AKUAKÜLTÜR TÜRKİYE

4 – 7 Şubat 2026 – Antalya, Türkiye

4. Oturum: TÜRK SOMONU

Türk Somonu Yetiştiriciliğinde Açık Denizlerde Geleceğin Sistemleri

Murat Yigit, Yeşim Büyükateş, Sebahattin Ergün

Çanakkale Onsekiz Mart Üniversitesi
Deniz Bilimleri ve Teknolojisi Fakültesi

https://www.comu.edu.tr

0554-3132513
muratyigit@comu.edu.tr
https://denizbilimleri.comu.edu.tr

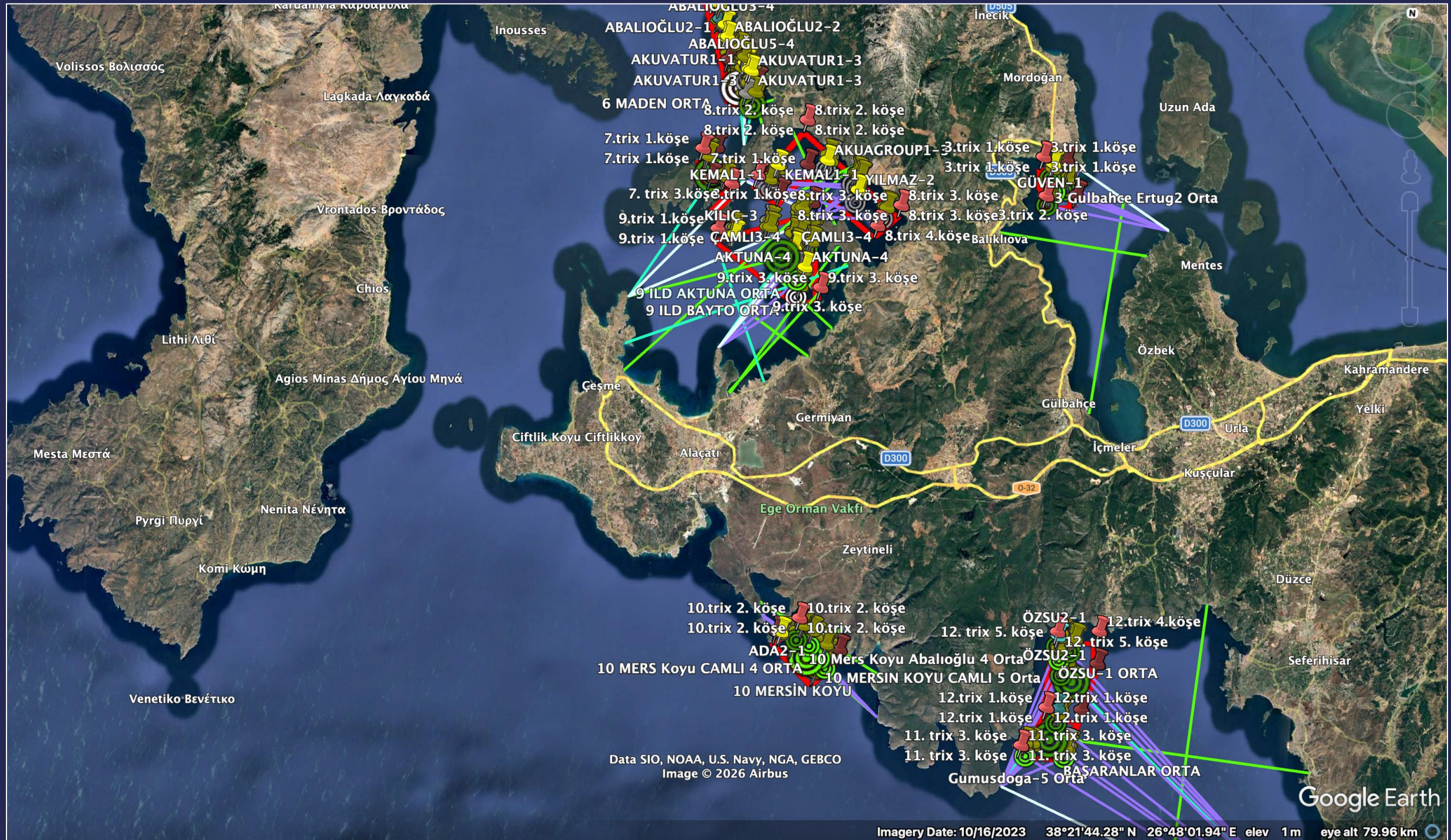
AÇIK DENİZLERİN ÖTESİNE ÇIKARKEN …

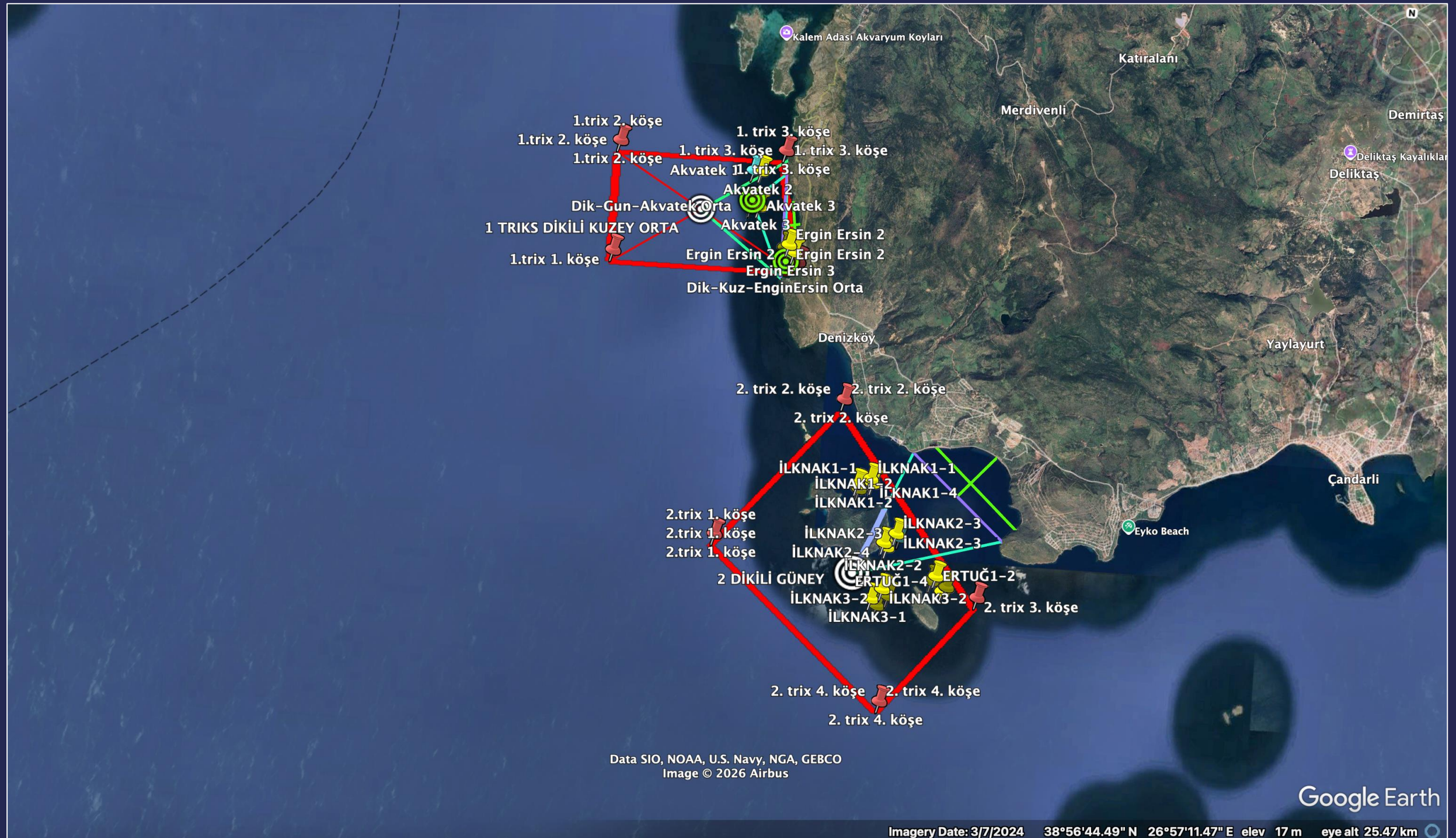
- Üretimde artış → Yetiştiricilik Alanlarında daralan Taşıma Kapasitesi
  → Ekosistem üzerinde Baskı (Çevre Yönetimi)
- Kıyı kullanım Hakları → Deniz Ekosistemi ve Endüstri Uyumu
- Deniz Saha Planlama → MSP…

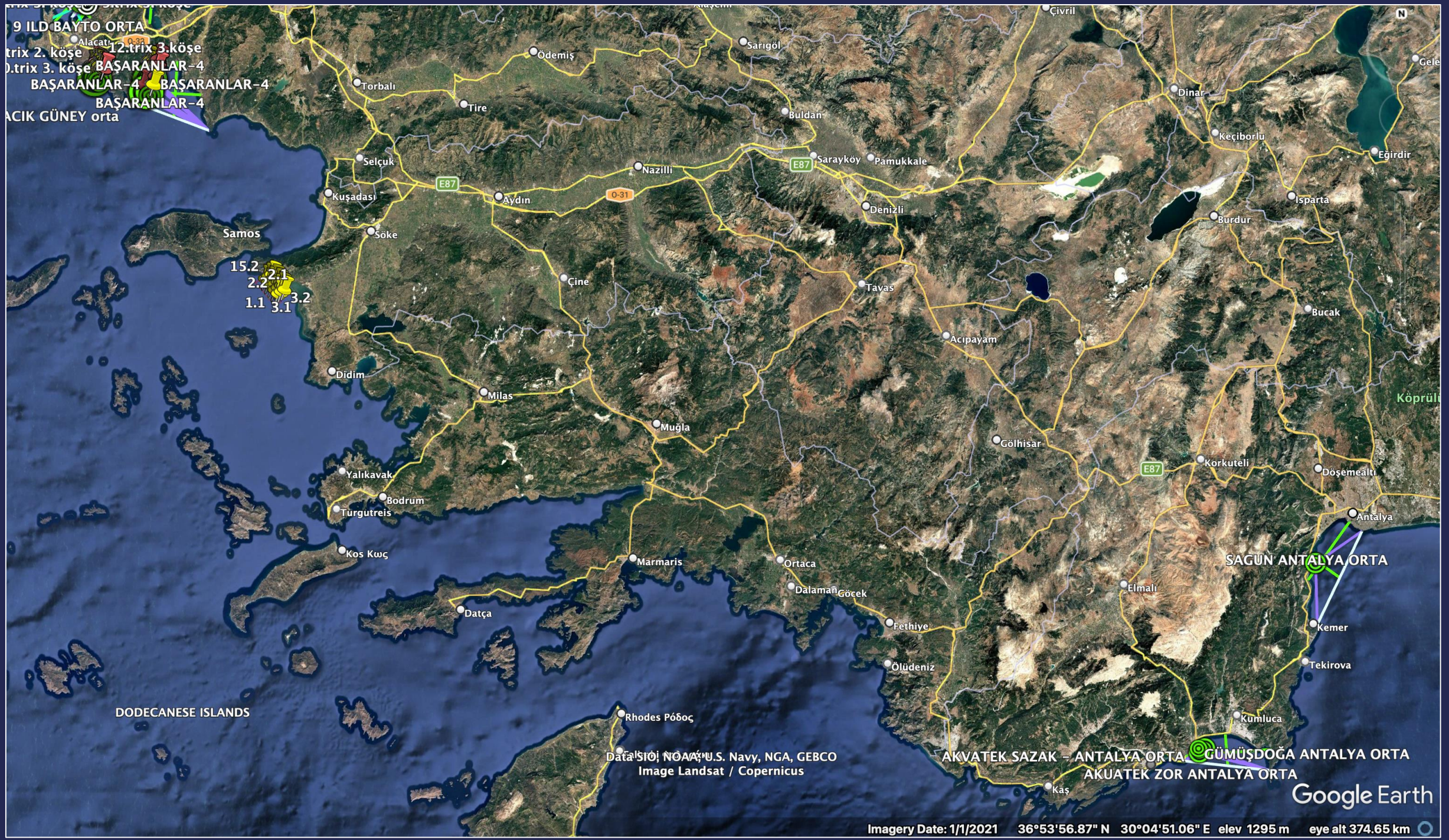
Mavi Vatan'da Savunma ve Ulusal Güvenlik Bir Bütündür,
Açık Deniz Kafes Balıkçılığı, Mavi Vatanın İnsansız Güvenlik Gücüdür

