



Estimating IUU

TDW8

Overview

- Background
- DEVFISH2 Contribution
- Example of analyses conducted to date
- Future Work



References for checking IUU

- The Minimum Terms and Conditions (MTCs) are the basis for establishing national legislation which provides the conditions for fishing.
- WCPFC Convention and Conservation Management Measures (CMMs) include obligations for compliance throughout the WCPFC Convention Area.



Examples of quantifying IUU in the available data

- **ILLEGAL FISHING:** Fishing in an area (EEZ or high seas) that is not permitted, which is evident in VMS, logsheet or observer data when considering licensing conditions and/or relevant WCPFC CMMs
- **UNREPORTED FISHING:** the obligation for logsheet provision is 100%, so any evidence of non-provision is “unreported” fishing.
- **UNREGULATED FISHING:** This is the most difficult to quantify and the only information currently available is reported to the WCPFC Technical and Compliance Committee (TCC).

Existing Estimates

- FAO - Global IUU
\$10 - 23 Billion
- Greenpeace - Pacific IUU
\$700 Million - \$1.5 Billion
- How does it help you combat IUU



DEVFISH2

- Estimates vary substantially
- All reports agree - data gaps causes uncertainty
- Aim to provide generalised tables of fact to inform discussion on IUU estimates
- Evolve as the fishers evolve
- Notes.
Lots of tables.
EEZ/Flag not displayed (Yet)
Subset years



Purse Seine Coverage Rates

FLAG	2009			2010			2011		
	TRIPS	VMS%	LOG%	TRIPS	VMS%	LOG%	TRIPS	VMS%	LOG%
	111	99%	82%	90	99%	98%	82	98%	89%
	33	94%	64%	46	100%	52%	52	98%	52%
	17	100%	53%	42	76%	76%	40	93%	88%
	57	96%	96%	62	98%	85%	54	96%	76%
	318	101%	53%	319	99%	83%	264	100%	88%
	46	100%	87%	58	98%	81%	61	98%	80%
	311	100%	96%	292	100%	95%	270	100%	99%
	59	97%	97%	79	97%	85%	91	97%	71%
	30	83%	100%	27	78%	100%	24	58%	96%
	102	71%	85%	70	69%	54%	95	71%	83%
	307	66%	93%	245	86%	94%	303	99%	79%
	46	87%	98%	73	111%	96%	92	109%	107%
	20	70%	95%	13	85%	85%	16	100%	88%
	6	100%	100%	10	100%	100%	8	100%	100%
	278	97%	97%	286	99%	99%	294	98%	95%
	320	98%	98%	284	103%	101%	241	104%	92%
	180	98%	85%	157	100%	94%	151	100%	87%
TOTAL	2241	92%	87%	2153	97%	91%	2138	98%	88%

Longline Coverage Rates

FLAG	2009			2010			2011		
	TRIPS	VMS%	LOG%	TRIPS	VMS%	LOG%	TRIPS	VMS%	LOG%
	289	0%	100%	255	0%	100%	209	0%	100%
	14	100%	43%	5	100%	0%	6	100%	0%
	139	88%	73%	100	99%	64%	82	100%	62%
	1326	100%	69%	1294	100%	56%	1260	100%	35%
	24	13%	92%	12	8%	92%	18	6%	94%
	578	89%	76%	619	86%	60%	671	90%	44%
	336			328			235		
	925			1043			981		
	0			7			18		
	331			267			264		
	66			61			57		
	6	0%	100%	5	0%	100%	4	0%	100%
	118	0%	100%	122	0%	100%	121	0%	100%
	116	0%	100%	120	0%	100%	114	0%	100%
	72	21%	89%	101	36%	64%	50	30%	70%
	3	100%	0%	2	100%	50%	7	100%	0%
	4	0%	100%						
				6	100%	0%	22	95%	23%
	1531	98%	37%	1909	99%	57%	1640	100%	48%
	926	5%	96%	770	5%	96%	31	100%	42%
	270	72%	88%	258	80%	76%	288	95%	55%
	4	0%	100%	19	0%	100%	6	0%	100%
TOTAL	7078	77%	63%	7303	80%	63%	6084	90%	47%

