

Southern California Coastal Pelagic Species Aerial Survey

Agenda Item G.2.a
Supplemental CDFW/CWPA PPT
November 2016



California Department of Fish and Wildlife
California Wetfish Producers Association

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Pacific Fishery Management Council
November 2016

Study Goals

- 1) Project 1 - Relative indices of nearshore abundance for sardine and anchovy
 - 2) Project 2 - Inshore Correction factor
 - Add to ATM biomass estimate
 - 3) Validate observer species identifications
 - 4) Collect biological samples
 - length, weight, age, maturity
- Field – aerial transects, boat sampling
- Lab – estimate calculations, mapping, process samples



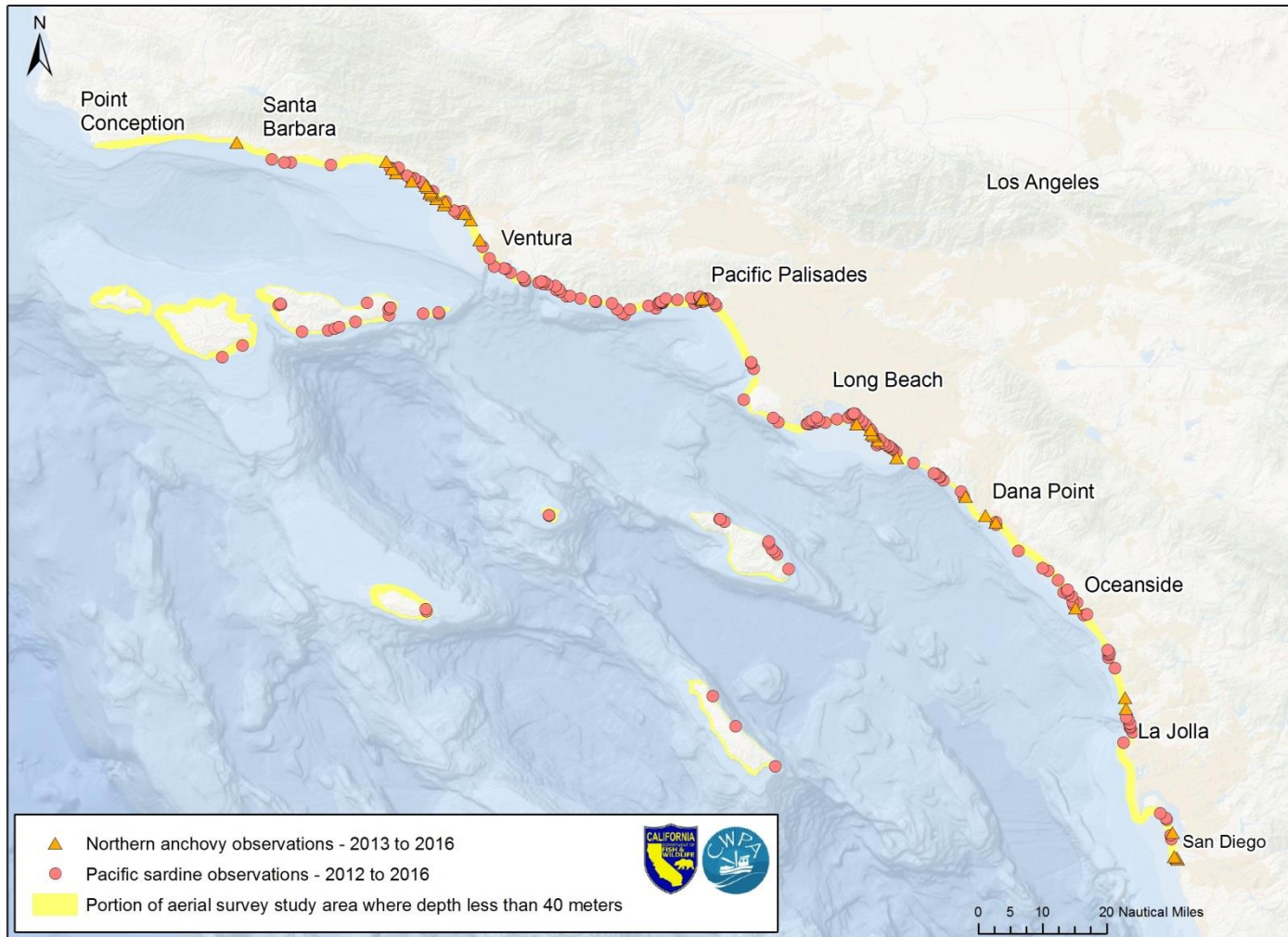
Aerial Survey and CPS Management

- Sardine stock assessment survey indices
 - Offshore waters
- CA - nearshore sardine fishery
- CDFW-CWPA partnership
 - Summer 2012 – present
 - Direct nearshore survey



Aerial Survey and CPS Management

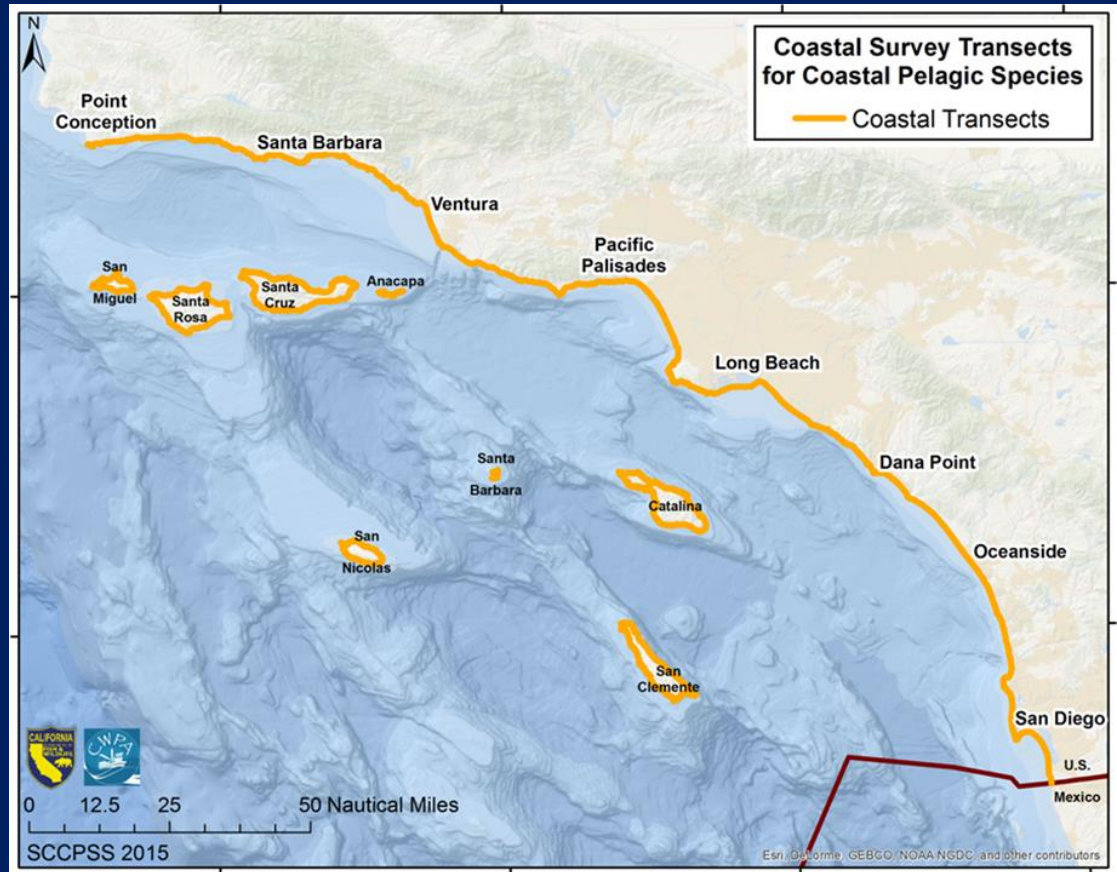
Aerial Survey Observations from Depths Shallower Than Minimum Operational Depth of ATM Vessel



