

Appendix 6. Summary of structure interpreted from geophysical logs for boreholes near Machiasport, Maine

Explanation Information for Appendixes

Abbreviations on log plots:

Acou Caliper, in inch	caliper measured by acoustic televiewer, in inches
ATV	acoustic televiewer traveltime
ATV Amp	acoustic televiewer amplitude
ATV Amp, in mV	acoustic televiewer amplitude, in millivolts
Azi	azimuth
Caliper, in inch	3-arm mechanical caliper, in inches
deg	degrees
dev	deviation
DO	dissolved oxygen
Eh, in mV	electromotive potential, in millivolts
EMI Cond, in mmho/m	electromagnetic induction conductivity, in millimhos per meter
Frax	fracture
FRX	fracture
gal/min	gallon(s) per minute
gpm	gallon(s) per minute
Fl Cond, in $\mu\text{S}/\text{cm}$	fluid conductivity, in microsiemens per centimeter
Gamma, in CPS	natural gamma radiation, in counts per second
HPFM Amb, in gal/min	heat-pulse flowmeter, under ambient conditions, in gallons per minute
HPFM Pump, in gal/min	heat-pulse flowmeter, under pumped conditions, in gallons per minute
LH	lower hemisphere
Lith	lithologic feature
ls	land surface
Max	maximum
Min	minimum
Mtn	Mountain
O ₂ ppm	dissolved oxygen, in parts per million
OTV	optical televiewer image
pH	pH
R ₈ , in Ohm-m	normal resistivity with electrode spacing of 8 inches, in ohm-meters
R ₁₆ , in Ohm-m	normal resistivity with electrode spacing of 16 inches, in ohm-meters
R ₃₂ , in Ohm-m	normal resistivity with electrode spacing of 32 inches, in ohm-meters
R ₆₄ , in Ohm-m	normal resistivity with electrode spacing of 64 inches, in ohm-meters
SP, in mV	spontaneous potential, in millivolts
SP Cond, in $\mu\text{S}/\text{cm}$	specific conductivity, in microsiemens per centimeter
SPR, in Ohm	single point resistance, in ohms
Std. Dev.	standard deviation
T-Frax	transmissive fracture
tad	tadpole
Temp, in deg F	temperature, in degrees Fahrenheit
TN	true north
toc	top of casing
tt	travel time
Tx	transmissive

Image log interpretation:

Interpretations of structure from the image logs are shown in three forms, including projection, stereo, and tadpole plots. A consistent color code was used for all three plots. In addition, lithologic features are shown in the tadpole and stereoplots with squares, so as to distinguish them from interpreted fractures. Fractures interpreted as transmissive and shown with blue dots, were determined to be transmissive using the heat-pulse flowmeter. Transmissive fractures coded with blue squares were inferred to be transmissive from fluid conductivity, temperature, or other water-quality parameter logs.

- Transmissive fracture
- Large fracture
- Minor fracture
- Partial fracture
- Sealed fracture
- Possible fracture
- Lithologic feature
- Transmissive fracture,
inferred from fluid logs

Example of interpretation of borehole imaging data:

