1. Introduction/Background

**Geologic Background**
- Bonaire is one of the three islands that make up the Leeward Antilles and is located roughly 60 miles off the coast of Venezuela.
- Composed of Carbonate formed during the Miocene, Bonaire is a platform overlying an igneous basement.
- Initially formed due to volcanism in the Cretaceous, Bonaire uplifted due to the subduction of the Caribbean plate during the Oligocene.
- For ease of discussion in this study, we divided the nearshore into three study regions, as shown below.

**Past Work**
- The high-resolution dataset was located on the leeward side of the island to try and show the sedimentary pathways and nearshore slope environment and the connection of the nearshore carbonate factory to the deepwater survey.
- Developing a coherent profile was initially complicated by shallow water depth, a thin and sparse sedimentary cover, and a hard carbonate seafloor.

**Current Work**
- Through reprocessing, we hoped to define the morphology that drives sedimentation along the coast.
- Using a series of predictive deconvolution to minimize the bubble pulse and source and receiver ghosts we were able to create a clearer image of the faults, the igneous basement beneath the carbonate platform and the accumulation of sediment in troughs.
- The definition of these features identifies the main sedimentary mechanisms in the region as gravity drive down the slope transport and mass transport.

2. Methodology

**Processing Flow**

1. Input Shot Data
2. Geometry Data
3. CMP Sort
4. Bandpass Filter, Decomposition
5. Velocity model, pick multiples
6. Slack
7. Migration

**Figure 2.1**

**Figure 2.2** (Left)-**Velocity Profiles**

Comparison of the previously used velocity profiles, and currently used velocity profiles. Increased velocities at shallower depths led to an increase in depth penetration in multiple lines. Each line of the survey had a velocity profile rework.

Key Techniques
- A trio of predictive deconvolutions helped reduce the impact of the bubble pulse and the source and receiver ghosts (Figure 2.1).
- Reworked velocity profiles, removal of CDPs smoothed anomalies in the original velocity profile (Figure 2.2).
- Sea floor retrace to account for the presence of out of plane features.

**Figure 3.1**

**Figure 3.2**

**Figure 3.3**

**Figure 3.4**

**5. Interpretation Results**

**Figure 5.1**

**Figure 5.2**

**Figure 5.3**

**6. Future Work**

- Update work by Bales (2016) and submit for publication.
- Use reprocessed dataset to connect nearshore sedimentary systems to deepwater systems imaged in a legacy USGS seismic survey.

**References/Acknowledgments**

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