D00282

Outer Savannah Harbor Channel

OPR-G322-TJ-24
Approaches to Savannah
Georgia

Responsible Party
DOC/NOAA/NOS/OCS -- Office of Coast Survey
Contact Information
hsd.chief@noaa.gov
Field Unit
NOAA Ship Thomas Jefferson (S222)
Survey Dates
April 30, 2024 - May 15, 2024
License Information
CC0-1.0
Approver
Captain Matthew J. Jaskoski, NOAA

Platform and Sonar Equipment

Thomas Jefferson (S222)

Kongsberg Maritime EM 2040

2904 (2904)

Kongsberg Maritime EM 2040

Bathymetry Grid

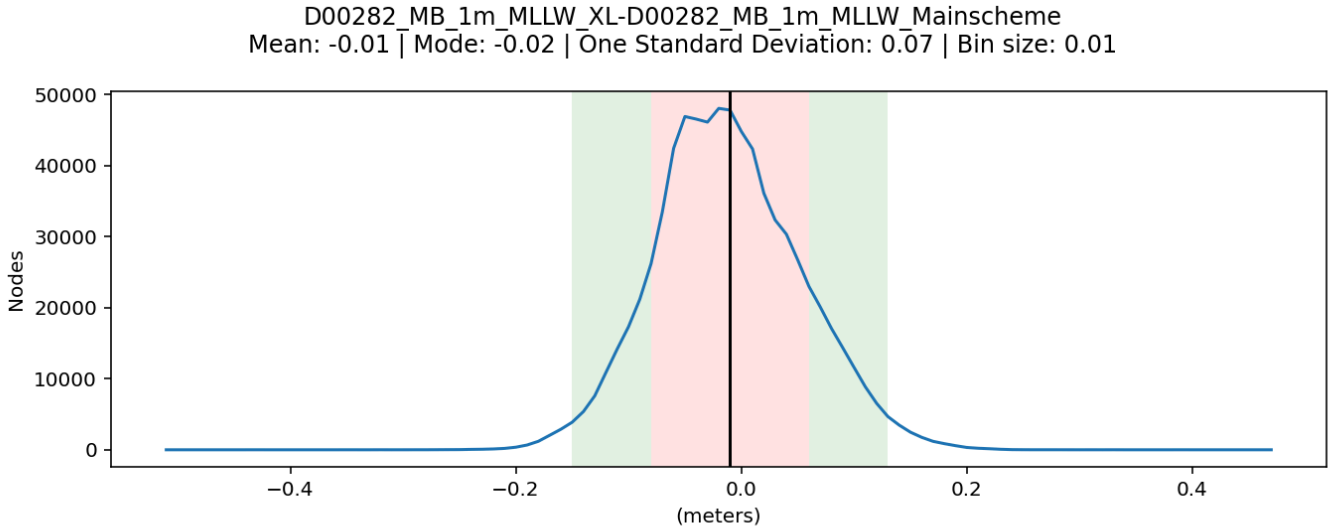
D00282_MB_1m_MLLW_Final_1of1 (*North American Datum 1983 (2011), Mean Lower Low Water, Projected UTM 17)*

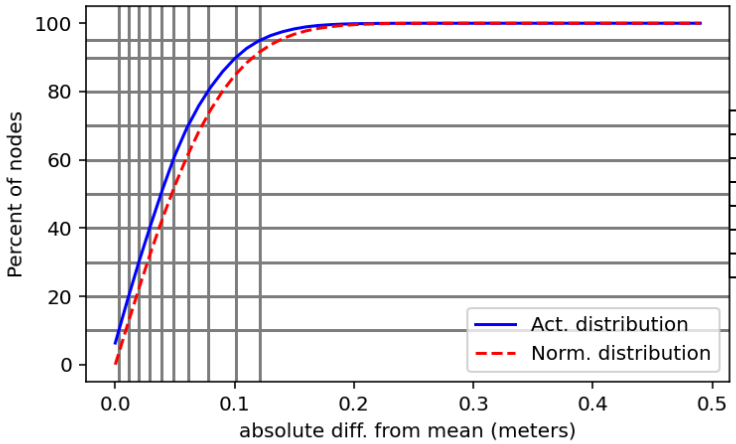
					Fixed	Variable
Sounding Technique:	***Multibeam***	Full Seafloor Coverage:	***No***	Feature Detection Size:	***N/A***	***N/A***
Features Detected:	***No***	Bathymetric Coverage:	***No***	Uncertainty Horizontal:	***1m***	***N/A***
Least Depth Detected:	***No***	Interpolated:	***No***	Uncertainty Vertical:	***0.15m***	***0.75%***

Quality Control Procedure

Crosslines

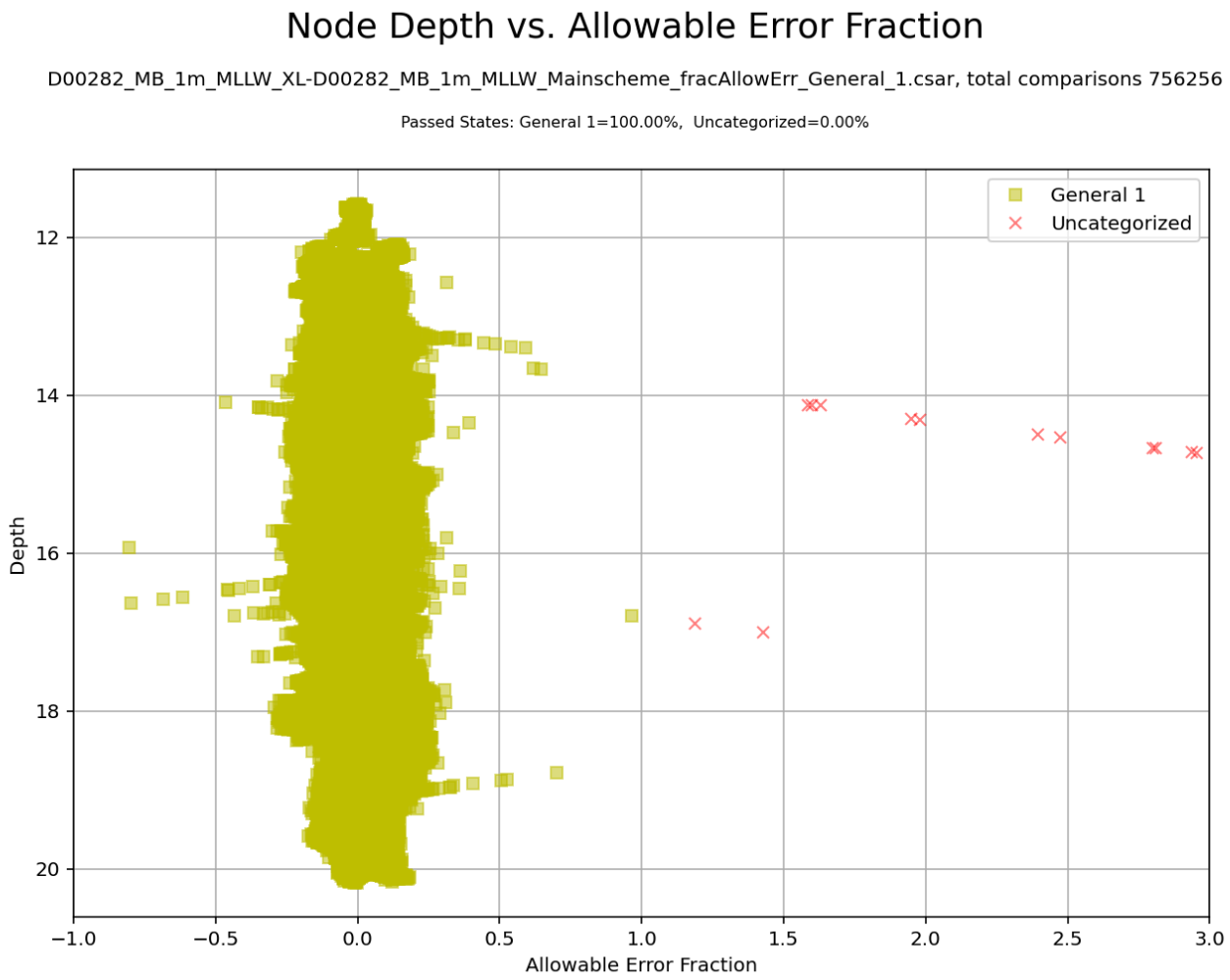
Pydro 22, a suite of software maintained by NOAA's Hydrographic Systems and Technology Branch (HSTB), contains various tools that aid in the analysis and quality control of hydrographic data. A Single Resolution (SR) 1m Combined Uncertainty and Bathymetry Estimator (CUBE) surface of this survey's mainscheme data and a SR 1m CUBE surface of this survey's crossline data were differenced with the Pydro 22 tool "Compare Grids." Vessels S222 and 2904 collected a combined total of approximately 54.00 linear nautical miles of MBES crosslines, a figure which constitutes about 16.61% of mainscheme mileage. A Single Resolution (SR) 1m Combined Uncertainty and Bathymetry Estimator (CUBE) surface of mainscheme data and a SR 1m CUBE surface of crossline data were differenced with the Pydro tool Compare Grids. The results of this comparison indicate that 100% of grid-node comparisons between the two surfaces are within the Fraction of Allowable Error for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 Hydrographic Surveys Specifications and Deliverables (HSSD). The resulting mean of this comparison was a -0.01m difference, with a standard deviation of 0.07m, verifying the consistency of the data.