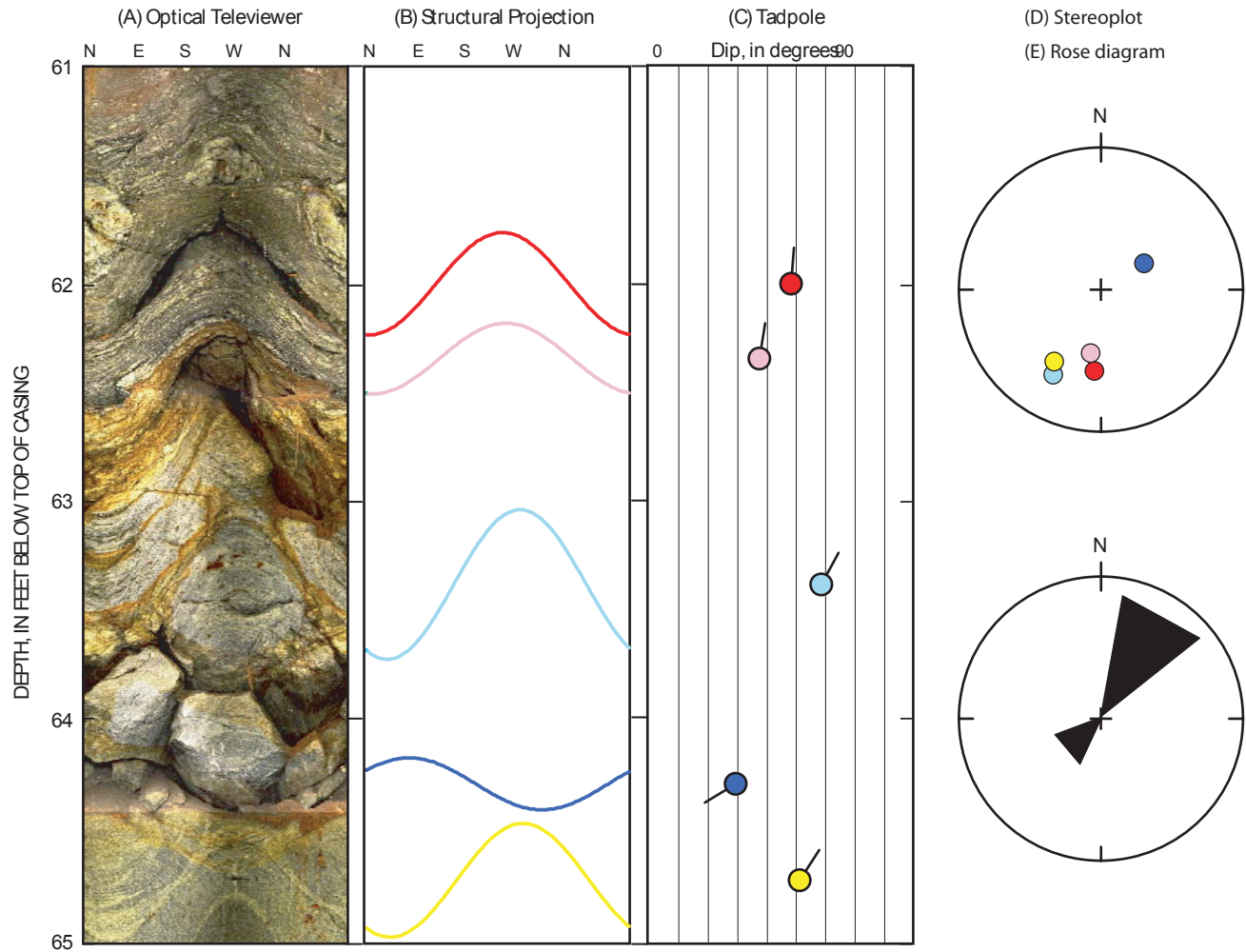


Figure. Example of interpretation of borehole imaging data.

(A) Optical televiewer image and the corresponding interpretation of planar data in (B) structural, (C) tadpole, and (D) stereographic projection plots. The trace of the features on the structural projection (B) directly overlays on the image (A). In the tadpole plot (C), depth is plotted along the y axis, and the magnitude of dip is plotted on the x axis. The tail of the tadpole points in the direction of dip relative to True North, which is at the top of the page. The poles to the planar features are shown in a lower-hemisphere equal-area stereonet (stereoplot) (D), which reduces the plane to a point. (E) Rose diagram, which shows frequency of dip direction.

Appendix 6.

Summary of structure interpreted from geophysical logs for boreholes near Machiasport, Maine

A. Summary of structure interpreted from geophysical logs of boreholes on or near Miller Mountain, near Machiasport, Maine – WY-GATR, MW-13, MW-14, DW-29, DW-22, DW-23, DW-24, DW-25, DW-31, DW-32, DW-33, DW-34, DW-39, and DW-40

Figure 6A–1. In depth below land surface-projection and tadpole plots for all features; fracture density plots at 10-foot intervals; stereoplots for all features in the boreholes; rose diagram of dip directions for all features in the boreholes.

Figure 6A–2. In depth below land surface-projection and tadpole plots for all features; fracture density plots; stereoplots for all features the entire boreholes; rose diagrams for the entire boreholes, all at 100-foot intervals.

Figure 6A–3. In elevation above NAVD 88-projection and tadpole plots for all features at 100-foot intervals; fracture density plots (all fractures and transmissive fractures) at 10-foot intervals; rose diagrams of dip direction at 100-foot intervals.

Figure 6A–4. Fracture density plots at 10-foot intervals for borehole WY-GATR, the deepest borehole in the group.

B. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine – DW-2, DW-4, WY-3, WY-3B, WY-3C, WY-4, WY-15, MW-8, MW-9, MW-10, MW-11, MW-12, MW-15, MW-16, MW-17, C-114, and C-501

Figure 6B–1. In depth below land surface-projection and tadpole plots for all features; fracture density plots at 10-foot intervals; stereoplots for all features in the boreholes; rose diagram of dip directions for all features in the boreholes.

Figure 6B–2. In depth below land surface-projection and tadpole plots for all features; fracture density plots; stereoplots for all features the entire boreholes; rose diagrams for the entire boreholes, all at 100-foot intervals.

Figure 6B–3. In elevation above NAVD 88-projection and tadpole plots for all features at 100-foot intervals; fracture density plots (all fractures and transmissive fractures) at 10-foot intervals; rose diagrams of dip direction at 100-foot intervals.

Figure 6B–4. Fracture density plots at 10-foot intervals for boreholes WY-3, WY-3B, and WY-15, the deepest boreholes in the group.

C. Summary of structure interpreted from geophysical logs of boreholes near the Transmitter Site on Howard Mountain, near Machiasport, Maine – DW-6, DW-10, MW-4, MW-5, MW-6, and MW-7

Figure 6C–1. In depth below land surface-projection and tadpole plots for all features; fracture density plots at 10-foot intervals; stereoplots for all features in the boreholes; rose diagram of dip directions for all features in the boreholes.