Methods – Design/Operations

Project 1

- Coastal areas
- Survey conducted during spring and summer
- Summer 2012 – Summer 2016
- Flights dependent on weather and plane availability



Methods – Transects

Project 1

- Verify species
- Get tonnage estimate
- Photo passes
- Frame/time noted
- Resume transect



Microsoft Excel - 20120731.xls

File Edit View Insert Format Tools Data Window Help ASAP Utilities Adobe PDF Type a question

AD9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
	Type	Time	Lat	Lon	RadAlt	Alt	Spd	Lens	OL	Mode	Internal	Count	GCS	GCF	GPSAlt	GPSMode	GPSSats	GPSSpeed
1	S	12:50:10																
2	S	12:50:10																
3	X	12:51:25	33.8123	118.1536	1649.1	3000	130	24	1	1	5.46	626	4500	3000	32	WAAS	9	0
4	C	13:44:17	33.8131	118.1532	2499.99	takeoff												
5	X	13:56:04	33.7283	118.4167	2499.99	2000	130	24	1	1	3.64	626	3000	2000	1983	WAAS	7	132.71
6	X	13:56:08	33.7295	118.419	1649.1	2000	130	24	1	1	3.64	627	3000	2000	1975	WAAS	6	132.18
7	X	13:56:11	33.7314	118.4205	1649.1	2000	130	24	1	1	3.64	628	3000	2000	1963	WAAS	7	131.06
8	X	13:56:15	33.7335	118.4208	1649.1	2000	130	24	1	1	3.64	629	3000	2000	1948	WAAS	8	129.13
9	X	13:56:19	33.7356	118.4202	1649.1	2000	130	24	1	1	3.64	630	3000	2000	1947	WAAS	7	124.96
10	X	13:56:22	33.7373	118.4187	1649.1	2000	130	24	1	1	3.64	631	3000	2000	1962	WAAS	8	120.83
11	X	13:56:26	33.7388	118.4171	1649.1	2000	130	24	1	1	3.64	632	3000	2000	1992	WAAS	9	119.11
12	X	13:56:30	33.7406	118.416	1649.1	2000	130	24	1	1	3.64	633	3000	2000	2018	WAAS	8	119.87
13	X	13:56:33	33.7426	118.4156	2499.99	2000	130	24	1	1	3.64	634	3000	2000	2020	WAAS	8	122.9
14	X	13:56:37	33.7446	118.4161	1649.1	2000	130	24	1	1	3.64	635	3000	2000	1995	WAAS	8	126.2
15	X	13:56:41	33.7467	118.4172	1649.1	2000	130	24	1	1	3.64	636	3000	2000	1962	WAAS	7	131.64
16	X	13:56:44	33.7486	118.4186	1649.1	2000	130	24	1	1	3.64	637	3000	2000	1942	WAAS	8	134.46
17	X	13:56:48	33.7504	118.4202	2499.99	2000	130	24	1	1	3.64	638	3000	2000	1933	WAAS	8	136.8

