Severn Marine Technologies, LLC
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MTS Buoy Conference Workshop

CDIP
Scripps Institution of Oceanography
UC San Diego

Enhanced Wave Measuring Buoy Performance through the use of Advanced Biofouling Control Methods

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Clear Signal Coated Datawell Buoy

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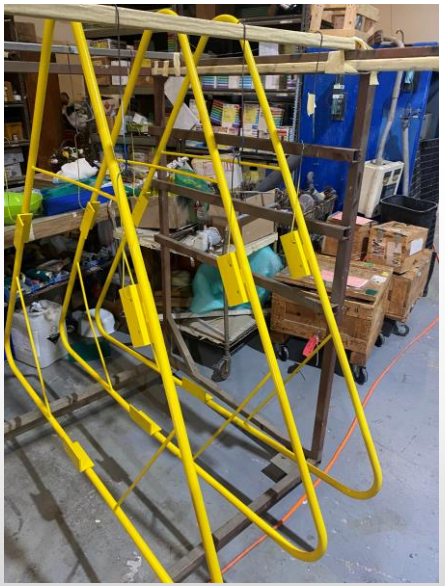

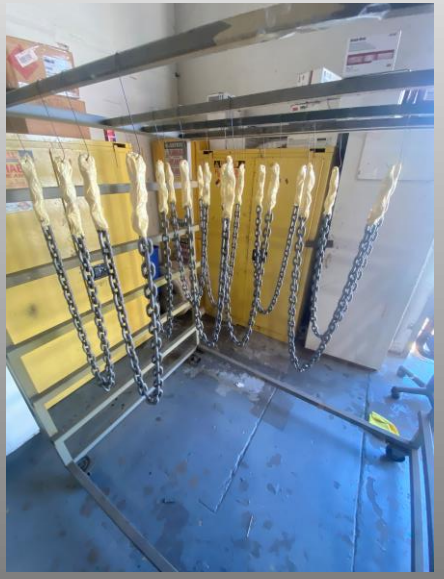

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Datawell Buoy Deployed

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Enhanced Wave Measuring Buoy Performance through the use of ClearSignal 2 years Pacific

ClearSignal Coated

Copper Coated

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Datawell Buoy
ClearSignal verse Traditional Deployment

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ClearSignal and Copper Coated
1.5 Years Atlantic

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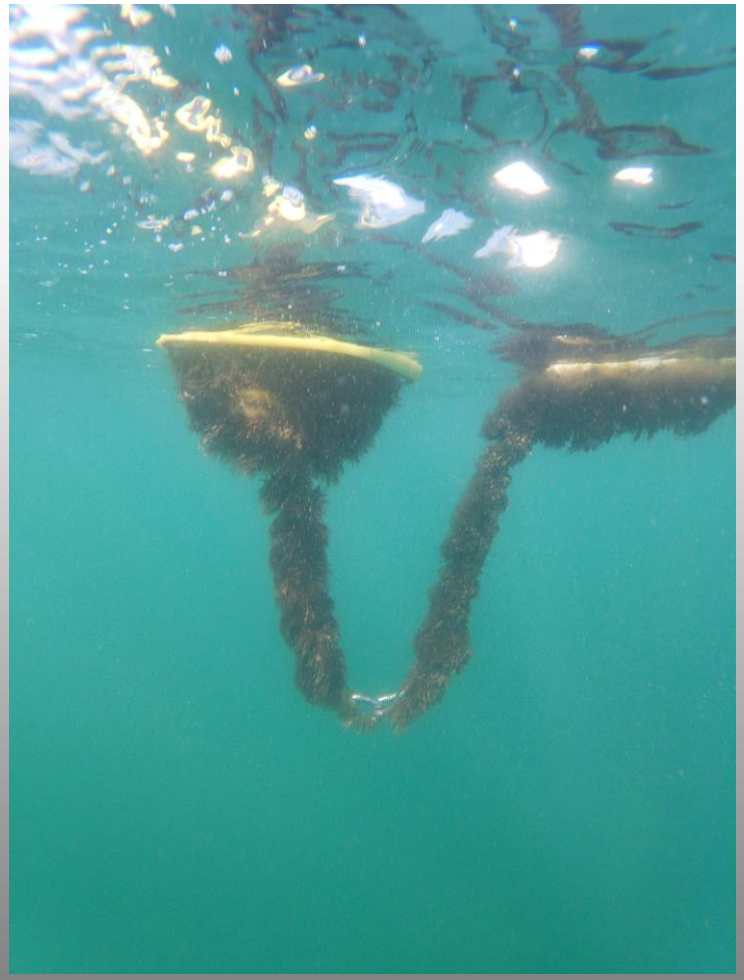
Spotter Buoy

