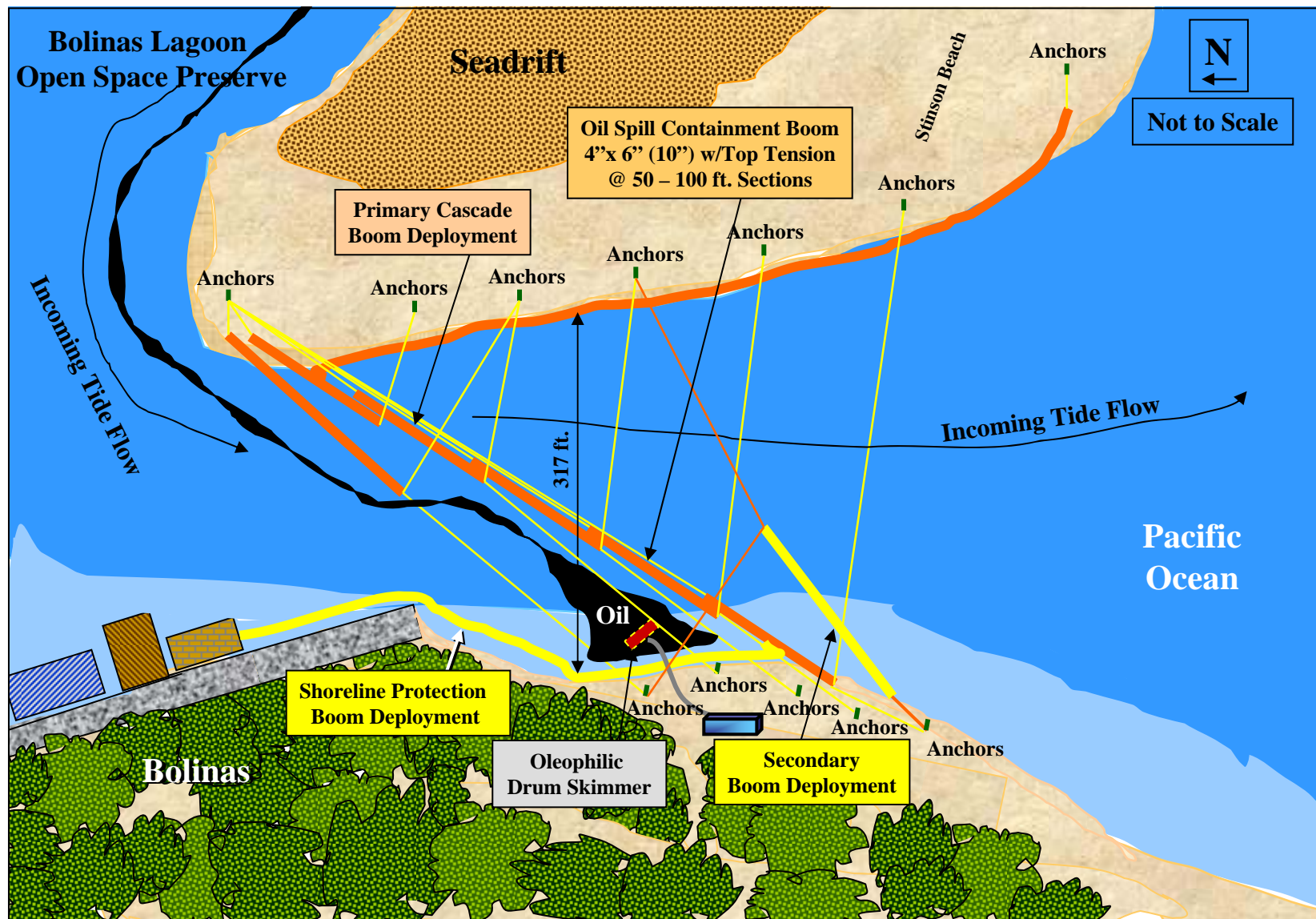


***Cascade Boom Deployment, Containment & Recovery Strategies - Bolinas Lagoon
High Tide Aerial Photos with Boom Deployment Overlay***