POTENTIAL Unauthorised Purse Seine fishing

EEZ	2009		2010		2011	
	TOTAL DAYS	% Illegal	TOTAL DAYS	% Illegal	TOTAL DAYS	% Illegal
	46	6.52%	28	28.57%	118	2.54%
	4,776	0.00%	7,626	0.00%	8,977	0.00%
	10,255	0.00%	8,350	0.00%	6,381	0.00%
	542	0.18%	910	0.00%	806	0.50%
	2,847	0.00%	4,904	0.00%	3,105	0.00%
	19,867	0.00%	33,132	0.00%	33,343	0.00%
	260	0.00%	39	7.69%	20	0.00%
	3,325	0.00%	5,763	0.00%	6,616	0.00%
	218	0.00%	237	1.27%	1,000	0.00%
	2,034	0.00%	2,197	0.00%	1,735	0.00%
TOTAL	44,170	0.01%	63,186	0.02%	62,101	0.01%

POTENTIAL Unauthorised LONGLINE fishing

EEZ	2009		2010		2011	
	TOTAL DAYS	% Illegal	TOTAL DAYS	% Illegal	TOTAL DAYS	% Illegal
	4,951	0.75%	3,969	0.13%	5,805	0.19%
	8,910	0.07%	7,365	0.00%	5,831	0.02%
	7,713	0.00%	7,703	0.00%	5,885	0.00%
	9,718	1.65%	6,053	1.65%	3,288	1.16%
	5,057	0.95%	6,302	0.51%	3,510	0.46%
	2	100.00%	115	15.65%	168	7.14%
	267	11.99%	247	22.27%	2	100.00%
	2,113	0.43%	3,482	0.06%	2,254	0.22%
	2,794	0.00%	7,842	0.00%	7,904	0.00%
	15,113	0.01%	15,683	0.03%	7,375	0.00%
	7	100.00%	3	100.00%	294	2.72%
	623	5.46%	336	11.31%	434	8.06%
	867	0.58%	895	0.00%	558	0.00%
	7,648	0.04%	5,393	0.07%	4,688	0.00%
	1,745	0.06%	2,332	0.04%	887	0.11%
TOTAL	66,982	0.52%	63,325	0.41%	39,397	0.33%

Vessel Matching : WCPFC RFV vs FFA Vessel Reg

Year	2013	2014	2015
FFA Vessel Reg	1372	1316	
Inactive	0	10	
Not Matching	140	107	
Not Close Matching		6	

PS Logsheet Sets > 50 KM closest VMS

FLAG	2012		2011		2010	
	Mis	Total	Mis	Total	Mis	Total
	2	322	14	1,768	31	1,981
	5	191	3	628	14	430
	0	35	24	632	56	483
	1	127	28	835	43	1,034
	0	0	0	0	2	42
	2	185	63	6,561	78	5,268
	2	101	44	817	25	520
	21	803	873	6,540	410	6,623
	0	133	113	1,242	80	1,577
	0	92	75	306	142	562
	1	157	539	7,306	315	6,494
	0	18	96	2,743	158	2,425
	6	109	48	764	31	379
	0	0	2	188	3	92
	0	15	30	268	9	327
	1	59	710	6,644	348	6,162
	3	355	67	5,575	168	7,848
	1	46	34	558	20	504