Figure 6C–2. In depth below land surface-projection and tadpole plots for all features; fracture density plots; stereoplots for all features the entire boreholes; rose diagrams for the entire boreholes, all at 100-foot intervals.

Figure 6C–3. In elevation above mean sea level-projection and tadpole plots for all features at 100-foot intervals; fracture density plots (all fractures and transmissive fractures) at 10-foot intervals; rose diagrams of dip direction at 100-foot intervals.

Figure 6C–4. Fracture density plots at 10-foot intervals for borehole DW-10, the only borehole near the Transmitter Site on Howard Mountain that exceeds a depth of 120 feet.

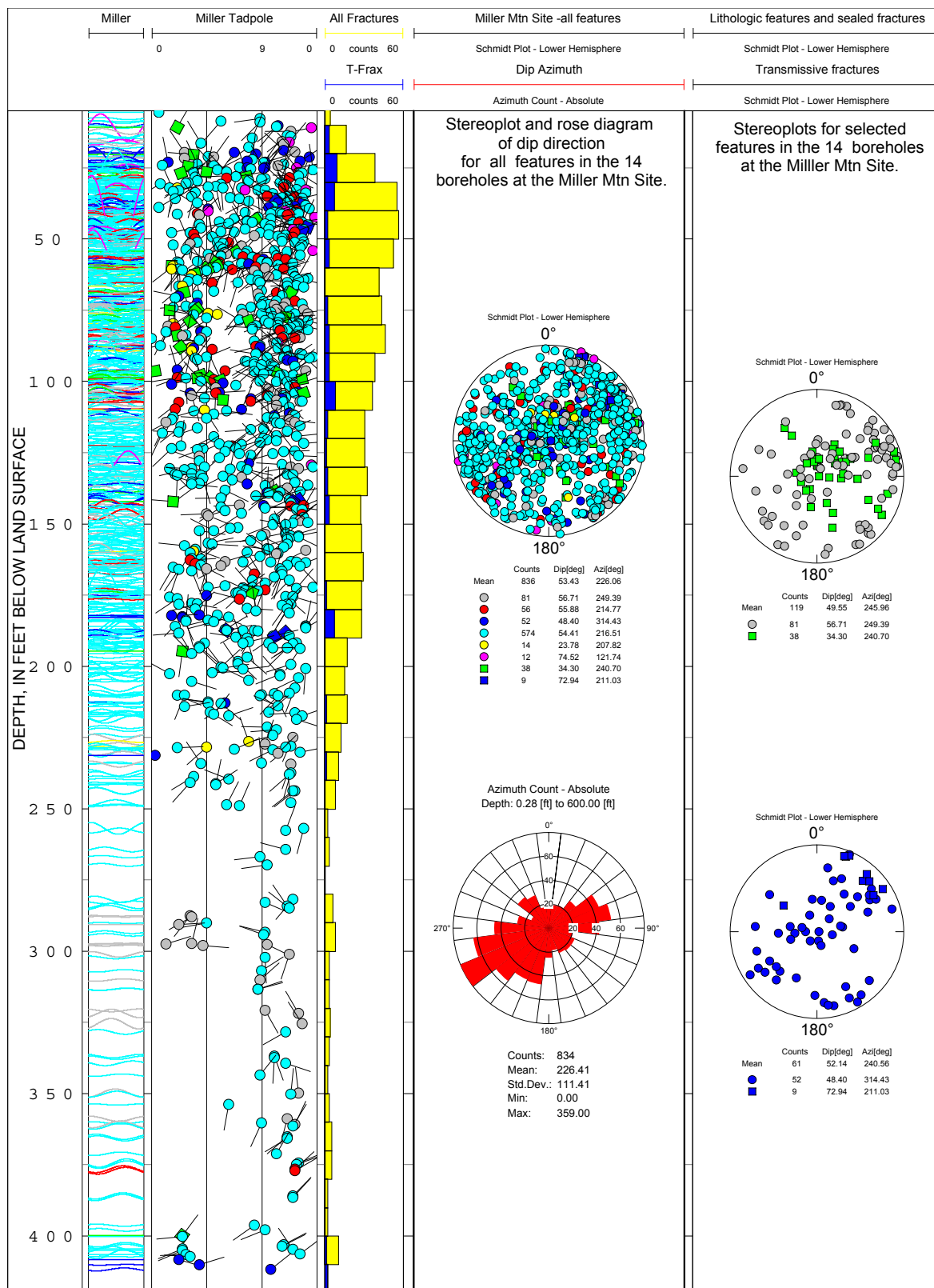


Figure 6A-1. Summary of structure interpreted from geophysical logs of boreholes on or near Miller Mountain, near Machiasport, Maine. In depth below land surface-projection and tadpole plots for all features; fracture density plots at 10-foot intervals; stereoplots for all features in the boreholes; rose diagram of dip directions for all features in the boreholes.