Data Log file

CPS Aerial Survey
Transect Flight Log

Date: 8-28-13 Pilot: Tom Evans Observer(s): Devin Reed, Kirk Lynn

Page 1 of 3

Transect(s)		Start Time	Start Photo No.	End Photo No.															
Obs No.	Fish Sp	Time	Frame Start No.	Frame End No.	Est Tonn (st)	Num of Schools	Cloud/Glare	Wind	Altitude	Comments									
		1008	9211				1/2	<5kts	~1400	an route Catalina #9 (boat in approach no f row)									
		1021	9363		START TRANSECT		9	(Shroud)		- some guessing if start pt is correct - also LAX airport activated									
		1038	9489				2/2	8-10kts		more clouds - spotty									
		1042	9522		PAUSE TRANSECT		9			too many clouds - pause ~21 miles short									
		1043	9526							an route Catalina (two turns)									
		1053	9710		START CATALINA														
		1058	9800							banking, can't see (near seal)									
		1104	9969							quarry, west end									
		1105	9887							a sample of logs, the decide to back from other end (from 1200)									
		1114	9979							turn @ quarry - > W									
1	S	1115	10000	10003	3-4	1		~5kts											
2	PM	1118	10081	10084	2-3	1				(pic - still not 8' above water but team - 2' and longer)									
3	S/PM	1123	10176	10190	6	4													
4	S	1124	10215	10216	1	1													

Fish species code: S - sardine, A - anchovy, PM - Pacific mackerel
Glare code: 1 - No glare, 2 - glare <50%, 3 - glare >50%, 4 - Cloud shadows <50%, 5 - Cloud shadows >50%, 6 - No visibility
Cloud Cover code: 1 - Clear, 2 - Cloud Coverage <50%, 3 - Cloud Coverage >50%, 4 - No visibility
Beaufort Wind Scale: Refer to attached Beaufort Wind Scale (0-12) to quantify sea state (or indicate wind speed in knots)

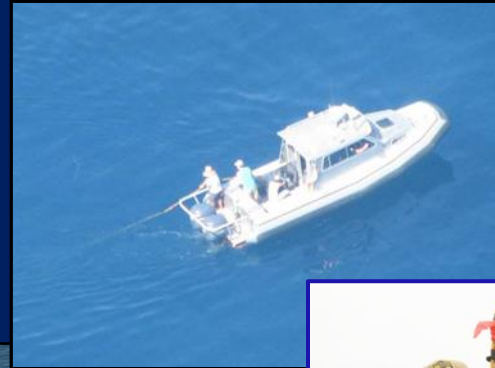
(PAUSE - CATALINA)

Logsheets

Methods – Boat Sampling

Project 1

- Conducted each season
- Boat directed by plane to fish school
- Aerial observer ID species
- Boat samples fish
 - tow camera (right) or diver video
 - Hook and line (sabiki rig), gillnet, purse seine
- Water temperature, clarity, salinity recorded



