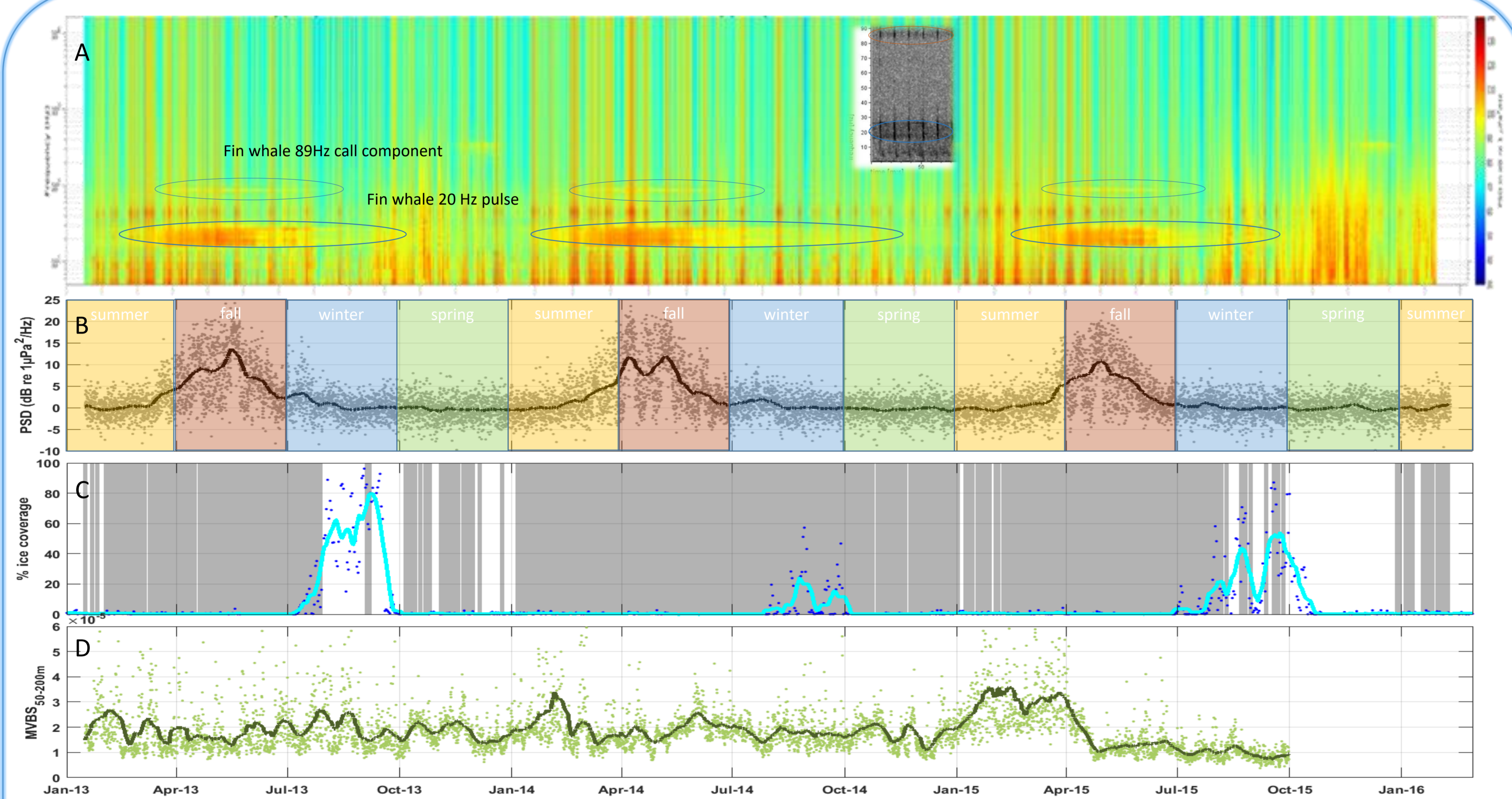


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In a nutshell:

- Repeated sightings of large fin whale groups suggest the Elephant Island (EI) area serves as important feeding spot.
- PAM data collected between Jan 2013 - Feb 2016 show recurring acoustic presence for extended periods of time.
- Analysis links calls primarily to breeding, rather than feeding.
- Analysis identifies EI as key habitat for fin whales throughout substantial part of the year, calling for management of anthropogenic activities in this area.