Percent of nodes	Deviation (m)
50%	+/- 0.04
60%	+/- 0.05
70%	+/- 0.06
80%	+/- 0.08
90%	+/- 0.10
95%	+/- 0.12

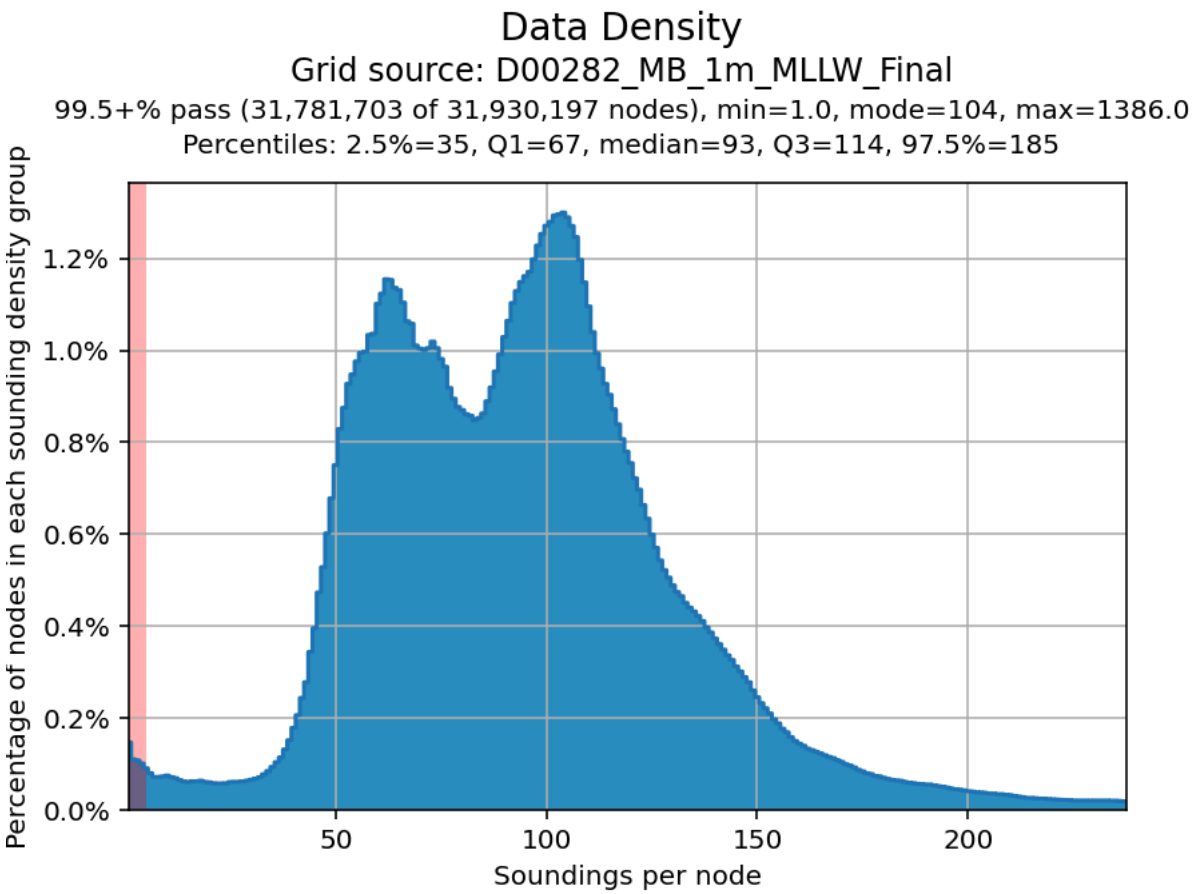
Crossline/mainscheme comparison statistics



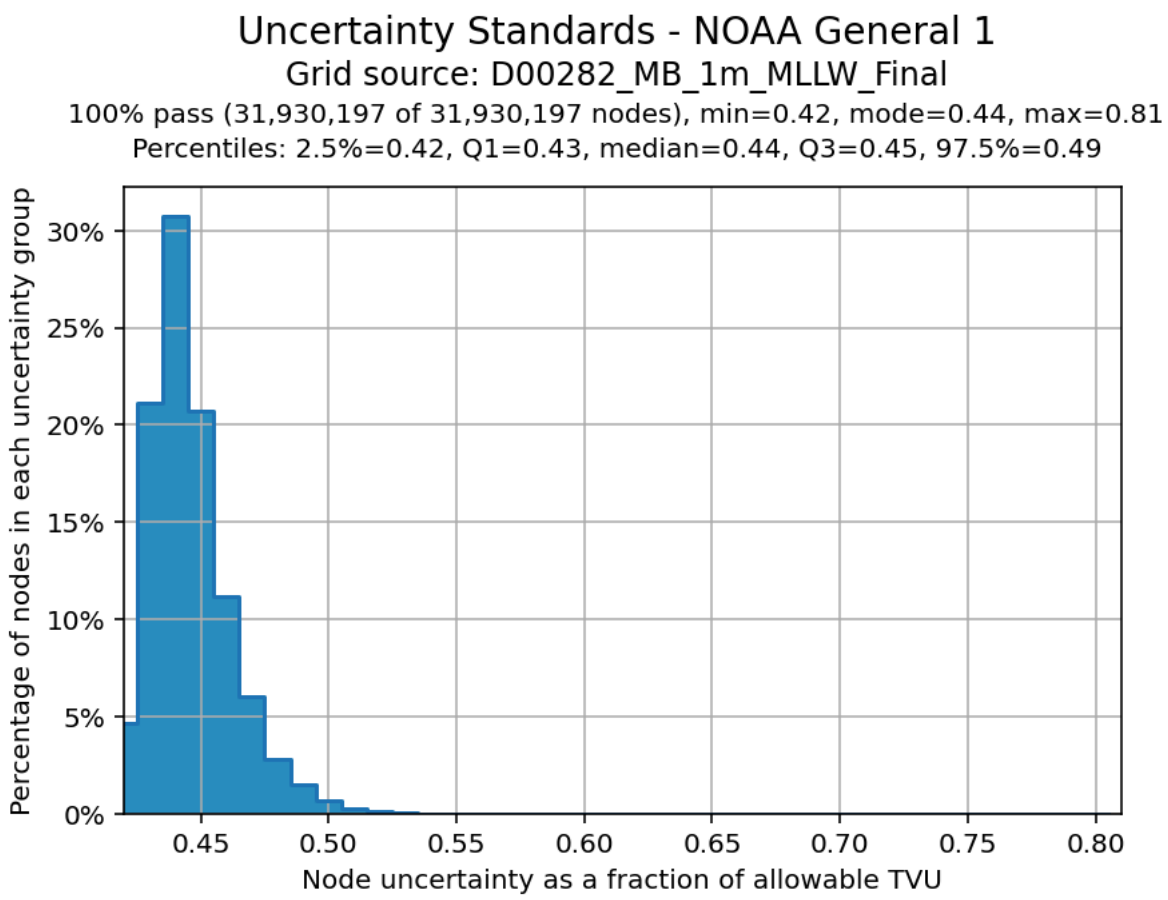
Crossline fraction of allowable error statistics

Statistical Analysis

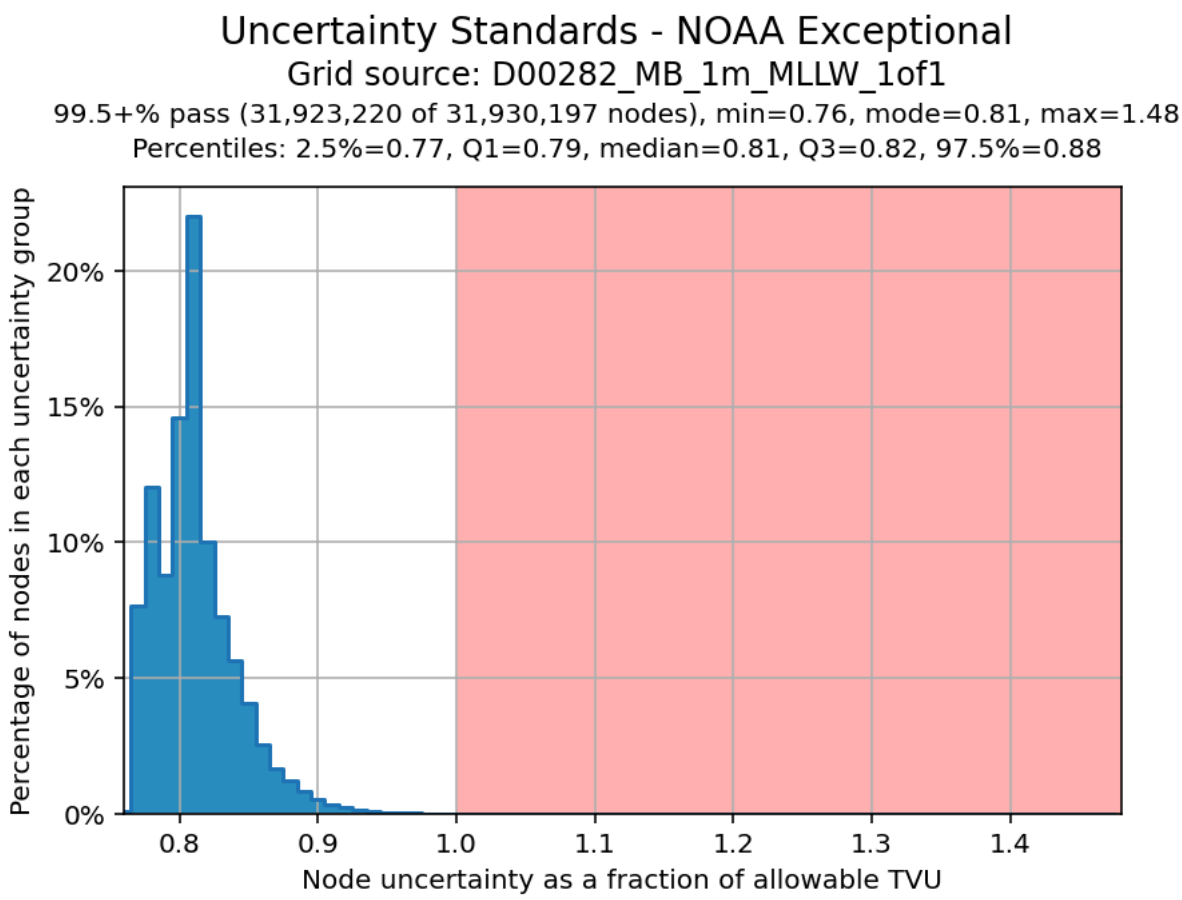
Statistical analysis of grid layers was conducted to assess the quality of the bathymetry. NOAA's Pydro 22 QC Tools "Grid QC" was used to asses grid density, resolution, and uncertainty against allowable standards specified in the 2024 HSSD. This survey was assigned quality metrics of General 1 and meets the quality metrics for General 1. The uncertainty metrics reported in the Metadata section reflect the highest Quality Metric that was achieved for each grid.