Cascade Boom Deployment, Containment & Recovery Strategies Bolin's Lagoon Open Space Preserve - Incoming Response Strategies



Cascade Boom Deployment, Containment & Recovery Strategies Bolinas Lagoon Open Space Preserve - Outgoing Response Strategies





Pacific Ocean

*Boom Laid Out Along the Shore
Preparing to Deploy Cascade System - 1st Exercise*



*Team "C" on Far Shore Locates Anchor Points
Pacific Ocean is Behind Them – 1st Exercise*



Two (2) Booms Deployed 1st Exercise

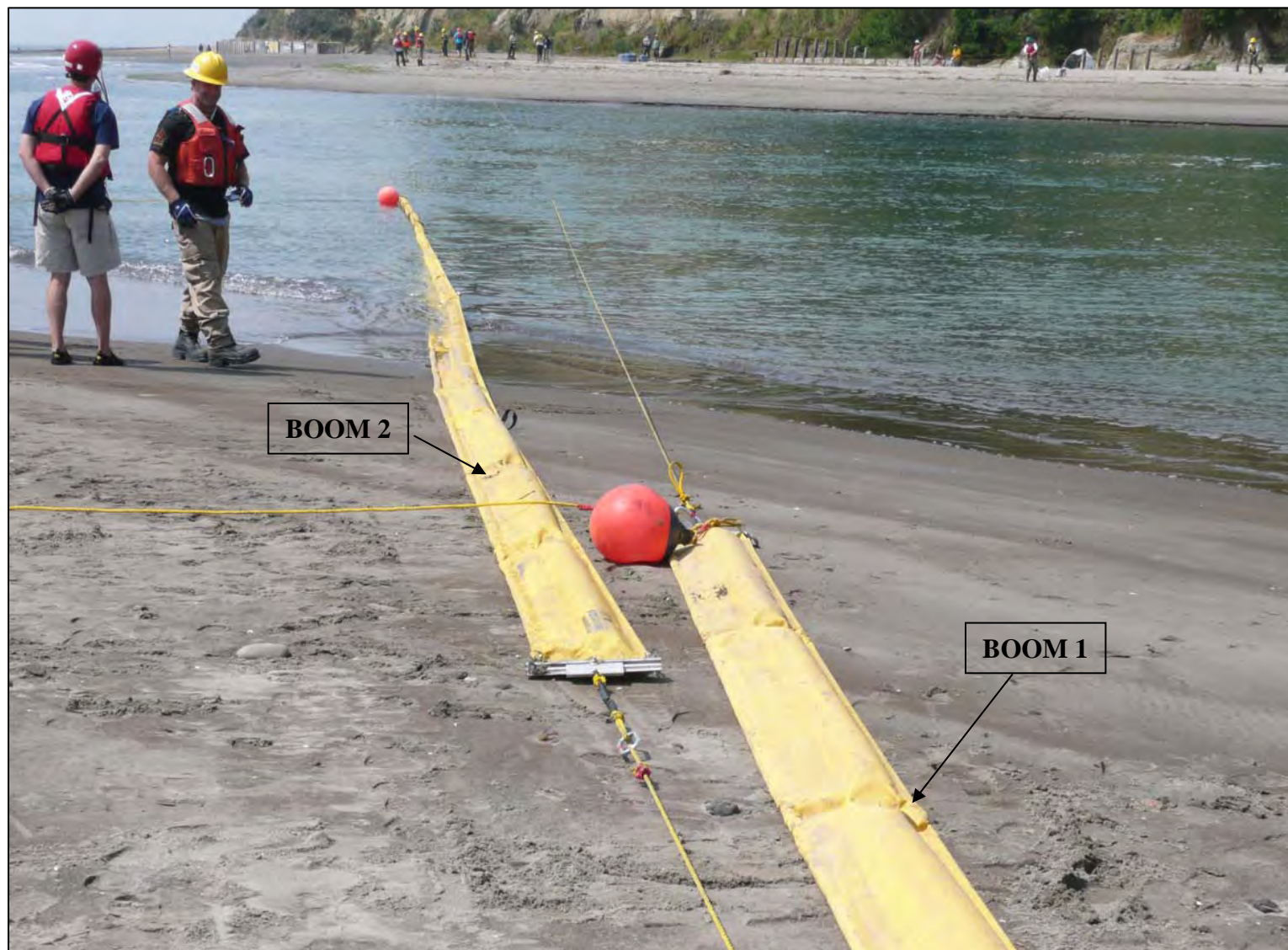


Four (4) Booms Deployed - 1st Exercise

INCREASED BOOM DEPLOYMENT ANGLE for 2nd EXERCISE BECAUSE

- ***NOT EXPECTING INCREASED CURRENT SPEED
BECAUSE of TIDAL CURRENT***
- ***PROBLEMS in ANCHORING on/or NEAR SEAWALL
DURING 1st EXERCISE***
- ***SAFETY CONCERNS of MOVING PERSONNEL with ANCHORING
LINES and ANCILLARY EQUIPMENT
THRU HIGH and FAST TIDAL WATERS ENROUTE to ANCHOR SITES***
- ***SUCCESS of DEPLOYING OIL SPILL CONTAINMENT BOOMS
in FAST WATER CASCADE SYSTEM
DURING 1st EXERCISE***