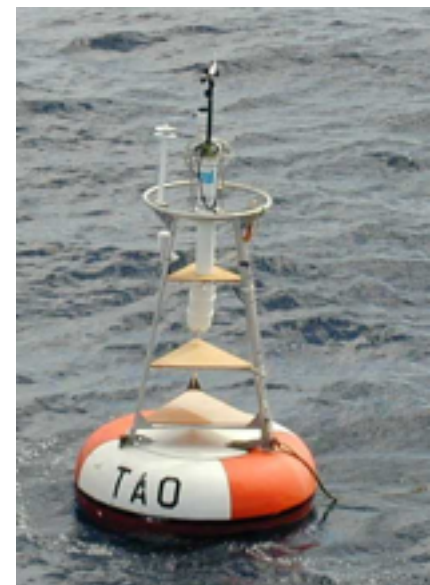
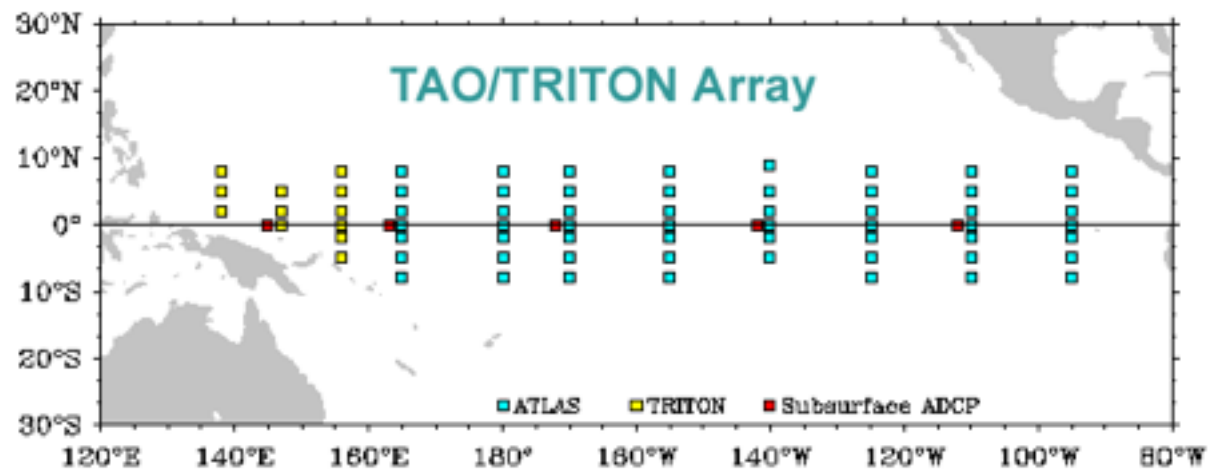
Observer Versus Logsheet Set Type (PS Only)

Year	Observer / Logsheet set matches	Unassociated sets misreported as Associated sets on Logsheet	%	Associated sets misreported as Unassociated sets on Logsheet	%
2008	3,769	15	0.4%	26	0.7%
2009	5,050	22	0.4%	76	1.5%
2010	13,956	92	0.7%	130	0.9%
2011	12,509	60	0.5%	140	1.1%

Compliance with WCPFC CMMs - Example

Fishing activities in the vicinity of TAO Buoys

- TAO Buoys are anchored data buoys that provide Real-time data from moored ocean buoys for improved detection, understanding and prediction of El Niño and La Niña.



- TAO Buoys act like Anchored FADs to aggregate schools of Tuna and other fish
- Fishing vessels take advantage of this situation to target schools associated to TAO Buoys

Compliance with WCPFC CMMs - Example

Fishing activities in the vicinity of TAO Buoys

CMM 2009-05 PROHIBITING FISHING ON DATA BUOYS

- “CCMs shall prohibit their fishing vessels from fishing within one nautical mile of, or interacting with a data buoy on the high seas...”

CMM 2012-01 CONSERVATION OF TROPICAL TUNAS

- “... A three (3) months (July, August and September) prohibition of setting on FADs shall be in place for all purse seine vessels fishing in EEZs and high seas...”

