A delicate balance: The Cabo Blanco and Panic Point (mis)management case, Peru

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Cabo Blanco bay in northern Peru (4° S) is where the cold and productive Humboldt current meets the tropical Equatorial current before drifting towards the westward Pacific. The increased productivity and diversity arising from the meeting currents has been noted by keen recreational fishermen that have caught in these waters the biggest black marlins on record. Cabo Blanco is also home of two world-class surfing waves (Figure 1).

During winter, the biggest swells from the southern hemisphere wrap around the headland and peel for approximately 200m along Panic Point before closing out against the sandy beach. Further north along the beach, the rocky ledge of Cabo Blanco offers the perfect configuration for waves approaching from northern swells during austral summer, resulting in arguable the best left barrel in Peru and South America. A crowd of up to 200 surfers every time it breaks is an indicator of the wave high quality. The wave breaks on a shallow reef and peels for just less than 100m before a pier interrupts the ride.

Figure 1: a) A wave wraps around Cabo Blanco headland (background) and closes out at Panic Point and the Cabo Blanco pier (foreground). b) A large SW swell peels along Panic Point. c) The Cabo Blanco pier trying to resist the impact of a solid swell. d) A NW groundswell focusing on Cabo Blanco reef.

In 1993, the local fishermen association built the pier in Cabo Blanco despite the opposition from surfers and other parties. Regardless of the lack of technical studies on local bathymetry and wave/current dynamics, fishermen argued that the pier would not affect or be affected by waves. The pier has lasted only half of its projected life span, officially declared damaged in 2008. A new proposal aims to build a second pier to the south of the current one, this time cutting through the Panic Point wave.

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This paper presents an overview of the efforts from a group of surfers together with the Peruvian Surfing Association to protect the waves in Cabo Blanco from further degradation by providing a technical assessment of the optimal location for the construction of the new pier.

Local bathymetry was surveyed and analyzed in conjunction with regional bathymetry (Figure 2) to simulate deep-water wave transformation using SWAN model. Typical wave parameters resulting in "classic surfing conditions" were sourced from the Wavewatch III model and anecdotal evidence. Three diifferent scenarios were run: i) *Normal conditions* – 73 days/year: S swell, 10-12s, 1.5-2m. ii) *Southern-Hemi groundswells* - 26 days/year: SW swell, 12-14s, 2.5-3.5m. iii) *Northern-Hemi groundswells* – 9 days/year; NW swell, 12-14s, 1-1.5m.

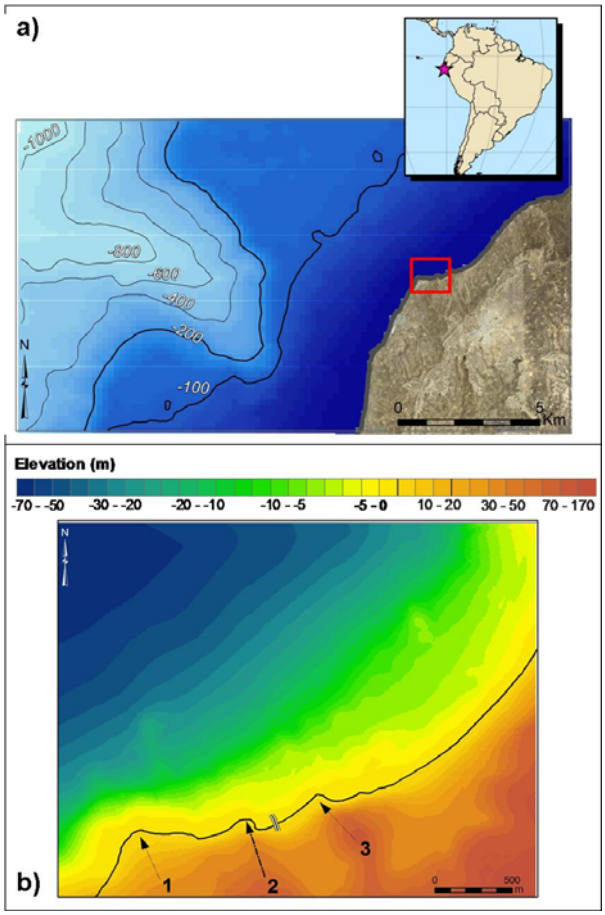

Figure 2: a) Cabo Blanco Bay location (red square) and regional bathymetry.b) Local bathymetry/elevation with focus (1) and ledge (2, 3) components resulting in surfing waves; 1. Panic Point, 2. Cabo Blanco and 3. Pico Point

Local wave measurements do not exist for the area of study but visual estimates and photo/video evidence corroborate the modeling results (Figure 3).