Statistical analysis of grid layers



Statistical analysis of grid layers



Statistical analysis of grid layers

Directed Editing

The 1m Single Resolution CUBE surface was visually inspected in CARIS HIPS and SIPS 11.4.3 to determine if any obvious erroneous fliers were noticeable. Next, Pydro 22's QC Tools 4 "Flier Finder" was utilized to scan the grid for anomalous data. One designated sounding was selected to ensure the gridded surface honors the true depth in regards to the least depth of an existing charted feature.

Holiday Identification

Per the Project Instructions, this survey was done with less than 100% MBES with no concurrent SSS. Holiday identification was not completed.

Survey Adequacy

Survey was completed using 300m set lines spacing to determine if shoals have shifted within the survey limits in accordance with OPR-G322-TJ-24 Project Instructions Note 2 (pg 34). Bathymetric Coverage not achieved per the Project Instructions (pg 33).

Imagery Coverage

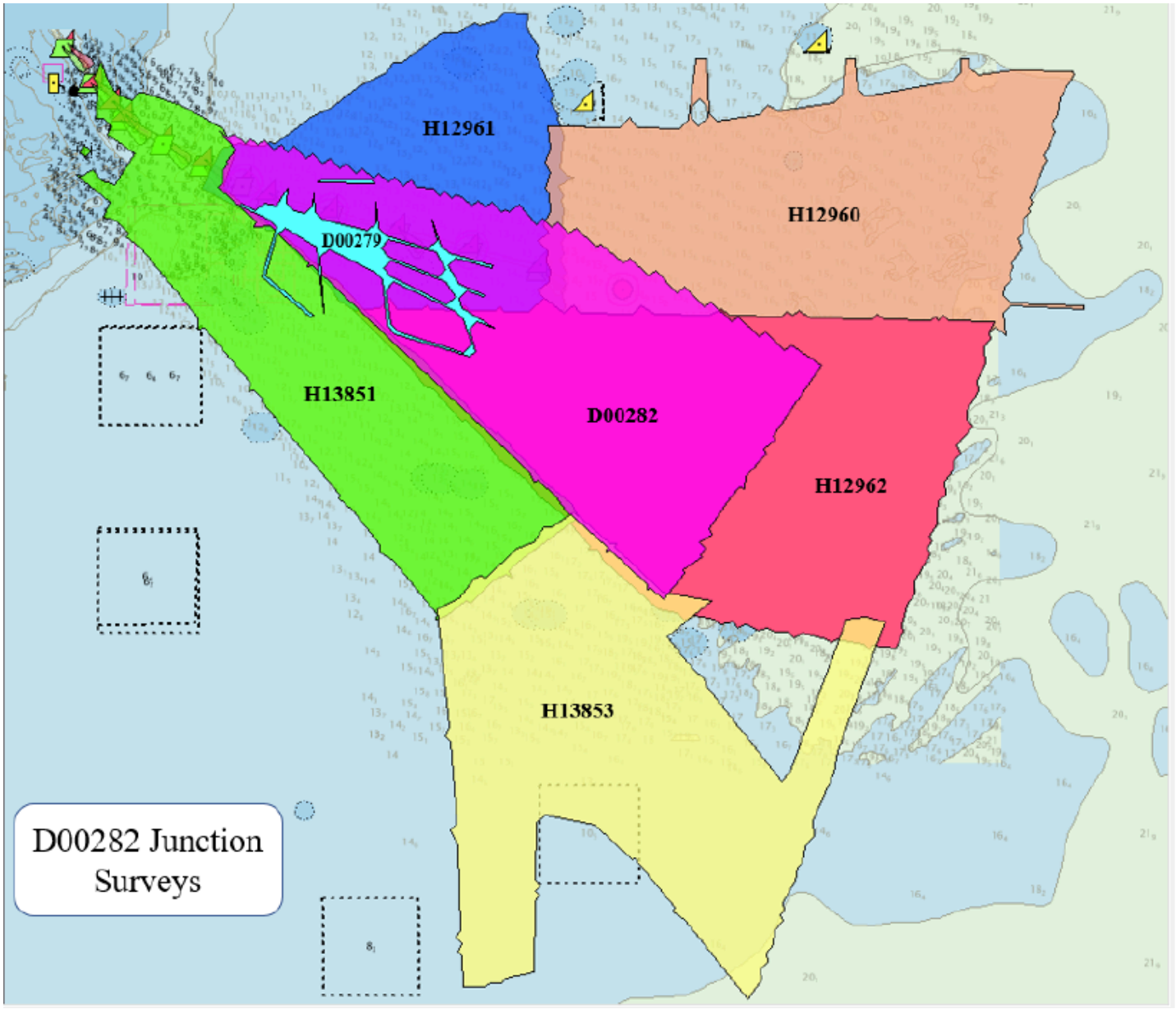
Imagery coverage assessment was not performed for this survey

Data Interpolation

Data interpolation was not performed for this survey

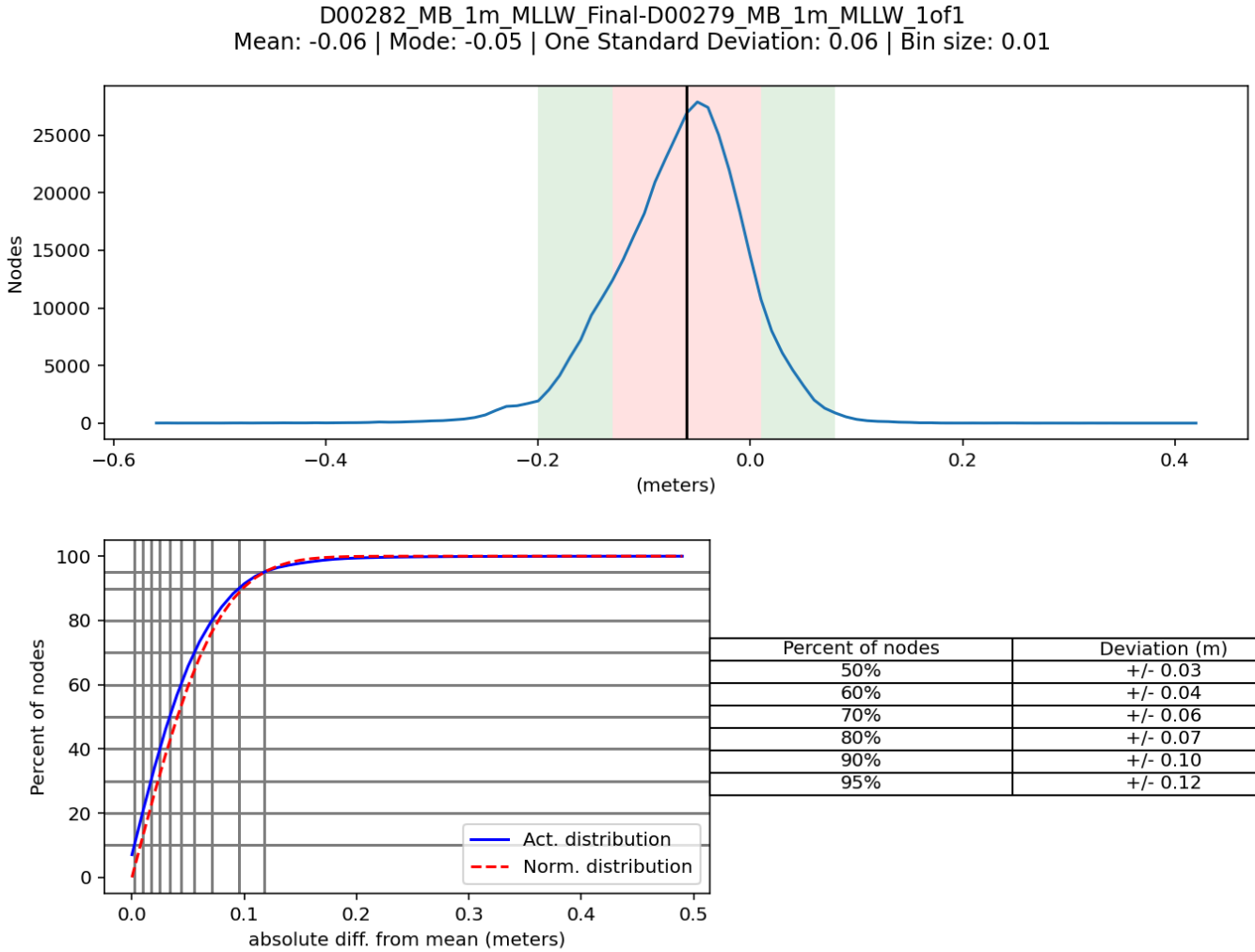
Junction Overlap

Survey D00282 junctions with six other surveys: D00279, H12960, H 12961, H12962, H13851, and H13853. The Pydro 22 tool "Compare Grids" was utilized to assess the overlap of these junctions. The results of these junctions are shown in the statistics below.