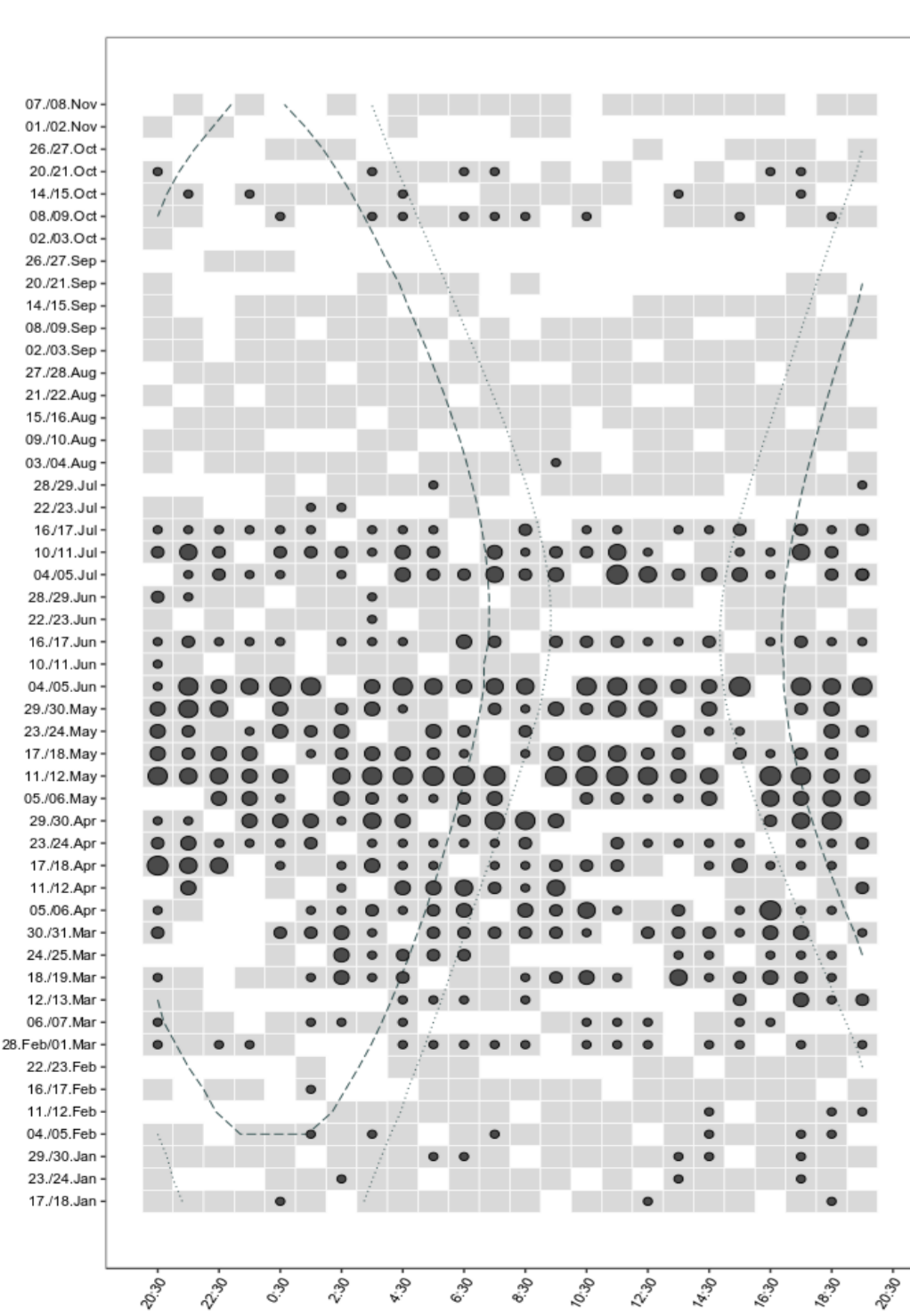
A) Longterm spectrogram of AURAL recordings Jan 2013 – Feb 2016; B) SNR 89 Hz call; C) Grey shading: daily acoustic occurrence, blue dots and cyan line: sea ice coverage; D) backscatter strength upward looking ADCP. Lines in plots 2-4 represent 14-day running means. MVBS is displayed in dB, hence a 3 dB increase implies a doubling of the reflecting biomass.

Site	Latitude South	Longitude West	period	Study	Analysis type	detection range [km]	presence
S2	63°50.63'	67°08.33'	Mar 01–Feb 03	SI 2004	ASC FIN-89	< 60	—FMAM—
S1	62°16.44'	62°10.02'	Mar 01–Feb 03	SI 2004	ASC FIN-89	> 60	—MAM—
WAP (=S1)	62°16.69'	62°07.80'	Mar 03–Feb 04	SI 2009	ASC FIN-89	see S1	..MAMJ..
EI-AWI	61° 0.9'	55°58.5'	Jan 13–Feb 16	this study	MSC FIN-21 FIN-89	≈ 30	—MAMJJ—
EI-SCRIPPS	60°53.2'	55°57.2'	Mar 14–Jul 14	BP 2015	FIN-21	-	..MAMJJ..
Scotia Sea	60°00.02'	51°53.88'	Jan 03–Apr 03	SI 2009	ASC FIN-89	-	—FMA..
Scotia Sea	54°–58°	50°–35°	Jan 03–Feb 03	SI 2006	-	-	—F..
Chile HA03	33°27.5'	78°56.0'	Jan 07–Dec 09	SB 2019	ASC FIN-17 FIN-85	97 to 324	---AMJJASON---
Chile HA03	33°27.5'	78°56.0'	Apr 14–Dec 16	SB 2019	ASC FIN-17 FIN-85	97 to 324	---AMJJASON---

