DSSV Pressure Drop: Descriptive Report

Suakin Transit Leg

February 2020

Report developed for Caladan Oceanic by Cassie Bongiovanni

Introduction

DSSV *Pressure Drop* left port in KAUST, Saudi Arabia on February 27th heading southwest toward the Suakin Deep as part of the Red Sea Expedition. The transit to and from Suakin lasted from February 27th to March 1st. The total transit time was three days. The Kongsberg EM 124 multibeam echosounder system (MBES) installed onboard was operated to acquire bathymetric, backscatter and water column data throughout the transit leg.

This document serves as the metadata and descriptive report of the Suakin Transit Leg's data acquisition, processing and interpretation.

Survey Details

Vessel : DSSV *Pressure Drop*
Survey Dates : 27 February – 1 March 2020

Data Acquisition and Processing System

- Hardware
  - MBES : Kongsberg EM 124
  - Positioning : Seapath 380, stand-alone
  - Motion Sensor : Kongsberg Seatex MRU 5+
  - Sound Speed : Teledyne Reson SVP70 (at transducer)

- Software
  - Acquisition : SIS v5.3.1.278 Build date 2019-12-09
    Sound Speed Manager v2018.1.50 for Sound Speed Profile
  - Processing : QPS Qimera v1.7.4
    QPS FM Midwater v7.8.6
    KMALL to ALL Datagram Converter

Survey Parameters

Survey Speed : 9 – 11 knots
Swath Angle (Sector) : ranging from 40 – 65 degrees each side (port and starboard)
Beam Spacing : Equidistance
Dual Swath Mode : ON

Data Coverage and Statistics

Total area covered	: 920 km^2	Total number of lines	: 41
Depth range	: 251 – 2,769 m	Data formats included	: *kmall, *all, *gsf
Average Swath Width	: 2,800 m	Northwest Lat/Long	: 22.08^o N, 38.49^o E
Average Uncertainty	: ± 2.5 m	Southeast Lat/Long	: 19.69^o N, 38.96^o E

Mapper

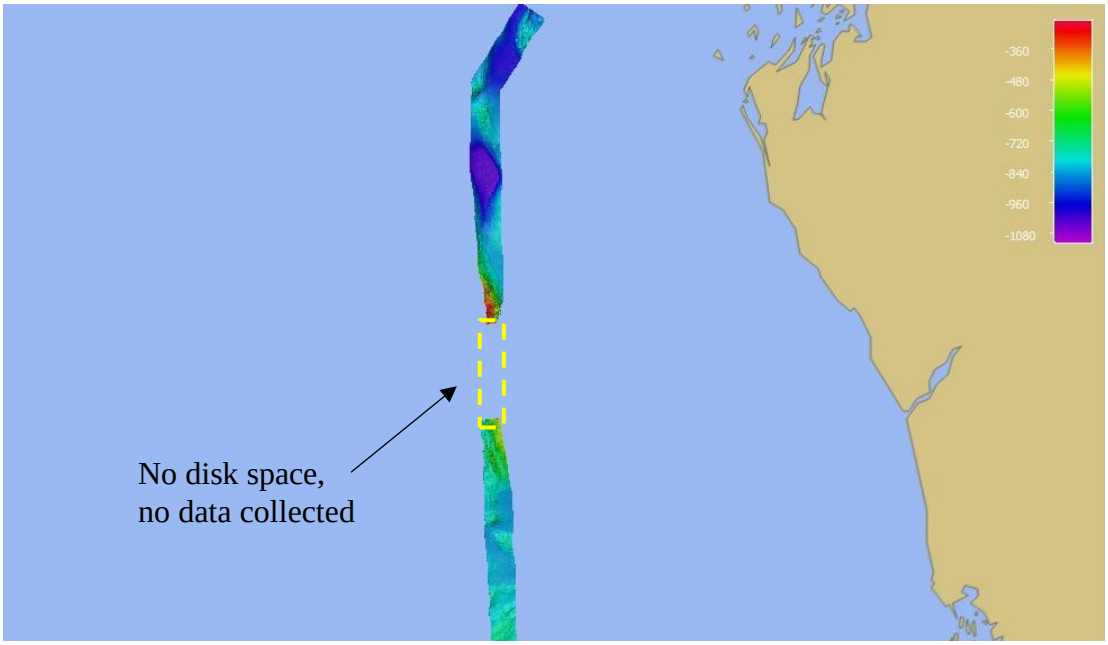
Cassie Bongiovanni – Caladan Oceanic LLC (USA)

Data Acquisition Notes

1. **Sound Speed Profile**
   The mapping team used sound speed profile from the Sound Speed Manager tool which is based on the World Ocean Atlas 2009 for the entire transit.