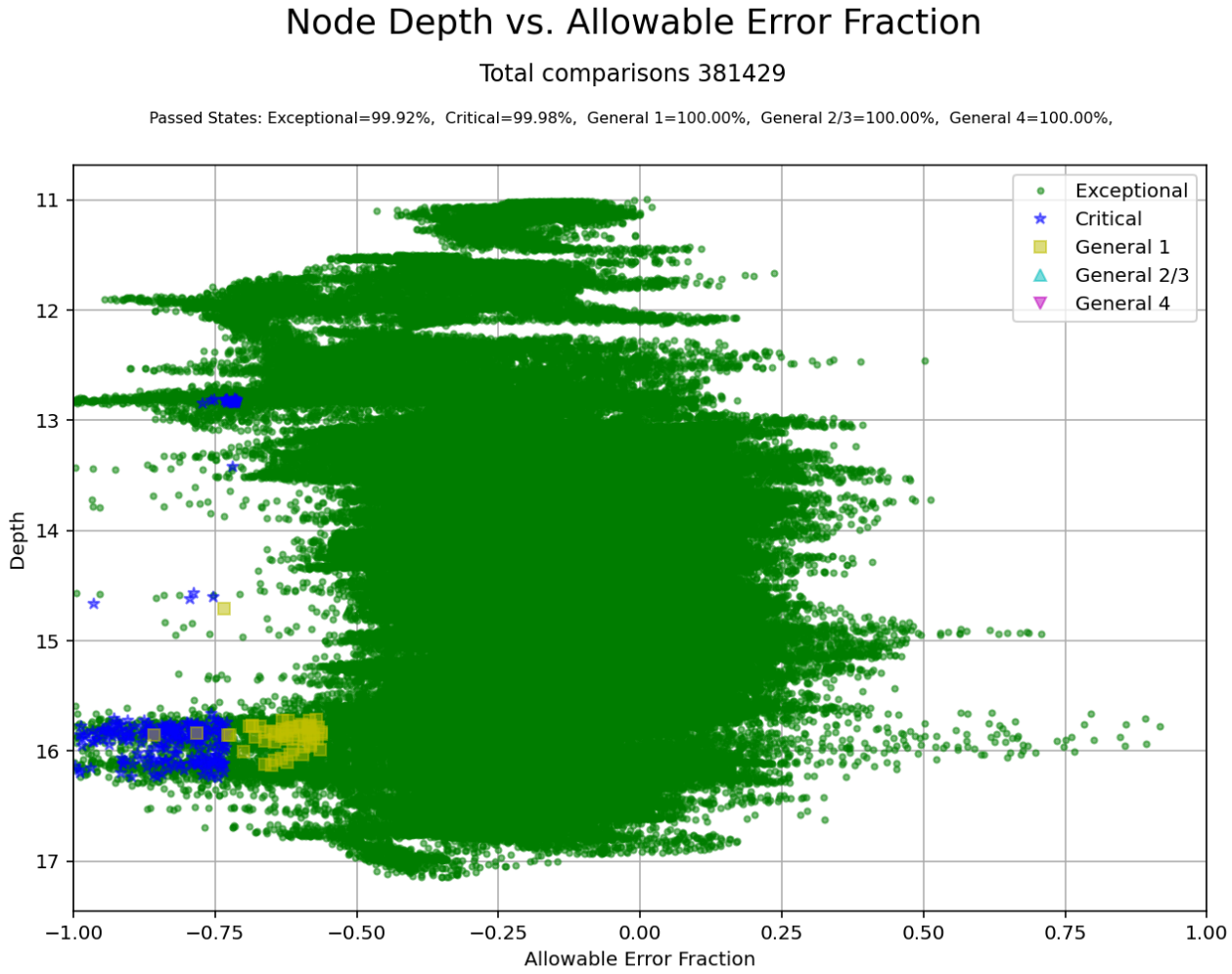
D00282 Junction Surveys

The results between D00282 and D00279 indicate that 100% of grid-node comparisons are within Fraction of Allowable Error standards in regards to for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 HSSD for General 1. The resulting mean of this comparison was a -0.06m difference, with a standard deviation of 0.06m, which is within allowable TVU for the area.



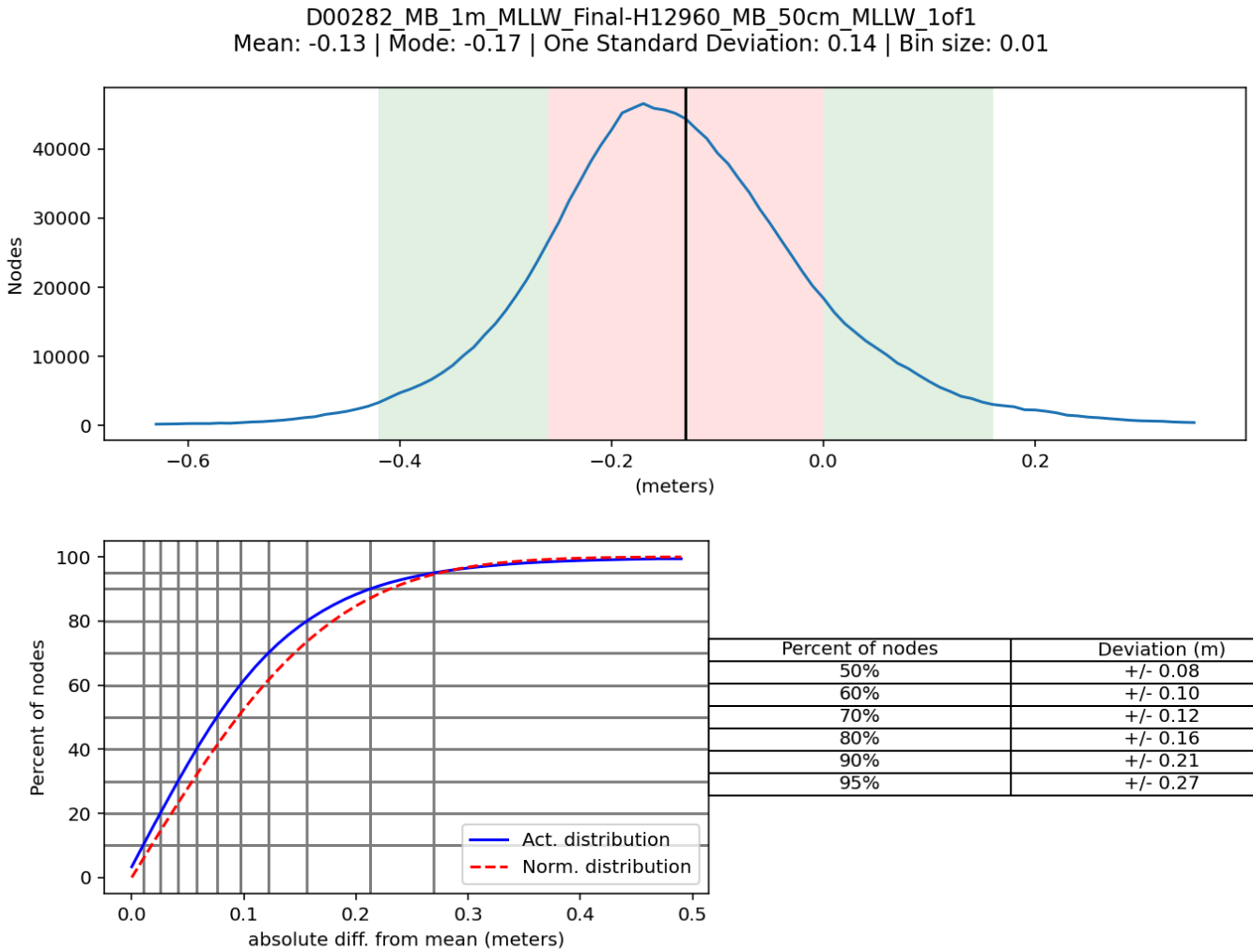
Percent of nodes	Deviation (m)
50%	+/- 0.03
60%	+/- 0.04
70%	+/- 0.06
80%	+/- 0.07
90%	+/- 0.10
95%	+/- 0.12

