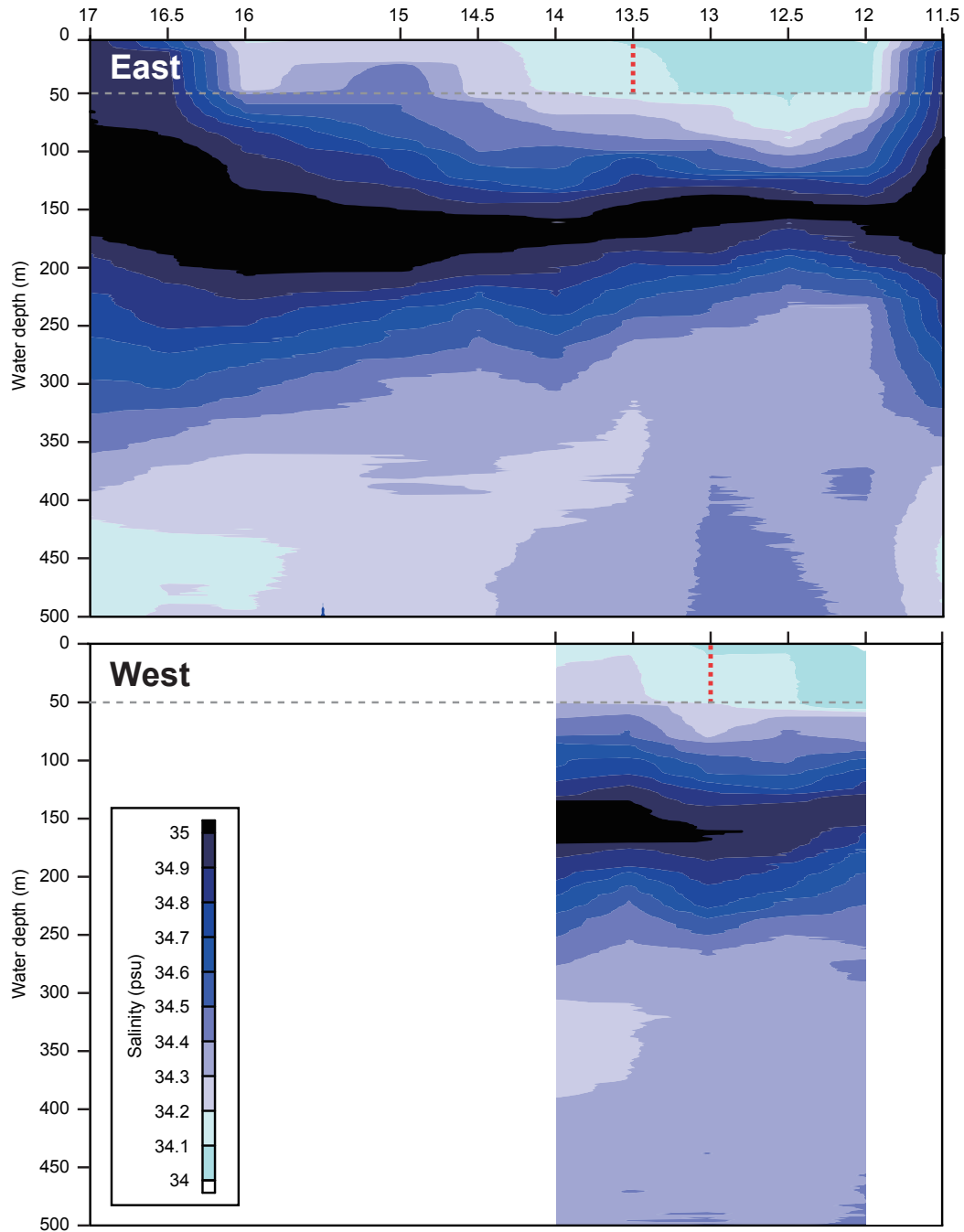
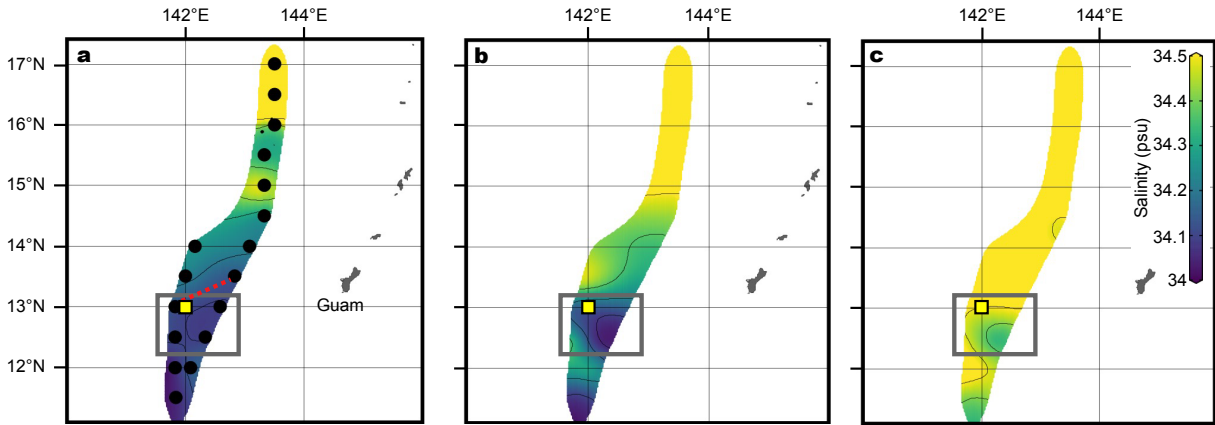