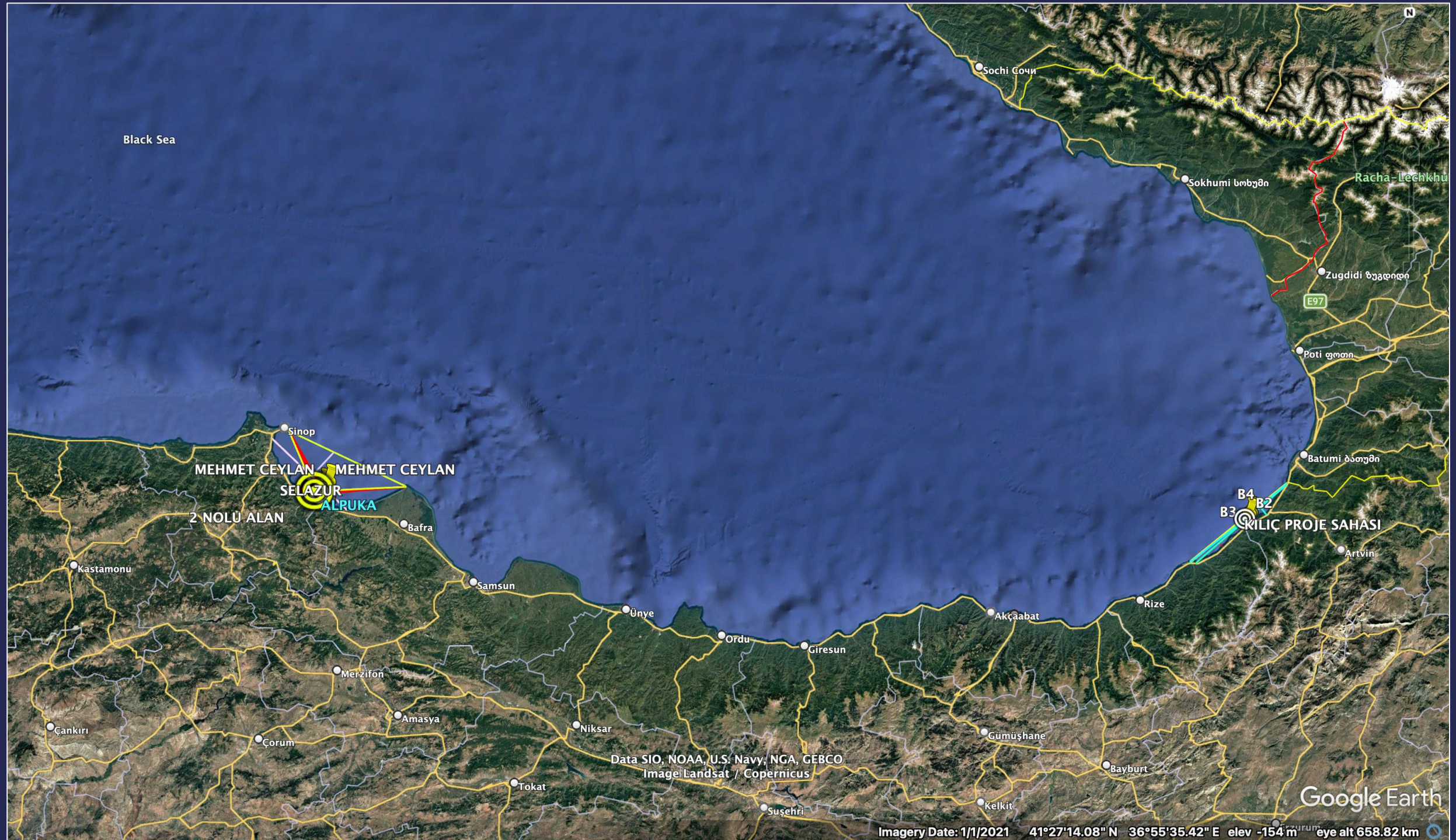
Tümamiral Cem Gürdeniz, 2006–Gelecek Nesiller Mavi Vatan'a daha bağımlı olacak
Tümamiral Cihat Yaycı, 2022–Mavi Vatan, Türkiye'nin Denizlerdeki Misak-i Milliyesi

Ekosistem Yönetimi – Yetiştiricilik Alanları – Taşıma Kapasitesi


ABALIOĞLU3-4
ABALIOĞLU2-1
ABALIOĞLU2-2
ABALIOĞLU5-4
AKUVATUR1-1
AKUVATUR1-3
AKUVATUR1-3
AKUVATUR1-3
6 MADEN ORTA
8.trix 2. köşe
8.trix 2. köşe
8.trix 2. köşe
8.trix 2. köşe
7.trix 1.köşe
7.trix 1.köşe
7.trix 1.köşe
AKUAGROUP1-3
3.trix 1.köşe
3.trix 1.köşe
3.trix 1.köşe
3.trix 1.köşe
KEMAL1-1
KEMAL1-1
YILMAZ-2
GÜVEN-1
7. trix 3.köşe
8.trix 1.köşe
8.trix 3. köşe
8.trix 3. köşe
3 Gulbahce Ertug2 Orta
9.trix 1.köşe
KILIC-3
8.trix 3. köşe
8.trix 3. köşe
3.trix 2. köşe
9.trix 1.köşe
ÇAMLI3-4
ÇAMLI3-4
8.trix 4.köşe
AKTUNA-4
AKTUNA-4
9.trix 3. köşe
9.trix 3. köşe
9 ILD AKTUNA ORTA
9 ILD BAYTO ORTA
9.trix 3. köşe
10.trix 2. köşe
10.trix 2. köşe
10.trix 2. köşe
10.trix 2. köşe
ADA2-1
10 MERS Koyu CAMLI 4 ORTA
10 Mers Koyu Abalıoğlu 4 Orta
10 MERSIN KOYU CAMLI 5 Orta
10 MERSİN KOYU
ÖZSU2-1
12. trix 5. köşe
12.trix 4.köşe
12. trix 5. köşe
ÖZSU2-1
ÖZSU-1 ORTA
12.trix 1.köşe
12.trix 1.köşe
12.trix 1.köşe
12.trix 1.köşe
11. trix 3. köşe
11. trix 3. köşe
11. trix 3. köşe
11. trix 3. köşe
BAŞARANLAR ORTA
Gumusdoga-5 Orta
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2026 Airbus
Google Earth
Imagery Date: 10/16/2023 38°21'44.28" N 26°48'01.94" E elev 1 m eye alt 79.96 km
Inousses
Volissos Βολισσός
Lagkada Λαγκαδά
Vrontados Βροντάδος
Chios
Lithi Λιθί
Agios Minas Δήμος Αγίου Μηνά
Mesta Μεστά
Pyrgi Πυργί
Nenita Νένητα
Komi Κώμη
Venetiko Βενέτικο
İnecik
Mordoğan
Uzun Ada
Balıklıova
Mentes
Özbek
Kahramandere
Yelki
Gülbahçe
Urla
İçmeler
Kuşçular
Çeşme
Germiyan
Ciftlik Koyu Ciftlikkoy
Alaçatı
Ege Orman Vakfı
Zeytineli
Düzce
Seferihisar
D300
O-32

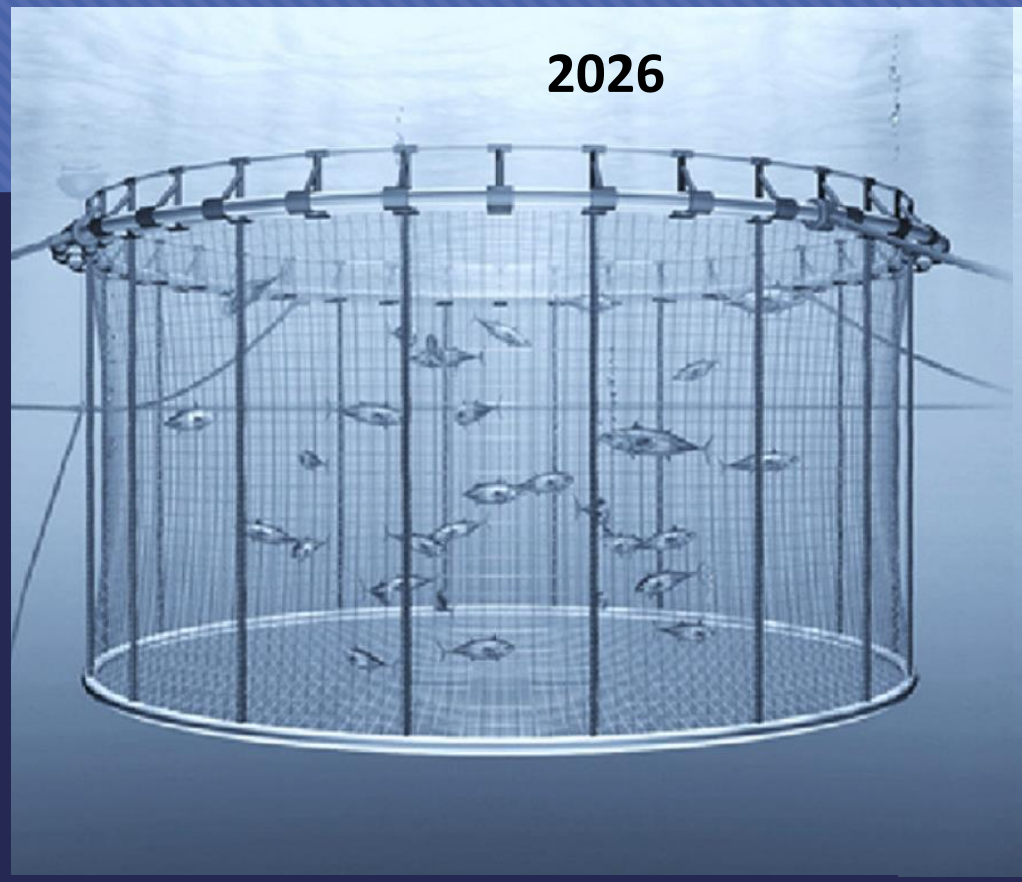

Kalem Adası Akvaryum Koyları
Katıralanı
Merdivenli
Demirtaş
Deliktaş Kayalıklar
Deliktaş
1.trix 2. köşe
1.trix 2. köşe
1.trix 2. köşe
1. trix 3. köşe
1. trix 3. köşe
1. trix 3. köşe
Akvatek 1
1. trix 3. köşe
Akvatek 2
Dik-Gun-Akvatek Orta
Akvatek 3
1 TRIKS DİKİLİ KUZEY ORTA
Akvatek 3
Ergin Ersin 2
1.trix 1. köşe
Ergin Ersin 2
Ergin Ersin 2
Ergin Ersin 3
Dik-Kuz-EnginErsin Orta
Denizköy
Yaylayurt
2. trix 2. köşe
2. trix 2. köşe
2. trix 2. köşe
İLKNAK1-1
İLKNAK1-1
İLKNAK1-2
İLKNAK1-4
İLKNAK1-2
Çandarli
2.trix 1. köşe
2.trix 1. köşe
2.trix 1. köşe
İLKNAK2-3
İLKNAK2-3
İLKNAK2-3
Eyko Beach
İLKNAK2-4
İLKNAK2-2
2 DİKİLİ GÜNEY
ERTUĞ1-4
ERTUĞ1-2
İLKNAK3-2
İLKNAK3-2
2. trix 3. köşe
İLKNAK3-1
2. trix 4. köşe
2. trix 4. köşe
2. trix 4. köşe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2026 Airbus
Google Earth
Imagery Date: 3/7/2024 38°56'44.49" N 26°57'11.47" E elev 17 m eye alt 25.47 km

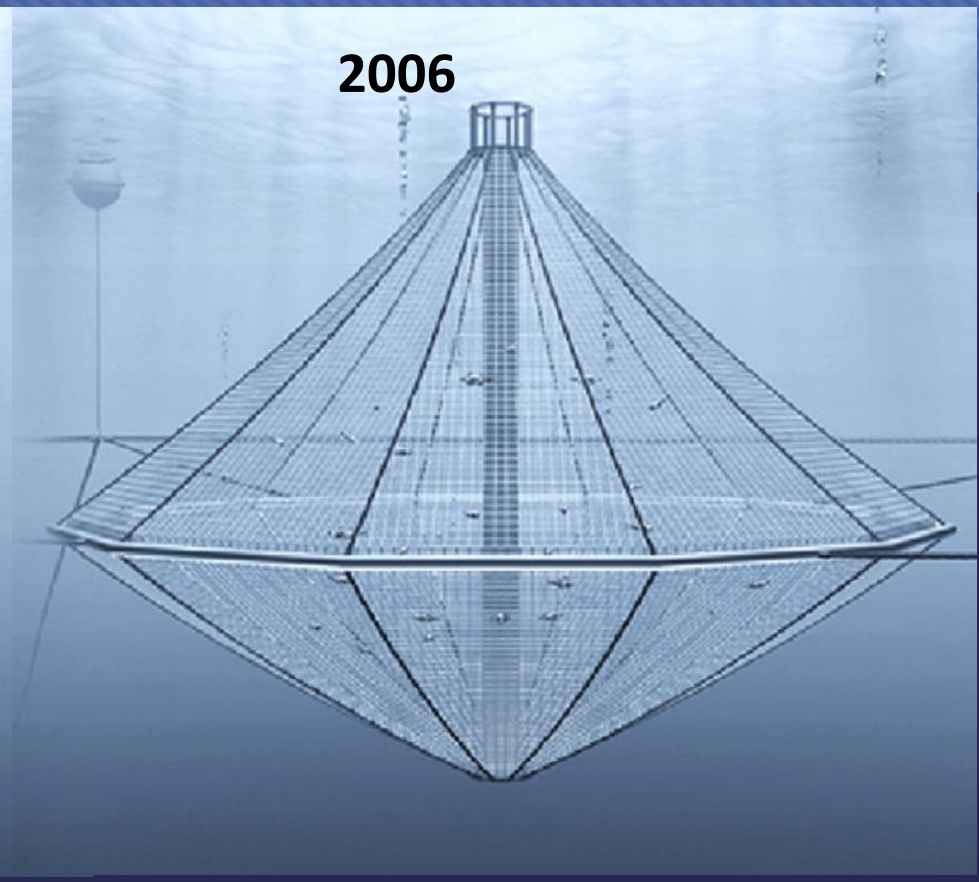

9 ILD BAYTO ORTA
Alacati
12.trix 3.köşe
BAŞARANLAR-4
BAŞARANLAR-4
BAŞARANLAR-4
BAŞARANLAR-4
ACIK GÜNEY orta
Ödemiş
Sarıgöl
Çivril
Torbalı
Tire
Buldan
Dinar
Keçiborlu
Eğirdir
Selçuk
Nazilli
E87
Sarayköy
Pamukkale
Kuşadası
Aydın
O-31
Denizli
Isparta
Burdur
Söke
Samos
15.2
2.2
2.1
1.1
3.1
3.2
Çine
Tavas
Bucak
Acıpayam
Didim
Milas
Köprülü
Muğla
Gölhisar
Yalıkavak
Bodrum
Turgutreis
Korkuteli
Döşemealtı
Antalya
Kos Κως
Marmaris
Ortaca
SAGUN ANTALYA ORTA
Dalaman
Göcek
Elmalı
Datça
Fethiye
Kemer
Ölüdeniz
Tekirova
DODECANESE ISLANDS
Rhodes Πόδος
Kumluca
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
AKVATEK SAZAK – ANTALYA ORTA
GÜMÜŞDOĞA ANTALYA ORTA
AKUATEK ZOR ANTALYA ORTA
Kaş
Google Earth
Imagery Date: 1/1/2021 36°53'56.87" N 30°04'51.06" E elev 1295 m eye alt 374.65 km