D00282 and D00279 junction statistics



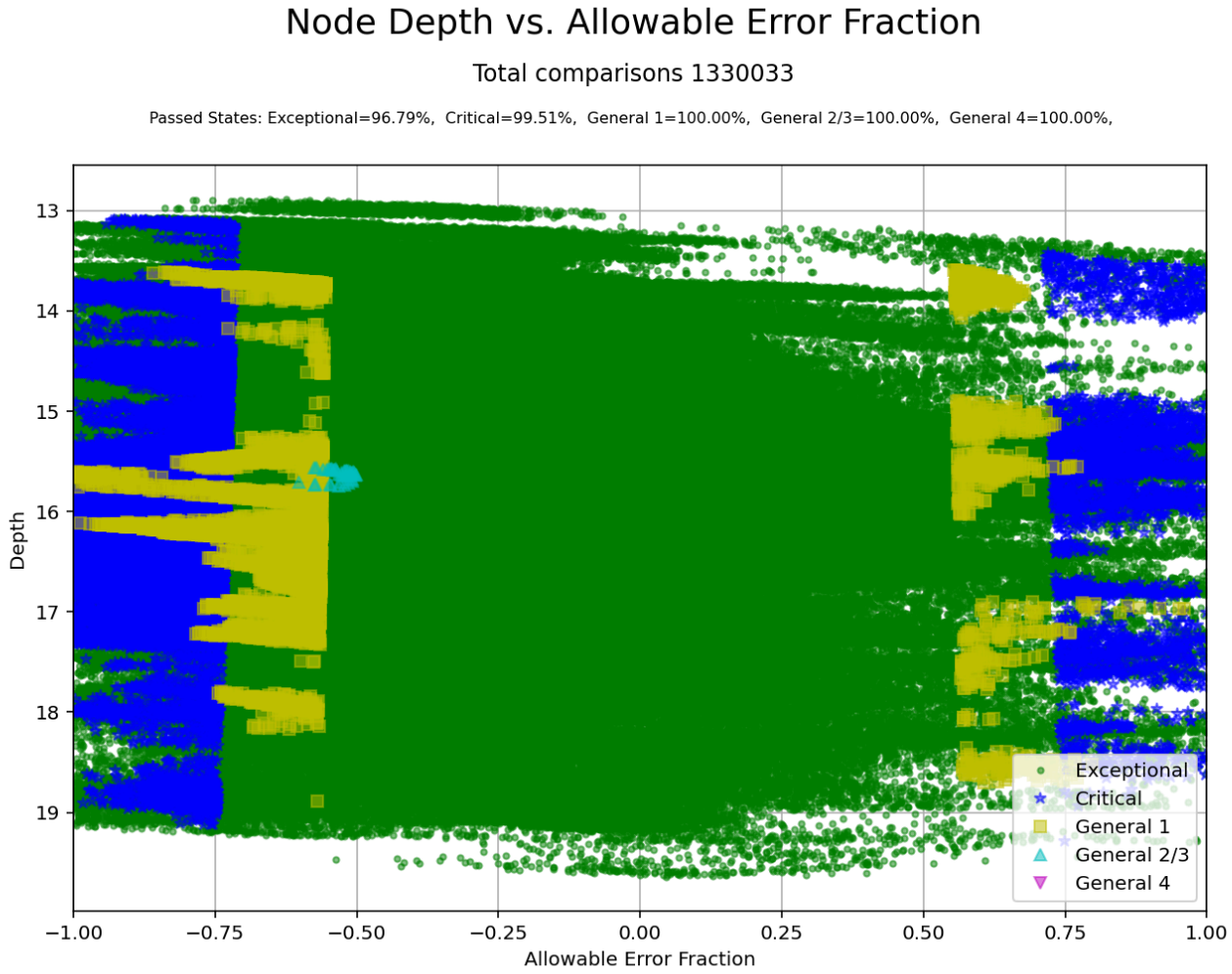
D00282 and D00279 junction statistics

The results between D00282 and H12960 indicate that 100% of grid-node comparisons are within Fraction of Allowable Error standards for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 HSSD for General 1. The resulting mean of this comparison was a -0.13m difference, with a standard deviation of 0.14m, which is within allowable TVU for the area.



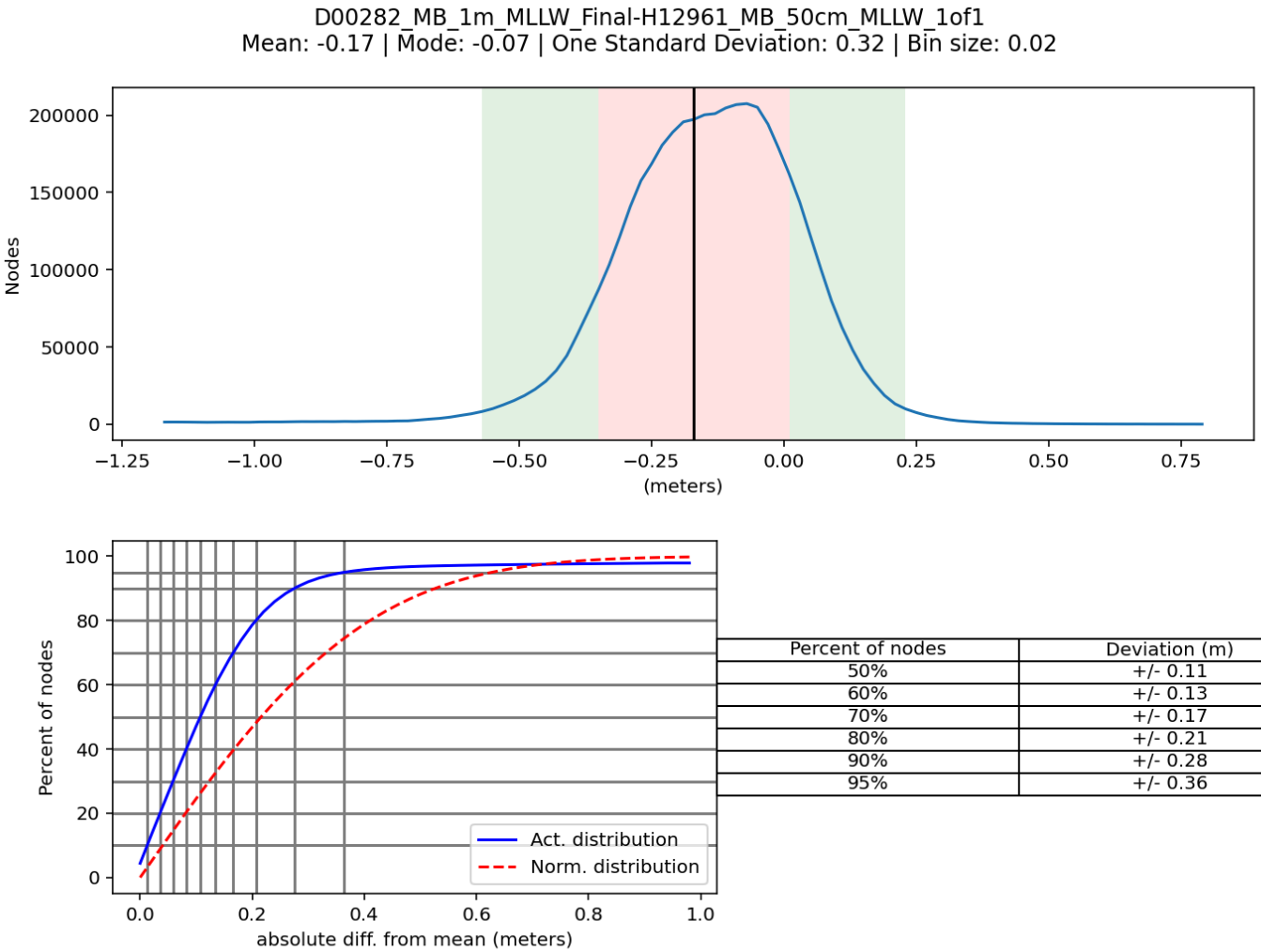
Percent of nodes	Deviation (m)
50%	+/- 0.08
60%	+/- 0.10
70%	+/- 0.12
80%	+/- 0.16
90%	+/- 0.21
95%	+/- 0.27

D00282 and H12960 junction statistics



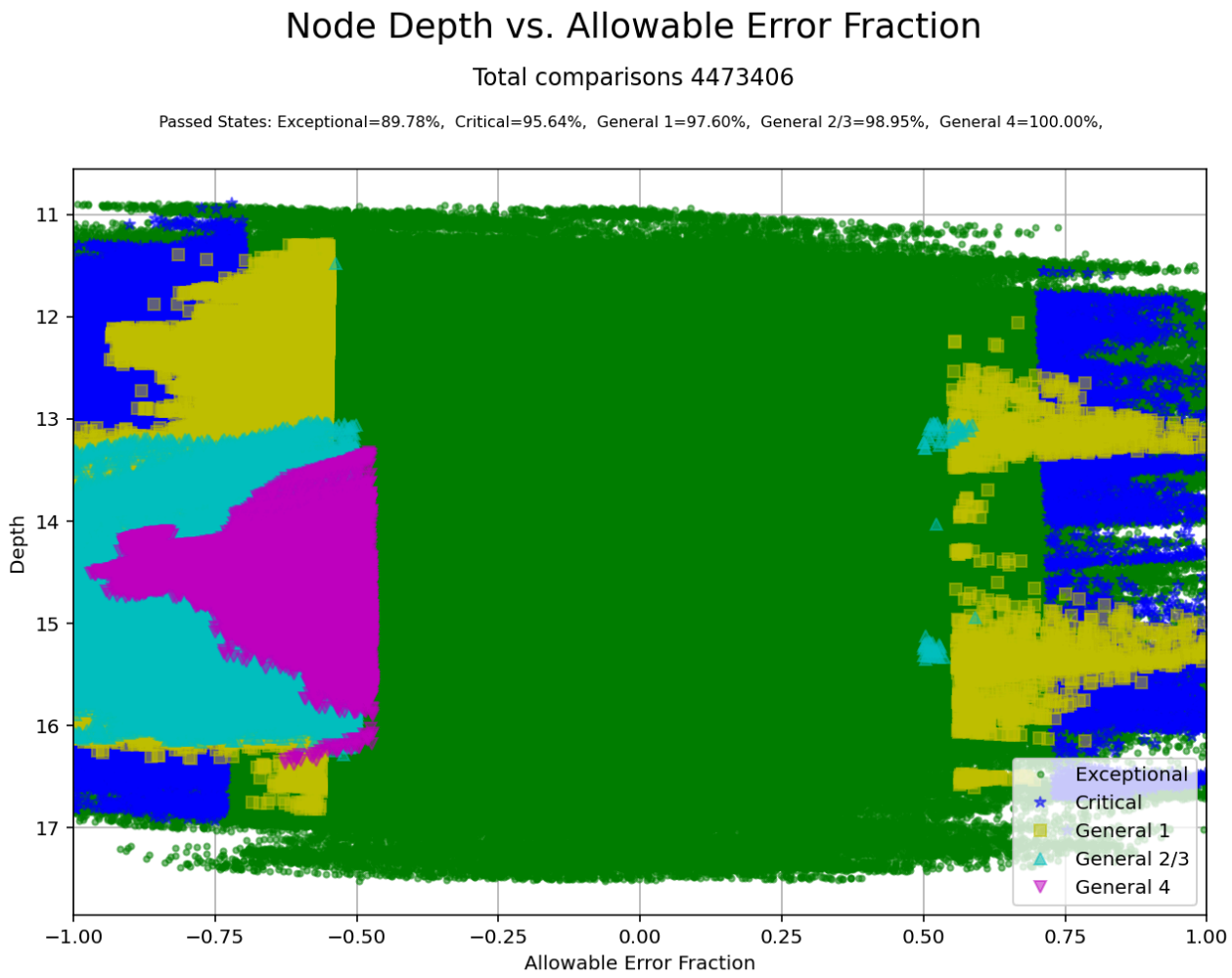
D00282 and H12960 junction statistics

The results between D00282 and H12961 indicate that 97.60% of grid-node comparisons are within Fraction of Allowable Error standards for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 HSSD for General 1. The resulting mean of this comparison was a 0.17m difference, with a standard deviation of 0.32m, which is within allowable TVU for the area.