The regional bathymetry configuration aligns and channels waves from both southerly and northerly directions. Waves at Panic Point break under all typical surfing conditions due to the focusing action of the headland and a wedge along the beach. The biggest and longest breaking waves (up to 3.7m, 200m rides) originate from Southern-hemi groundswells. Northern-hemi groundswells result in more sections at Panic Point closing out. However, waves are focused and break intensely along reef ledges, particularly at Cabo Blanco and Pico Point reefs (400m north of Cabo Blanco reef).

The location proposed by the fishermen association for the construction of the new pier on Panic Point (A in Figure 3) is exposed to significant wave energy (H_b>2m) approximately 30% of a typical year. Consequently, the location for a pier is not feasible. Further, the pier would interrupt the Panic Point wave, reducing its surfing quality. From the analysis undertaken, the optimal location for the construction of the new pier is in location C (Figure 3), as this area is the closest to the village experiencing reduced wave energy under both southern and northern wave conditions with a relatively deeper bathymetry suitable for pier construction and anchoring.

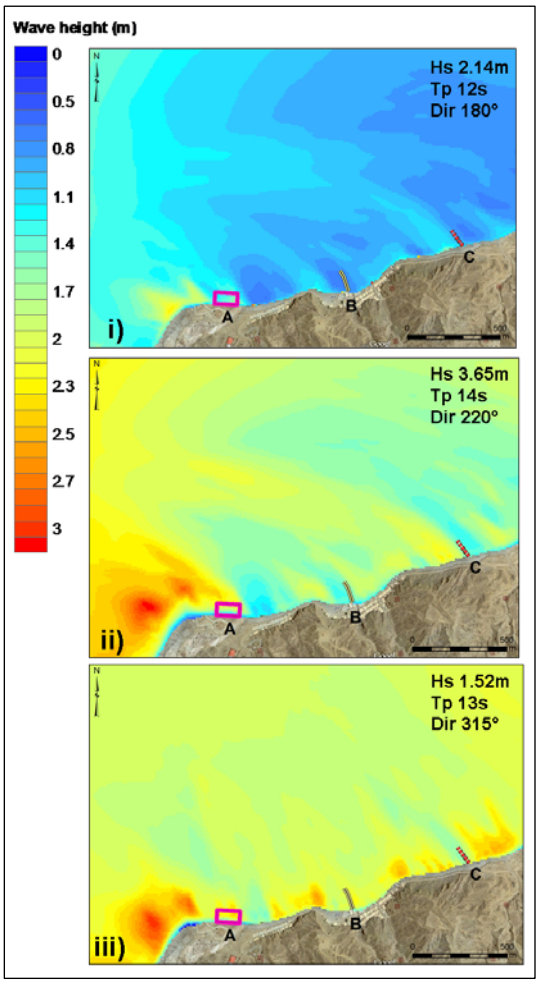

Figure 3: SWAN model runs for i) Predominant conditions, ii) Southern-hemi groundswells and iii) Northern-hemi groundswells. Location A is the proposed area by local fishermen association for new pier, location B is the current location of the pier and location C is the proposed location by National Surfing Association.

Javier is passionate about the coast. After spending countless hours travelling and surfing along the uplifted and sediment-rich beaches of the Peruvian desert, he decided to study this complex space from a formal geographical approach. He completed a BA in Geography and then crossed the Pacific to further specialize in coastal geomorphology in New Zealand. His research has applied geospatial applications, like GIS terrain analysis and remote sensing, to better understand the seafloor dynamics and evolution. He recently completed his PhD thesis in Wollongong, Australia focusing in the geomorphology of coral reefs of the Torres Strait region. He is yet to surf an uncharted left reef somewhere warm and uncrowded.