

Evaluating potential biodegradable twines for use in the tropical tuna FAD fishery

Jon Lopez¹, Jose Mari Ferarios², Josu Santiago²,
Oscar Gustavo³, Gala Moreno⁴, Hilario Murua¹

¹AZTI tecnalia, Pasaia, Spain

²AZTI Tecnalia, Sukarrieta, Spain

³Calvo, Madrid, Spain

⁴ISSF, United States

IATTC WG FADS 2016

LA JOLLA



The Problem

Increasing use of DFADs built with no biodegradable materials



Objective

- To test and develop biodegradable materials for the construction of an effective FAD that covers all the requirements of fishers and environmental needs
 - ✓ By-catch reduction
 - ✓ Affordable
 - ✓ Reproducible
 - ✓ Lifetime
 - ✓ Aggregate biofouling and potentially tuna

Materials



- Cotton **TWISTED**
- Reg. Cotton + Sisal



- Reg. Cotton + Linen **PLAITED & BULKED**



- Cotton + Reg. Cotton + Linen



- Reg. Cotton + Sisal + Hemp



Methods

- Deployment of samples (160 days; 5 samplings)



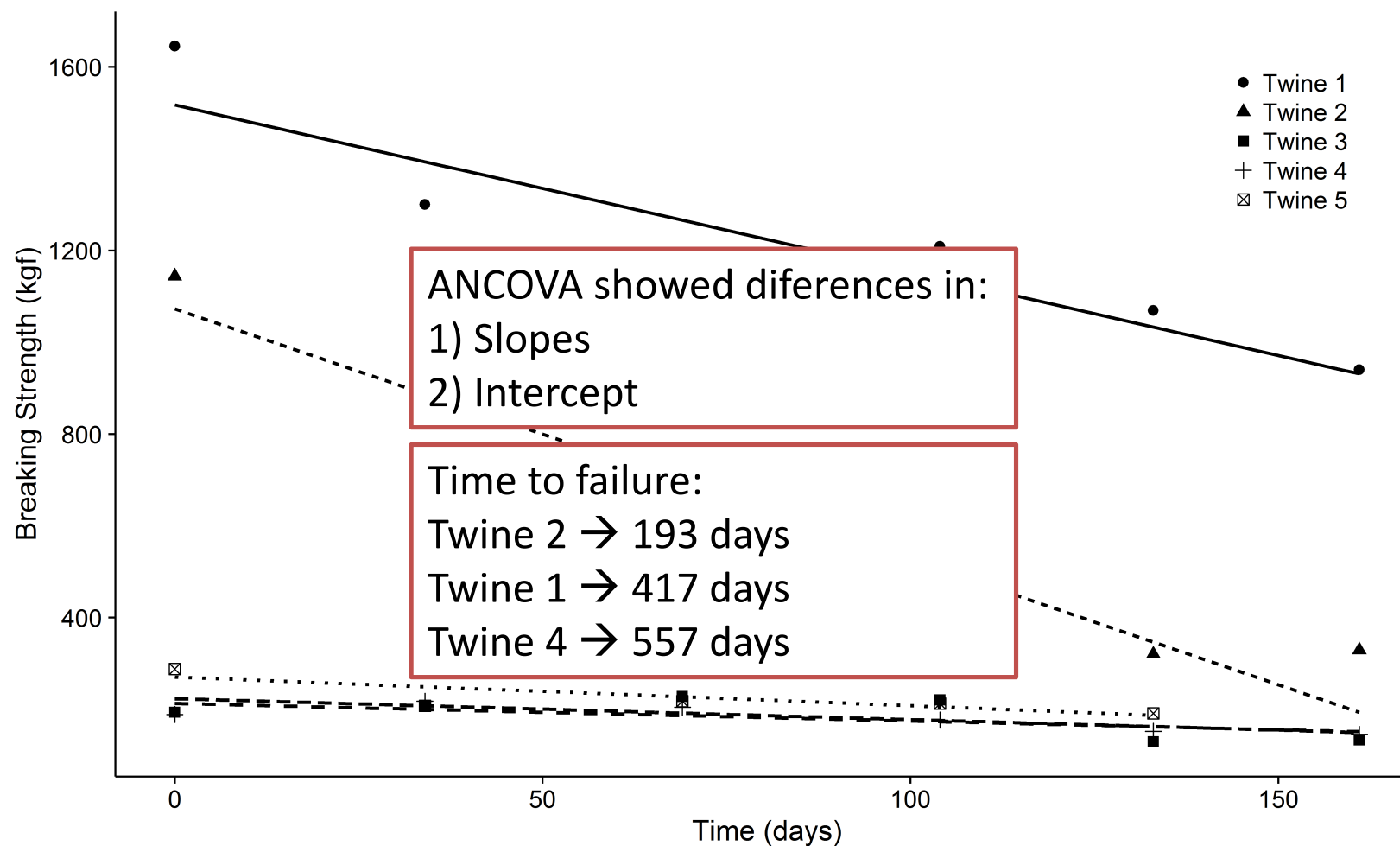
Methods

- Sampling and measuring: Bio, Fmax, etc.