Black Sea
Sochi Сочи
Sokhumi სოხუმი
Racha-Lechkhu
Zugdidi ზუგდიდი
E97
Poti ფოთი
Batumi ბათუმი
Sinop
MEHMET CEYLAN
MEHMET CEYLAN
SELAZUR
ALPUKA
2 NOLU ALAN
Bafra
B4
B2
B3
KILIÇ PROJE SAHASI
Artvin
Kastamonu
Samsun
Ünye
Ordu
Giresun
Akçaabat
Rize
Merzifon
Amasya
Çankırı
Çorum
Niksar
Gümüşhane
Bayburt
Tokat
Suşehri
Kelkit
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Google Earth
Imagery Date: 1/1/2021 41°27'14.08" N 36°55'35.42" E elev -154 m eye alt 658.82 km

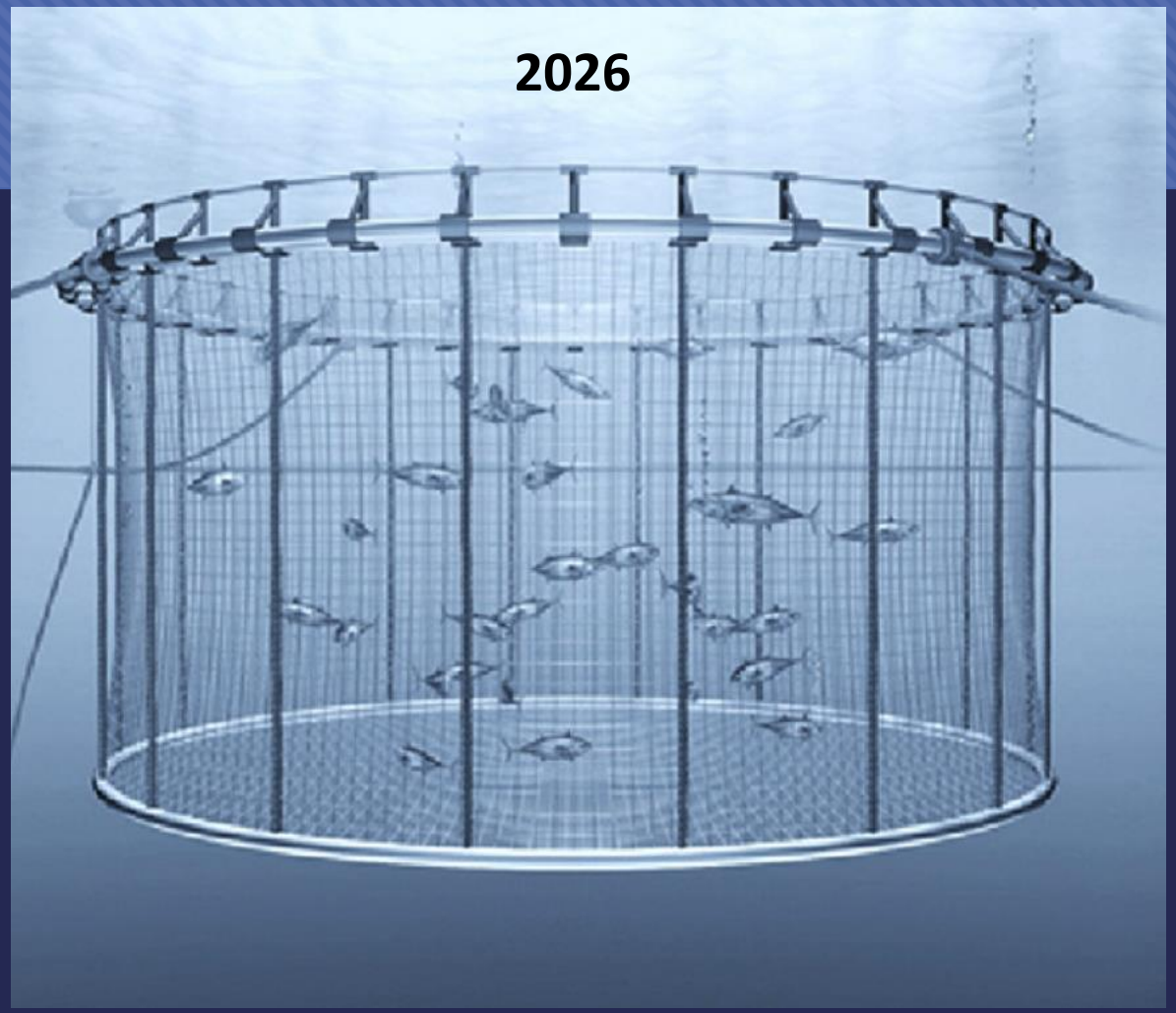

L1
34.801,74 m
AA
69.065,11 m
G1
27.588,51 m
L2
49.073,26 m
G2
54.651,88 m
MEHMET GEYLAN
NOLU ALAN
Row: 2
Row: 2
Row: 5
Row: 1
Row: 1
Row: 3
Row: 3
Row: 4
Row: 4
Ç2
Ç2
Sinop
Dibekli
Yenikent
Kerim
Emenli
Doyran
Yakakent
Alaçam
Dikmen
Tatlısak
Image © 2021 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2021 Maxar Technologies
Image © 2021 CNES / Airbus
Google Earth

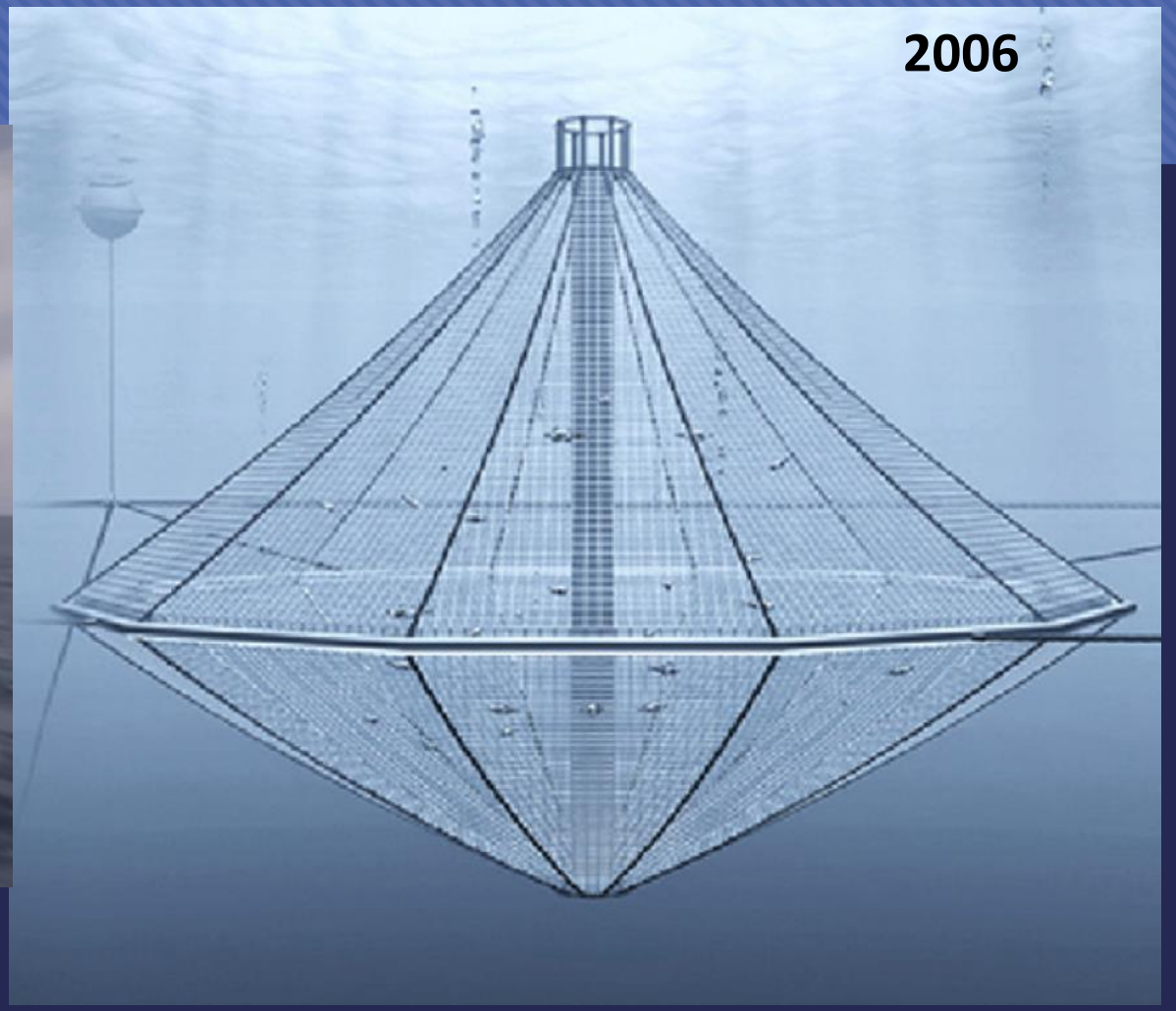
OFFSHORE SİSTEMLER





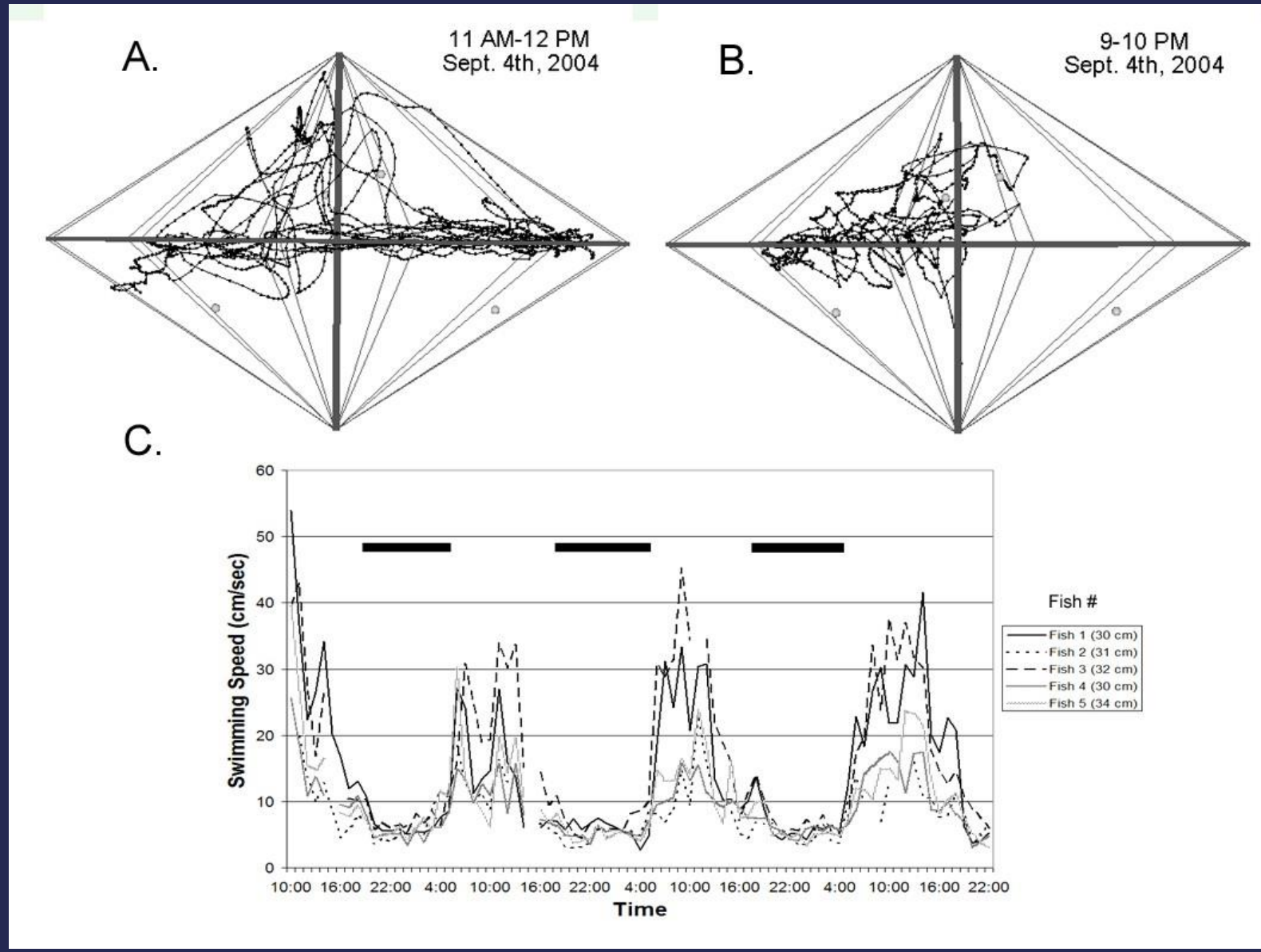
2026




2006

İzle
https://www.youtube.com/watch?v=kx3HvGReNl0

2005


A.
11 AM-12 PM
Sept. 4th, 2004
B.
9-10 PM
Sept. 4th, 2004
C.
Swimming Speed (cm/sec)
60
50
40
30
20
10
0
10:00 16:00 22:00 4:00 10:00 16:00 22:00 4:00 10:00 16:00 22:00 4:00 10:00 16:00 22:00
Time
Fish #
Fish 1 (30 cm)
Fish 2 (31 cm)
Fish 3 (32 cm)
Fish 4 (30 cm)
Fish 5 (34 cm)