2. **Sea State and Vessel Movement**
   The sea state was low for most of the transit –ideal for surveying.

3. **SIS Errors and Troubleshooting**
   During the transit, the HWS computer ran out of disk space for an hour resulting in no data being collected and a gap in coverage.



Data Processing Notes

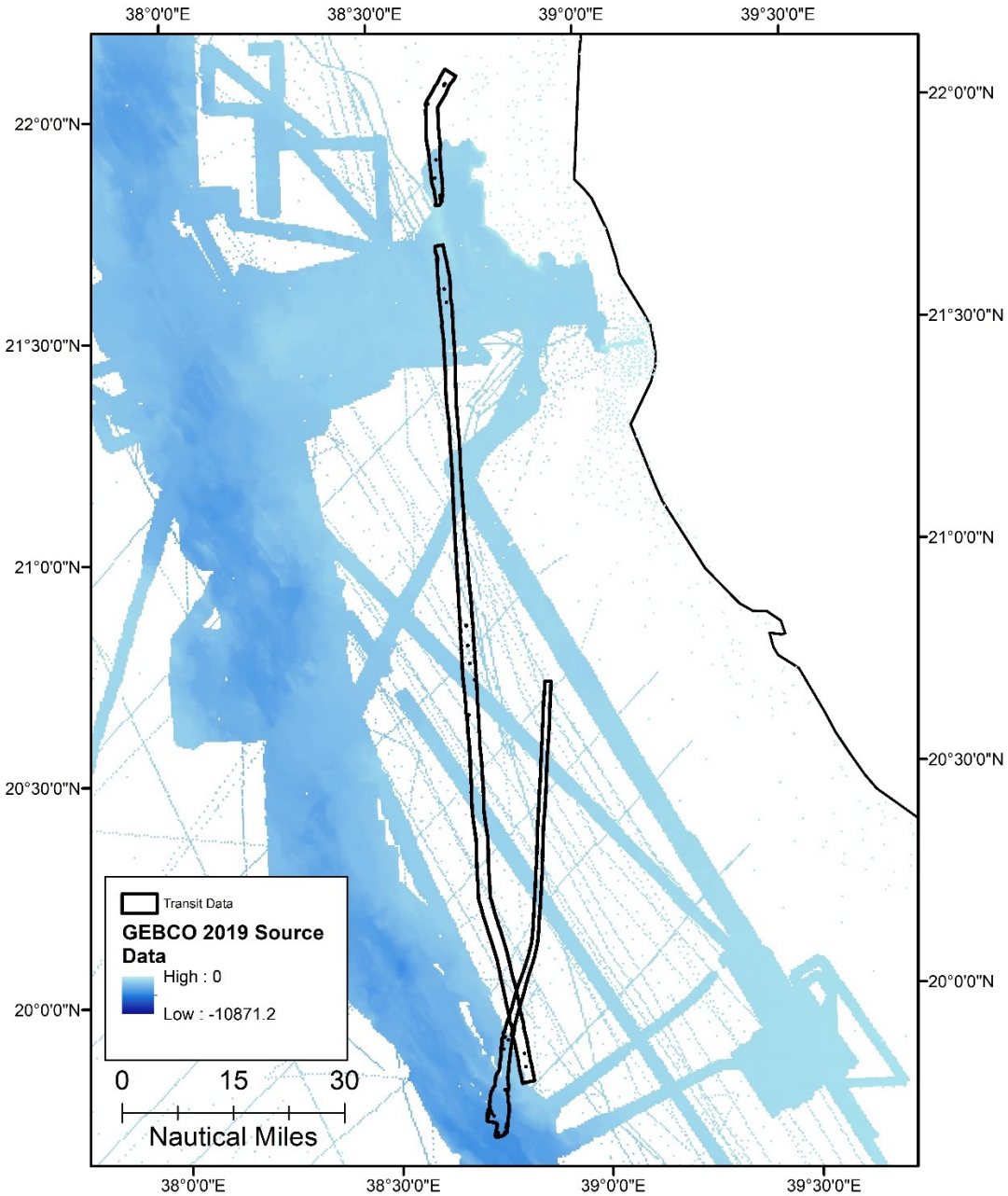
1. Qimera Project Parameters
   Coordinate System : FP_WGS_84_UTM_zone_37N
   (Horizontal Datum: WGS 84, Projection: UTM_zone_37N)
   Dynamic Surface : CUBE at 30m resolution with Hypothesis Resolution Algorithm: Number of Samples + Neighborhood