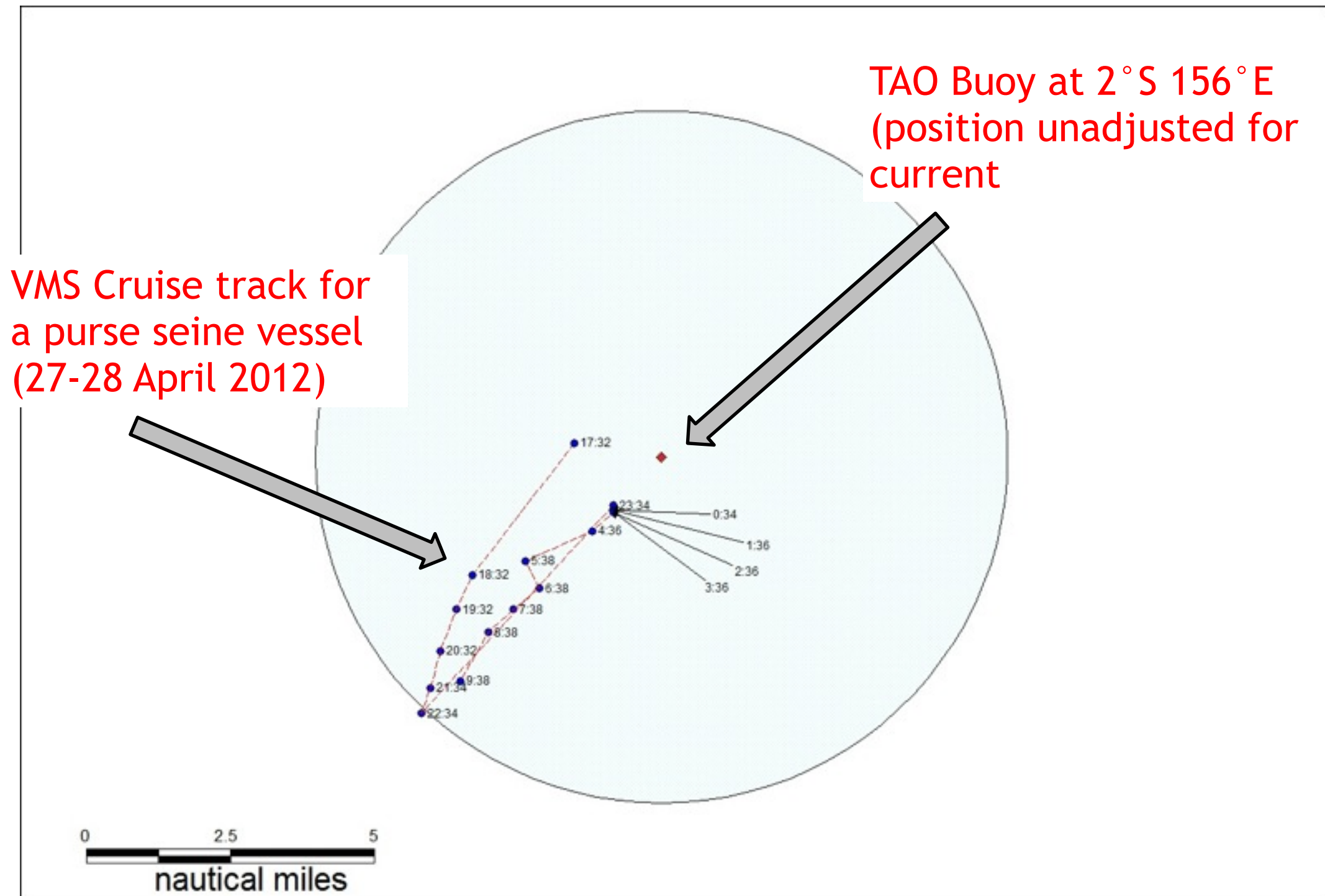
TAO BUOY (NOAA) Web site - Fishery advisory

- “... DON'T moor to, damage, or destroy any part of the buoys... DON'T deploy gear around or near to the buoys ...”