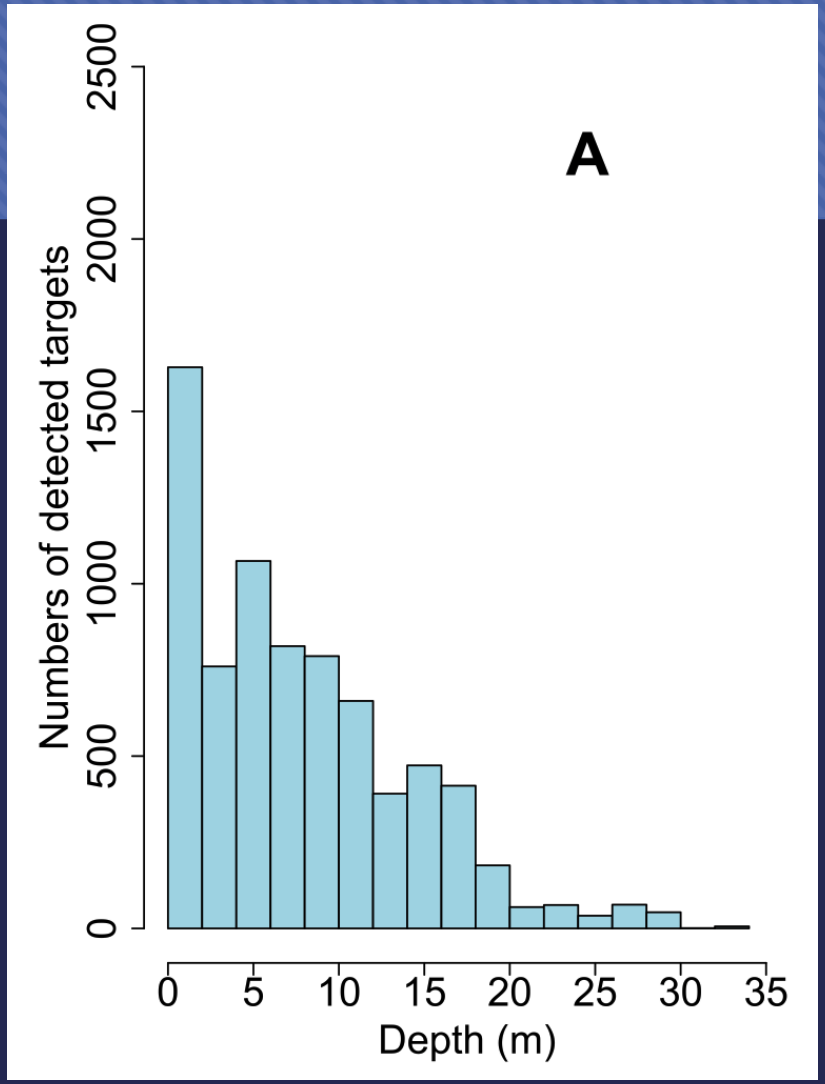
TÜRKİYE'DE İLK BATAR KAFES DENEYİMİ

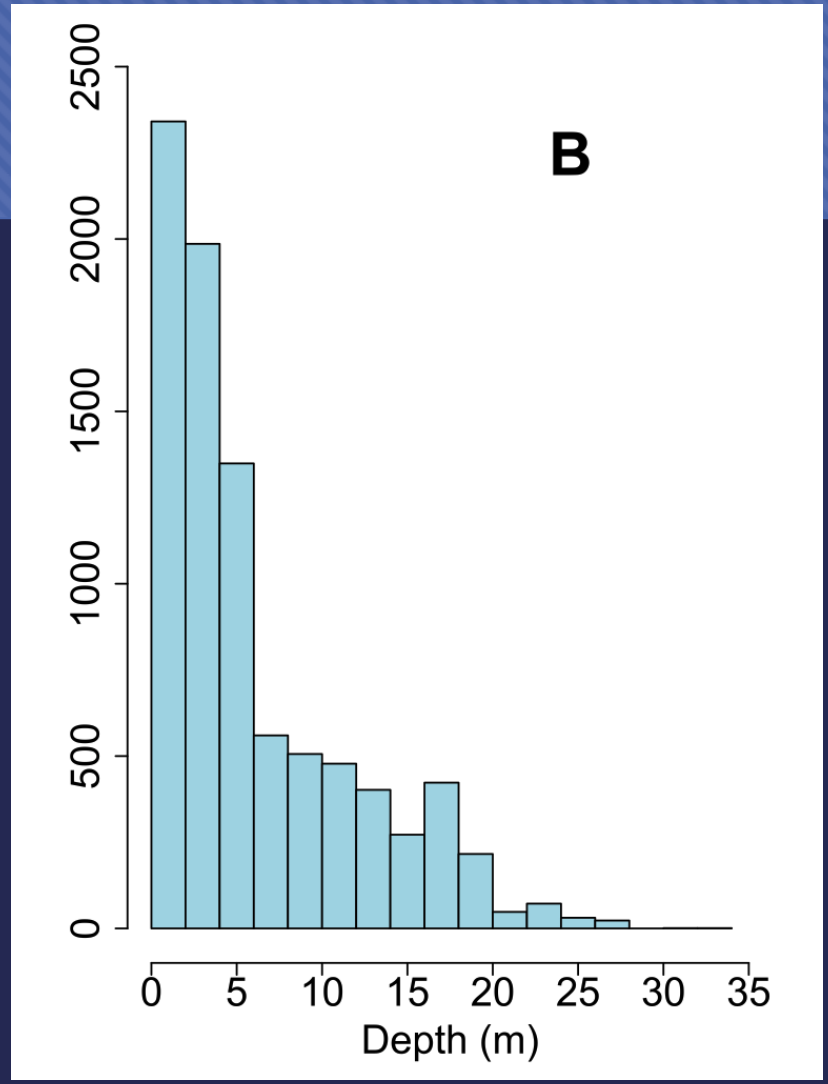
Yer : DOĞU KARADENİZ

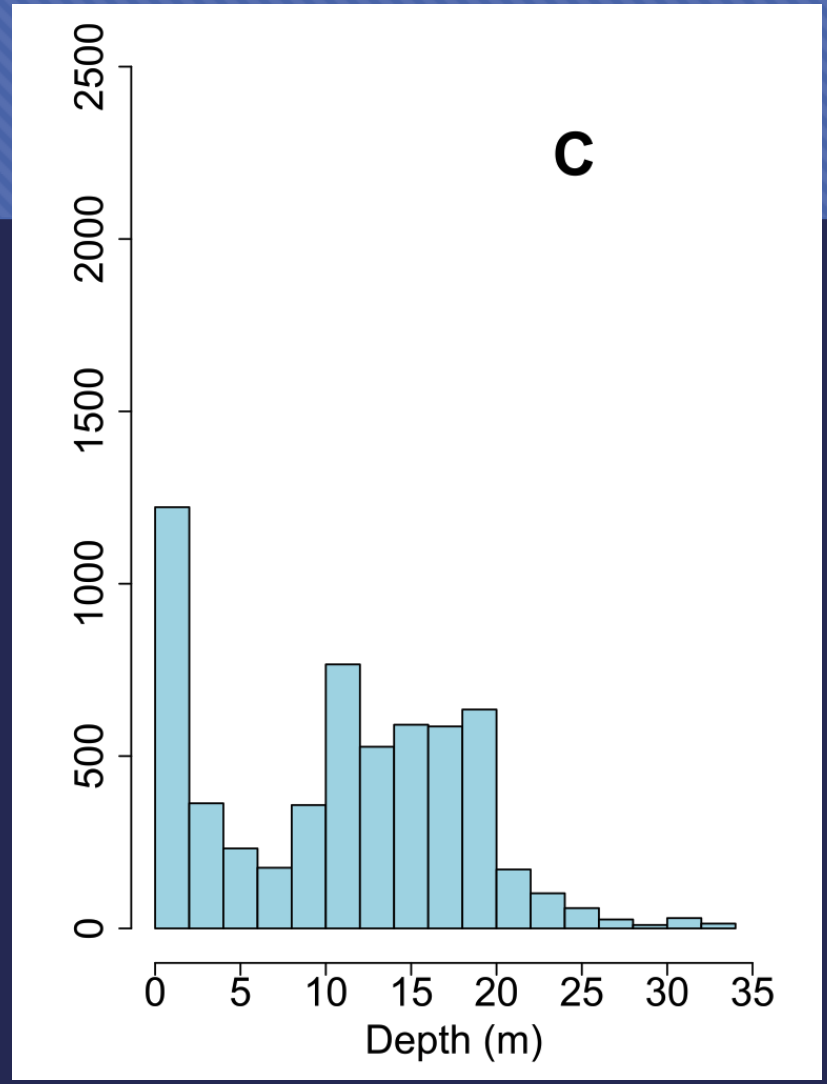
Yıl : 2008 - 2009

Adı	: OCAT
Yer	: Batum - Gürcistan
Deniz Derinliği	: 50 m
Kafes Derinliği	: 35 m
Ağ Derinliği	: 6 m