## Supplement 1



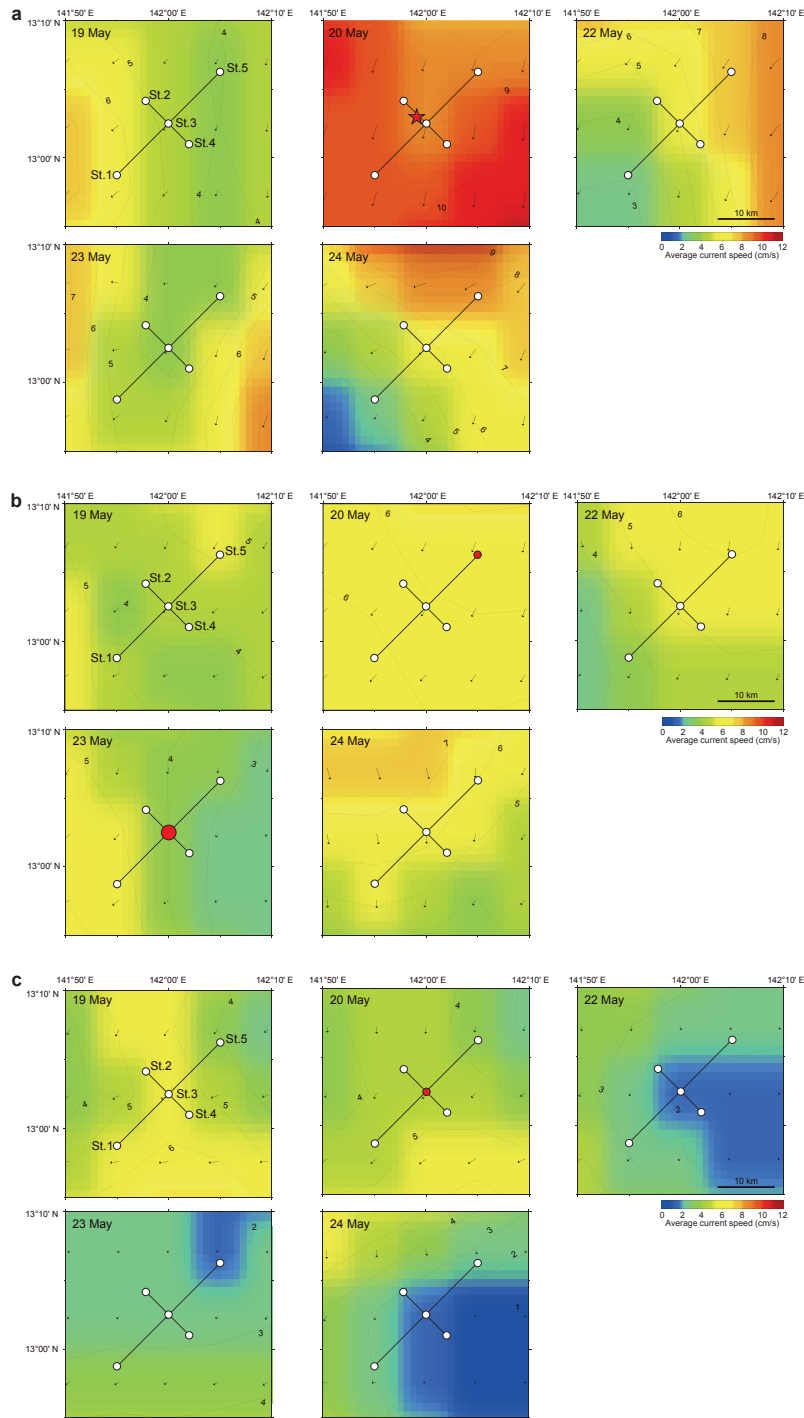
**Fig. S1. Vertical salinity structure during the YK17-10 research cruise.**

The location of the near-surface pool of low-salinity water of 34 psu at the edge of the apparent salinity front (red lines) from 13.5°N in the east to 13°N in the west side of the West Mariana Ridge.



**Fig. S2. Horizontal salinity contour maps at 3 different depths.**

Horizontal salinity structures at water depths of 50 m (a), 75 m (b), 100 m (c) show that the low-salinity water mass was present south of the apparent salinity front region (red line in a). Black circles show the X-CTD stations (see Fig. 1a). The survey area (yellow squares) was located at the northwestern edge of the area of deeper low-salinity water (grey boxes).