ClearSignal vs Traditional Deployment – 6 months Atlantic



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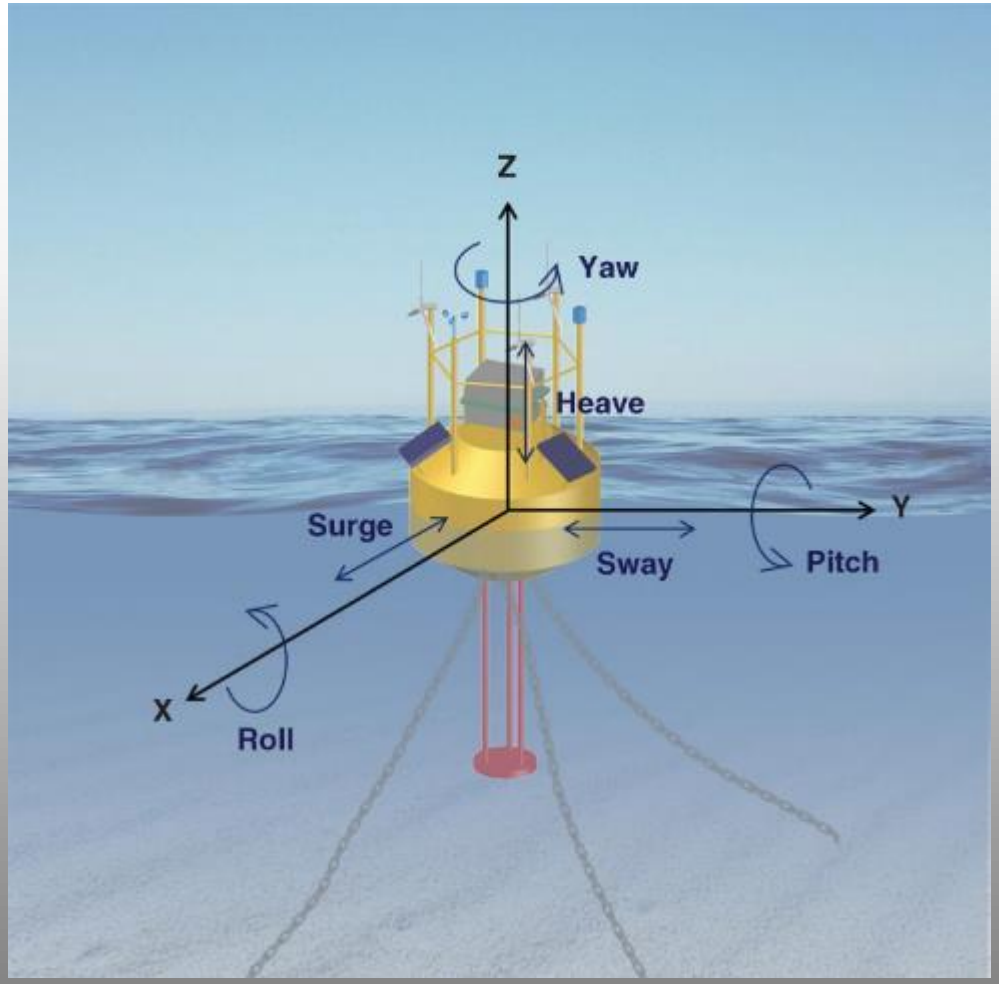
Heave Provides Self Cleaning to Foul Release Coatings



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Coating Robustness
Failure Containment from Anchor Chain

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This Applies to Wave Energy Conversion (WEC)

Summary Review

- Foul Release Coatings offer Long Term Protection
- Biofouling and its Prevention is an Adhesion Issue
- Coating Robustness and Adhesion to the Substrate are Critical Factors
- Flow Separation Contributes to Biofouling Settlement
- Buoys in Heave Provide Self Cleaning for Foul Release Coatings