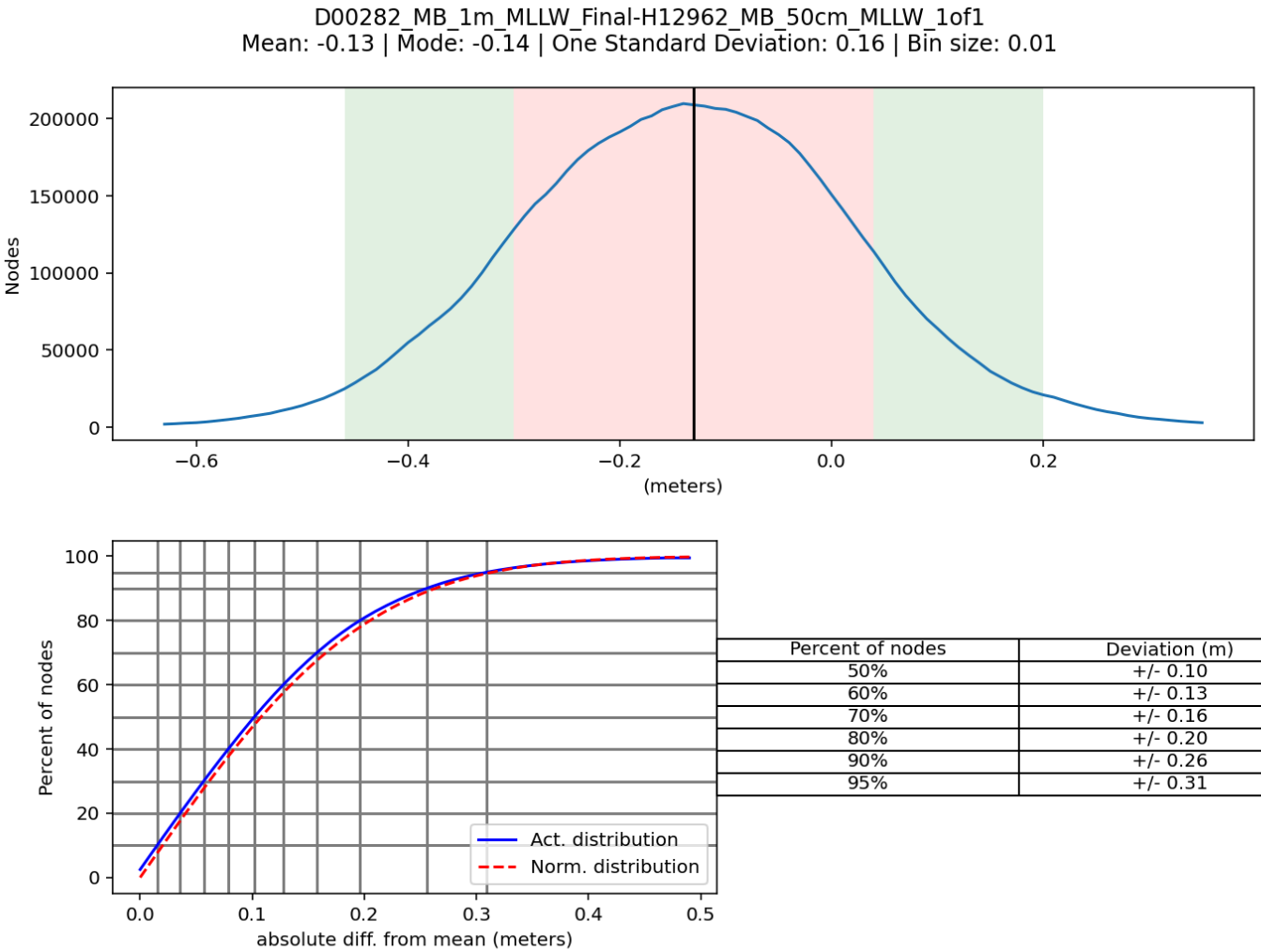
Percent of nodes	Deviation (m)
50%	+/- 0.11
60%	+/- 0.13
70%	+/- 0.17
80%	+/- 0.21
90%	+/- 0.28
95%	+/- 0.36

D00282 and H12961 junction statistics



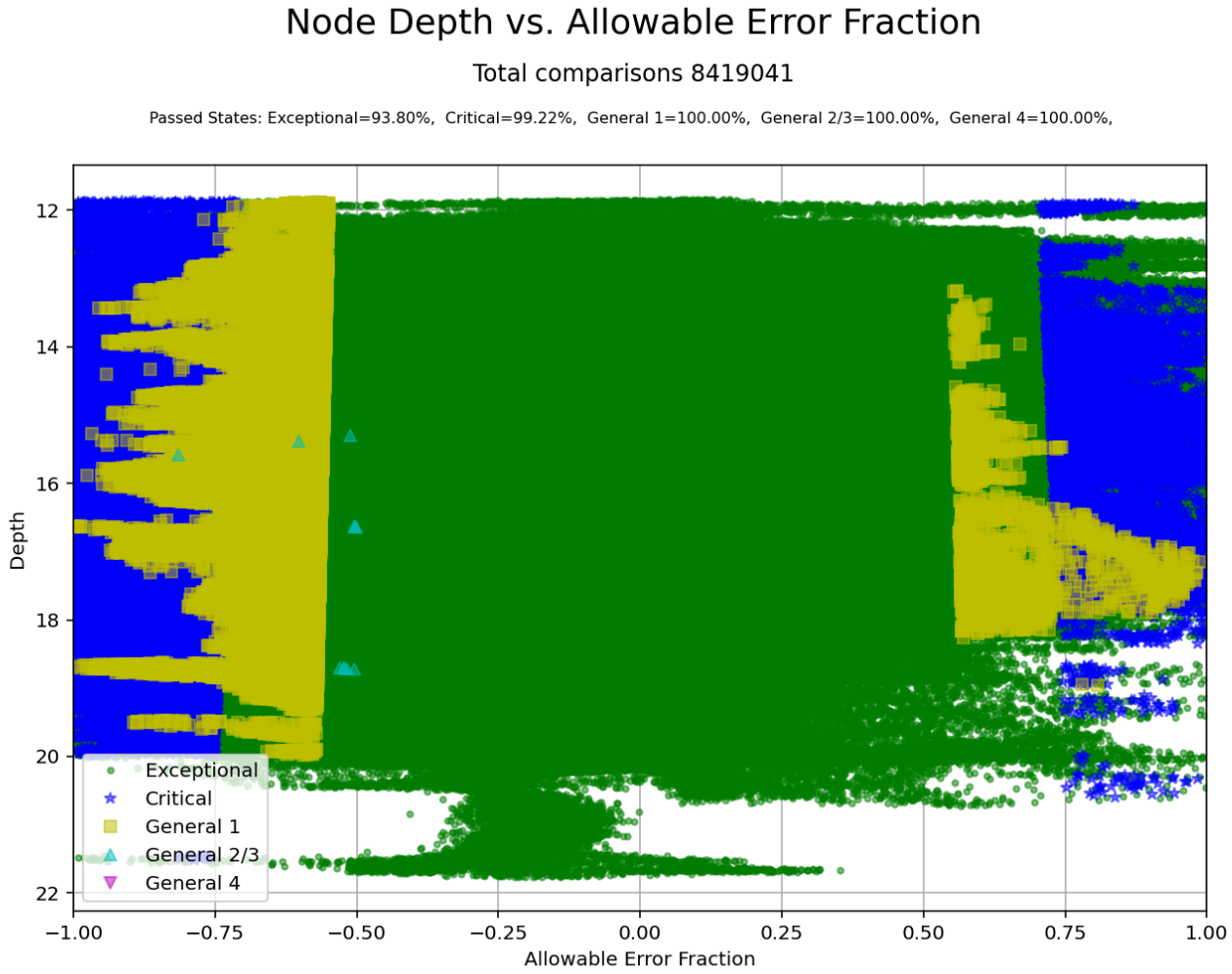
D00282 and H12961 junction statistics

The results between D00282 and H12962 indicate that 100% of grid-node comparisons are within Fraction of Allowable Error standards for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 HSSD General 1. The resulting mean of this comparison was a -0.13m difference, with a standard deviation of 0.16m, which is within allowable TVU for the area.