KAFES İÇERİSİNDE SOMON BALIĞININ GECE – GÜNDÜZ DAVRANIŞ FARKLILIKLARI





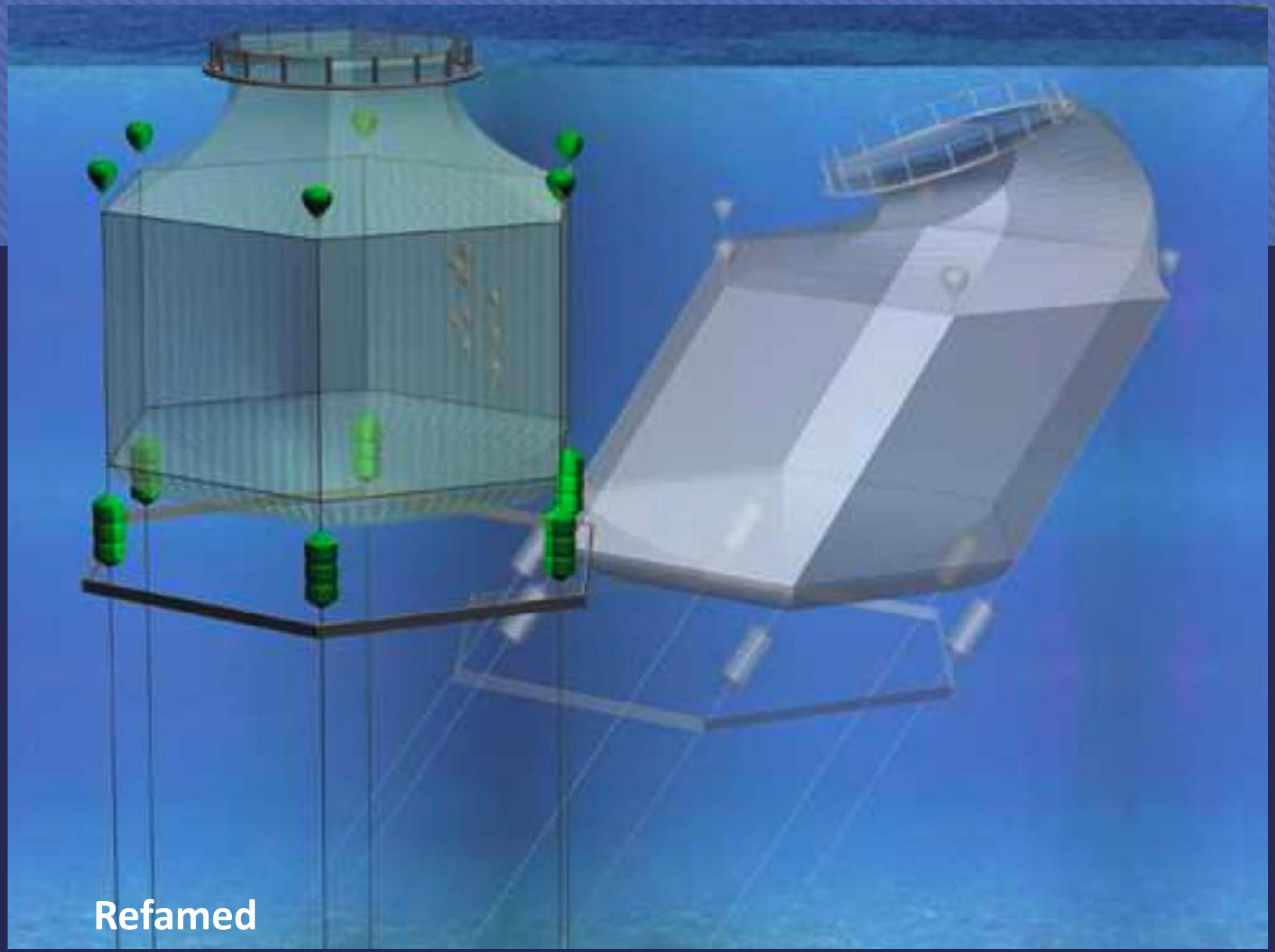


A: Yemleme esnasında, gündüz, 400 g

B: Yemleme yok, gece, 400 g

C: Yemleme yok, gündüz, 2 kg

Banno et al., 2024. https://doi.org/10.1016/j.aquaculture.2024.740879


Refamed


1996

TÜRKİYE'DE İLK ATLANTİK SOMONU DENEYİMİ

Yer : BATI KARADENİZ, Kefken Adası, Bioakva International AS

Yıl : 1992

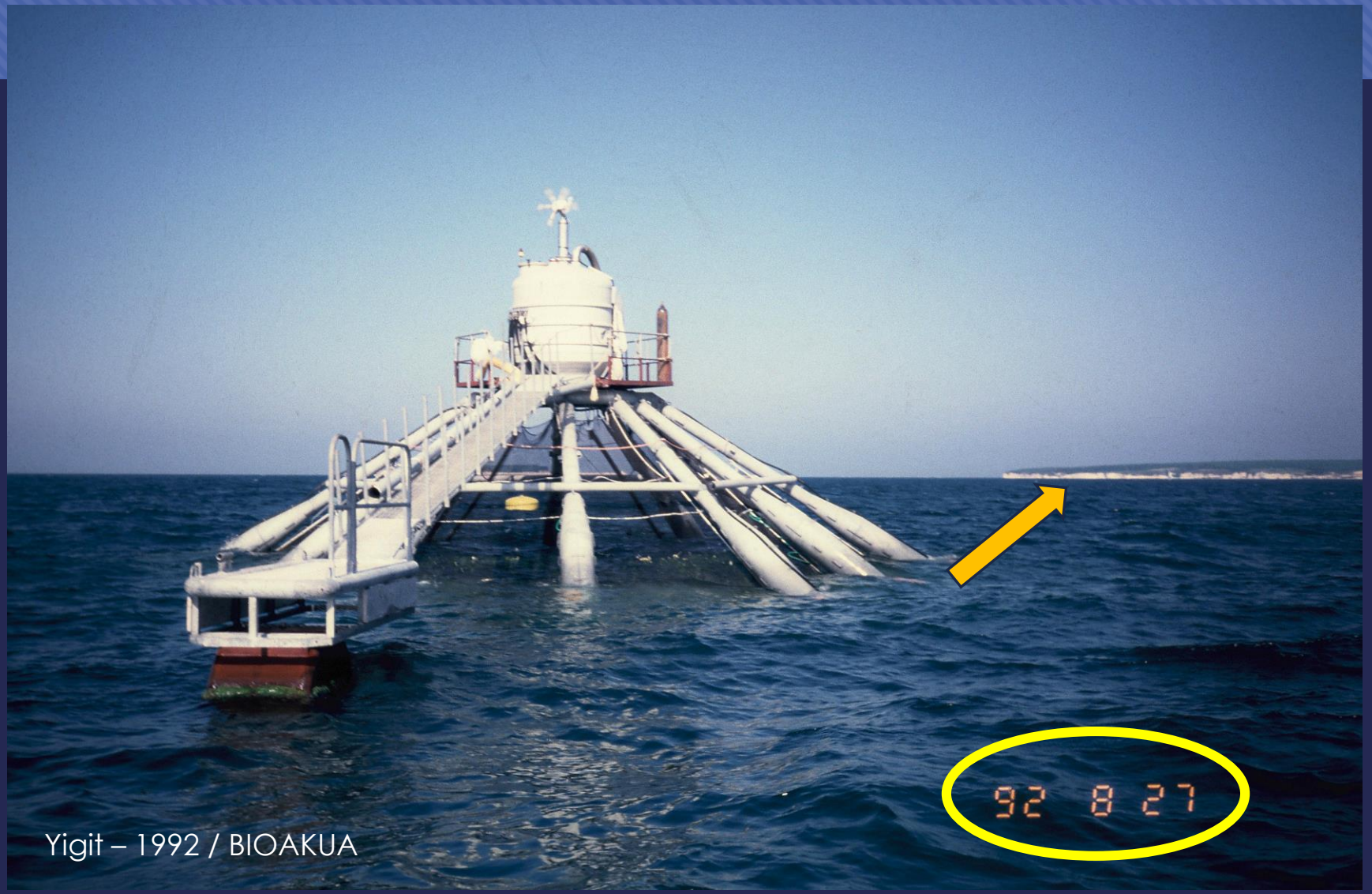
Kefken Adası - *Yiğit, 1992*

TÜRKİYE'DE İLK OFFSHORE DENEYİMİ

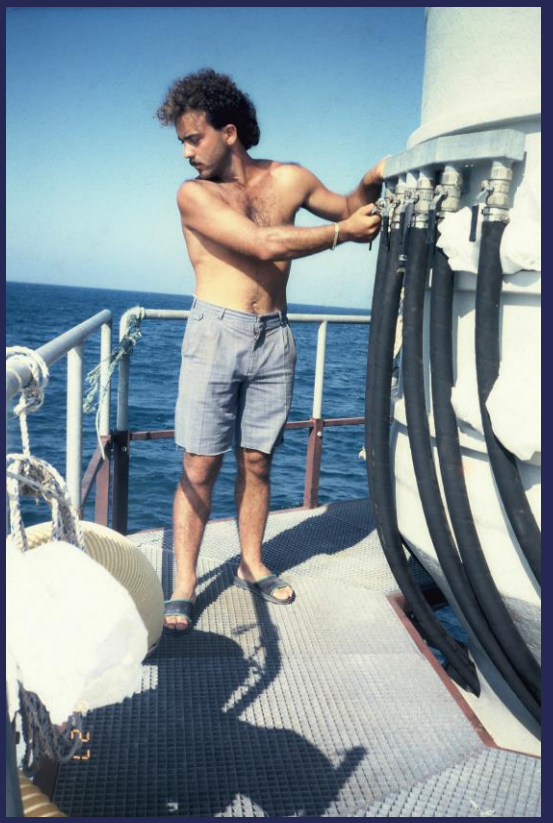
Yer : BATI KARADENİZ

Yıl : 1992-1993

Adı	: FARMOCEAN
Yer	: Kefken Adası
Derinlik	: 60 m
Ağ derinliği	: 40 m



Yigit – 1992 / BIOAKUA

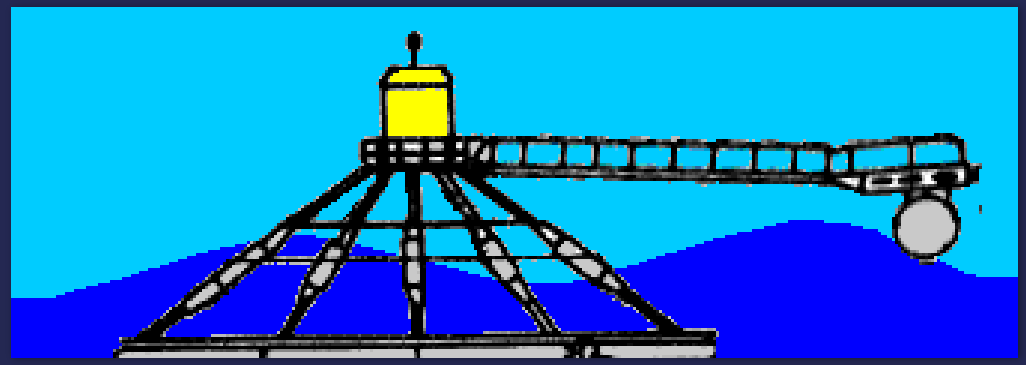


TÜRKİYE'DE İLK OFFSHORE DENEYİMİ

Yer : BATI KARADENİZ

Yıl : 1992-1993

Adı	: FARMOCEAN
Yer	: Kefken Adası
Derinlik	: 60 m
Ağ derinliği	: 30 m



TÜRKİYE'DE KAFESLERDE İLK ALABALIK YETİŞTİRİCİLİĞİ

Yer : BATI KARADENİZ

Yıl : 1993

Yer : Sinop mendirek önü
Derinlik : 10-15 m
Ağ derinliği : 3-5 m

1993

2026

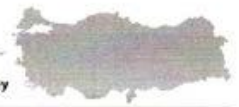
Avrupa'nın İlk Anti-fouling Kafesi
Çanakkale - Türkiye

Current use and future applications

Copper alloy mesh technology began in 1975 with small salmon farming enclosures in Northeastern USA. Since then, alloy technology has evolved and now is being successfully used in Japan, Australia and Chile, providing productive and sustainable solutions for fish farmers. Development of future applications and trials of improved copper alloy materials, mesh forms, and aquaculture system configurations are underway with a variety of species in China, Korea, Panama, Norway, South Africa, Turkey and the United States.

Australia

At Van Diemen Aquaculture, Copper-Zinc mesh cages have been used since 2005 to raise Atlantic salmon. Based on demonstrated success in improving fish health, the first installation of 6 rigid cages has been increased to 28 cages, with further expansion in progress. Growers have reported a 15% reduction in feeding costs over the past 3 years. Fish mortality decreased from 20% to 10% and losses from attack by predators were reduced from 5% to less than 0.1%. Net cleansing is now only performed once or twice a year.



Turkey

A cooperative project involving the University of New Hampshire and Çanakkale University is developing copper alloy aquaculture cages for sea bass and sea bream farming in the Mediterranean region.

Norway

EcoSea Farming and the International Copper Association are cooperating with Norwegian aquaculture organizations to trial copper alloy mesh cages for use in exposed conditions in Norway and other European locations.

Australia

TÜRKİYE

Norway

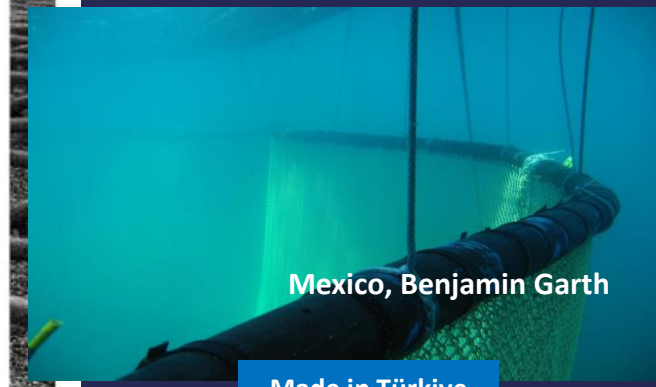
For further information:

European Copper Institute:
www.eurocopper.org
+32 (0)2 777 70 70
ndc@eurocopper.org

International Copper Association:
www.copperinfo.com
hstillman@copper.org

EcoSea Farming:
www.ecosea.cl
rsanchez@ecosea.cl

SeaStation, Mexico – Benjamin Garth



Mexico, Benjamin Garth

Made in Türkiye by ÇOMÜ

CAM - Japan - 2021

Copper-Alloy Nets in Aquaculture Cage System

FOB Price:	US$30.00 / kg
Min. Order:	1,000 kg
Port:	Qingdao, China
Production Capacity:	50ton/Month
Payment Terms:	L/C, T/T, Western Union, Paypal

Contact Now
Inquiry Basket

İNOVATİF TEKNOLOJİLER

Product of ROLLS – ROYCE UK
& SalMar Norway

Made in China

SalMar DeepSea Aquaculture - 2018

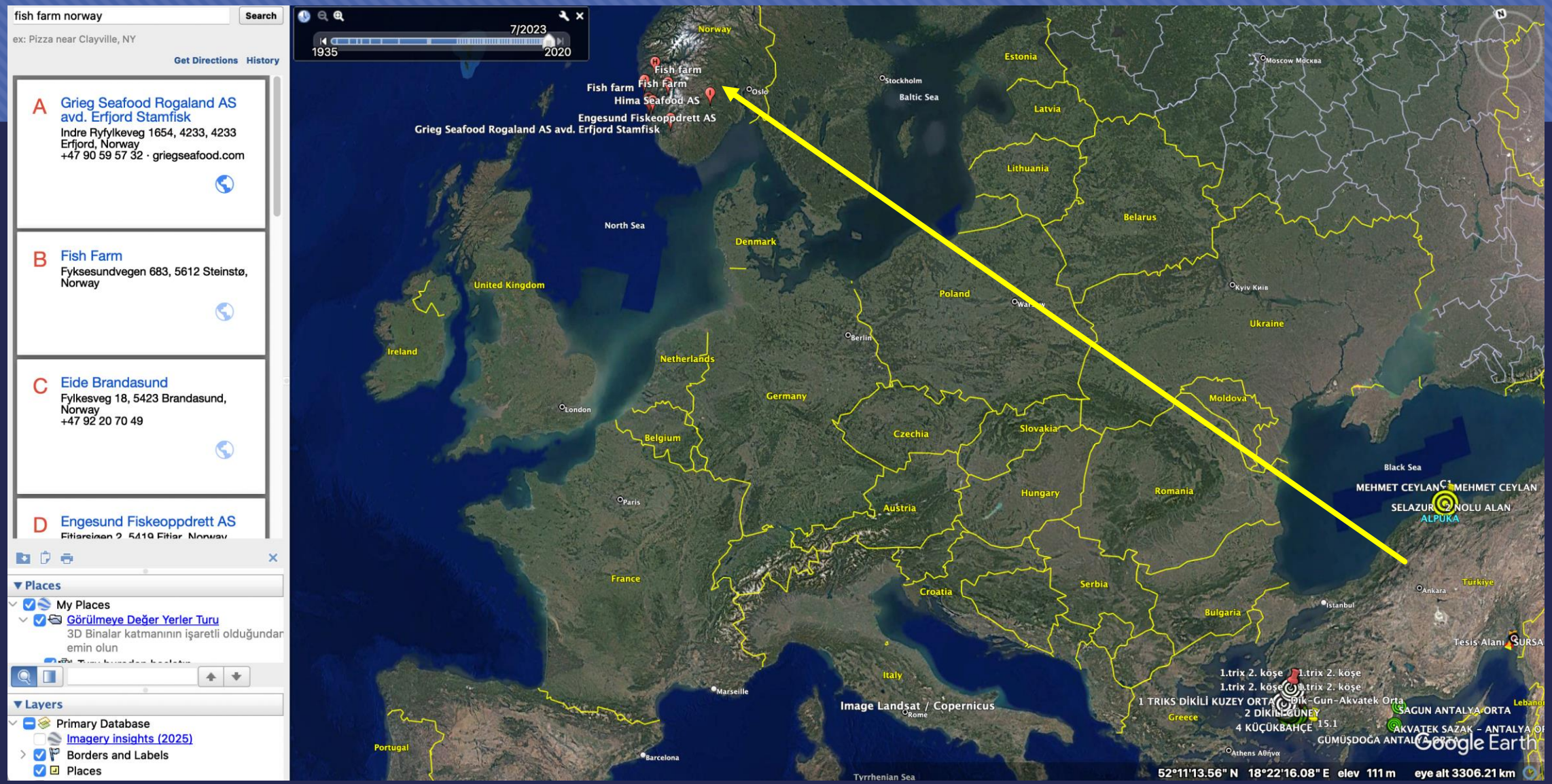
Designed in Norway (SalMar), Made in China (Qingdao Wuchuan)

Marine Cage Culture & The Environment

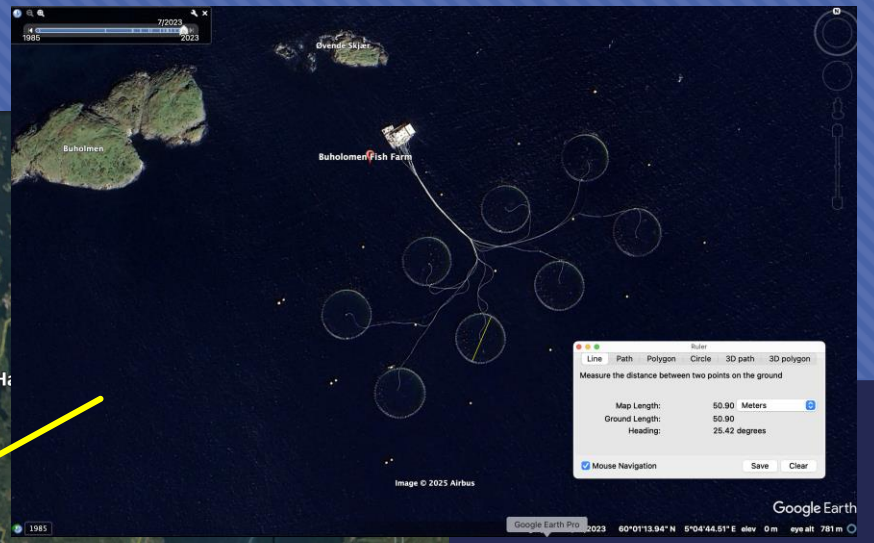
Twenty-First Century Science Informing a Sustainable Industry