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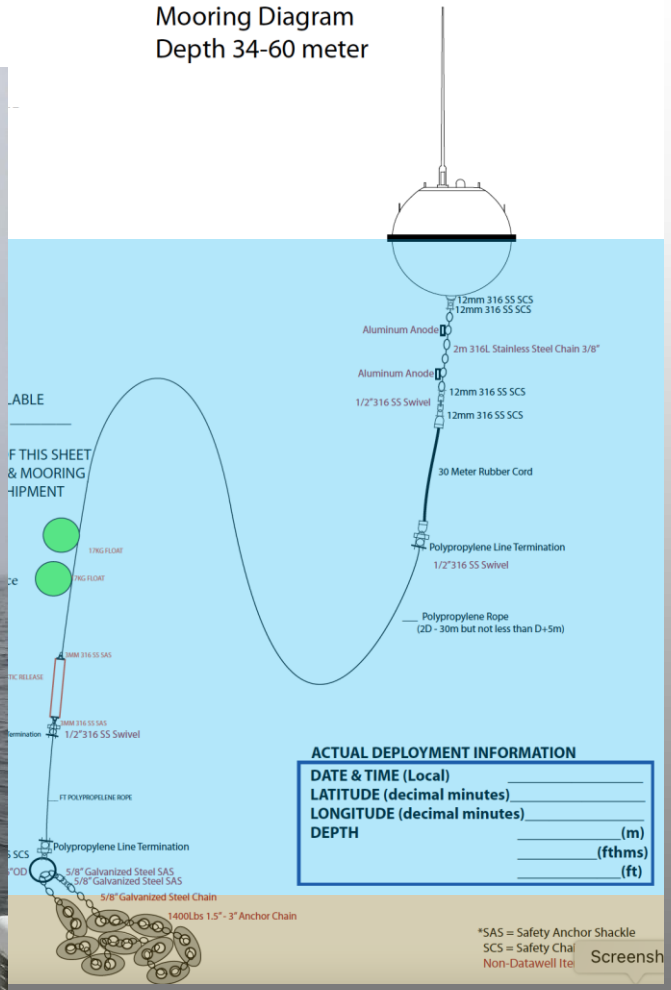
Biofouling adds weight and drag to the wave buoy + mooring system

- Extra weight increases recovery demands on vessel and crew
- Buoys submerge in currents; loss of Iridium transmission



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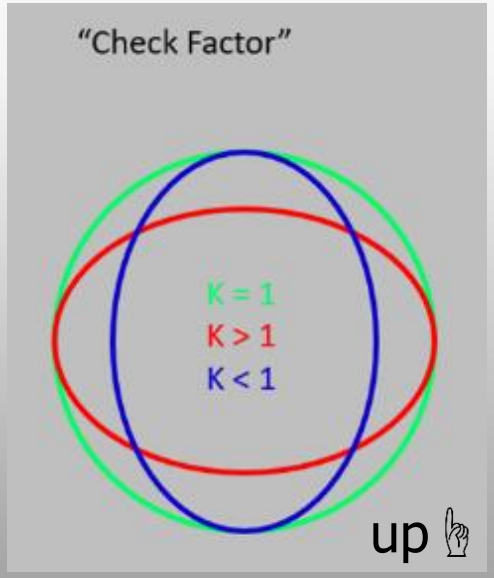
Biofouling adds weight and drag to the wave buoy + mooring system

- Increasing mooring effects, and thus...
- decreasing fidelity of the wave data.



Biofouling indicator in wave data:
Check Factor (CF)

Datawell buoy data include CF for each frequency bin in each wave spectrum.

CF is the ratio of horizontal displacements to vertical displacements.

CF = 1 for deep water waves.