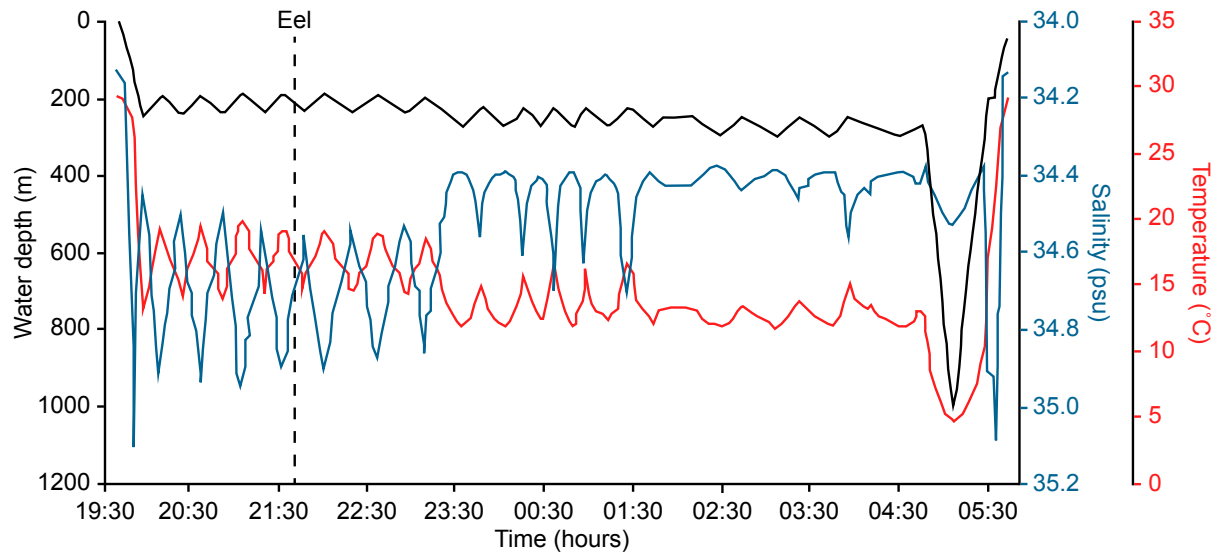


**Fig. S3. Average water current at depths of 3 different depths within the survey area.** The HYCOM analysis results of average current speeds (cm/s) and directions on each day (black vectors) at water depths of 200 (a), 400 (b) and 600 m (c) within the survey area. eDNA detection (red circles), non-eDNA detection (white circles) and a possible eel observation (red star).

**Table S1. Summary of eDNA detection of the Japanese eel *Anguilla japonica* (*A. japonica*) from 10 L seawater collected using the Niskin bottles attached in the *Yokosuka Deep-Tow* camera system (YKDT).**

Sampling data	20-May	20-May	20-May	20-May	20-May	20-May	21-May	21-May	22-May	23-May	23-May	24-May
Day before new moon	-6	-6	-6	-6	-6	-6	-5	-5	-4	-3	-3	-2
Water sampling time	5:17–5:39	8:27–8:56	10:52–11:16	13:18–13:42	15:30–15:53	17:34–17:57	5:05–5:41	7:22–7:45	1:11–2:07	0:26–1:14	7:38–8:02	20:57–21:48
Dive number of YKDT	#186	#187	#188	#189	#190	#191	#192	#193	#194	#195	#196	#197
Station	St. 3	St. 3	St. 4	St. 5	St. 2	St. 1	St. 3	St. 3	St. 3	St. 3	St. 3	St. 3
Water depth (m) for collecting seawater												
50	-	-	-	-	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-	-	-	-	-
150	-	-	-	-	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	-	-	-	-	-
400	-	-	-	+	-	-	-	-	-	-	+++	-
600	-	+	-	-	-	-	-	-	-	-	-	-
800	-	-	-	-	-	-	-	-	-	-	-	-
1000	NS	-	-	-	-	-	-	-	-	-	-	-

Plus signs (+) show qPCR replicates and positive detection of Japanese eel eDNA. Minus signs (-) show non-detection of Japanese eel eDNA. NS means that a seawater sample was not collected because of the sampler system error.



**Fig. S4. Temperature, salinity and water depth during the YKDT deployment when the eel was recorded.**

Temperature (red), salinity (blue) and water depth (black) when a possible eel was recorded using the *Yokosuka* Deep-Tow camera system (YKDT dive number #192 being towed from station 2 to 4).



**Fig. S5.** Frame-capture of a video of a possible Japanese eel (white arrow) recorded by the *Yokosuka* Deep-Tow high-vision camera during the YK17-10 cruise on 20 May 2017. The eel emerges from the center of the video frame and swims downward to the left corner while it is moving the lateral body and tail. See Video S1 in Supplement 2