NOAA Technical Memorandum NOS NCCOS 164

Norveç'te Somon Üretiminde Kullanılan Sistemler - 2026

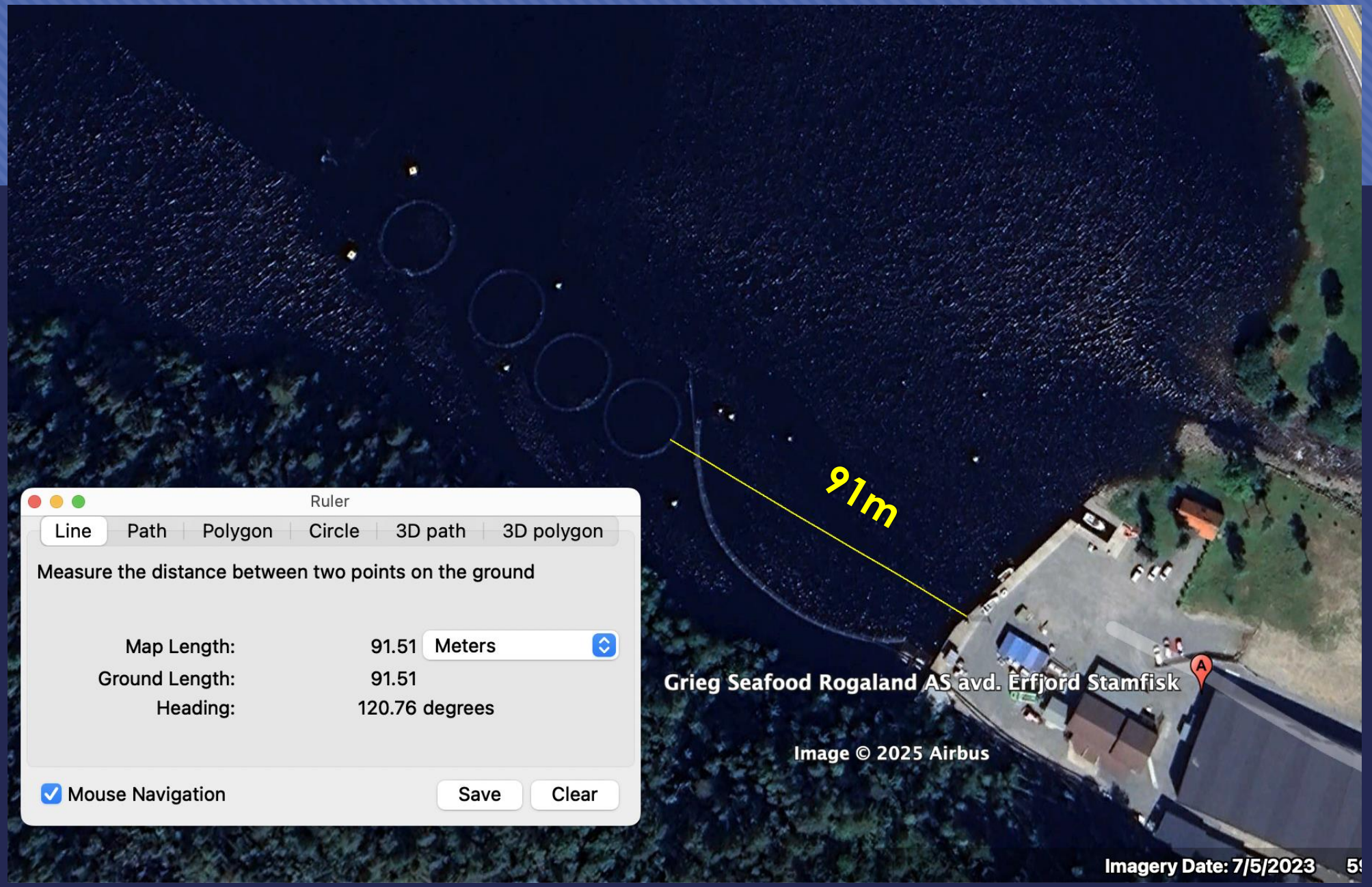


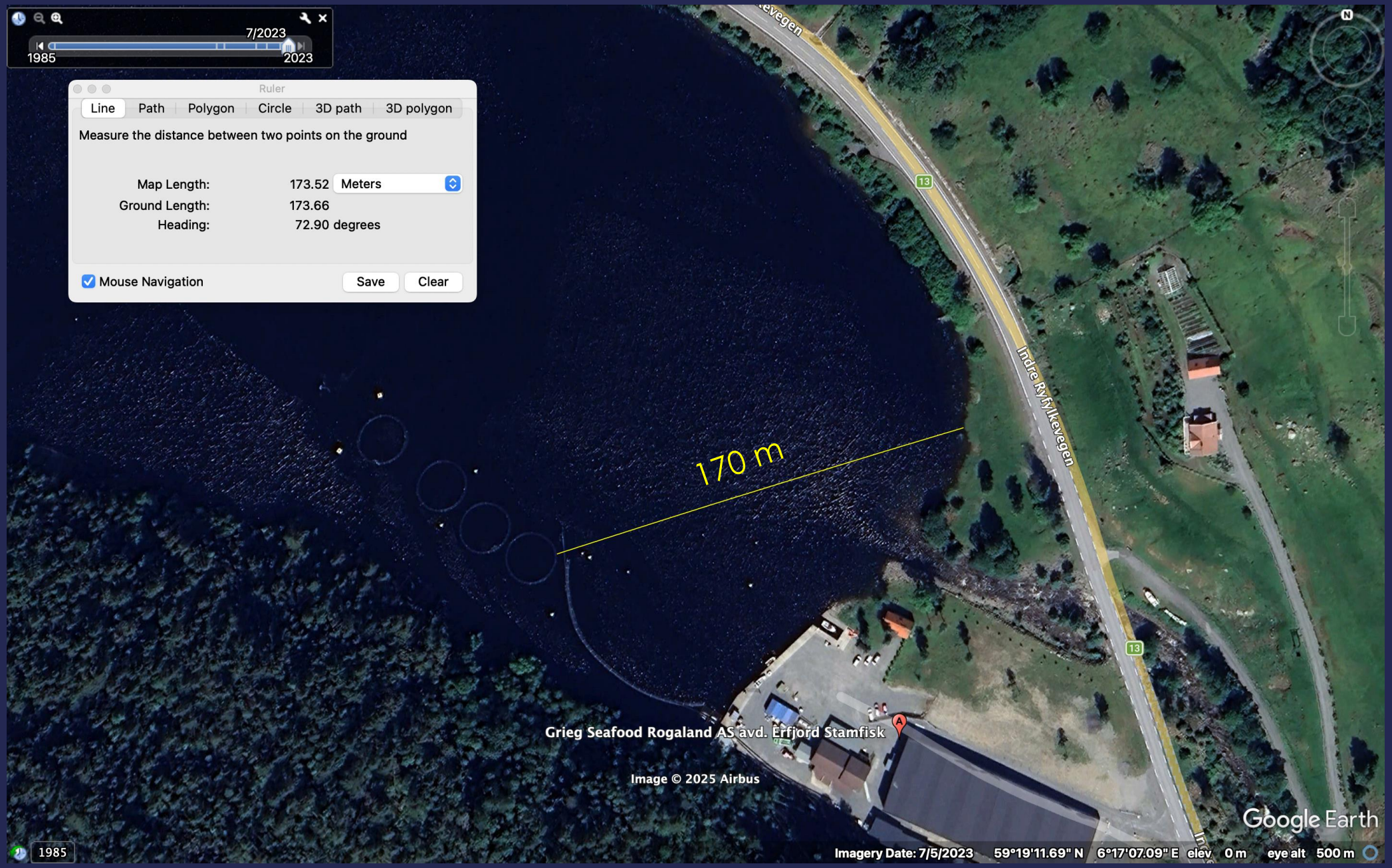
Norveç – Alabalık & Somon Çiftlikleri - 2026

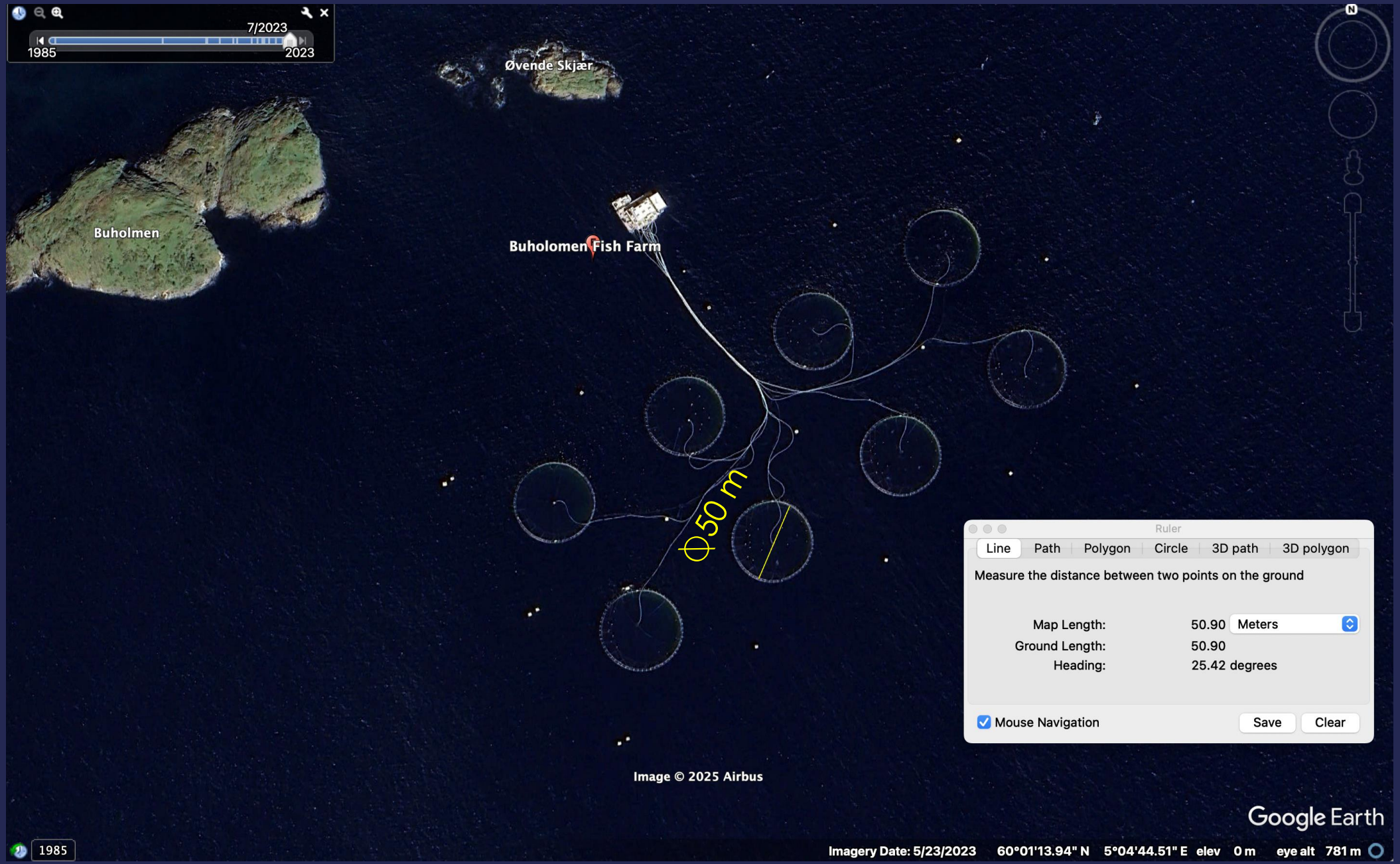


Torangsvåg
Austevoll
Storebø
546
BJÅNESTANGEN
Kolbeinsvik
Huftarøy
E39
Husavik
546
Vinnes
Bekkjarvik
Buholomen Fish Farm
Stolmen
Reksteren
Årland
Våge
Gauksheim
E39
Sandvik
545
Fonno
Image Landsat / Copernicus
Google Earth
60°03'30.53" N 5°09'02.59" E elev 0 m eye alt 29.83 km

Norveç – Alabalık & Somon Çiftlikleri - 2026



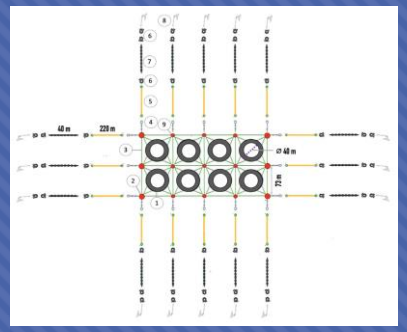

7/2023
1985
2023
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the distance between two points on the ground
Map Length: 173.52 Meters
Ground Length: 173.66
Heading: 72.90 degrees
Mouse Navigation
Save
Clear
170 m
Indre Ryfylkevegen
13
Grieg Seafood Rogaland AS avd. Erfjord Stamfisk
Image © 2025 Airbus
Google Earth
1985
Imagery Date: 7/5/2023 59°19'11.69" N 6°17'07.09" E elev 0 m eye alt 500 m


7/2023
1985
2023
Øvende Skjær
Buholmen
Buholomen Fish Farm
ϕ50 m
Ruler
Line
Path
Polygon
Circle
3D path
3D polygon
Measure the distance between two points on the ground
Map Length: 50.90 Meters
Ground Length: 50.90
Heading: 25.42 degrees
Mouse Navigation
Save
Clear
Image © 2025 Airbus
Google Earth
1985
Imagery Date: 5/23/2023 60°01'13.94" N 5°04'44.51" E elev 0 m eye alt 781 m