[Mtn, Mountain; T-Frax, transmissive fracture; deg, degrees; ft, feet; Std. Dev., standard deviation; Min, minimum; Max, maximum]

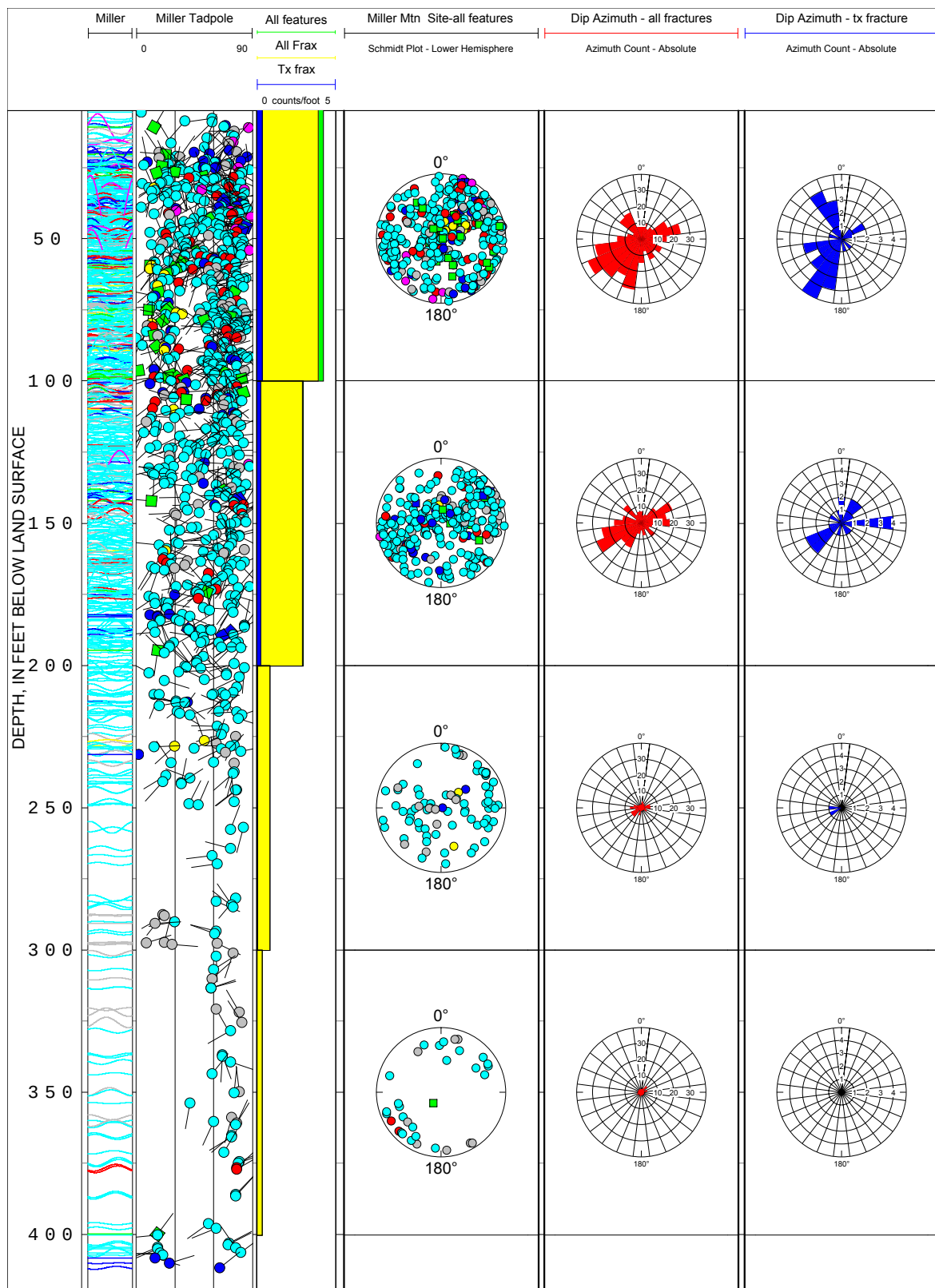


Figure 6A-2. Summary of structure interpreted from geophysical logs of boreholes on or near Miller Mountain, near Machiasport, Maine. In depth below land surface-projection and tadpole plots for all features; fracture density plots; stereoplots for all features in the entire boreholes; rose diagrams for the entire boreholes, all at 100-foot intervals.

[Tx, transmissive; Frax, fracture]