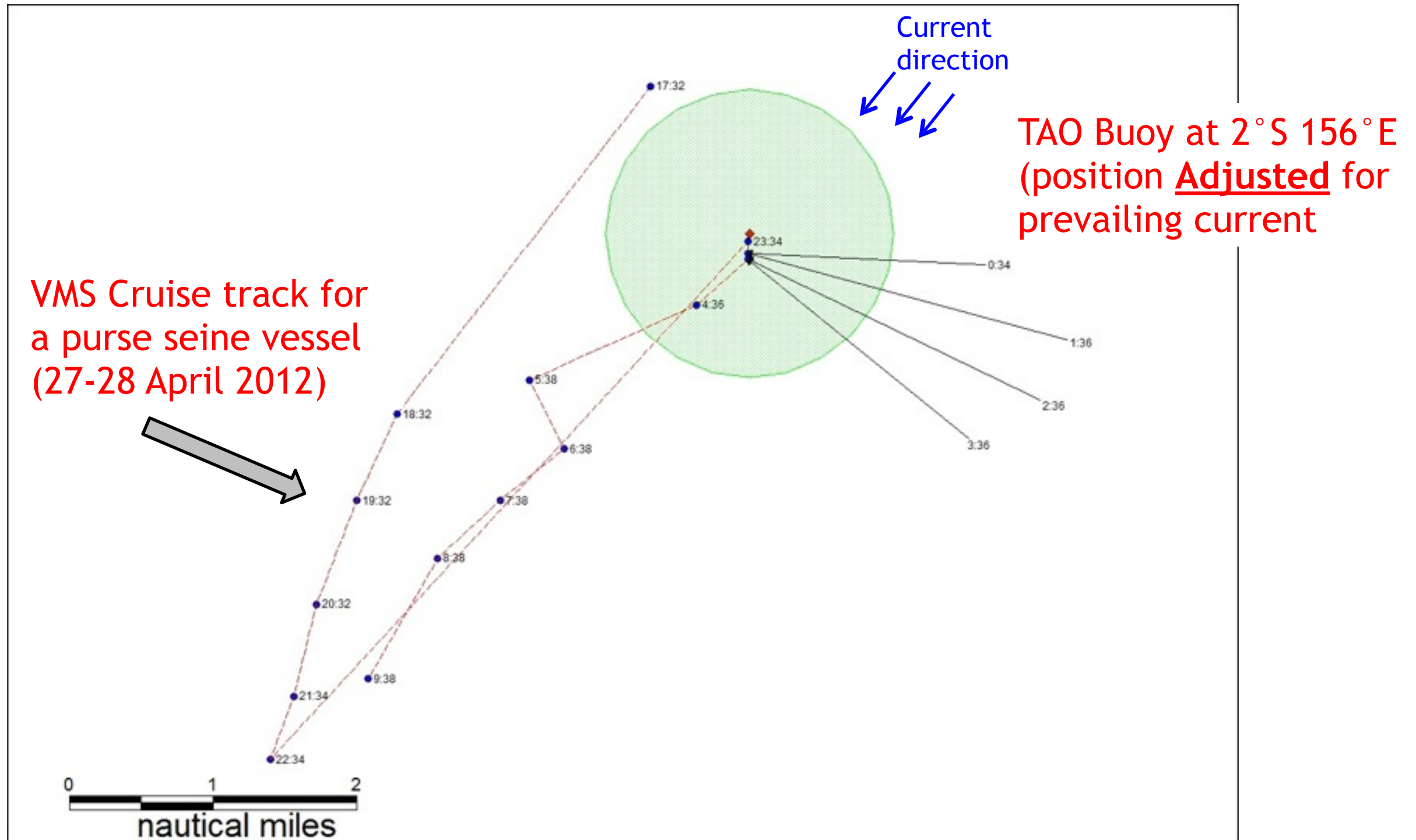
- Use available data on fishing activities to check for compliance ...