**APPLYING FASTER WATER BOOMING TECHNIQUES
to COASTAL ENVIRONMENTS**



***Boom 1 Deployed Onshore for High Tide
Boom 2 Deployed Toward Point on Opposite Shore - 2nd Exercise***

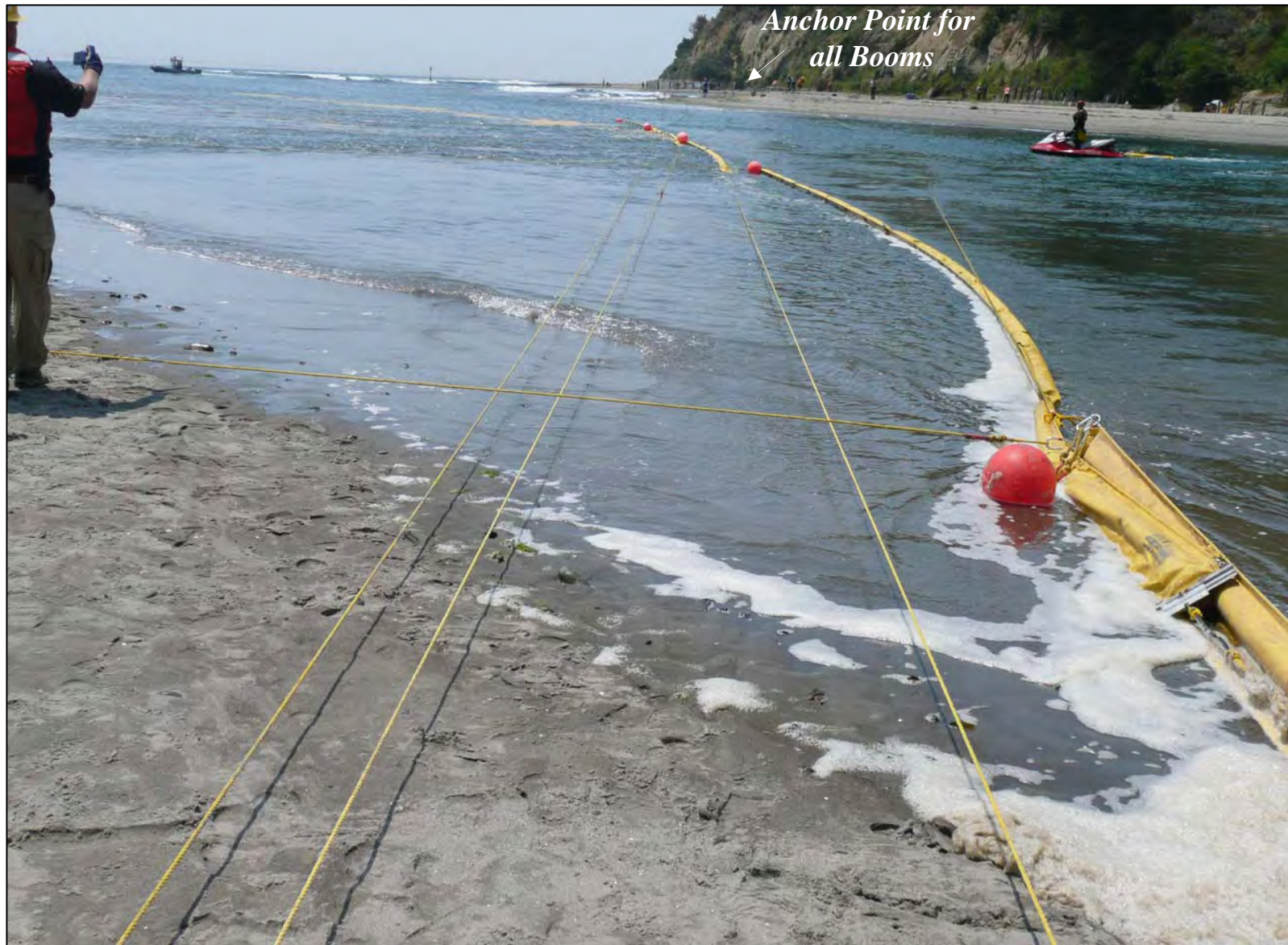
***APPLYING FASTER WATER BOOMING TECHNIQUES
to COASTAL ENVIRONMENTS***



***Four Booms Deployed
Boom 1 Onshore due to Low Tide in Anticipation of Incoming High Tide***



Four Booms Deployed - Containment of Rice Hulls Beginning



Cascade System is Catching Rice Hulls - 2nd Exercise



*Cascade System for Fast Water Environments
is Effective in a Coastal Water Environment*