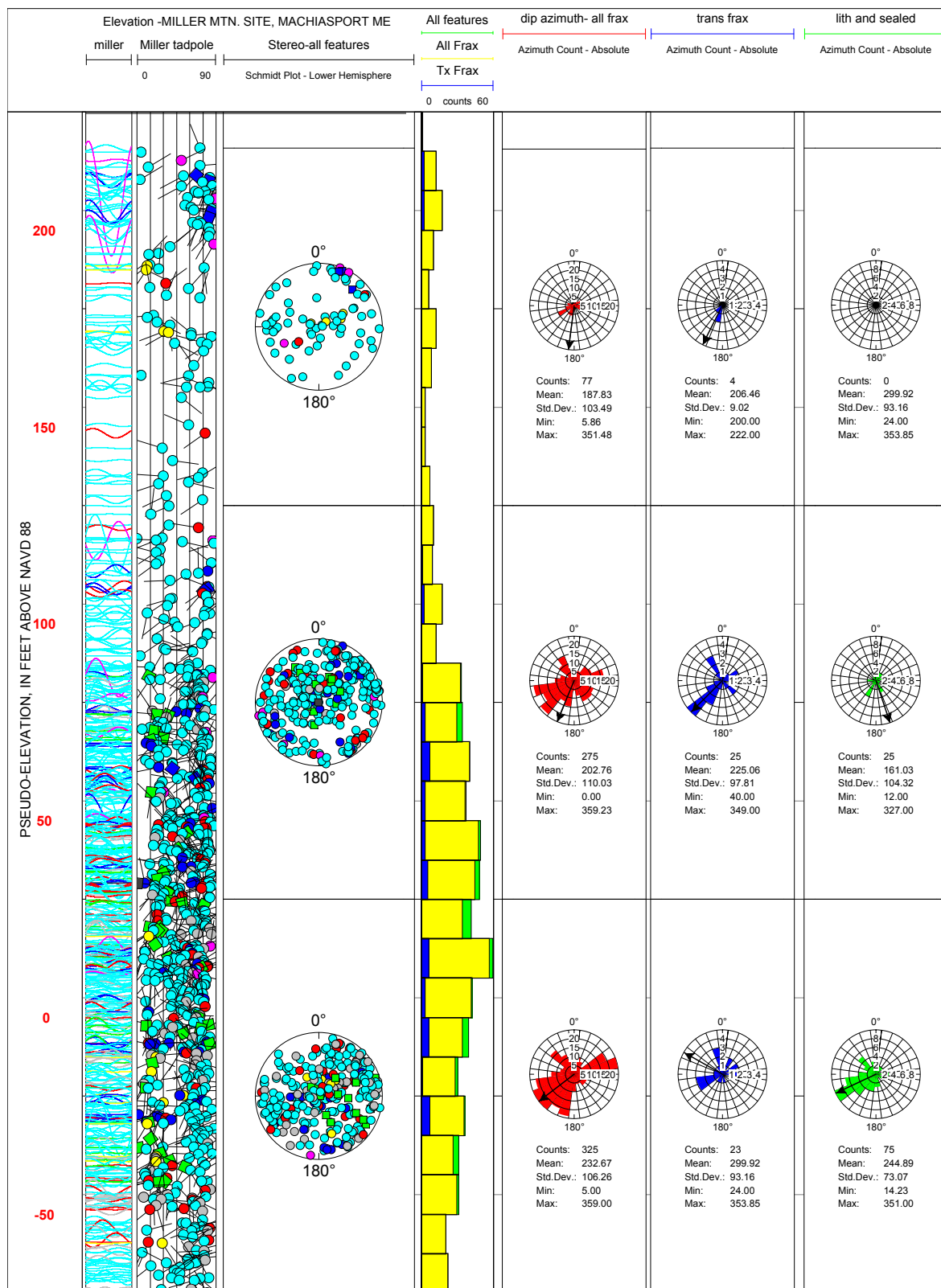


Figure 6A-3. Summary of structure interpreted from geophysical logs of boreholes on or near Miller Mountain, near Machiasport, Maine. In elevation above NAVD 88-projection and tadpole plots for all features at 100-foot intervals; fracture density plots (all fractures and transmissive fractures) at 10-foot intervals; rose diagrams of dip direction at 100-foot intervals.

[Frax, fracture; Tx, transmissive; Std. Dev., standard deviation; Min, minimum; Max, maximum]