- For example -- VMS, Observer, Oceanographic data

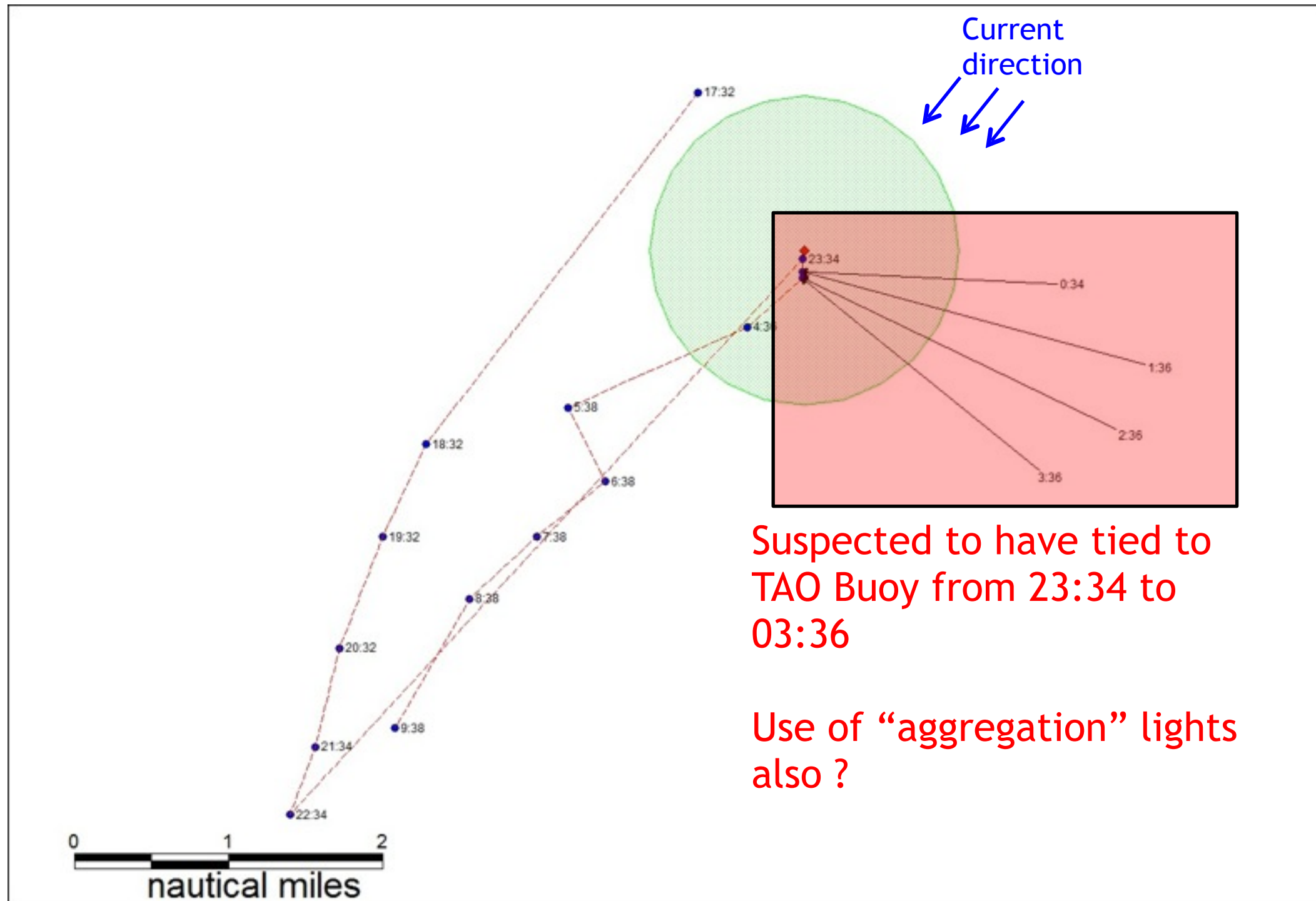
TAO Buoy interaction - Example



TAO Buoy interaction - Example



