



Title: *“Sand Ripples at Doctor’s Point”*

Description: Monochrome winter sunrise over sand ripples.

Photographer: Nicola Pye

Where, when: Doctors Point, Waitati, June 2019

Sustainability? Photographers share the scientists’ love for nature’s patterns. I took this photo to highlight the patterns in the sand and water at Waitati, primarily because they are aesthetically pleasing and rhythmic. Sustainability scientists observe recurring patterns for clues about the forces of nature that affect local distributions and abundance of species, and physical processes that pose threats. If the patterns change, something in the environment is changing, for better or worse.

For example, American geologists have been working out ancient weather patterns by studying ripple patterns in ancient seabeds (<https://news.mit.edu/2018/beach-sand-ripples-ancient-weather-0928>). Ripple defects resembling hourglasses, zigzags, and tuning forks were likely shaped during strong storms, or when tidal flows changed, so close study of the preserved ripples give clues on how variable the weather and environmental conditions were way before humans, and now climatologists, were around to measure them.

Ripple patterns in sand act to roughen the seabed, slowing down water flow near the shore. For instance, recruitment of juvenile toheroa (surf clams, a threatened Ngāi Tahu ‘Taonga species’) is concentrated around the edges of ripples scoured into Oreti Beach where the water flow slows up just enough for them to burry themselves rather than being washed back into the sea.

A whole range of much smaller and usually forgotten critters, the “intertitial fauna”, live in the minute spaces between the sand particles where they breakdown the deposited organic material drifting in from the sea or being flushed down the rivers to end up in the inlets and beaches. So, these minute critters provide a free “beach cleaning” service. Ripples allow suspended particles to settle and create a microscale variation in the sizes and shapes of the sand particles. They end up creating miniature mountain ranges and valleys for those small intertitial critters! Therefore ripples are creating variation in ecological opportunities within the substrate and so promote biodiversity to keep our beach cleaning service resilient and adaptable.

My camera shows the human eye one scale of pattern, but also tells a story at a different ecological and geological scale if you learn how to read it.

Photo notes: *Camera:* Olympus OM-D E-M5 Mark II. *Lens:* Olympus M.Zuiko Digital ED 12-40mm F2.8 Pro. *Settings:* f/8 1/80 sec ISO500 12mm.

Waking early for a sunrise is always a bit risky – you never know whether it will be worth photographing till you’re all set up and ready to go. This particular morning’s sunrise was not very interesting in itself, but the combination of the low tide and the sand ripples in the harsh early morning light provided a great contrast. Beautiful photographs of sunrises and sunsets can sometimes seem a dime a dozen, so the sand textures here seemed a more obvious point of interest to me.

Digital specs: 4559 x 3070 pixels (7.22 MB).

Key words: Sunrise, shore, seaside, sand ripples, reflection, low tide, texture, contrast, monochrome, black and white, winter, beach, coast, Nicola Pye, Aotearoa, New Zealand, sustainability

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Donation: The price includes a \$100 donation to a sustainability organisation or project of your choice, or otherwise for the Dunedin Night Shelter Trust
<https://dunedinnightshelter.co.nz/>

The Dunedin Night Shelter trust is the only night shelter in Dunedin, and offers free temporary emergency accommodation for anyone in need. They provide warm meals, showers and somewhere for people to wash their clothes, and they assist people in need to find more permanent homes. They do all this with no central government assistance, but rely almost completely on grants and donations, many from the local community. I’ve chosen this charity for this image because I remember how freezing cold it was on the beach that winter morning – but I had come from a warm bed, and had a cosy home to go back to afterwards. I can’t imagine sleeping rough during a Dunedin winter.

Image Ref: NP#001 (Please refer to this reference in orders and correspondence).

Nicola Pye
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