2. Some rough topography made it difficult for complete coverage – but overall good quality data.

Comparison with publicly available base surface

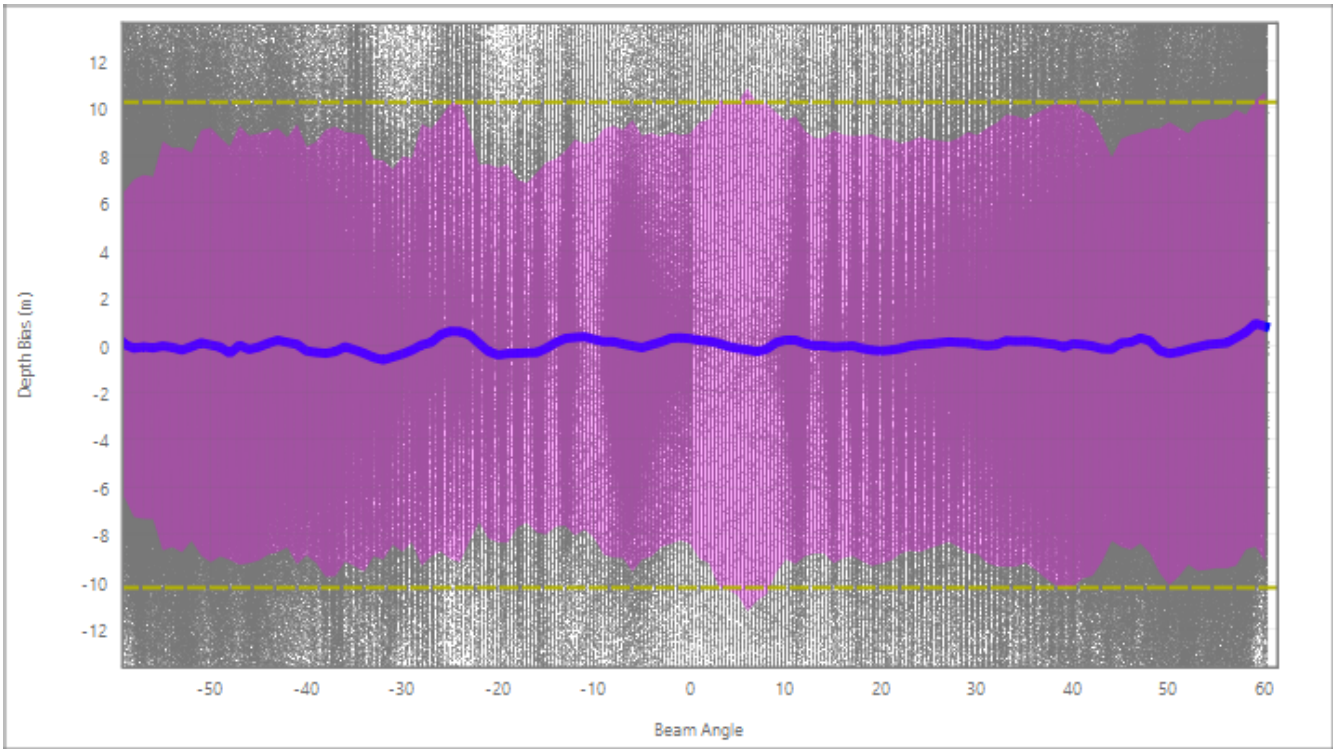
A bathymetric grid was extracted from the GEBCO 2014 30 arc-second compilation grid and was used as the base surface while the vessel is transiting and collecting data. However, since their collection the GEBCO 2019 came out and is used in this report for the most up-to-date comparisons.

The map below illustrates the transit data coverage and the data sources of GEBCO2019 grid.



Majority of the transit data did not intersect sounding data from multibeam and single beam. Specifically, only 60% of these transit data covered interpolated areas and are new data to the world.

These data meet IHO Order 1 specifications and are anticipated to supersede any data.



The yellow-dashed line is the IHO Order 1 uncertainty requirements in comparison to the transit data in purple, thus proving these data meet the quality requirements.

Features

No features were identified in these data.