ASC: Automatic Screening
 FIN-XX: SNR @ XX-Hz band

- Seasonality in acoustic presence, peaking in fall.
- Peak season coinciding with onset of Southern Hemisphere fin whale mating season (April/May).
- Lack of diel cycle during peak acoustic activity.
- Acoustic activity increases subsequent to peak in ADCP-Mean Volume Backscatter (proxy for food)
- Acoustic activity decreases prior to ice formation
- EI might serve as important feeding and breeding area before partial northward migration

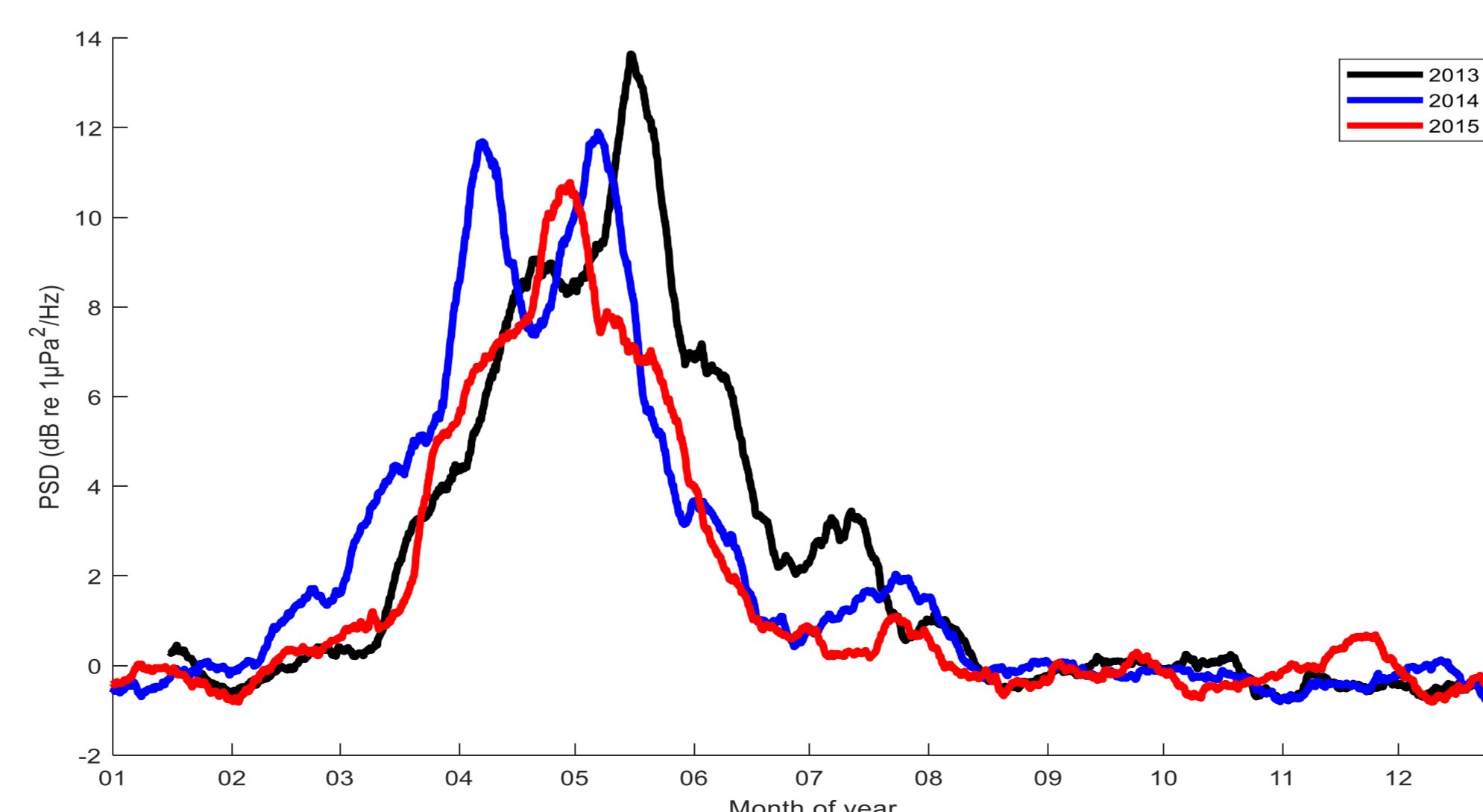
2013 diel pattern



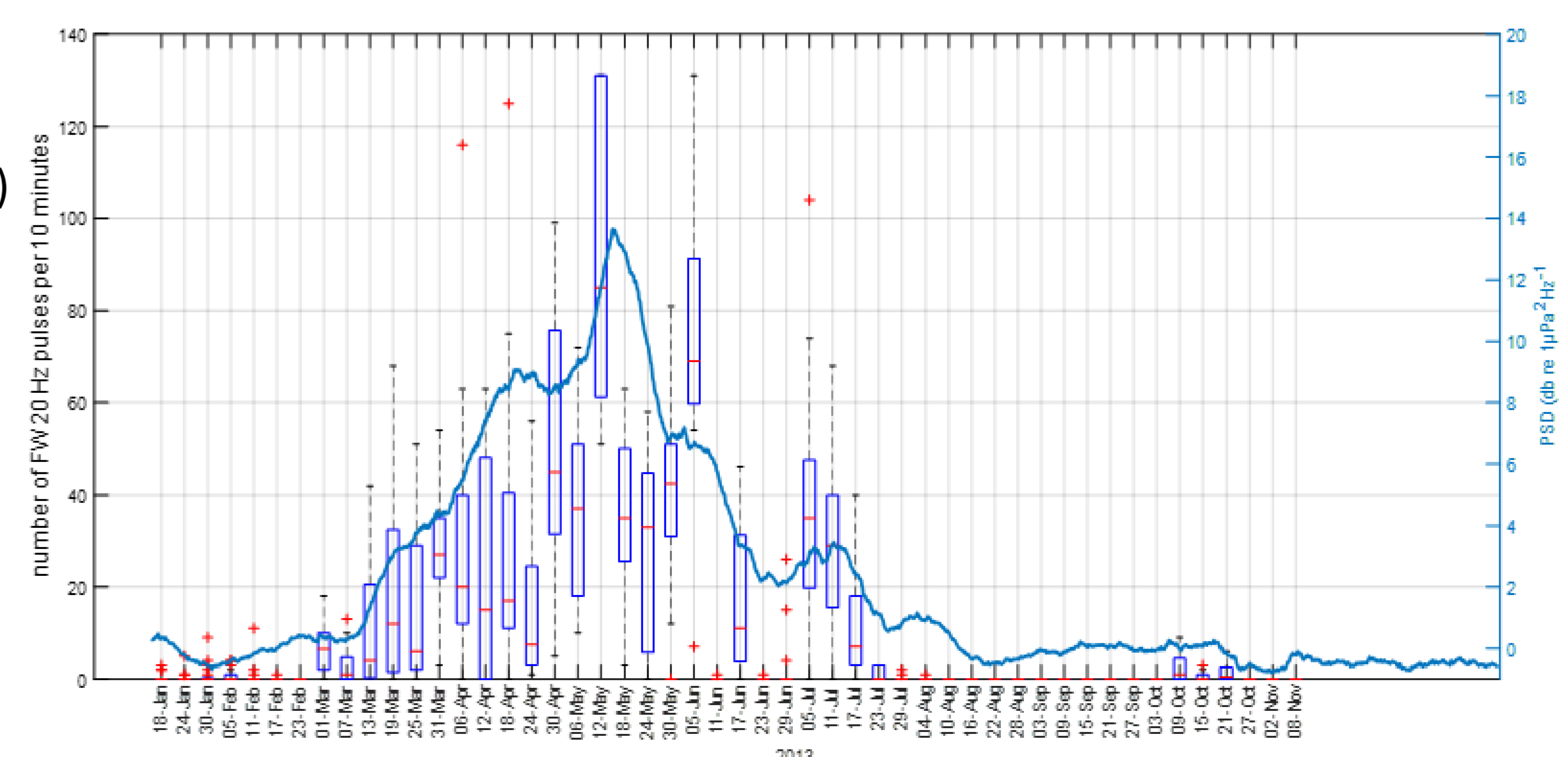
Jan-Nov fin whale call abundance (per 10 min) derived from continuous Sonovault data (every 7th file on every 6th day) → no diel cycle.

89-Hz SNR for 3 year AURAL data

Ratio of acoustic power for 88-90 Hz band versus the mean of the 80-82 and 98-100 Hz bands (4-hourly data was subjected to a 14-day running mean).
 → inter-annual similarity of acoustic activity.
 (SNR 89 Hz similar to SNR 20 Hz while avoiding blue whale call contamination.)



Call abundance (boxplot) and 89-Hz SNR (line)



Jan-Nov 2013 continuous data calls/10 min file vs. 89-Hz SNR → SNR of 89 Hz call component shows similar waxing and waning as manual call counts.