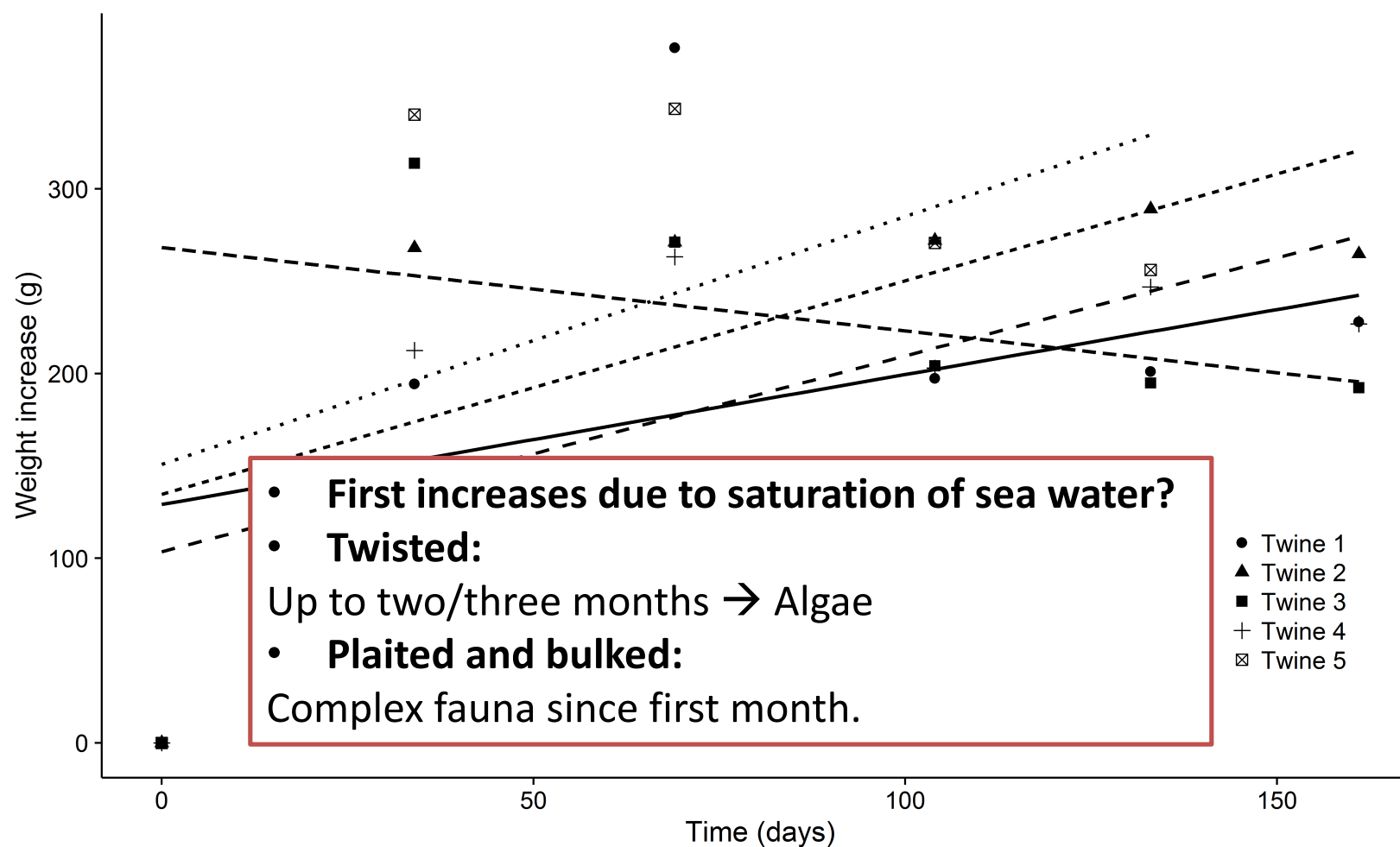
Results

- Breaking strength decrease ~ degradation



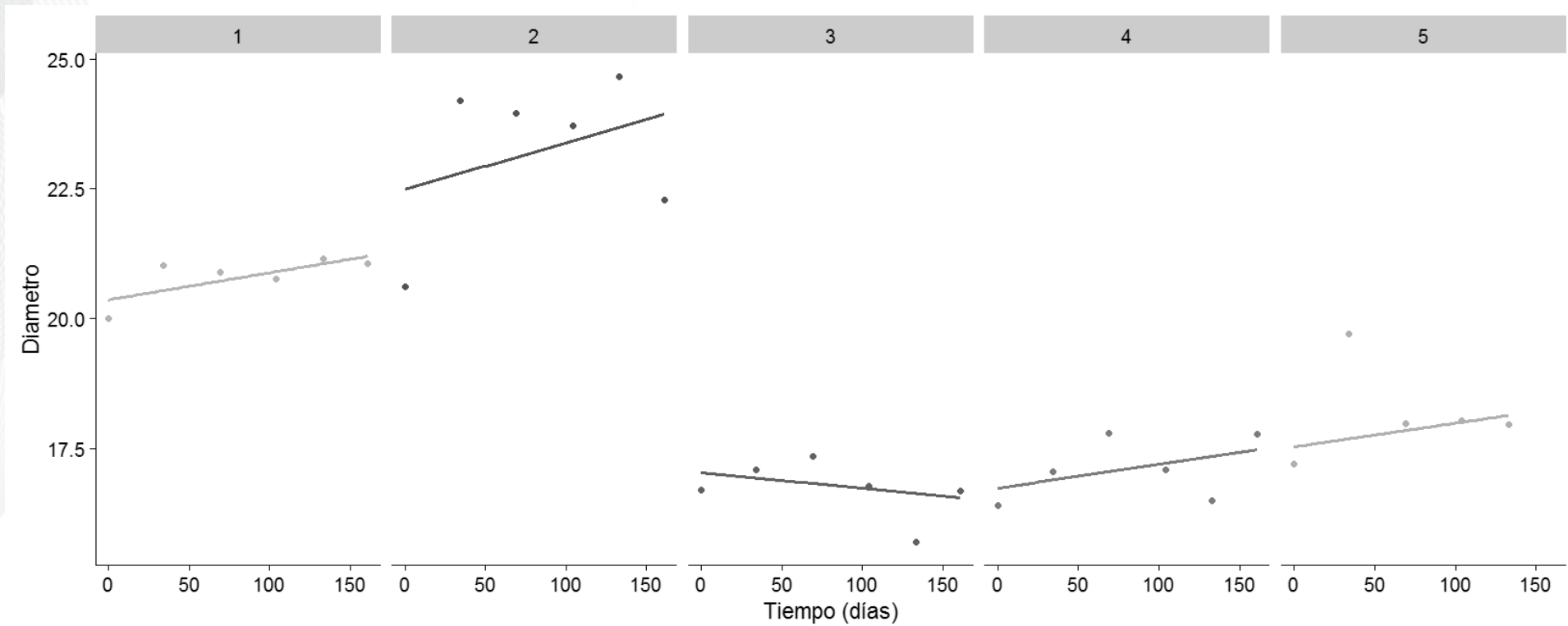
Results

- Weight increasing on time ~ Biofouling



Results

- Diameter increasing with time ~ Biofouling



Conclusions

- Initial descriptors are not an appropriate indicator of degradation at sea.
- Combination of construction design and material is highly significant for degradation rates.
- Different degradation rates by twine (Twine 2 → 193 d).
- All twines showed good probability of biofouling.
- Plaited and bulked twines faster complex colonization.

Prospect Work

- Explore new materials and designs?
 - A twisted and bulked cotton, sisal and linen twine.
- Increase the number of samples and soaking time.
- Testing of resulting materials at DFADs in:
 - Regular commercial fishing trips
 - Anchored FADs in tropical areas [Panama, Salvador, etc.]
- Discuss results with fishers and keep improving.

**ESKERRIK ASKO, GRACIAS,
THANK YOU**



www.azti.es | www.alimentatec.com | www.itsasnet.com

T. +34 94 657 40 00

Txatxarramendi ugarte z/g
48395 Sukarrieta, Bizkaia

Herrera Kaia, Portualdea z/g
20110 Pasaia, Gipuzkoa

Astondo Bidea, Edificio 609
Parque Tecnológico de Bizkaia
48160 Derio, Bizkaia