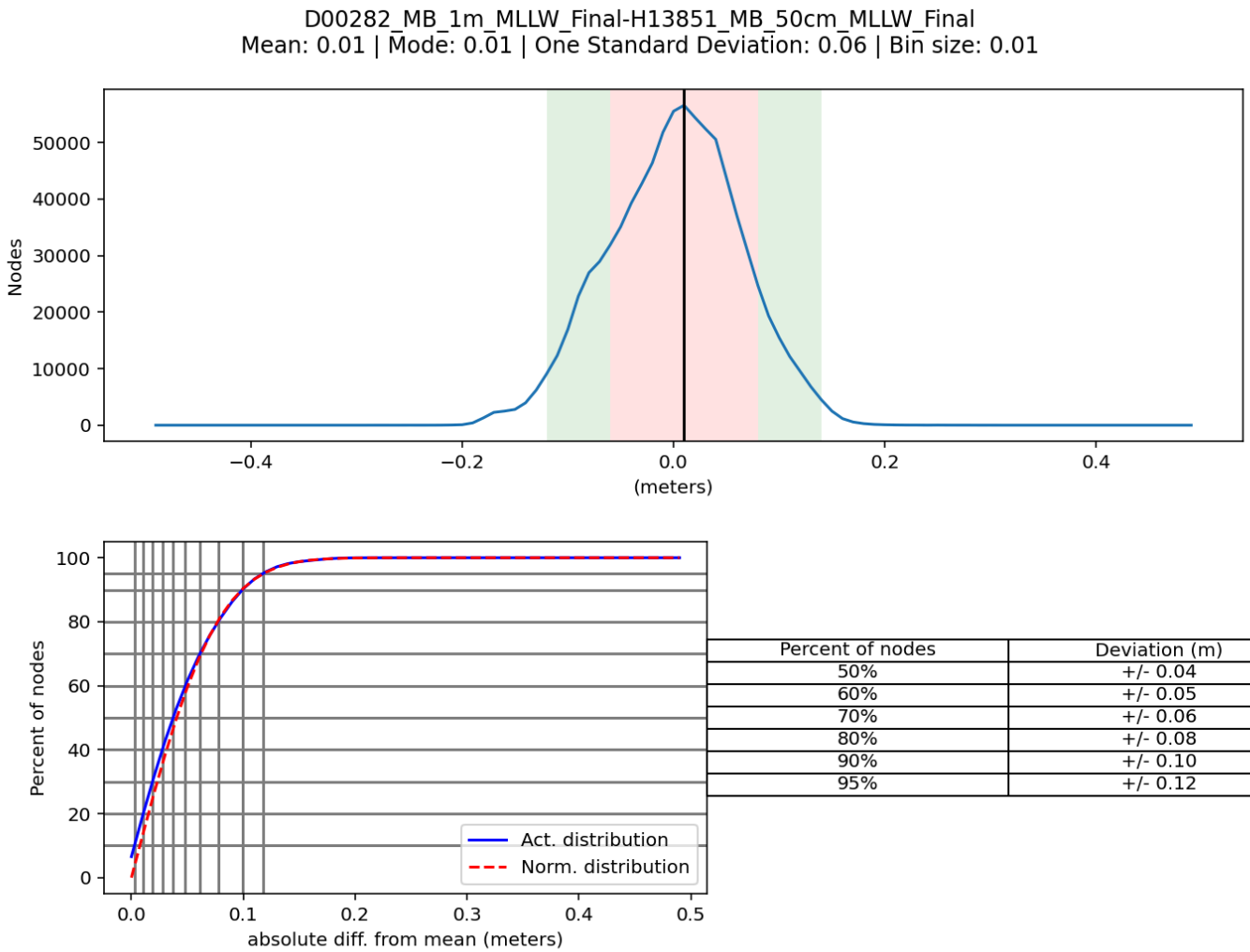
Percent of nodes	Deviation (m)
50%	+/- 0.10
60%	+/- 0.13
70%	+/- 0.16
80%	+/- 0.20
90%	+/- 0.26
95%	+/- 0.31

D00282 and H12962 junction statistics



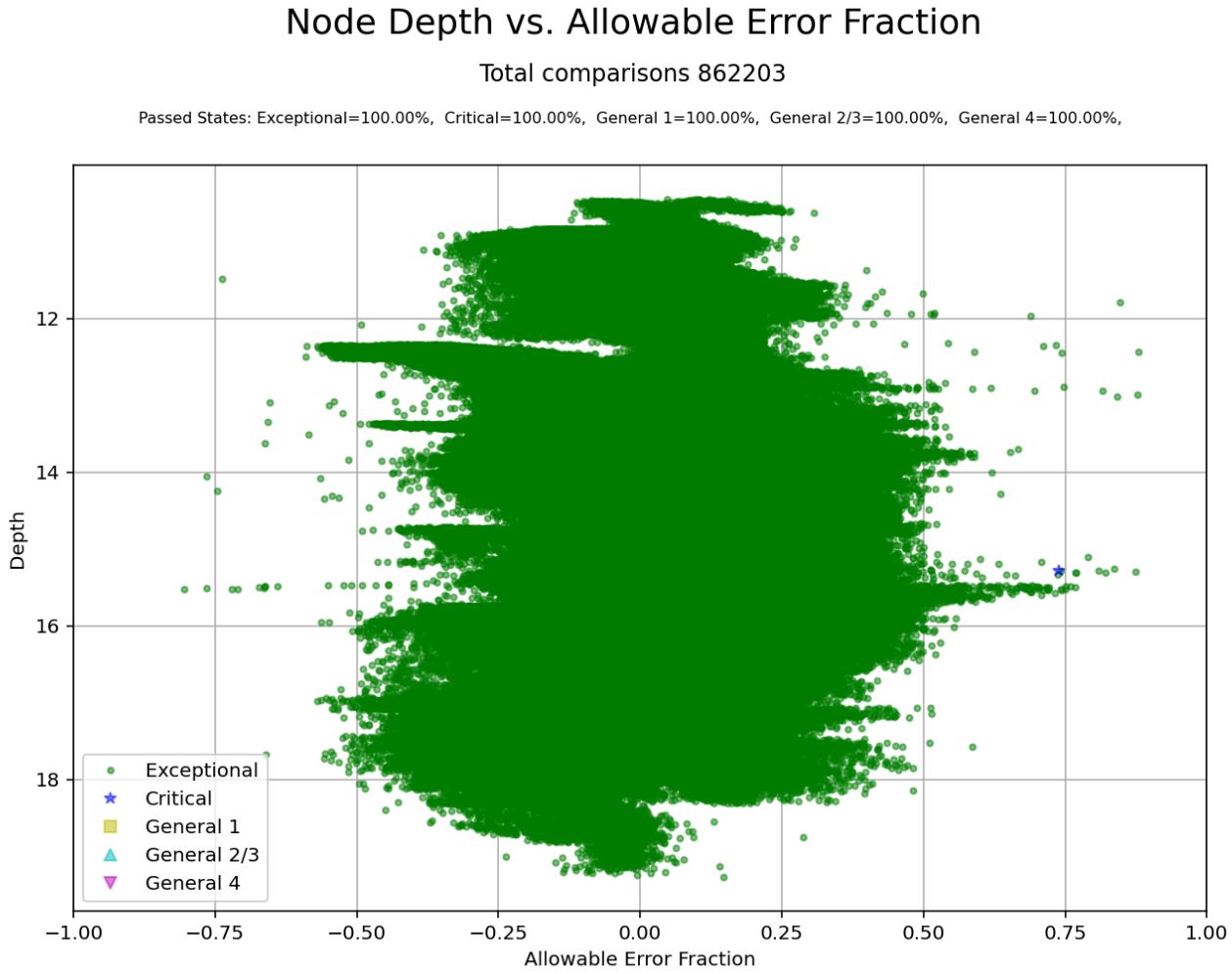
D00282 and H12962 junction statistics

The results between D00282 and H13851 indicate that 100% of grid-node comparisons are within Fraction of Allowable Error standards for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 HSSD for General 1. The resulting mean of this comparison was a 0.01m difference, with a standard deviation of 0.06m, which is within allowable TVU for the area.



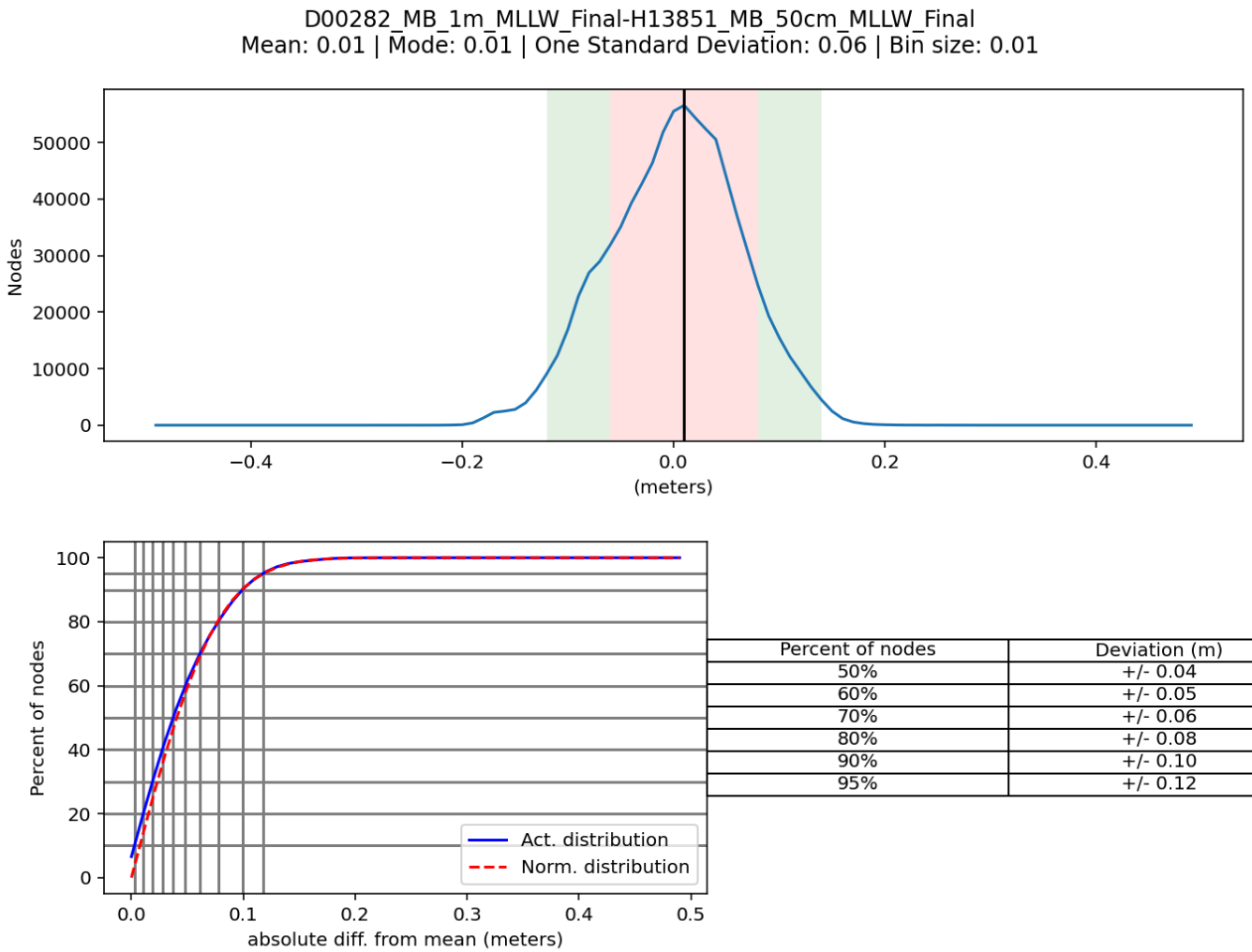
Percent of nodes	Deviation (m)
50%	+/- 0.04
60%	+/- 0.05
70%	+/- 0.06
80%	+/- 0.08
90%	+/- 0.10
95%	+/- 0.12