Deploying tow camera



Fish schools under boat

Methods – Analyses

Project 1

Survey Photos

- Document observations
- Corroborate field logs



Species ID Validation - Boat

- Tow and diver video
- Hook and line sampling



Biological Samples

- Age structure of population



Methods – Analyses

Project 1

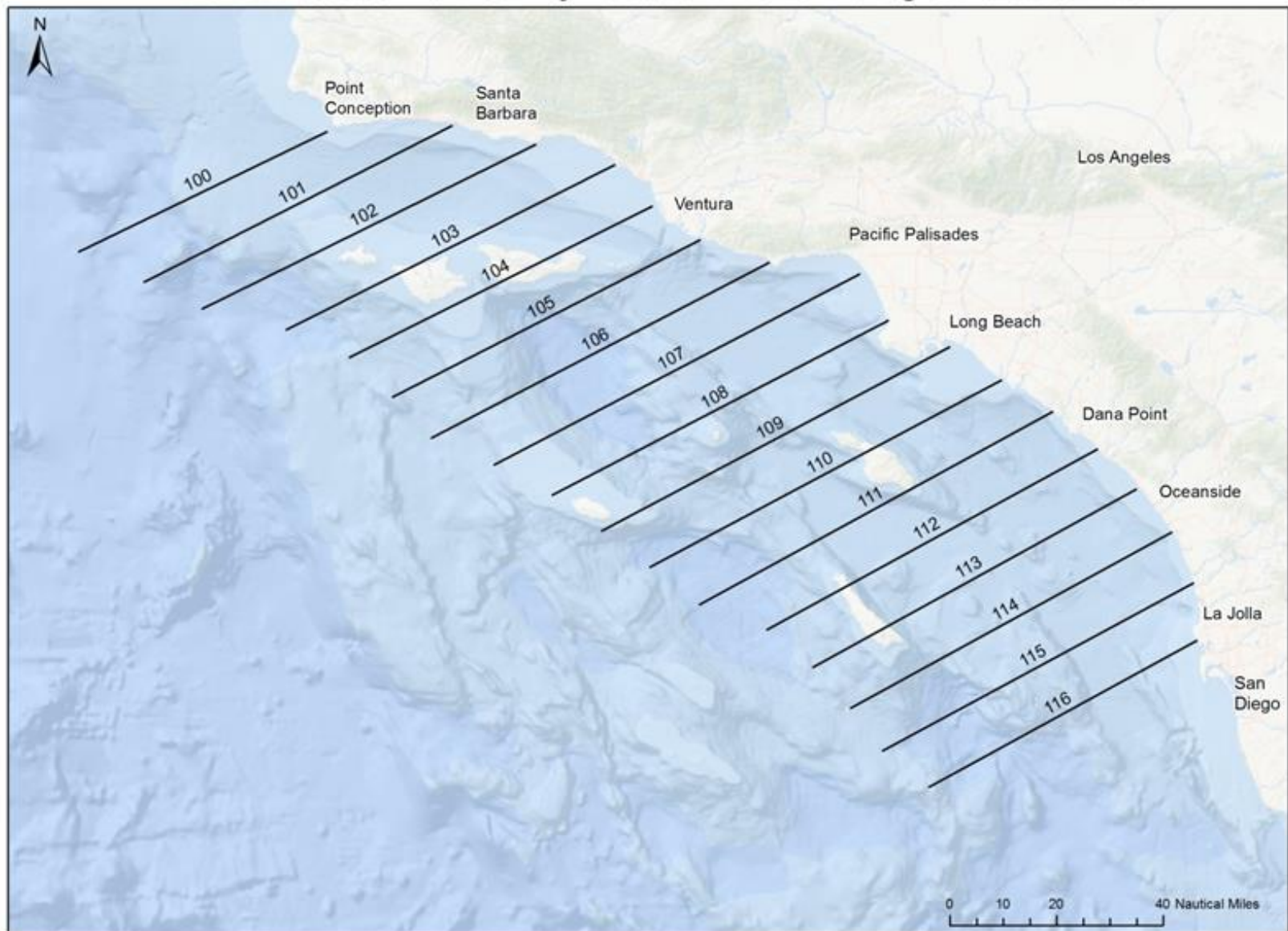
- Index of relative abundance = fish density
- Fish density (D) = all estimated observed tons (T_{obs}) / area surveyed (A):

$$D = T_{\text{obs}}/A$$

- Estimated observed tons - adjusted for observer bias
- Area surveyed - dependent on actual flight path and transect width

Methods - Project 2

NOAA Acoustic Trawl Survey - Southern California Bight Transect Lines



Methods – Analyses

Project 2

Goal: Total SCB estimate (offshore and inshore)