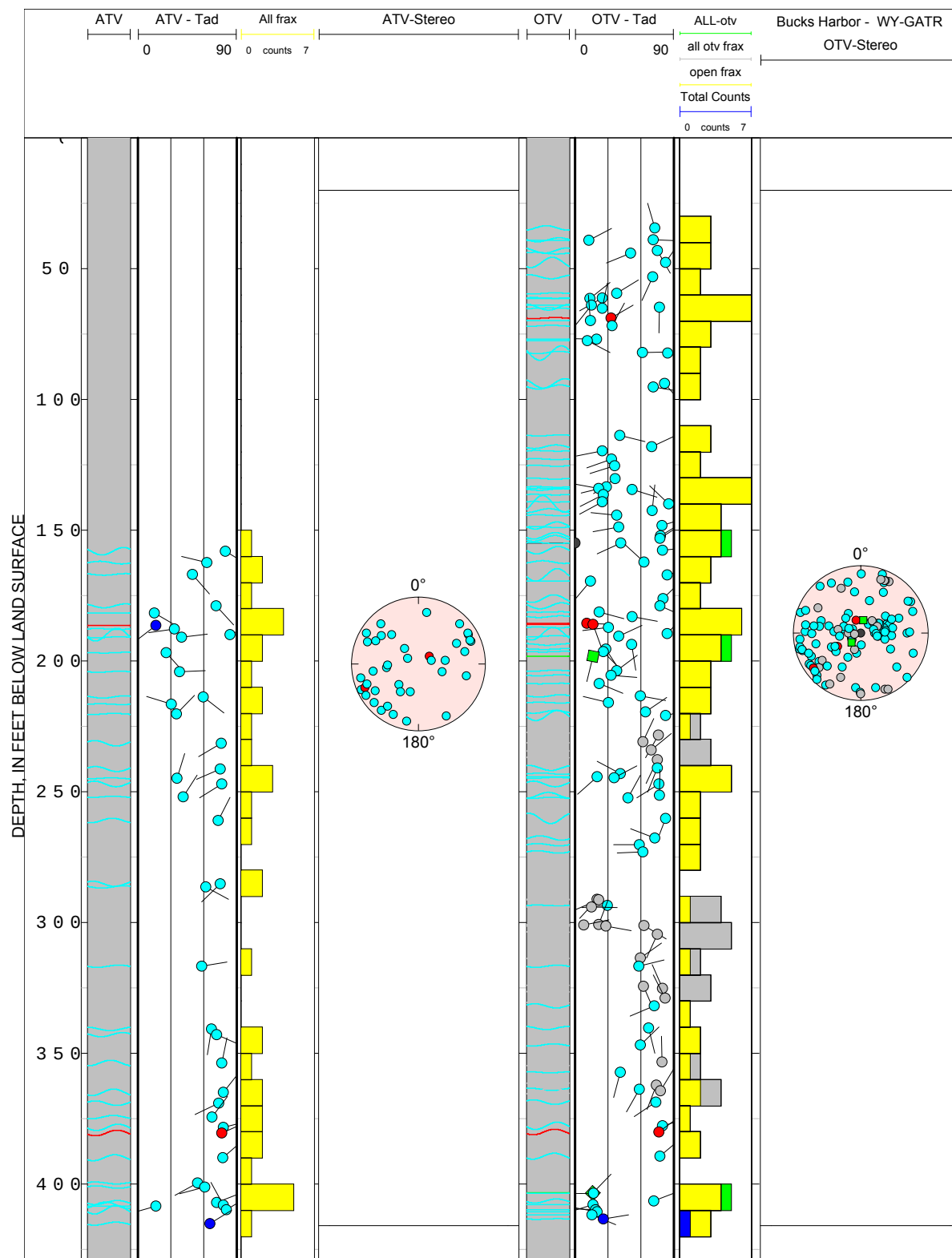


Figure 6A-4. Summary of structure interpreted from geophysical logs of boreholes on or near Miller Mountain, near Machiasport, Maine. Fracture density plots at 10-foot intervals for borehole WY-GATR, the deepest borehole in the group.
[frax, fracture]

