I. Introduction

The inner-shell is mainly affected by wind and surface gravity waves with secondary forcing from offshelf currents [1]. The influence of winds, waves and the Florida Current (FC) on subtidal currents were investigated at the Cape Canaveral inner-shell in Florida. The study focused on two cape-associated shoals: Chester Shoal at False Cape and Canaveral II Shoal at Cape Canaveral (Fig 1).

II. Data

Acoustic Doppler current profilers (ADCPs) were moored either side (seaward and landward) of Canaveral (Can.) and Chester (Che.) shoals for 52 days in 2013 (Fig 1). The following variables were filtered to remove tides and the inertial period:
- ADCP depth, and depth-averaged currents and backscatter
- NOAA buoy wind velocity and wave parameters
- Florida Current transport
- Sea level at Trident Pier south of Cape Canaveral

III. Discussion

**Currents:**
- Geostrophic balance existed between FC and sea levels at weekly intervals, in an inverse relation by the 180° phase (Fig 2).
- Currents were consistent at all locations, with along-shelf currents dominating (Fig 3).
- Stronger semi-diurnal and weaker diurnal signals in currents and sea level (Fig 4).

**Complex Empirical Orthogonal Function (CEOF):**
- CEOF shows dominant spatial and temporal structures [4].
- Mode 1 accounted for 92% of the variance, with unidirectional vertical profiles throughout (Fig 5B,C).
- Along-shelf current vertical structures had same direction and magnitude, while cross-shelf currents varied with Chester weaker than Canaveral.
- Cross-shelf vertical structure at Chester east was opposite the rest, showing convergence/divergence at Chester Shoal.

**Wavelet Coherence: EOF vs Forcings**
- fortnightly and weekly north winds played a role in shelf currents, suggesting passage of weather systems (Fig 6).
- Sea levels dominated the along-shelf currents at almost all periods (Fig 6).
- Weekly FC oscillations dominated both current components during the first half when FC variability was high.

IV. Conclusion

Inner-shell subtidal currents at Cape Canaveral were dominated by the along-shelf component, which was controlled by the geostrophic balance between FC and sea levels, with secondary effects from weekly north winds.

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VI. References