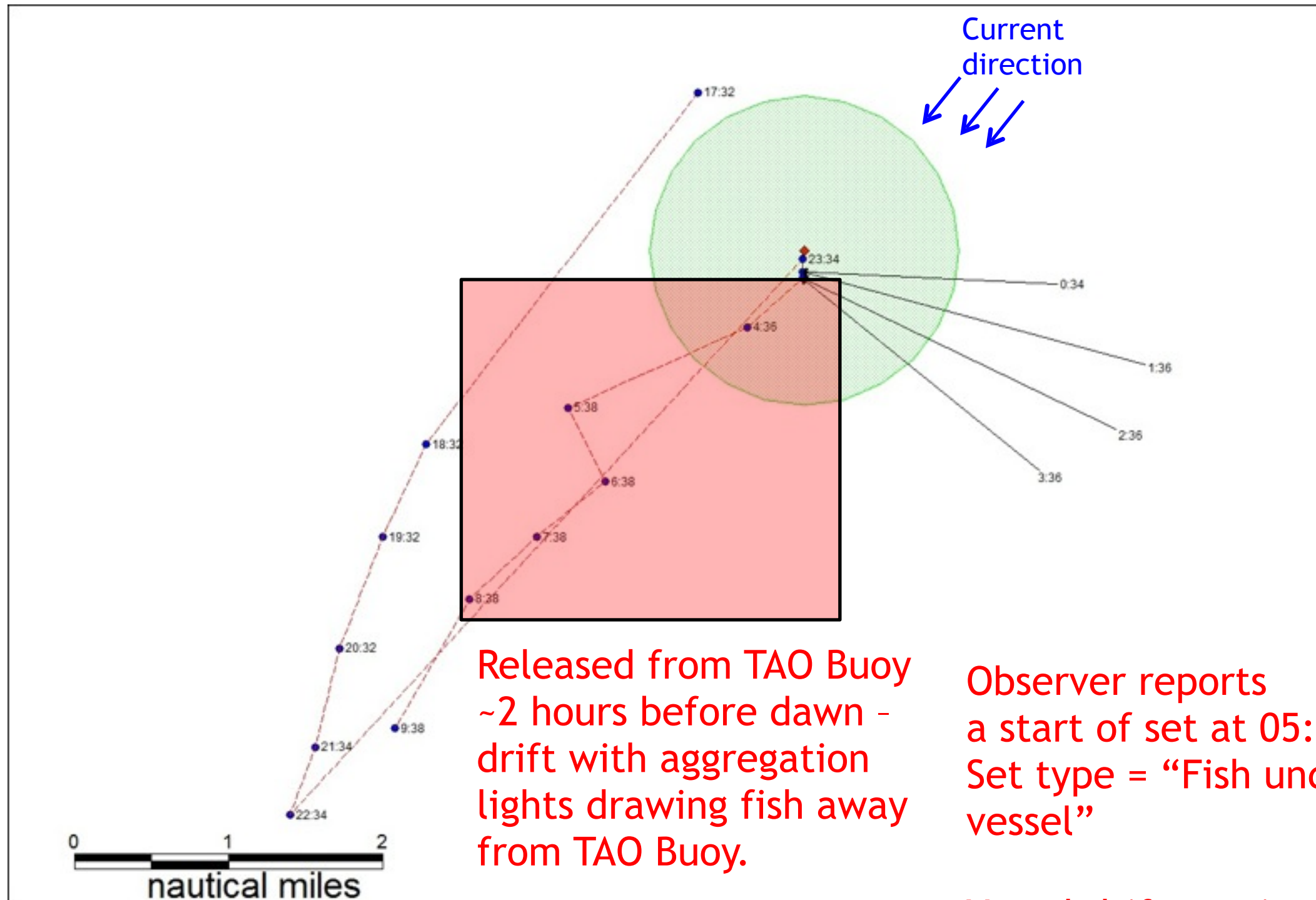
TAO Buoy interaction - Example



Suspected to have tied to
TAO Buoy from 23:34 to
03:36

Use of “aggregation” lights
also ?