1. Combine ATM (offshore) and SCCPSS (inshore) estimates for SCB

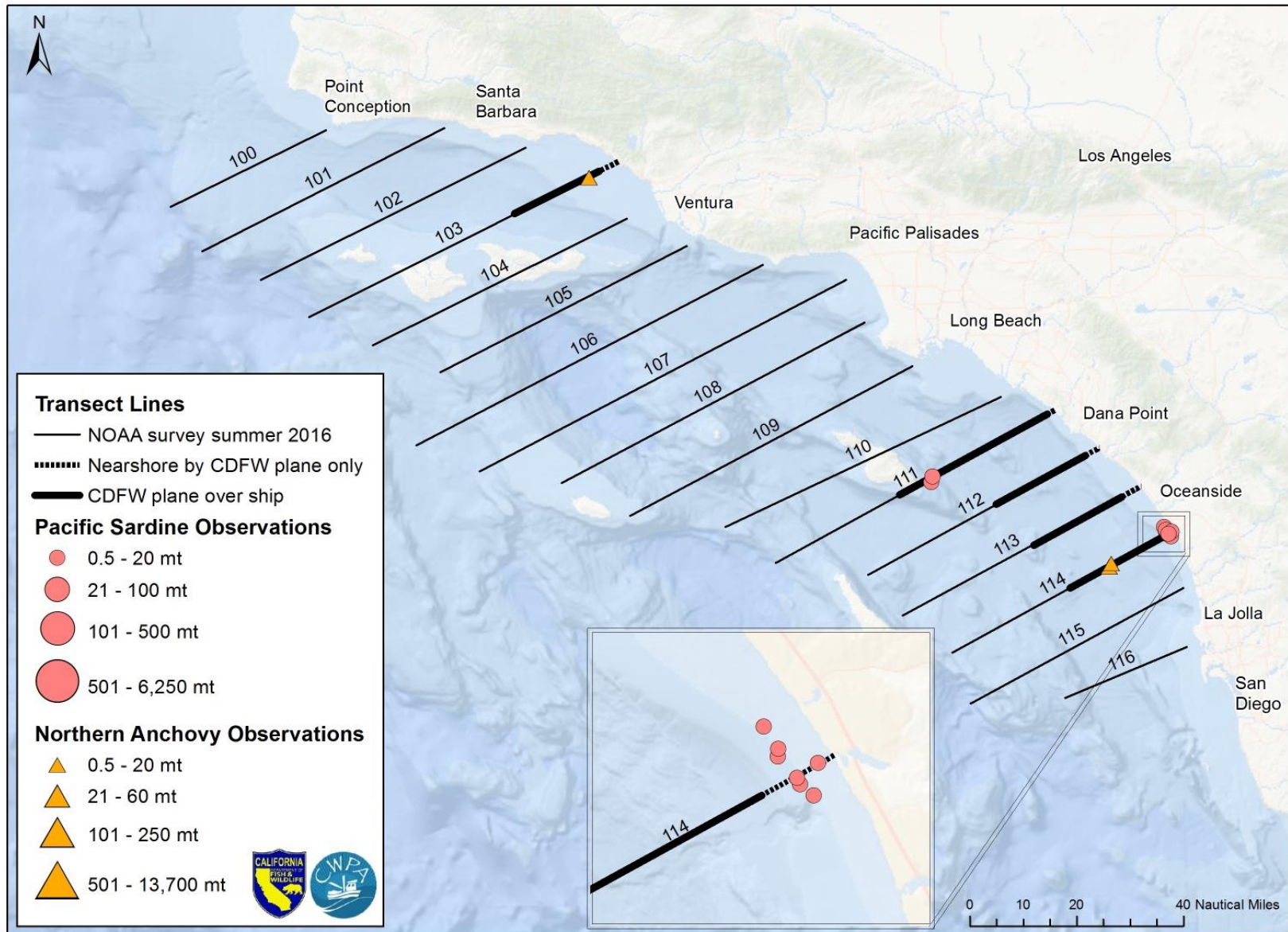
$$T = T_{\text{ATM}} + T_{\text{SCCPSS}}$$

2. Combine ATM (offshore) and calculated tonnage (inshore) from SCCPSS and ATM data

$$T = T_A + (\Sigma T_C / \Sigma T_{Bp}) * T_{Bs}$$

Results – Project 2

CDFW Aerial Overflight Observations of NOAA Acoustic Trawl Survey



Future Work

- Continue boat sampling - validate species ID, collect additional samples
- Collect more data for Project 2 inshore/offshore ratio
- Potential index of recruitment
- Continued CDFW and CWPA support

Summary

- Survey covers coastal nearshore areas of Southern California Bight
- Results useful for:
 - Index of nearshore abundance (Project 1)
 - Supplement to ATM offshore data to account for nearshore biomass (Project 2)
- Additional data stream for CPS stocks

Acknowledgements



- CWPA - Diane Pleschner-Steele
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