CF > 1 indicates buoy motion is being affected by the mooring

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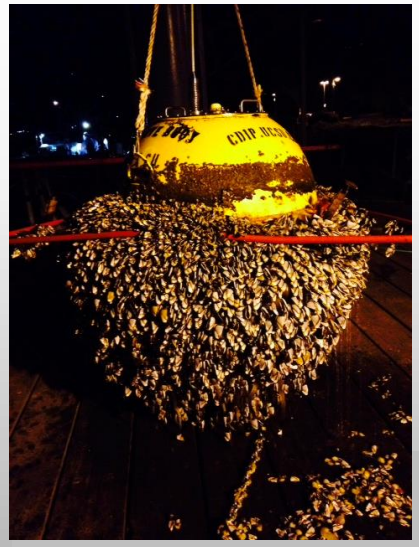
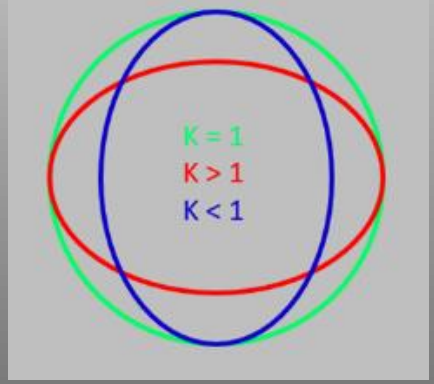
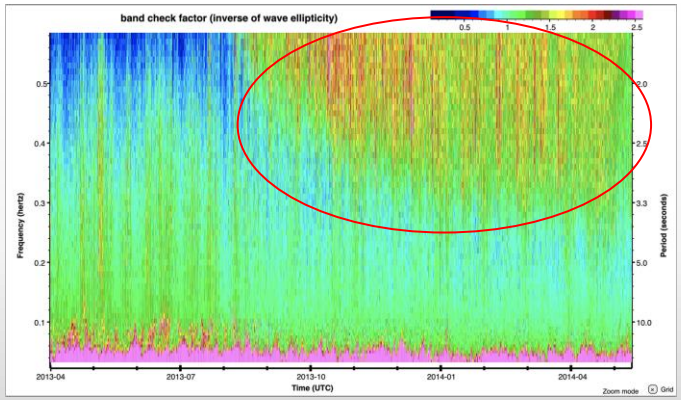
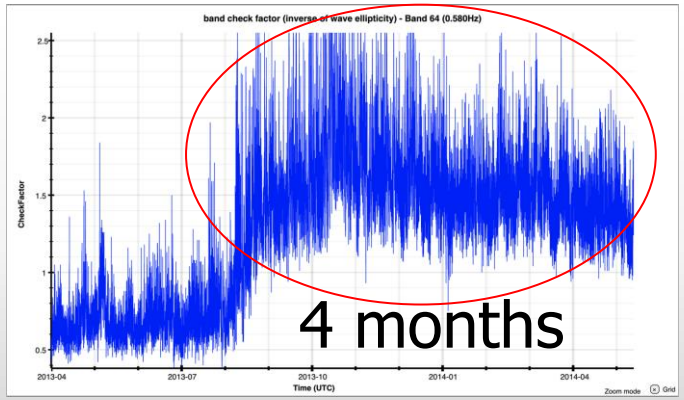
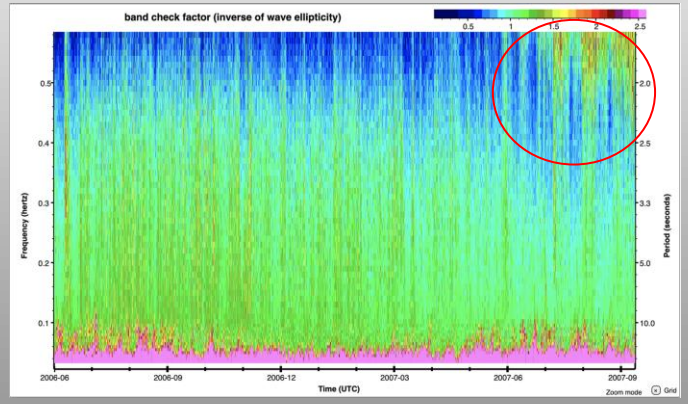
Check Factors – Untreated Stainless Steel Hull, Cape Mendocino, CA

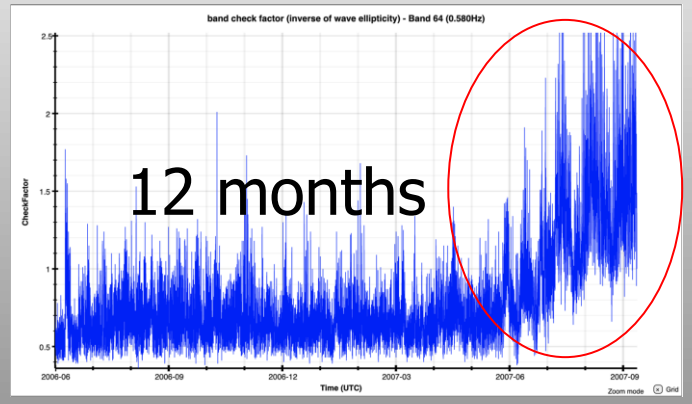












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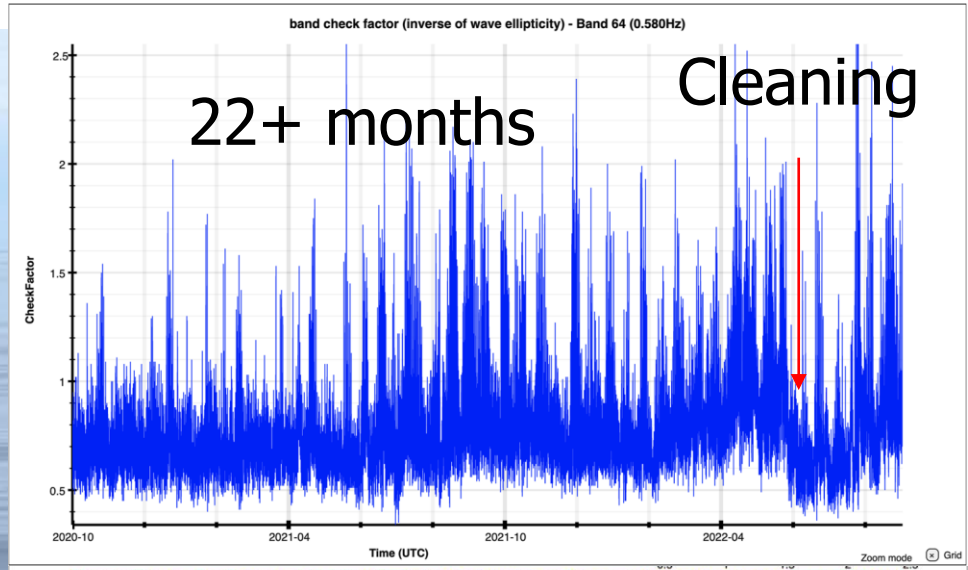
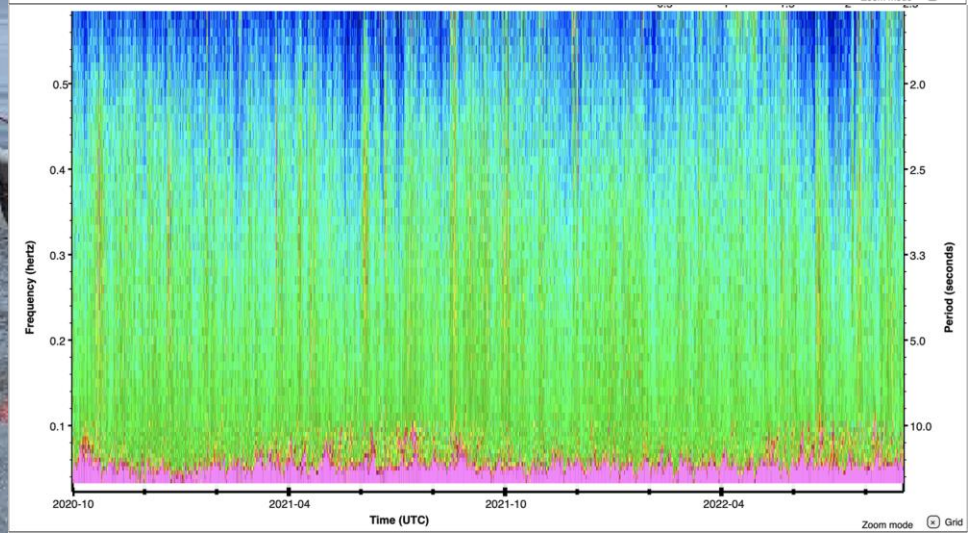
Check Factors – ClearSignal on SS hull, Cape Mendocino, CA





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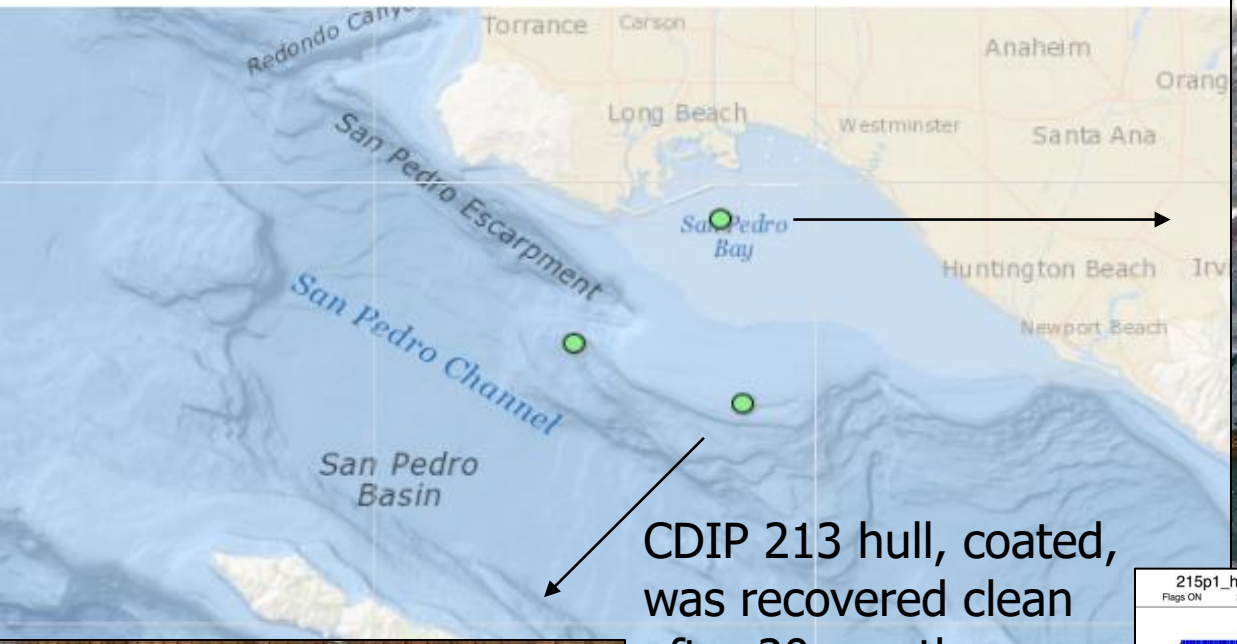
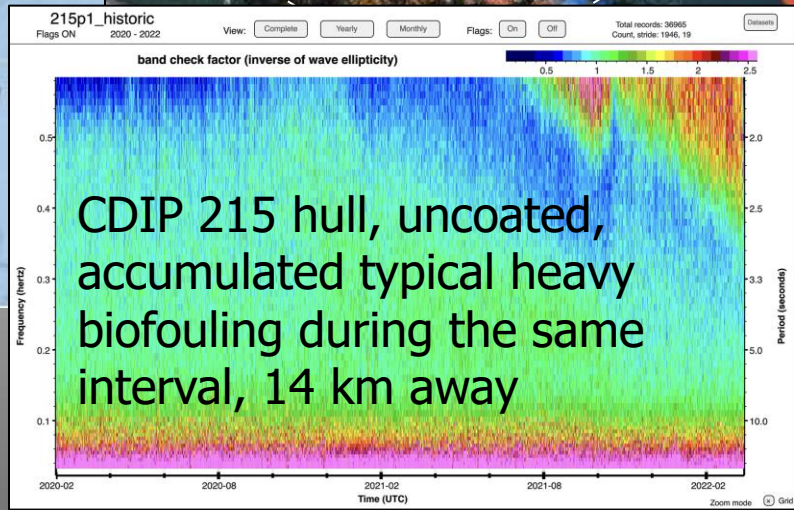
Check Factors – ClearSignal vs non-ClearSignal



CDIP 213 hull, coated, was recovered clean after 20 months (2020-2022)



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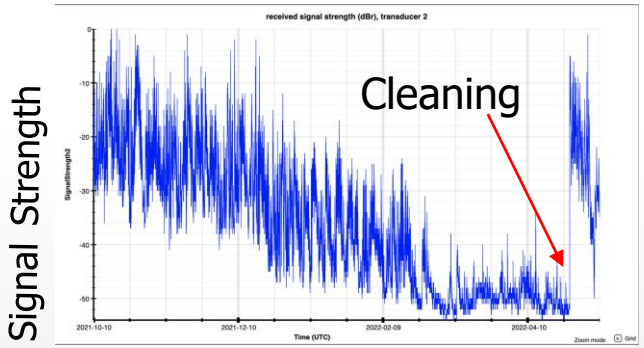
Other Applications



ClearSignal is applied to other buoy & mooring components:

- Acoustic transducers for surface current measurements. Rapid fouling without coating, and still requires periodic cleaning.
- Anti-spin triangles – major improvement!
- Ballast chain below buoy – but beware of electrically isolating the anodes!