TAO Buoy interaction - Example



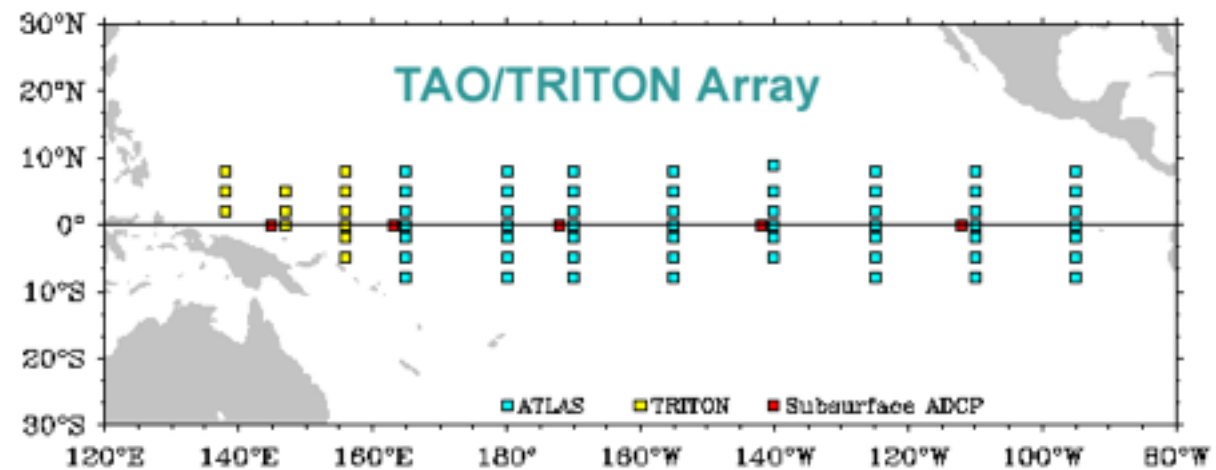
Released from TAO Buoy
~2 hours before dawn -
drift with aggregation
lights drawing fish away
from TAO Buoy.

Observer reports
a start of set at 05:43
Set type = "Fish under
vessel"

Vessel drift consistent with
current direction during set

Potential TAO Buoy interaction - Summary

Precise TAO Buoy positions (accounting for drift in the current) are available and can be used to check compliance ...



YEAR	VESSELDAYS	
	Within 1nm	Within 2nm
2009	134	246
2010	243	482
2011	133	274
2012	58	145

This table shows the total days (and potentially sets) when VMS vessel reports came within 1nm and 2nm of the TAO buoys in the WCPFC Area

AIS

- Designed for local vessel safety / collision avoidance - NOT VMS
- IMO requirement for **all** vessels >300t. Other vessels **may** operate.
- Sat based receivers make long range possible, but do not guarantee data
- Like VMS, while reports vessel positions, but importantly “Not court ready” only an indicator



AIS Data

<i>VESSELS</i>	<i>2014</i>	<i>2015</i>
<i>TOTAL AIS</i>	49,870	
<i>UNIDENTIFIED</i>	33,054	
<i>MERCHANT</i>	9,720	
<i>FISHING</i>	1,517	
<i>FFA</i>	549	
<i>WCPFC</i>	2	

<i>1 YEAR</i>	<i>POLLS</i>
<i>FFA VMS</i>	1,977,913
<i>AIS</i>	282,242



2012

AIS

Demo - 2012

What is next

- Developing further
- Analysis Areas
 - WCPO public domain catch data
 - Observer data
- Suggestions
- Target for 1st report MCSWG9





Thank you