D00282 and H13851 junction statistics



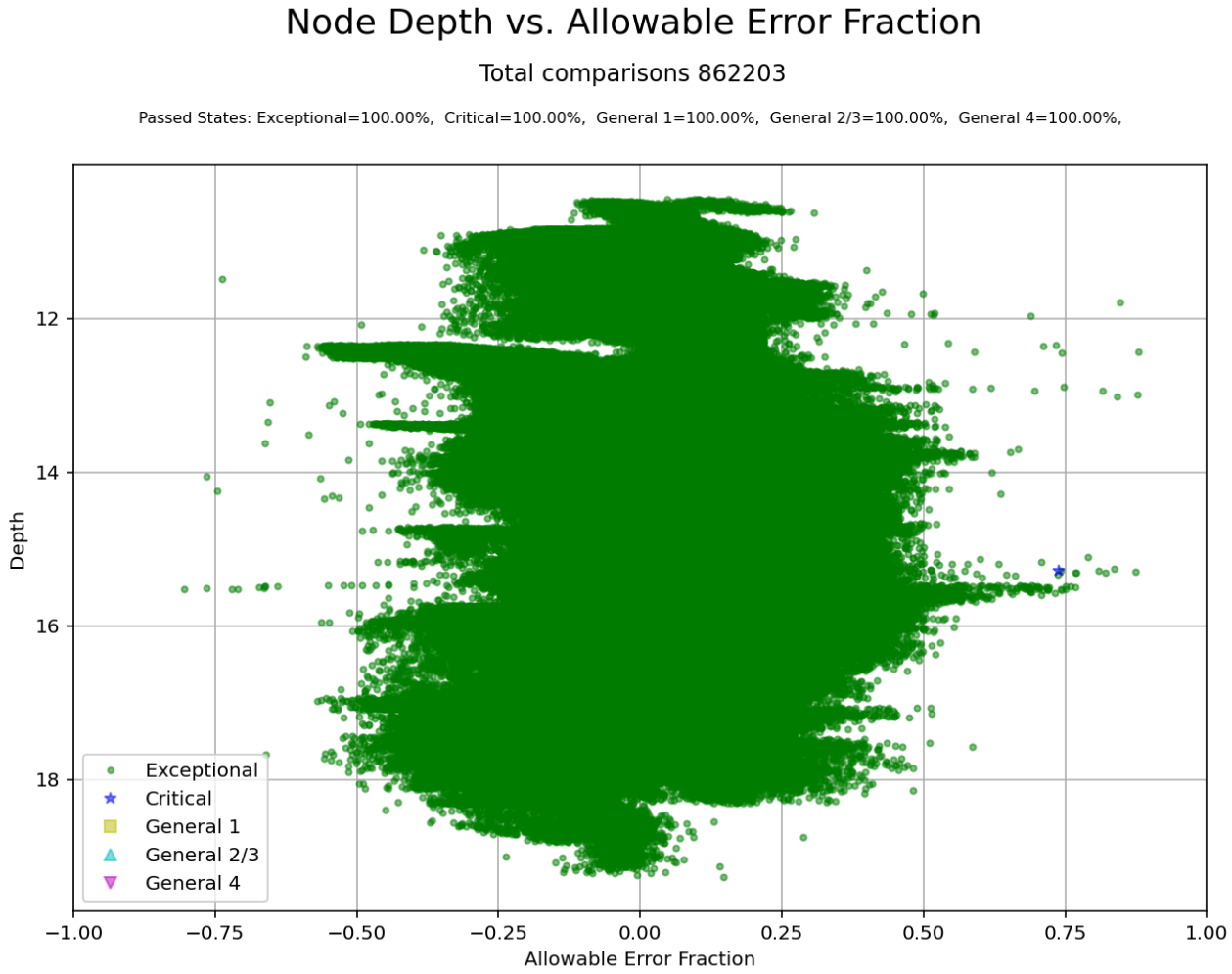
D00282 and H13851 junction statistics

The results between D00282 and H13853 indicate that 100% of grid-node comparisons are within Fraction of Allowable Error standards for depth/height, exceeding the specification of 95% stipulated by NOAA's 2024 HSSD for General 1. The resulting mean of this comparison was a 0.01m difference, with a standard deviation of 0.07m, which is within allowable TVU for the area.



Percent of nodes	Deviation (m)
50%	+/- 0.04
60%	+/- 0.05
70%	+/- 0.06
80%	+/- 0.08
90%	+/- 0.10
95%	+/- 0.12

D00282 and H13853 junction statistics



D00282 and H13853 junction statistics

Backscatter

Calibration Method

N/A

Dynamic Range

The system echo sounders have the dynamic range to accommodate the relatively homogeneous survey area. The frequency was held constant at 300 kHz while the system automatically controlled pulse type.

Acquisition Configuration

No special techniques were used outside of normal considerations for quality data acquisition for a bathymetric survey.

Environmental Variable

Sound speed profiles were collected at the start of acquisition each day and at a minimum of once every four hours in order to apply appropriate absorption coefficients during acquisition.

Acquisition Output

Please refer to Section 4.3.2.1.2 Acoustic Backscatter Imagery of the Field Procedures Manual 2020 for the backscatter post processing workflow.

Report of Survey

Uncertainty Source

Information about uncertainty values used for data processing can be found within the Caris HIPS & SIPS processing project and in the associated Hydrographic Vessel Files (HVFs) for each survey platform. Uncertainty results for D00282 can be found in the Statistical Analysis section of Quality Control Procedures in this document.

Supplementals

- **Trained Marine Mammal Observers list** (*Mar 05, 2024*)
- **Coast Pilot Report** (*Jul 05, 2024*)
- **Final Survey Outline** (*May 15, 2024*)
- **NCEI Sound Speed Data** (*May 15, 2024*)

Approval Statement

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed and approved all data and metadata. The survey meets or exceeds requirements as set forth in the Project Instructions and NOS Hydrographic Surveys Specifications and Deliverables. The survey is complete and no additional work is required with the exception of any deficiencies noted in the Report of Survey.

Approver Name	Approver Title	Approver Certification
Captain Matthew J. Jaskoski, NOAA	Commanding Officer	

Personnel

Name	Title	Certification

Full Equipment List

Equipment Type	Manufacturer and System	Model Number	Serial Number	Calibration Date	Frequency	Accuracy Check Date
Thomas Jefferson *(S222)*						
Positioning and Attitude System	Applanix POS MV 320 v5	POS MV 320 V5	6497	2024-04-01	NA	NA
Multibeam	Kongsberg Maritime EM 2040	EM2040	40260	2024-04-02	200-400 kHz	2024-04-03
CTD	Sea-Bird Scientific SBE 19plus V2	SBE 19plus V2	19P60744-6667	2024-01-23	n/a	2024-04-01
CTD	Sea-Bird Scientific SBE 19plus	SBE 19plus	19P36399-4630	2024-01-17	n/a	2024-04-01
CTD	AML Oceanographic MVP200	MVP-200	M12981	2024-04-01	n/a	2024-04-01
CTD	AML Oceanographic MVP-X	MVP-X CTD	9006	2022-02-08	n/a	2024-04-01
Sound Speed System	Teledyne RESON SVP 70	SVP 70	0614179	2021-10-03	n/a	2021-10-03
Sound Speed System	Teledyne RESON SVP 70	SVP 70	1013077	2024-01-09	n/a	2024-01-09
2904 *(2904)*						
Positioning and Attitude System	Applanix POS MV 320 v5	POS MV 320 v5	8959	2024-03-26	NA	NA
Multibeam	Kongsberg Maritime EM 2040	EM 2040	40122	2024-03-27	200-400 kHz	2024-04-04
Sound Speed System	Teledyne RESON SVP 70	SVP 70	1921072	2024-01-10	n/a	2024-01-10
CTD	Sea-Bird Scientific SBE 19plus	SBE 19plus	19P33072-4472	2024-01-24	n/a	2024-04-01
CTD	Sea-Bird Scientific SBE 19plus	SBE 19plus	19P33589-4487	2024-01-24	n/a	2024-04-01
CTD	SonTek CastAway-CTD	CastAway-CTD	CC2333002	2023-08-21	n/a	2024-04-01