AÇIK DENİZLERİN ÖTESİNE ÇIKARKEN …

İHTİYACIMIZ OLAN YENİ TEKNOLOJİLER

→ Yatay Çapalama yerine **DİKEY ÇAPALAMA SİSTEMLERİ**

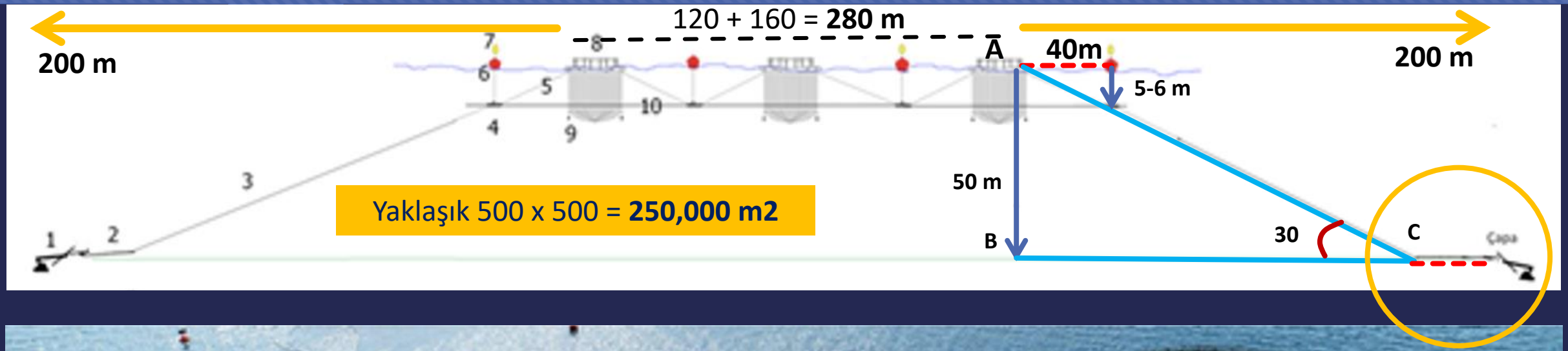


h x 3 → 50 m x 3 = 150 m

+ 20 m zincir = 170 m

+ 15(20) m ilave kol halatı = 190 m

+ 10(15) m ilave çapa hattı = 200 m



Yaklaşık 500 x 500 = **250,000 m2**

→ Artan saha kullanımı

→ Ekonomik yük

→ Deniz saha planlamada sapma

AĞ KAFES SİSTEMLERİNİN AÇIK DENİZ RÜZGAR SANTRALLERİYLE ENTEGRASYONU

Denizde Enerji Sektörüyle Entegrasyon

→ Denizüstü RES'ler & Kafes Balıkçılığı

→ Enerji Platformları & Kafes Balıkçılığı

- Maliyet hesabı
- Teknik fizibilite
- Ekonomik analizler

OCEAN WORLD – Hedef 2050

Proposal full title: **Ocean** deepwater multi-purpose offshore platforms for an innovative and sustainable **World**

Proposal acronym: **Ocean World**

Type of funding scheme: **Collaborative Project, Small or medium-scale focused research project**

Work programme topics addressed: **OCEAN.2011-1**

2010

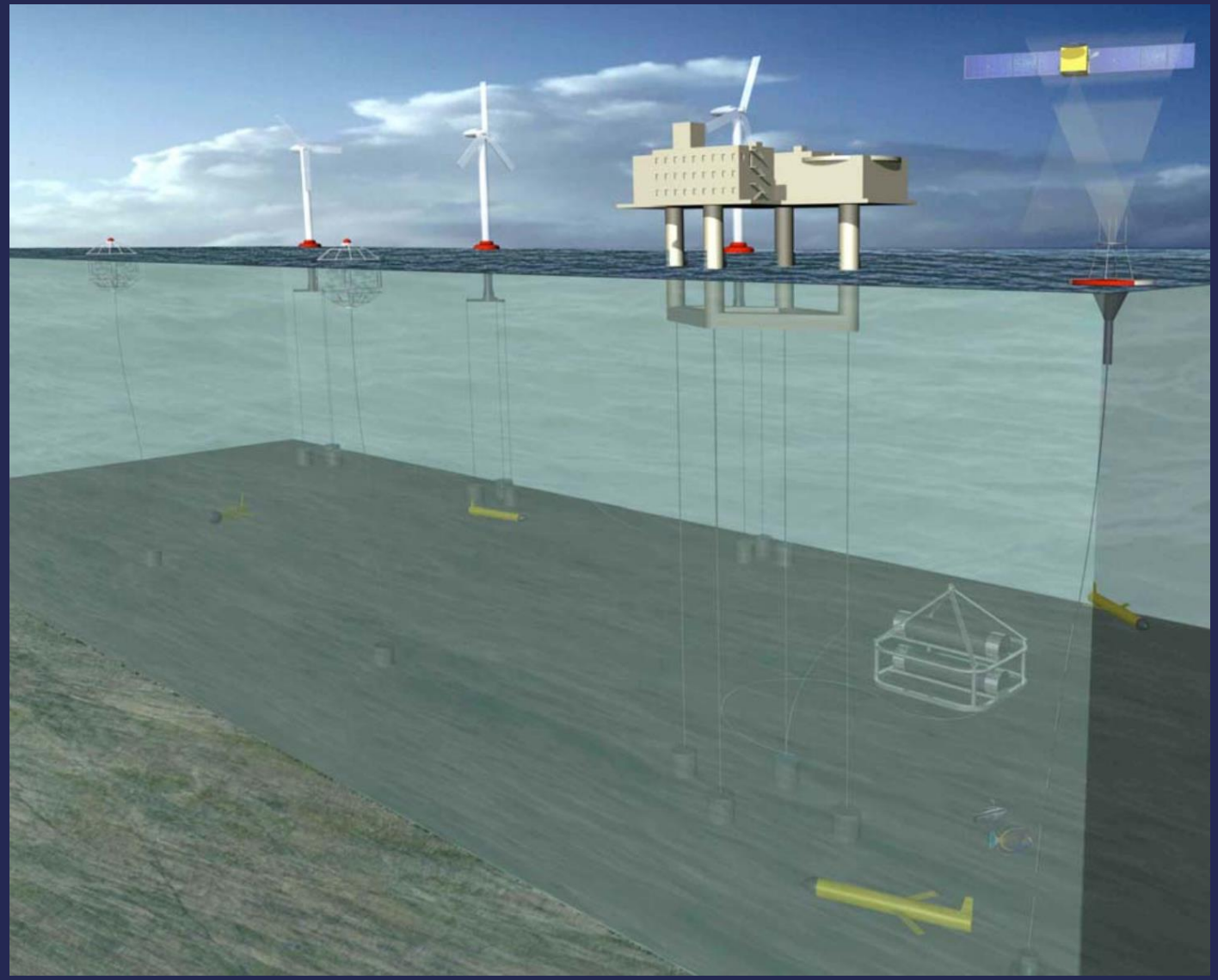
List of participants:

Participant no.	Participant organisation name	Country
1 (CO)	Alma Mater Studiorum - University of Bologna (UNIBO)	IT
2	National And Kapodistrian University of Athens (NKUA)	GR
3	National Technical University of Athens (NTUA)	GR
4	Istituto Nazionale di Geofisica e Vulcanologia (INGV)	IT
5	Sarost Sa (SAROST)	TN
6	Consiglio Nazionale delle Ricerche (CNR)	IT
7	Universita Ta Malta (UOM)	MT
8	University of Plymouth (UNiPLY)	UK
9	Sustainable Future (SUSFUT)	UK
10	Puertos Del Estado (PUERTOS)	ES
11	Universitat Politecnica de Catalunya (UPC)	ES
12	Amplio Solar Srl (AMPLIO)	UK
13	Centro Euro-Mediterraneo per i Cambiamenti Climatici Scarl (CMCC)	IT

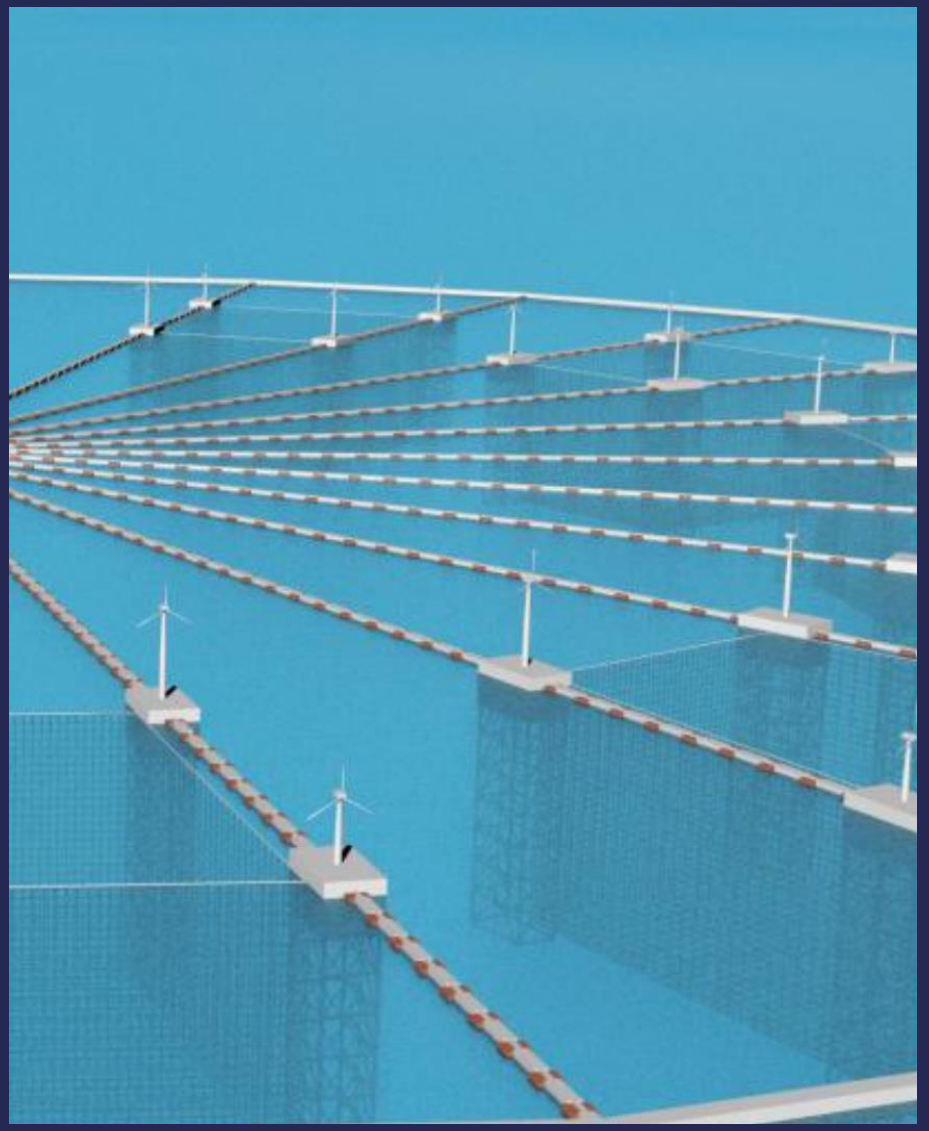
Ocean World FP7-OCEAN-2011-1

Participant no.	Participant organisation name	Country
14	Advanced Computer Systems SpA (ACS)	IT
15	Consejeria de Medio Ambiente - Junta de Andalucia (CMA-REDIAM)	ES
16	CLU Srl (CLU)	IT
17	Aalborg Universitet (AAU)	DK
18	[illegible]	BE
19	Canakkale Onsekiz Mart Universitesi (COMU)	TR
20	[illegible]	TR
21	Fundacio Privada Institut de Recerca de L'energia de Catalunya (IREC)	ES
22	D'appolonia Spa (DAPP)	IT
23	Sadco-Shelf (SADCO)	RU
24	Karlsruher Institut Fuer Technologie (KIT)	DE

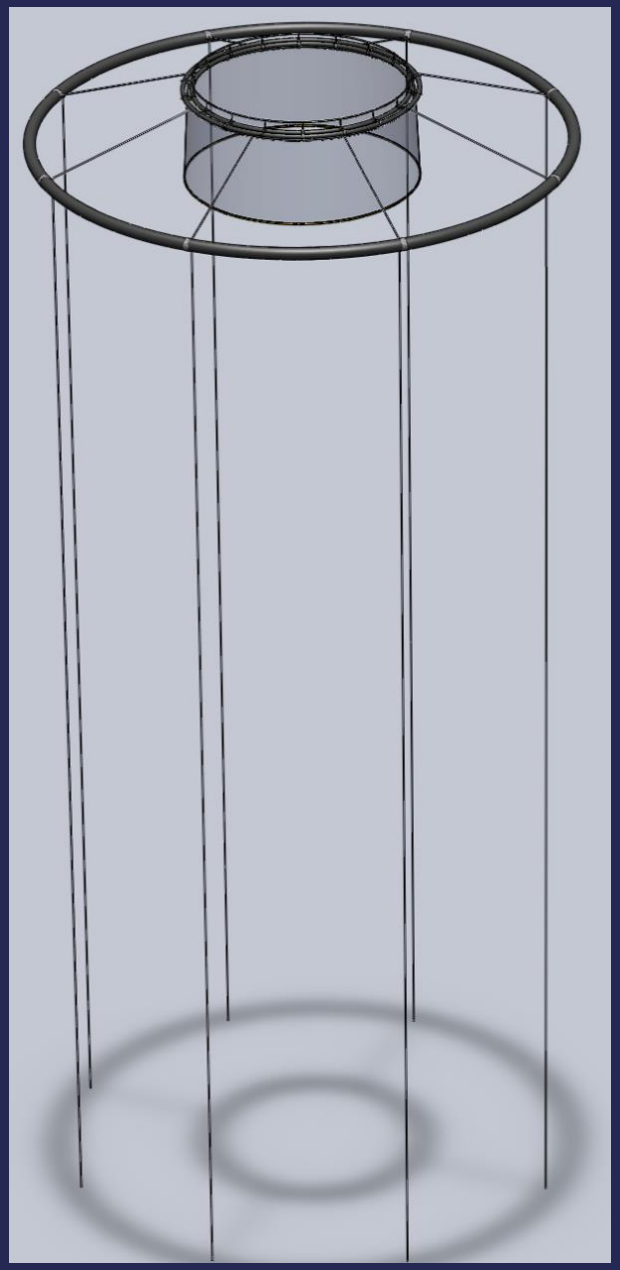
OCEAN WORLD Project - 2010



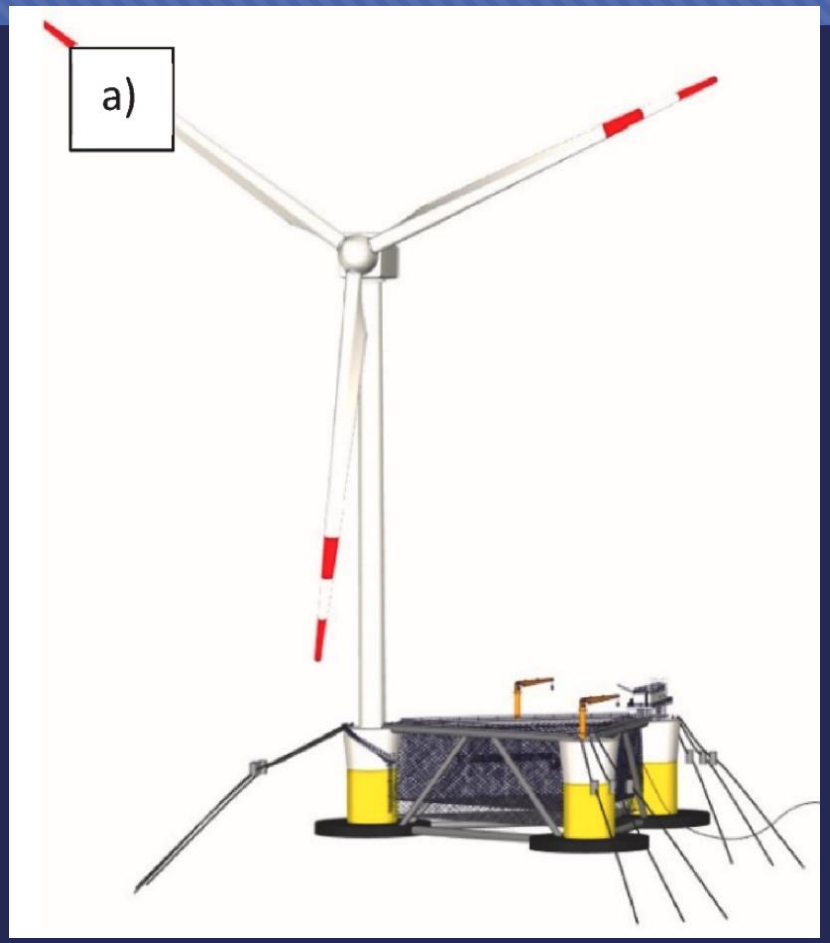
OCEAN WORLD Project - 2010

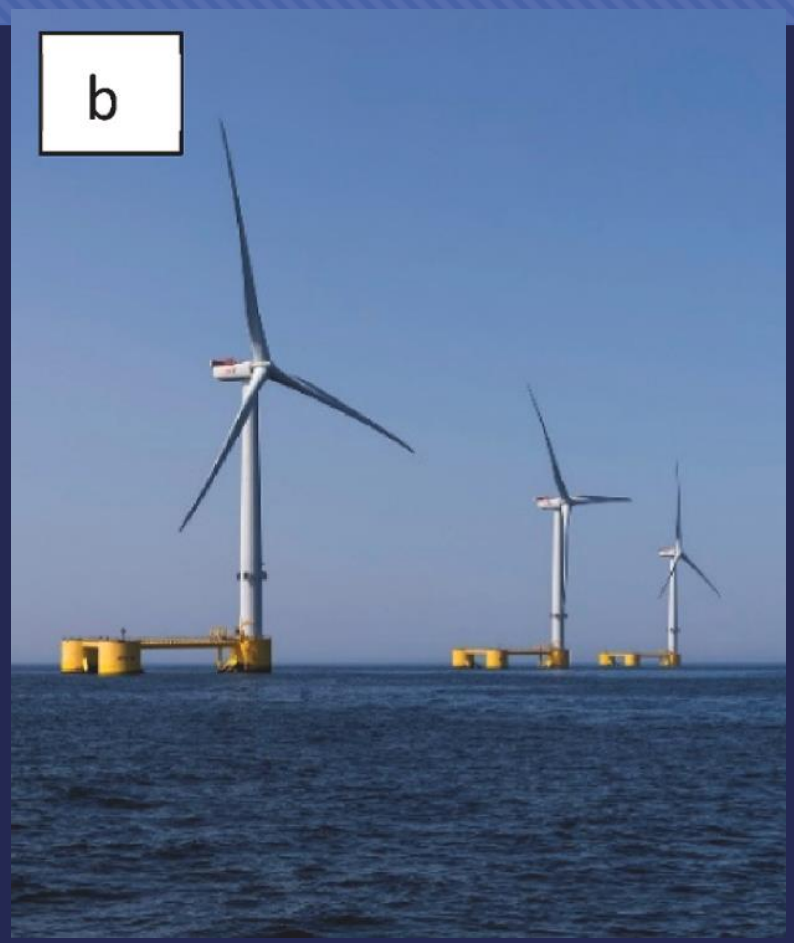


2050 >



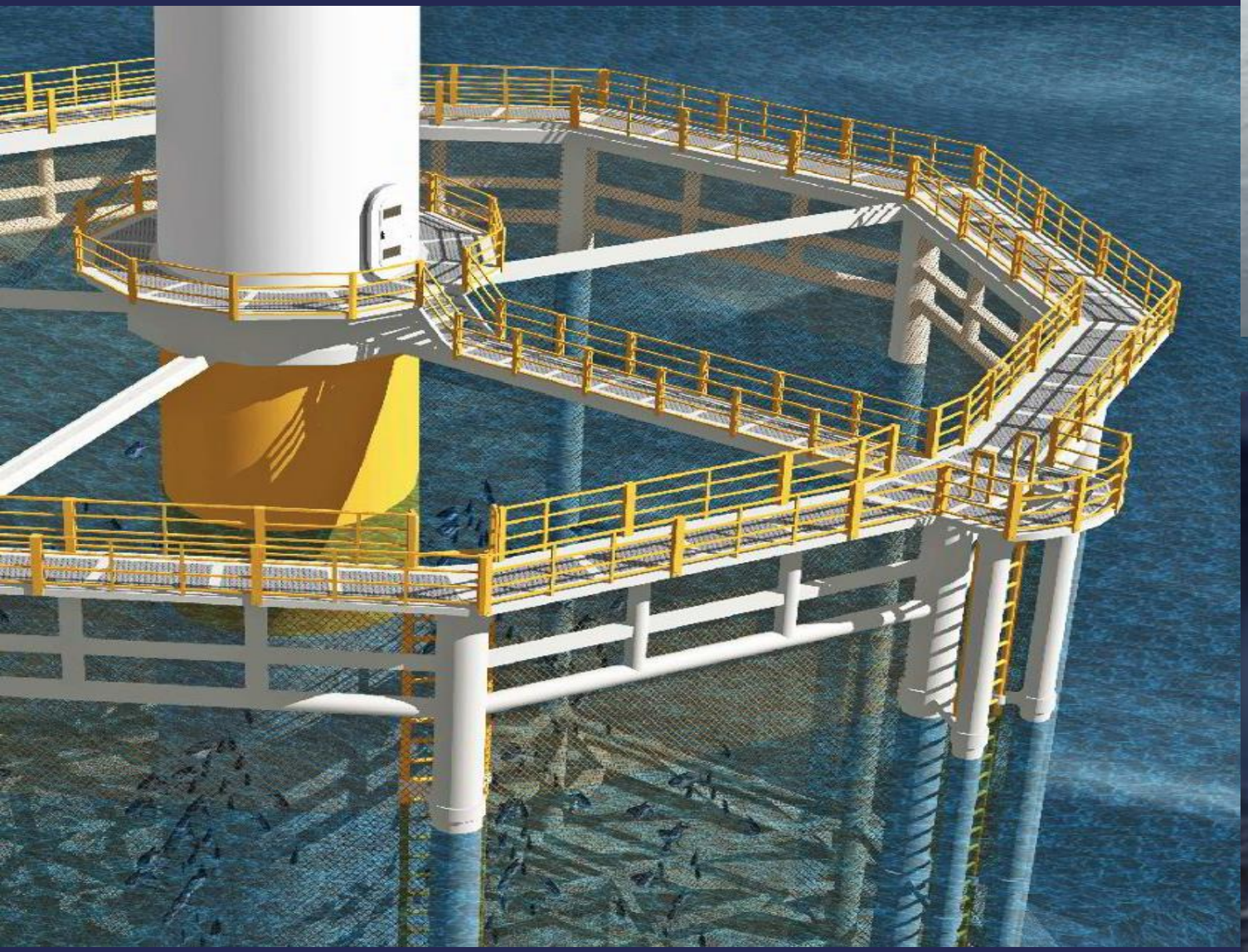
AĞ KAFES SİSTEMLERİNİN AÇIK DENİZ RÜZGAR SANTRALLERİYLE ENTEGRASYONU





IntraFish.com

Karampour et al. 2020



OFFSHORE WIND TURKIYE 2025 EVENT

CONFERENCE PROGRAM

REGISTRATION FORM

7-8 May 2025
City of Çanakkale (Trojan City)
Çanakkale Onsekiz Mart University – İÇDAŞ Conference Center

TÜRK PATENT - ÇOMÜ

DERİN DENİZLER ÇAPALAMA PLATFORMU

TÜRK PATENT

TEKNOFEST
2. Ödülü

ISIF ’24
International
Invention Fair
Silver Award

Yigit, 2024

TÜRK PATENT - ÇOMÜ

TÜRK SOMONU YAZ KAFESİ

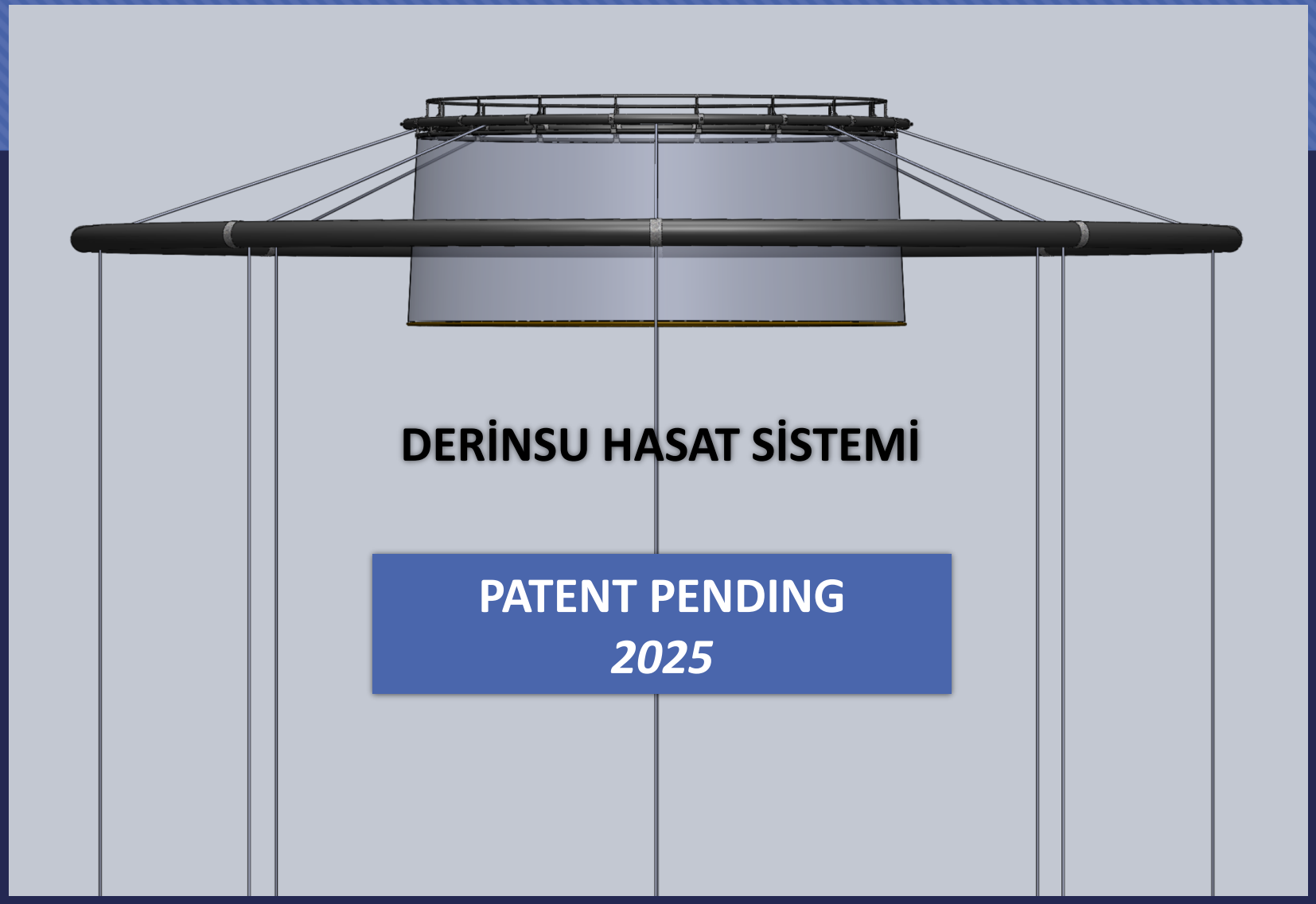
TÜRK PATENT

TEKNOFEST
3. Ödülü

ISIF '24
International
Invention Fair
Bronz Award

Yigit & Ergün,2024

TÜRK PATENT - ÇOMÜ



DERİNSU HASAT SİSTEMİ

PATENT PENDING
2025

TÜRK PATENT

TEKNOFEST
2026

ISIF ’26
International
Invention Fair

Yarışmacı / Aday
Yiğit & Büyükateş, 2026

https://www.seafoodsource.com/news/aquaculture/copper-alloy-nets-being-trialed-in-japanese-aquaculture