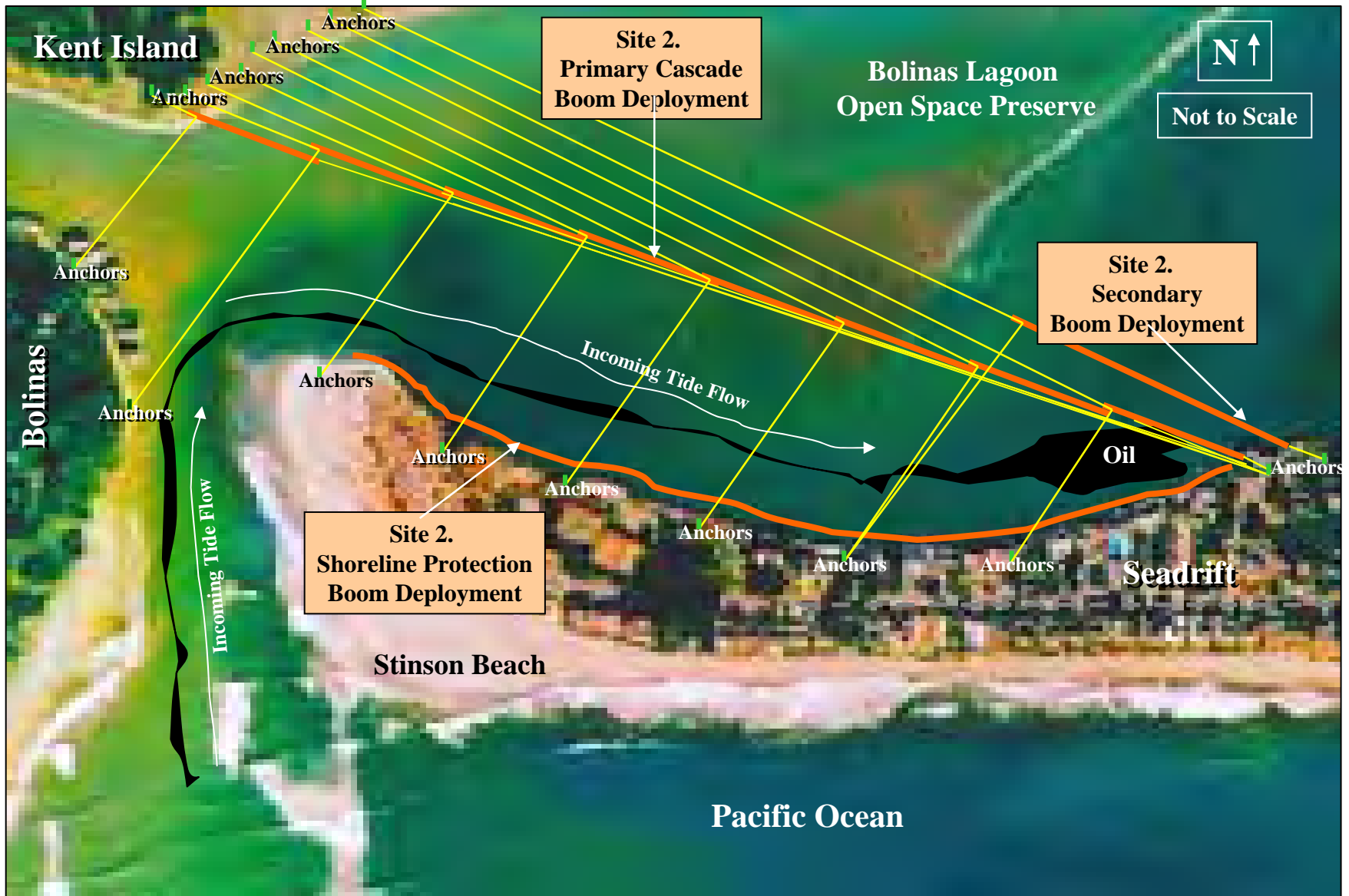
Five Booms Deployed

Boom Deployment, Containment & Recovery Strategies
Bolinas Lagoon Open Space Preserve - High Tide



Chevron Boom Deployment, Containment & Recovery Strategies

Incoming Tide - Photo with Boom Deployment Overlay



*APPLYING FASTER WATER BOOMING TECHNIQUES
to COASTAL ENVIRONMENTS*



Boom in 100' Lengths is Zig-Zagged on the Boat Ramp in Seadrift



Team Setting Up Anchor to Receive Boom



Jet Ski Ferries Line Attached to Boom to Anchor Team on Sand Bar Small Island



Team on Sandbar Island Pulls Line and Boom is Being Deployed

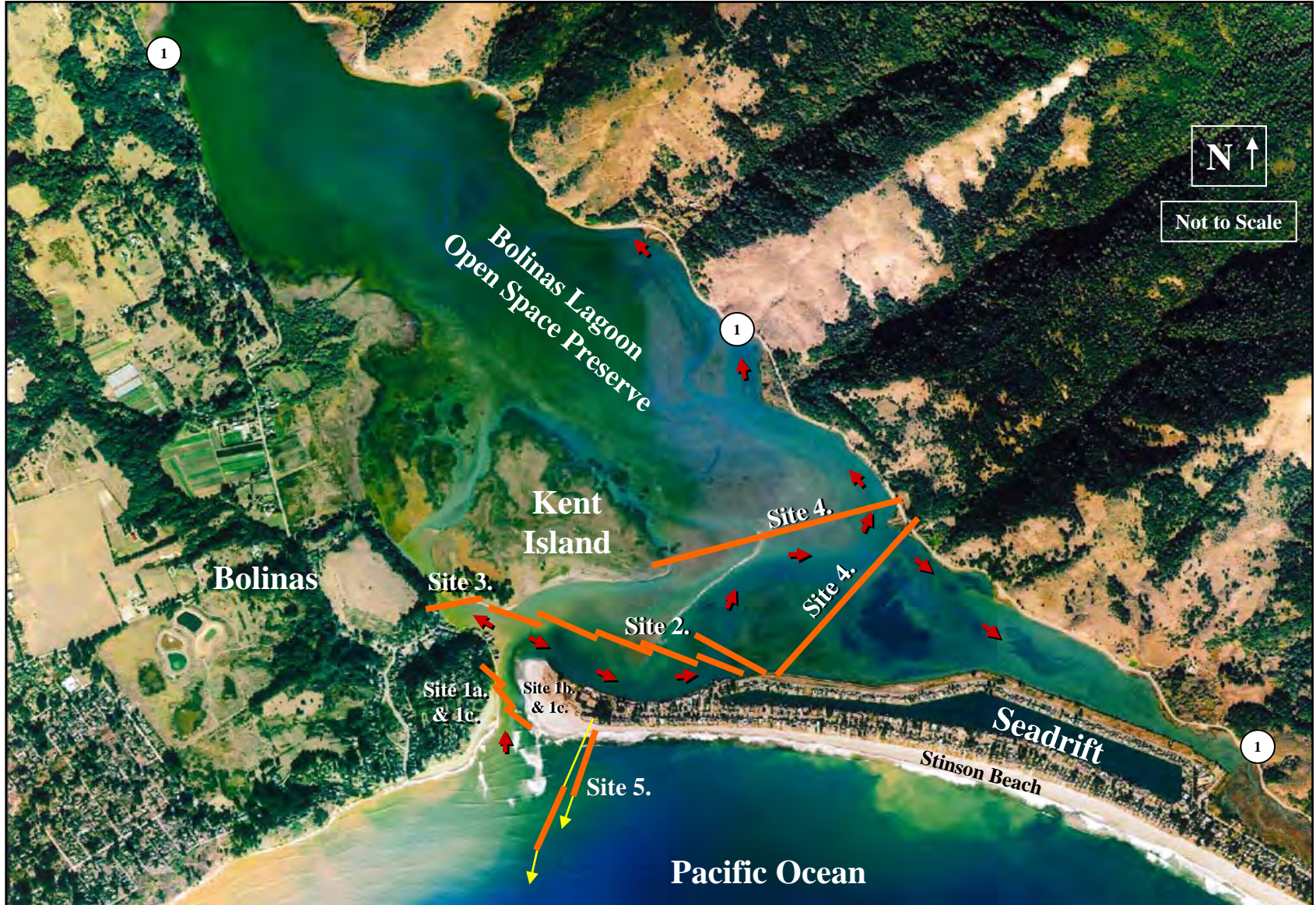


Shoreline Containment & Protection Boom Being Deployed



Team Waits to be Ferried back to Nearside Seadrift Boat Ramp as the Tide Comes in

*Boom Deployment, Containment & Recovery Strategies
Bolinas Lagoon Open Space Preserve - High Tide Aerial Photo*



LESSONS LEARNED

- ***UNREALISTIC EXPECTATIONS by PARTICIPANTS and OBSERVERS***
- ***OVERCROWDED CLASSROOM***
- ***INTRUSIVE MEDIA***
- ***TOO MANY REGULATORS***
- ***MEDIA EXPOSURE TOO SOON –
TECHNIQUE HAD NEVER BEEN TRIED***

OBSERVATIONS

- **COMMUNITY DRIVEN**
- **LOCAL RESIDENTS INVOLVED in EXERCISES AND TRAINING**
- **GOVERNMENT AGENCIES ALSO INVOLVED**
- **CONCEPTS of CASCADE SYSTEM INCORPORATED in RESPONSE STRATEGY**
- **FOLLOW-ON EXERCISES OCCURRING**

SUMMARY

- *FAST WATER STRATEGIES are a PART of BOLINAS LAGOON OIL SPILL RESPONSE*
- *SHORTER, SMALLER BOOM*
- *SMALLER ANGLES (LESS THAN 20°)*
- *OVERLAPPING SEGMENTS*
- *AGENCIES and LOCAL CITIZENS CONTINUE to WORK TOGETHER*

***APPLICATION of TECHNIQUES for
FAST WATER ENVIRONMENTS
(SUCH AS RIVERS)
to a
COASTAL ENVIRONMENT
PROVIDES MORE OPTIONS for SUCCESS
at BOLINAS LAGOON.***