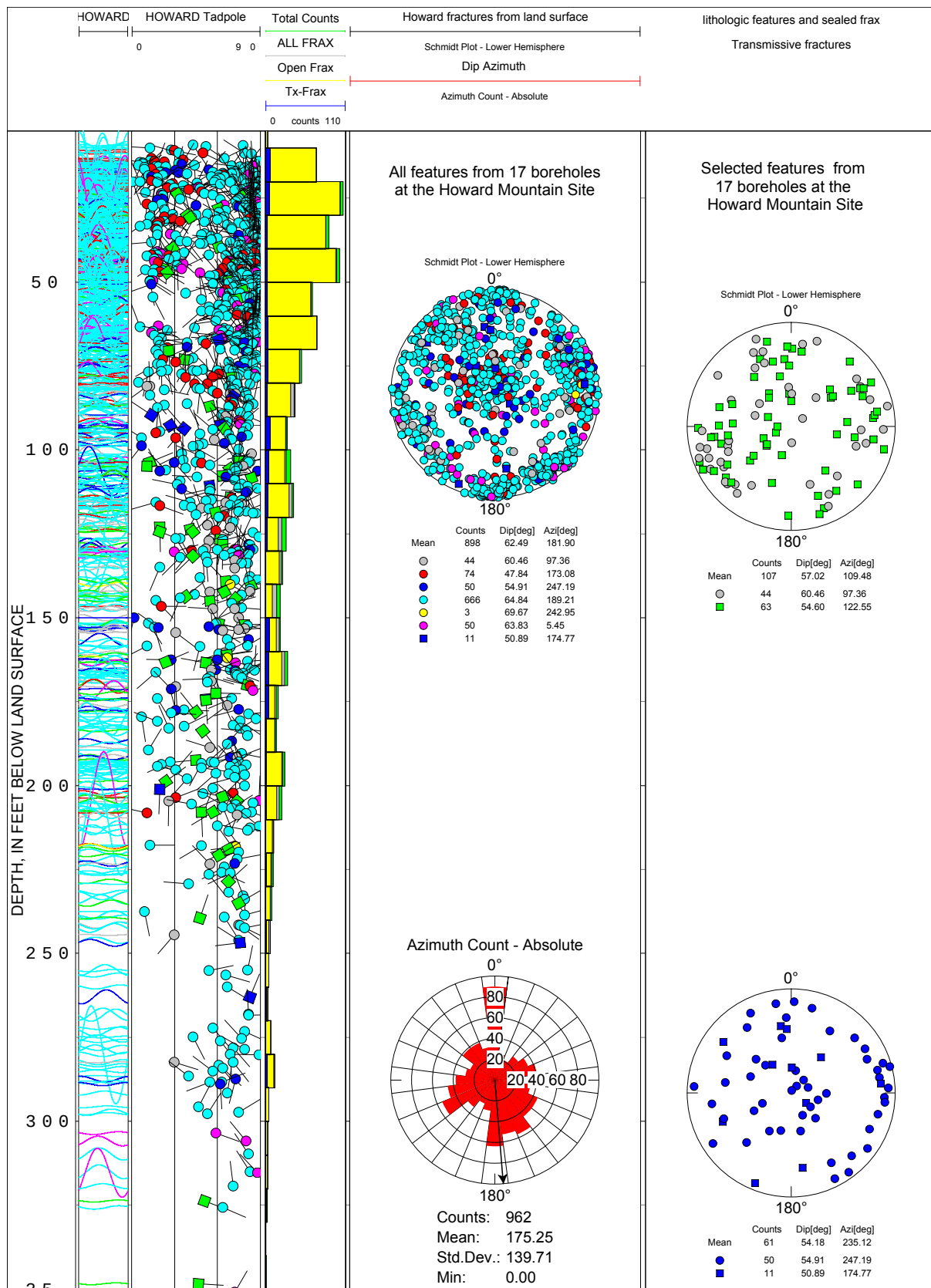


Figure 6B-1. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine. In depth below land surface-projection and tadpole plots for all features; fracture density plots at 10-foot intervals; stereoplots for all features in the boreholes; rose diagram of dip directions for all features in the boreholes.
 [Frax, fracture; Tx, transmissive; deg, degrees; Std. Dev., standard deviation]

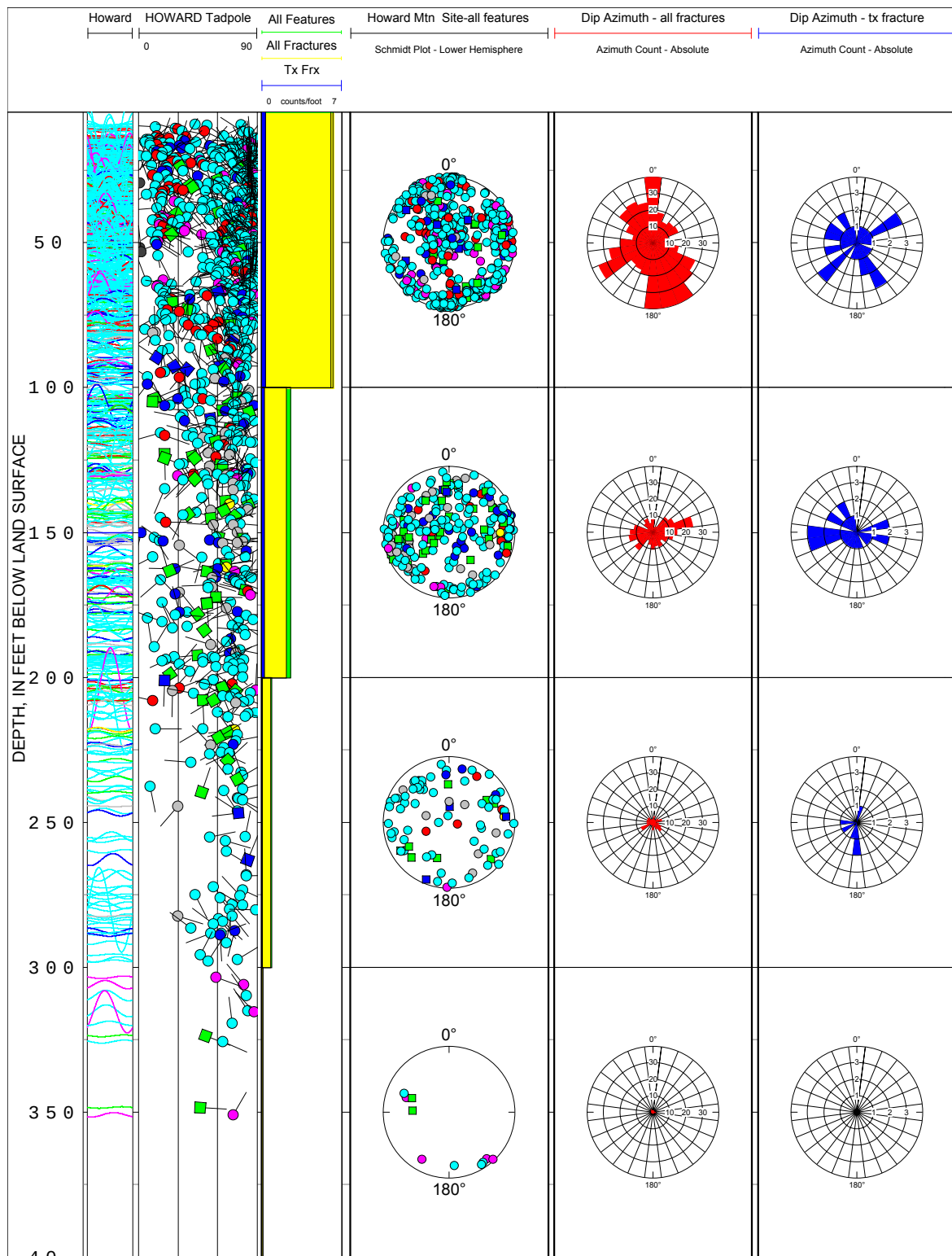


Figure 6B-2. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine. In depth below land surface-projection and tadpole plots for all features; fracture density plots; stereoplots for all features the entire boreholes; rose diagrams for the entire boreholes, all at 100-foot intervals.
[Tx, transmissive; Frax, fracture]

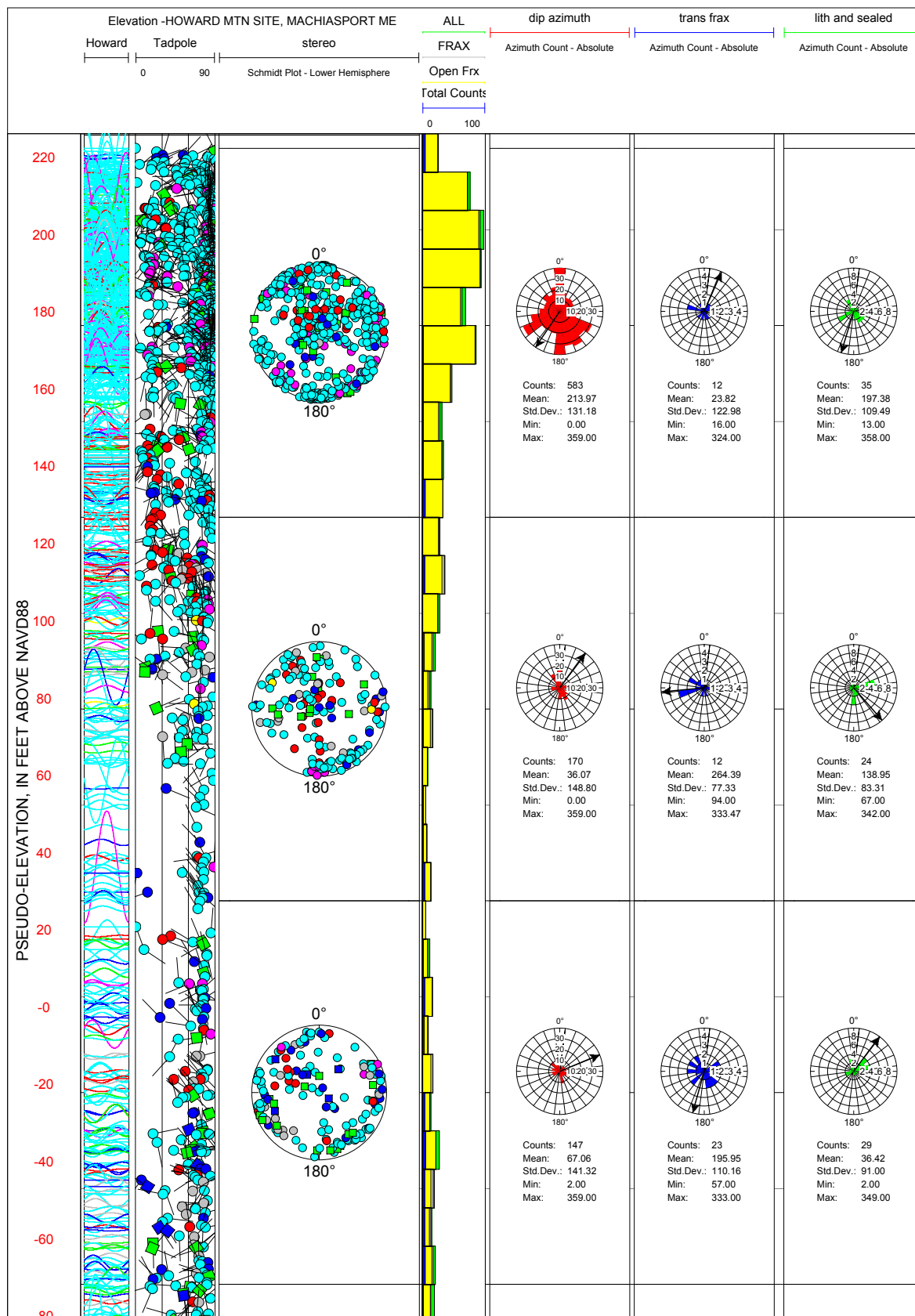


Figure 6B-3. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine. In elevation above NAVD 88-projection and tadpole plots for all features at 100-foot intervals; fracture density plots (all fractures and transmissive fractures) at 10-foot intervals; rose diagrams of dip direction at 100-foot intervals.
[Frax, fracture; Std. