

ACOUSTIC TELEMETRY OF DUNGENESS CRAB AT A NEARSHORE SEDIMENT DISPOSAL SITE



CURTIS ROEGNER



STEPHANIE FIELDS



COLUMBIA RIVER
ESTUARY CONFERENCE

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ASTORIA, OREGON
26 MAY 2016

MOTIVATION:

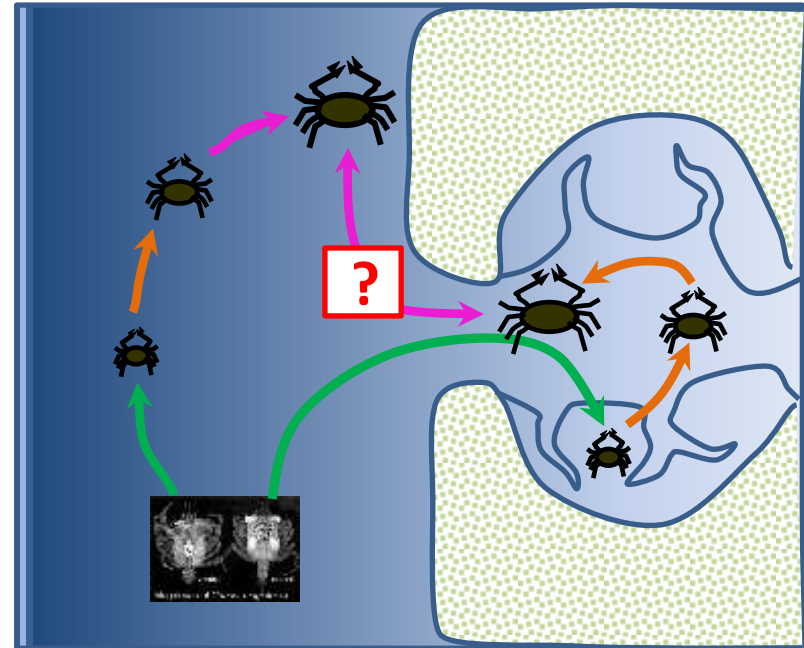
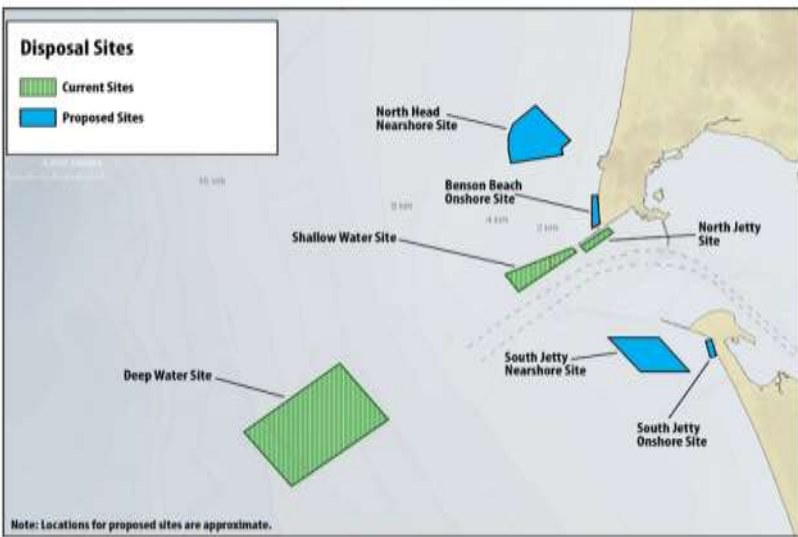
Channel maintenance operations

- Beach erosion mitigation
- Impact by dredging/sediment deposition

Recruitment to estuarine systems

- Habitat use in estuary and near shore
- Migration timing & triggers

Network of Regional Disposal Sites



Armstrong et al. 1986



Monitoring Approaches



Crab pots

Abundances of crab (traditional tool)



Baited Lander

Relative abundances before and after a disposal event



Video Sled

Densities in control and impact areas

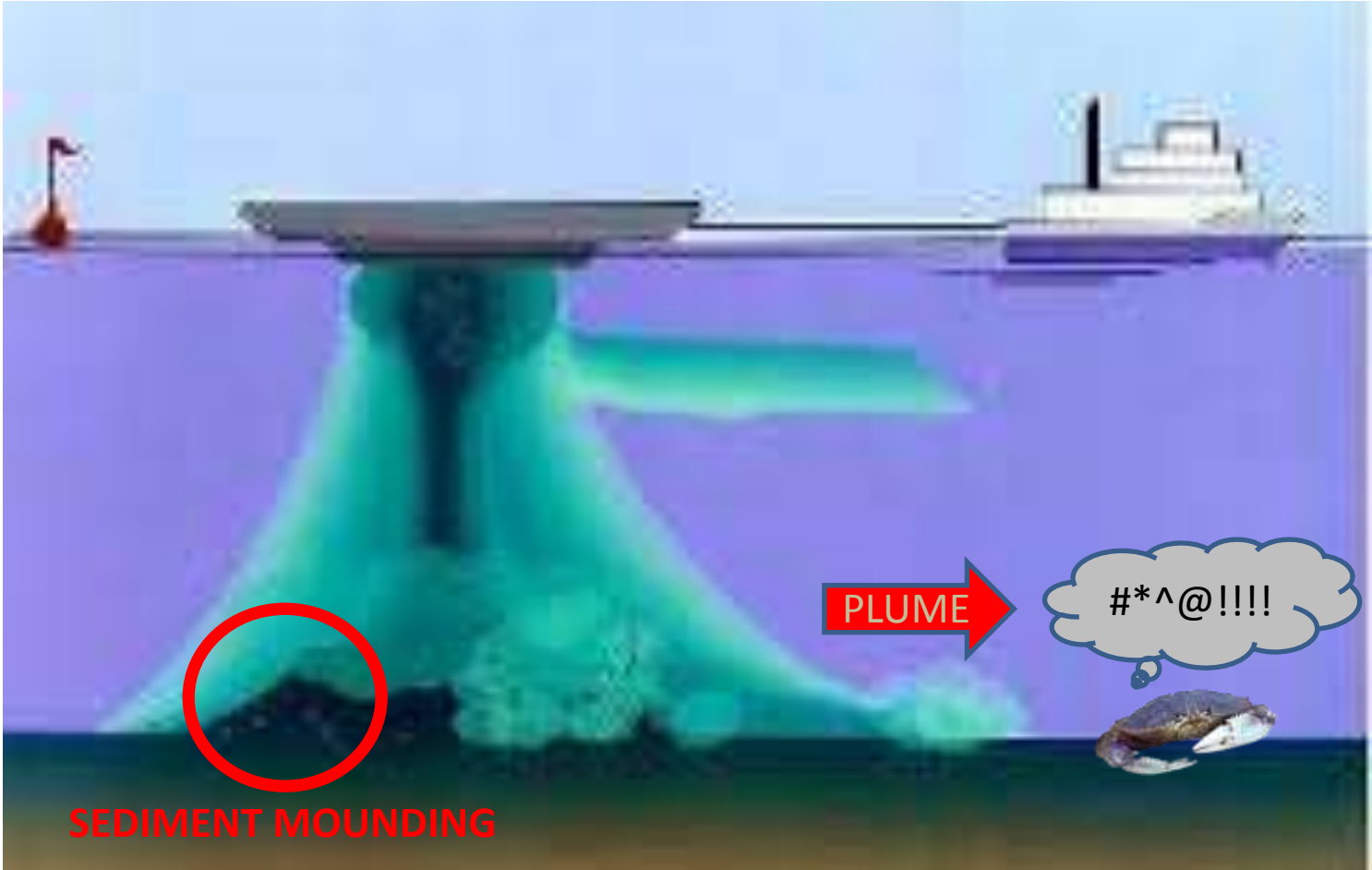


Acoustic Tags

Movement of crabs in control and impact areas

SEDIMENT DEPOSITION PLUME

THIN SHEET DEPOSITS



DEPOSITION EVENTS



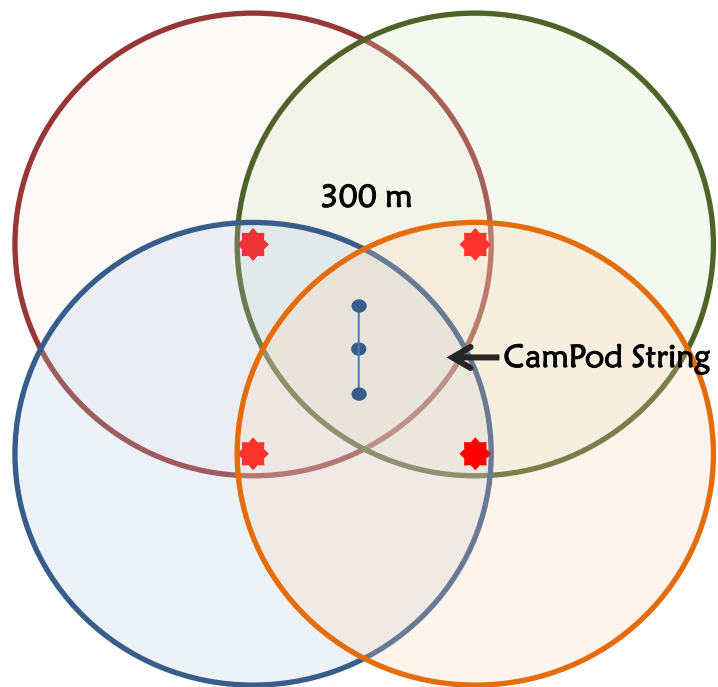
ACOUSTIC NODE ARRAY



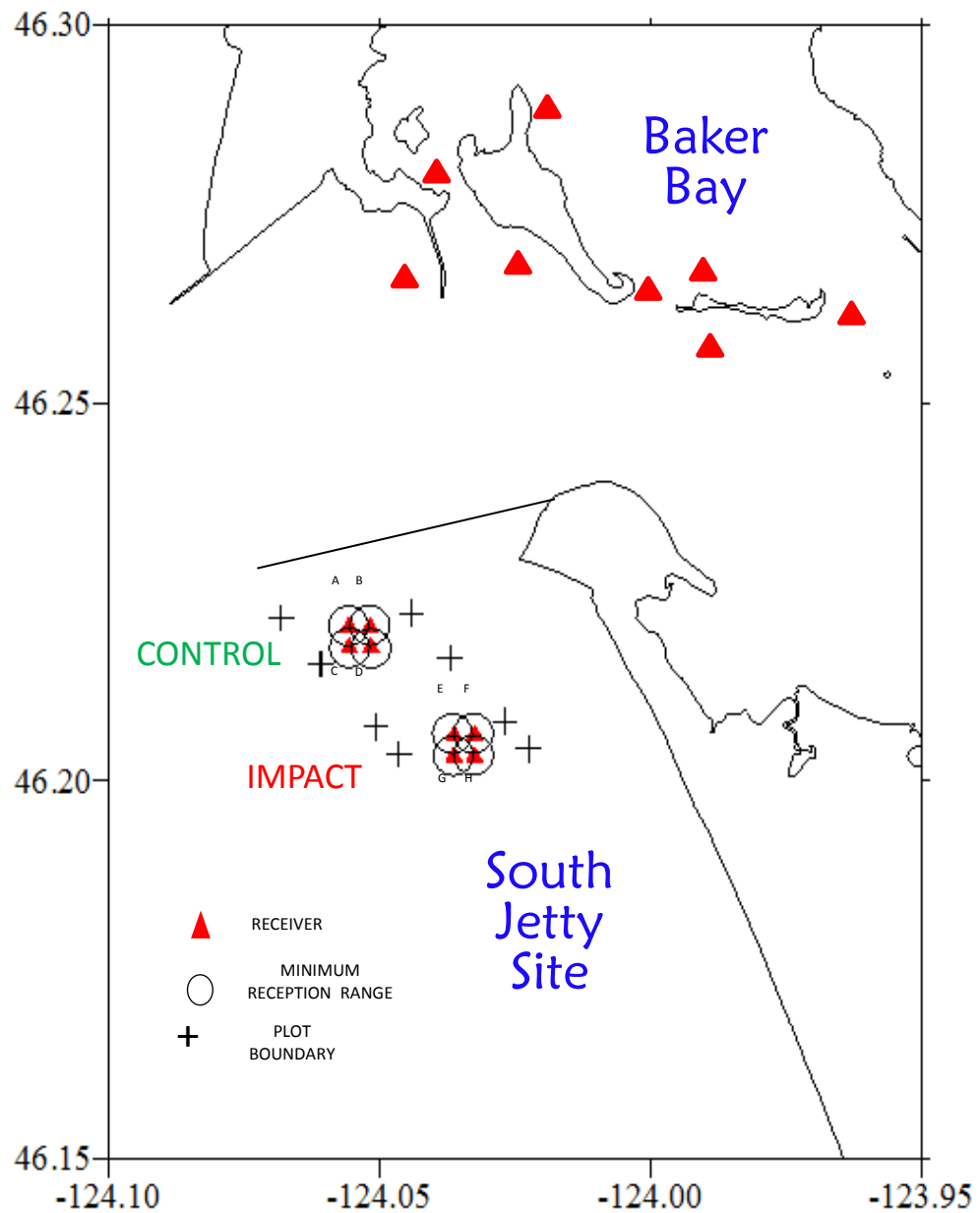
RECEIVER



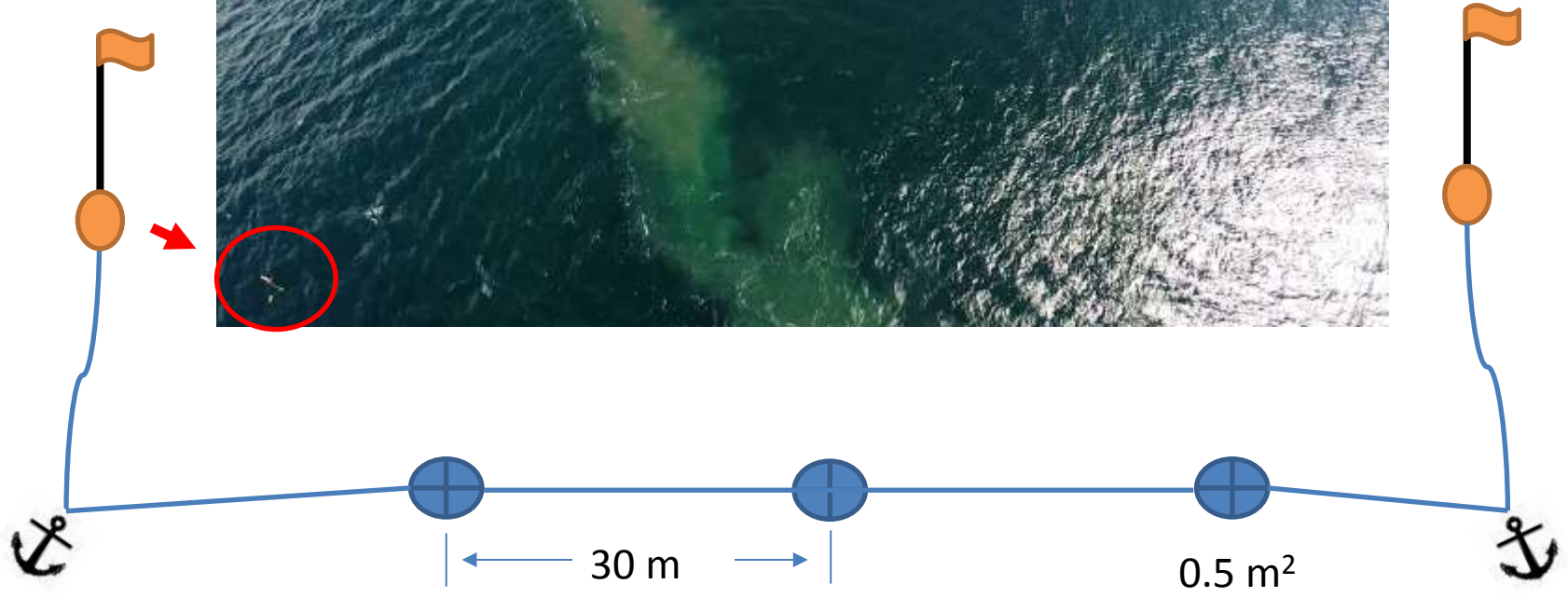
TAGGED CRABS



RECEPTION RANGE



SEDIMENT DEPOSITION EVENT (DRONE'S EYE VIEW)

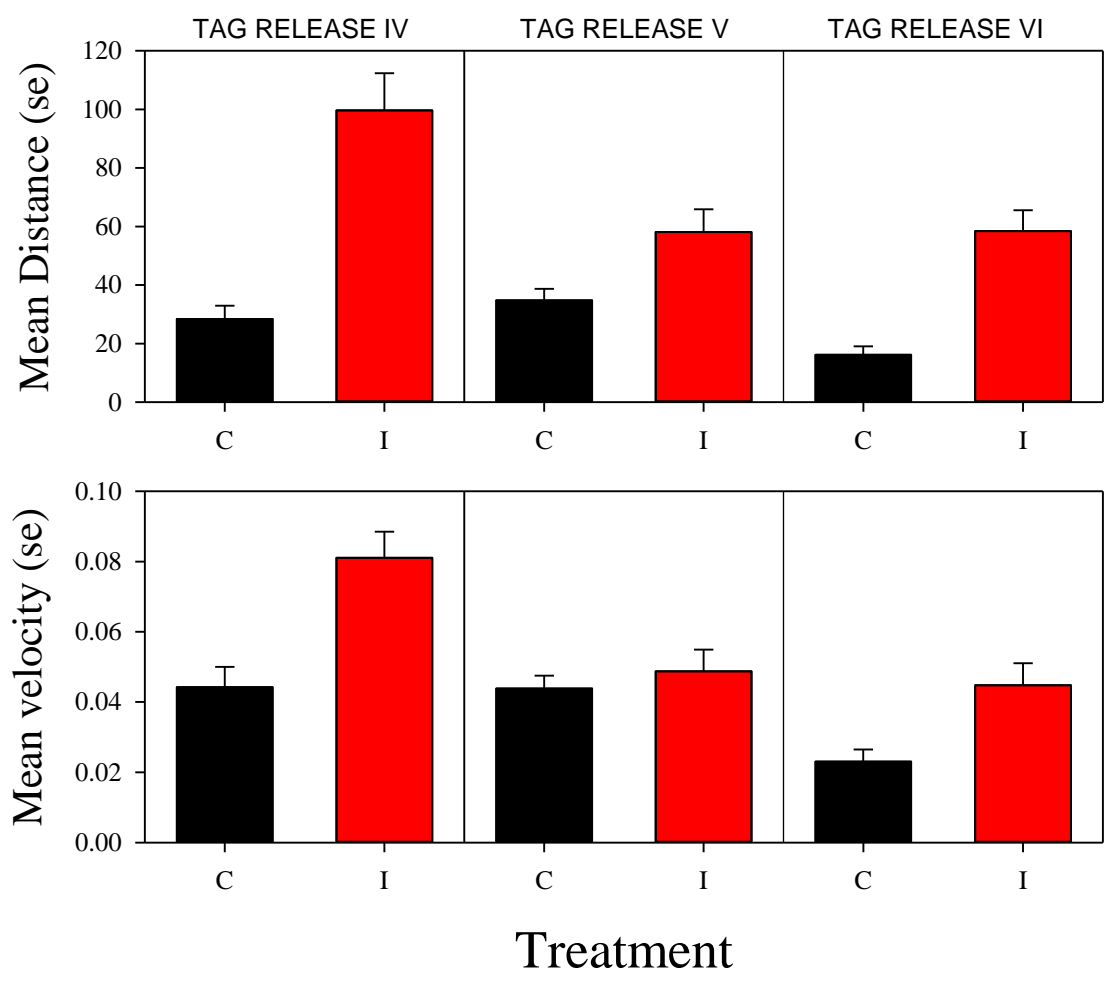


CamPod daisy chain

MOVEMENT OF TAGGED CRABS



IMPACT EFFECTS

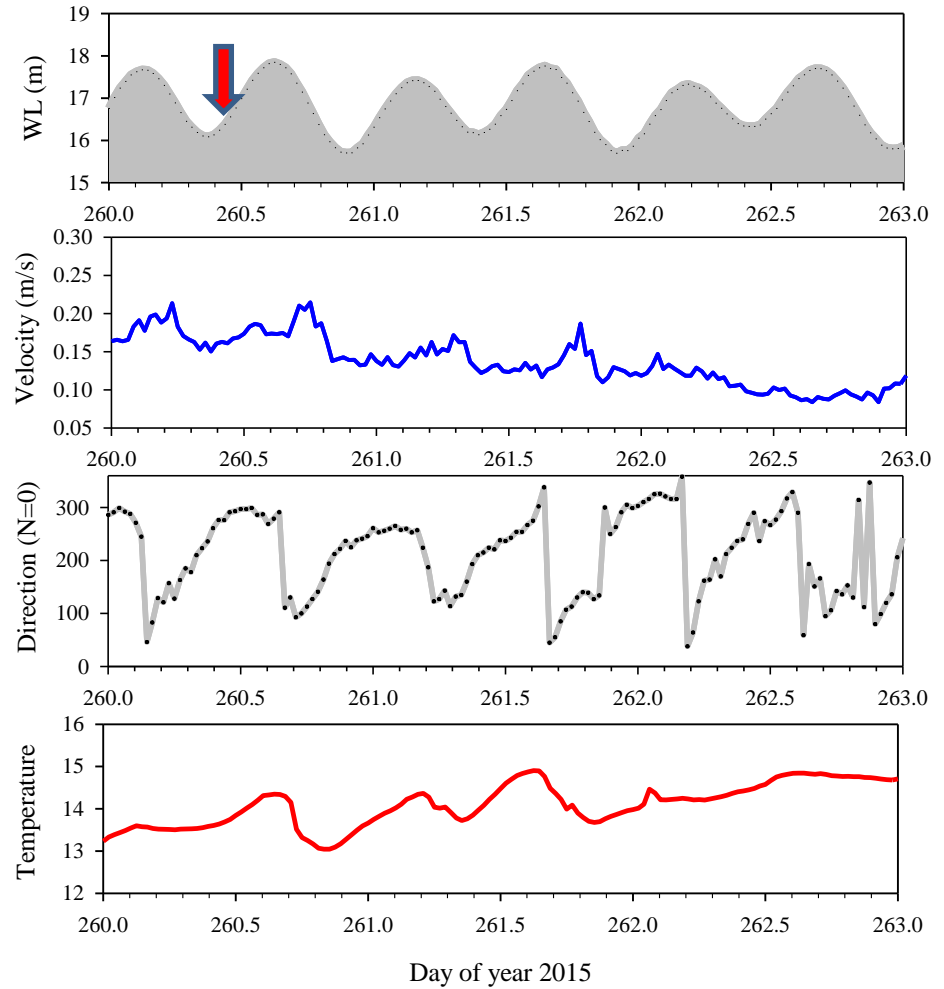


ENVIRONMENTAL BUOYS

SATURN 10

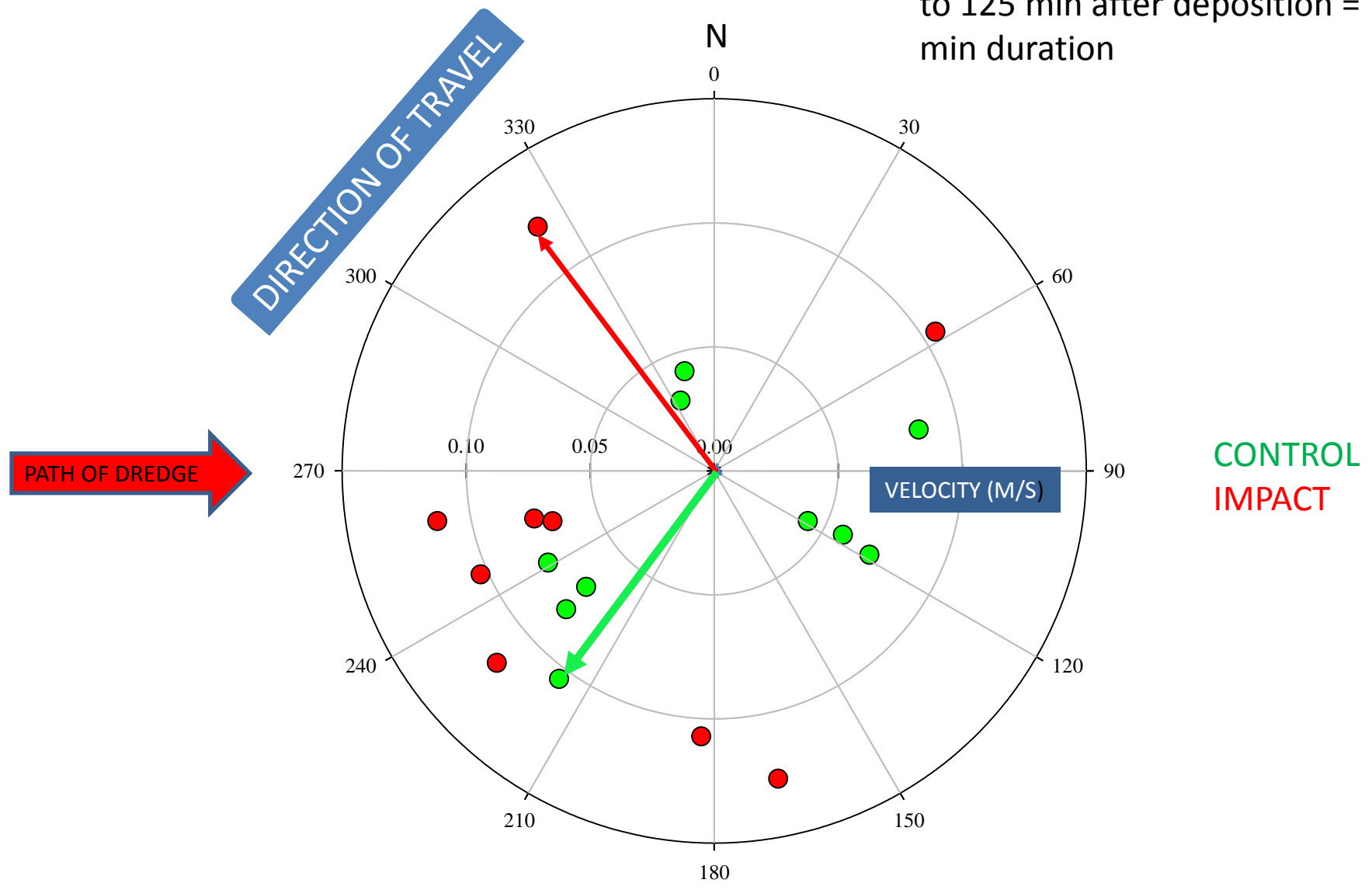


CURRENT TRIPOD RELEASE IV

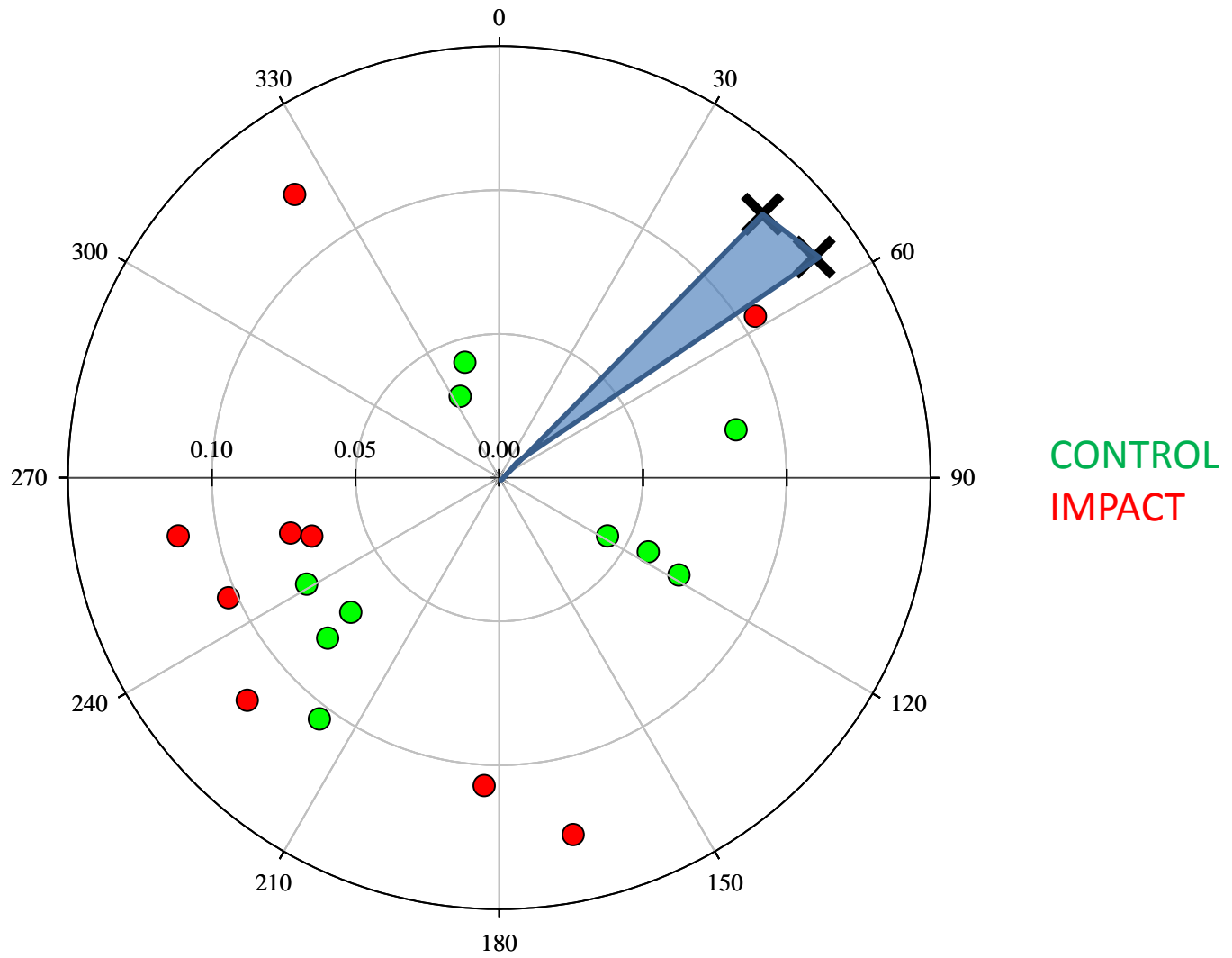


POST-IMPACT MOVEMENTS

Time = 45 min after deposition
to 125 min after deposition = 80
min duration

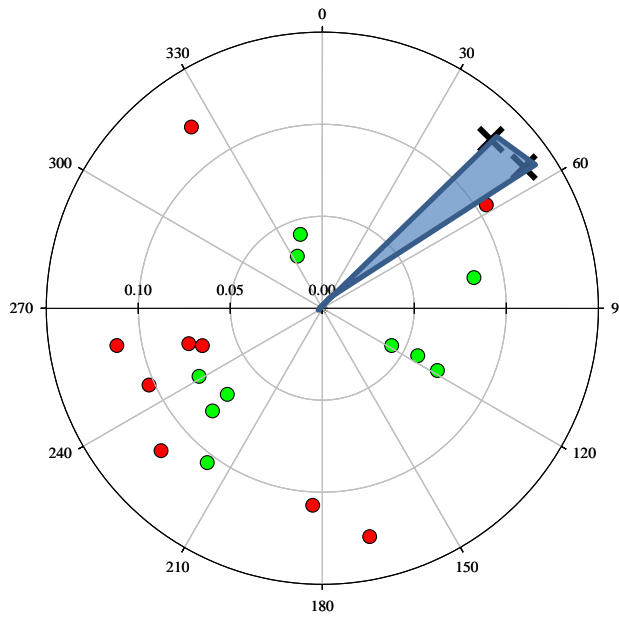


POST-IMPACT MOVEMENTS

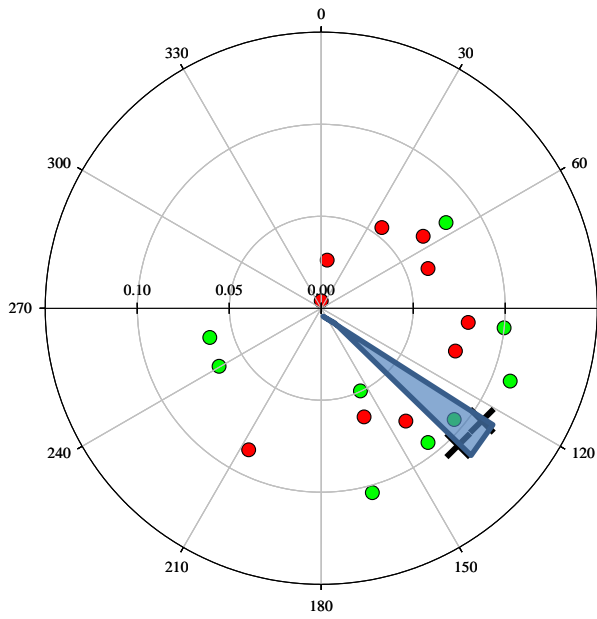


POST-IMPACT MOVEMENTS

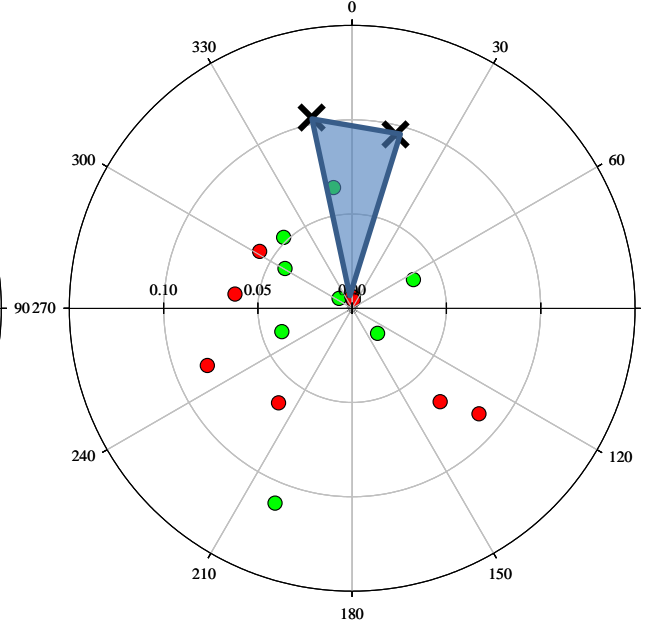
RELEASE IV



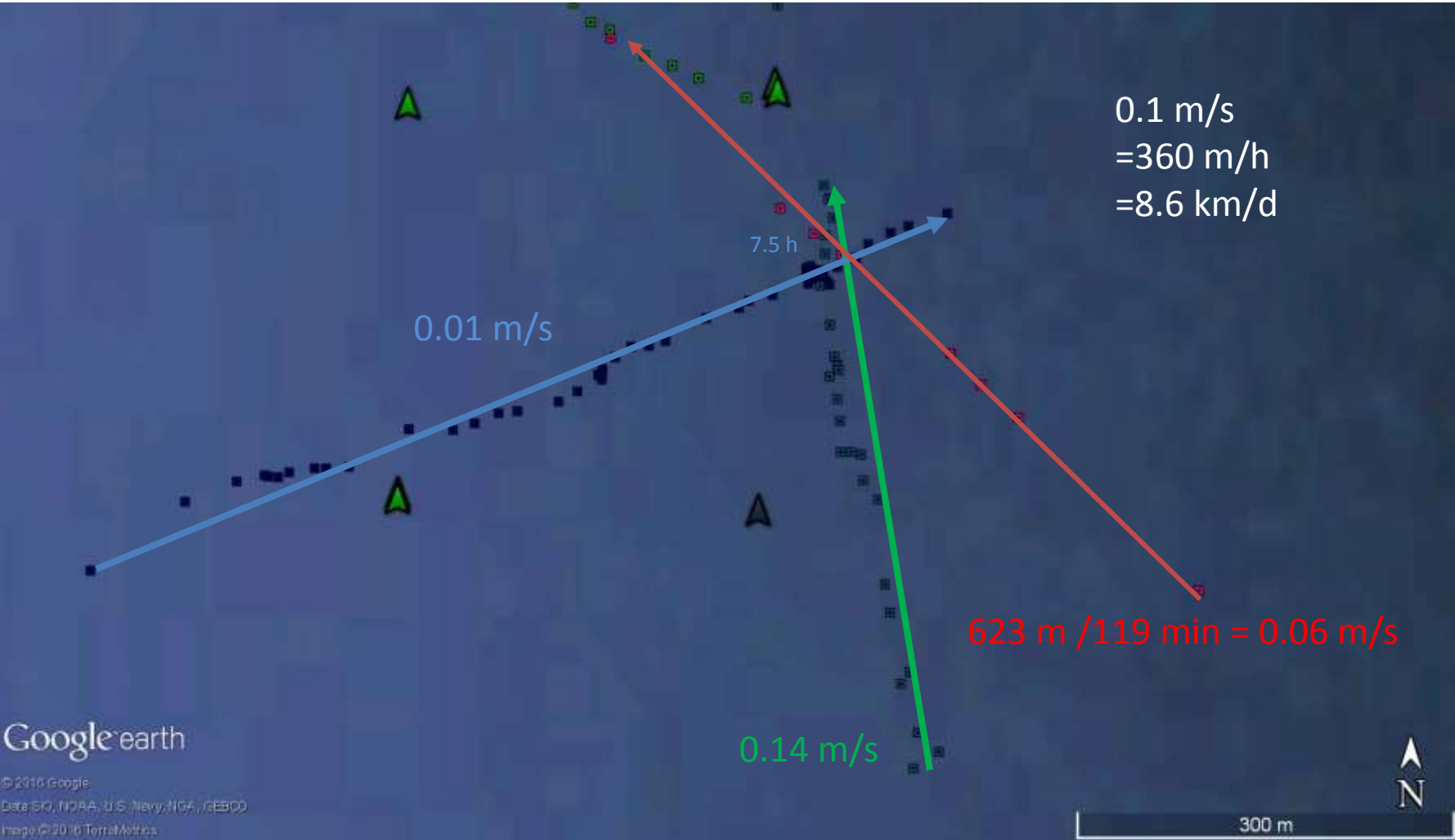
RELEASE V



RELEASE VI



MEASUREMENT METRICS



crab ID	Crab		ADV	
	Velocity	Direction	Velocity	Direction
111	0.06	58	0.14	39.7
119a	0.07	175	0.18	142
119b	0.03	138	0.20	360
140	0.06	298	0.11	338

EBUOY

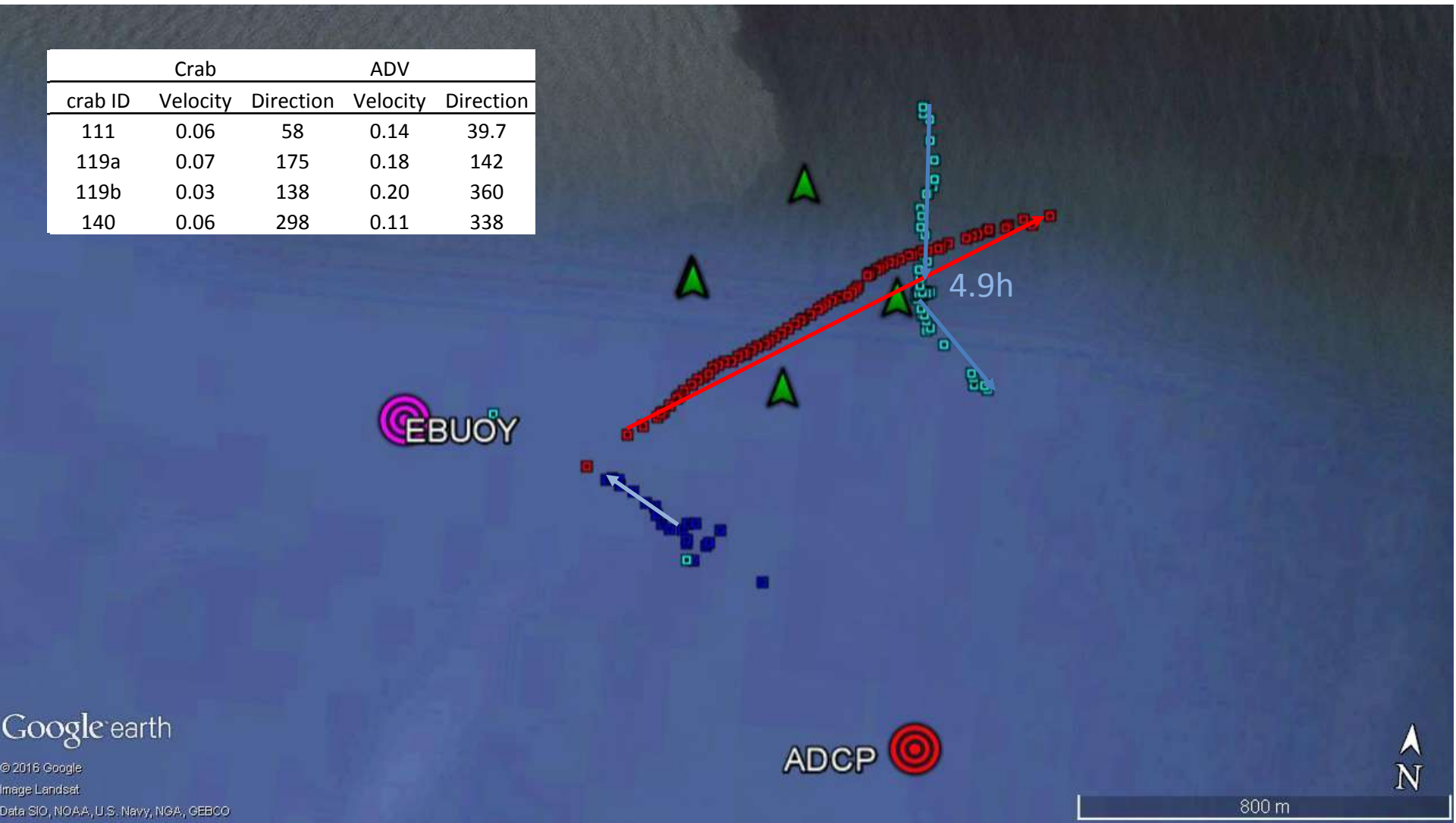
ADCP

4.9h

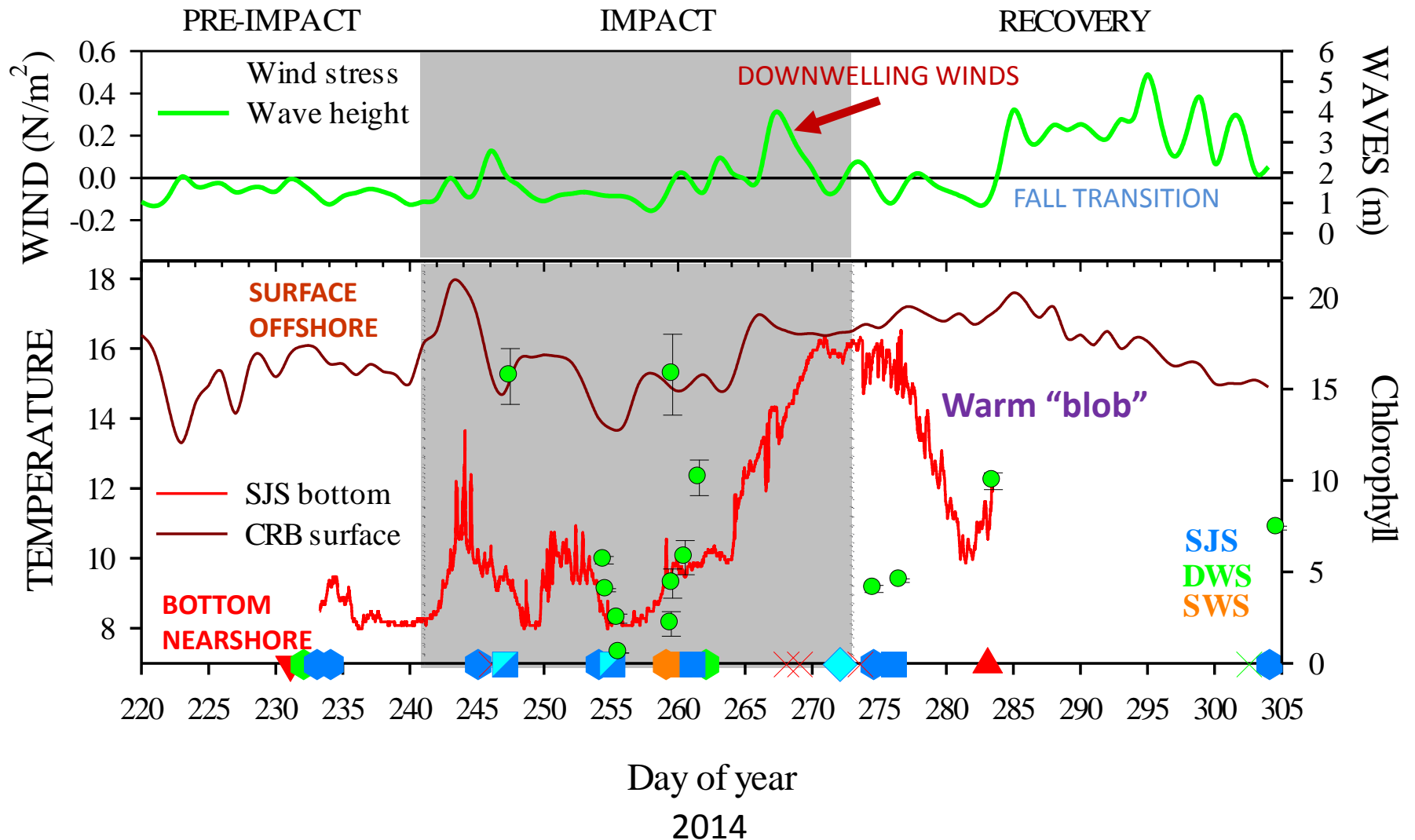
Google earth

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 Image Landsat
 Data SIO, NOAA, U.S. Navy, NGA, GEBCO

800 m

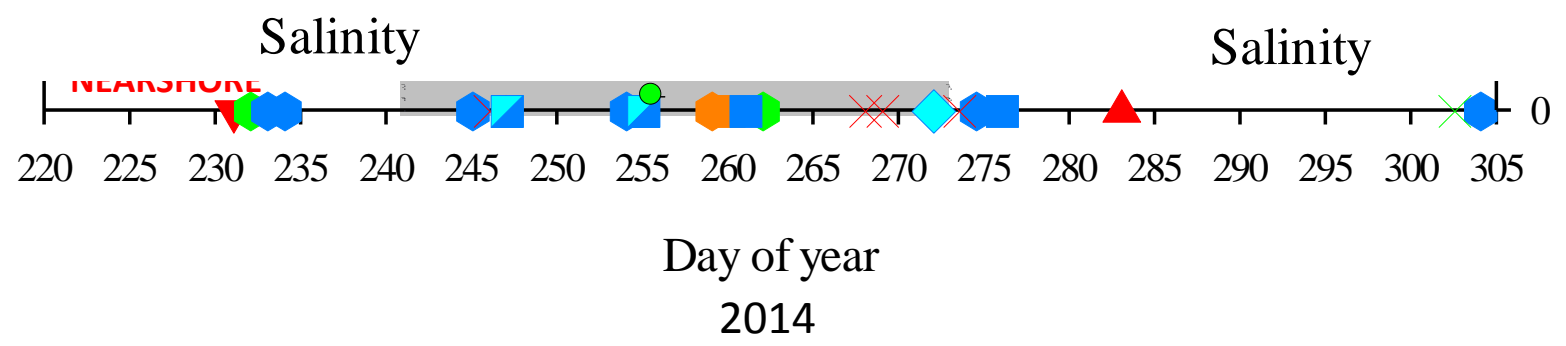
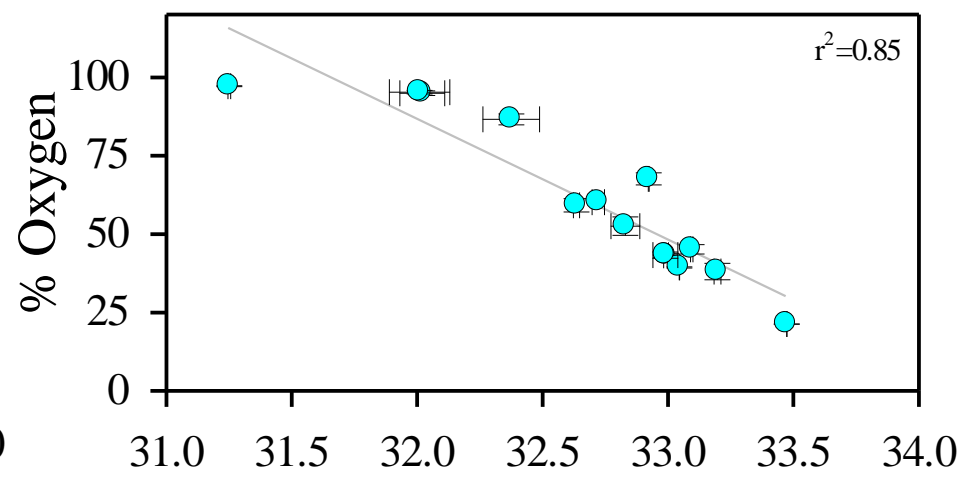
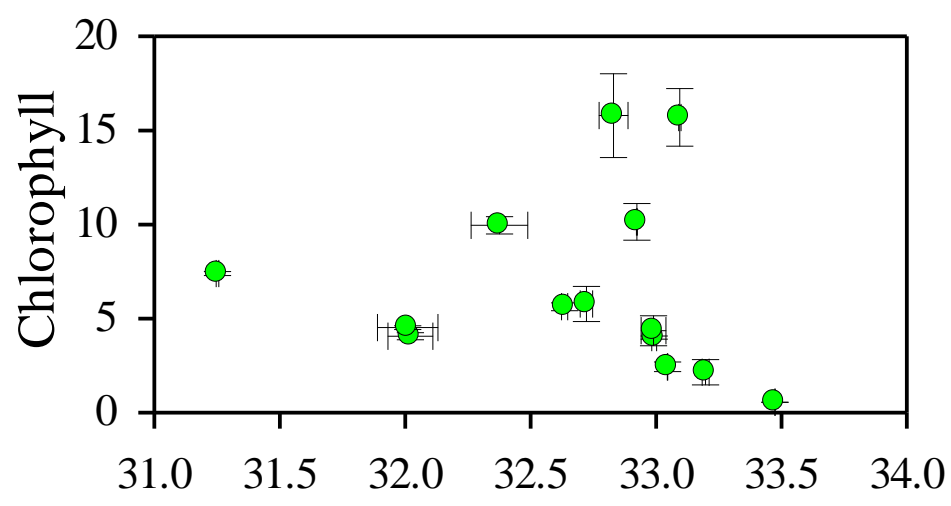
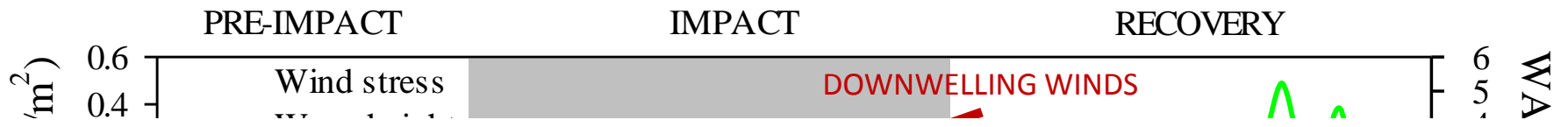


Climate factors affecting behavior?

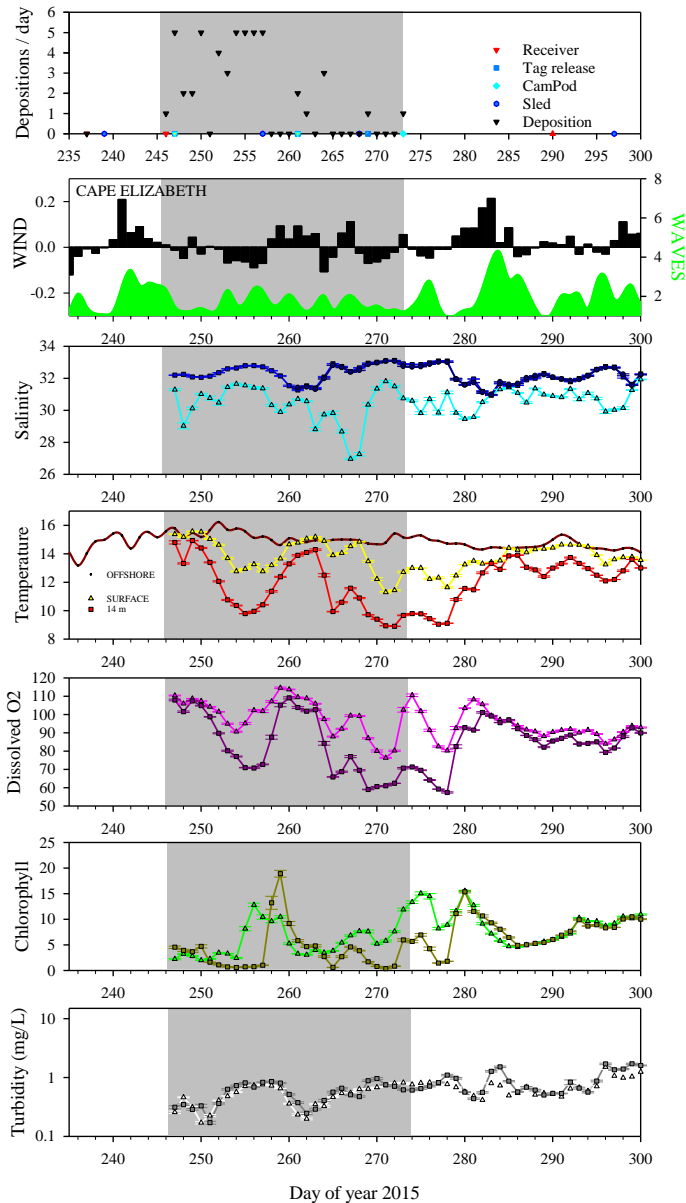


Oceanography affecting behavior?

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Environmental Buoy Data



Summary

- Conducted Control-Impact experiments to investigate sediment deposition on crab.
- Acoustic data reveal that crabs are highly motile and exhibit directed motions.
- Acute survival appears high and no evidence of incapacitated or dead crab based on current velocity data.
- Limited examples indicate survival for weeks to months post-release.
- Conclude the thin disposal presents limited risk to crabs and is an effective management tool for this system.
- High temperatures and low DO are already at levels inducing stress (if food is limiting).

ACKNOWLEDGEMENTS:

- ODFW & WDFW
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- LCSG



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- “DRONY” JOE AGA
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- STEPHANIE FIELDS



MORE VIDEOS ON YOUTUBE AT “FISHOOHEAD”

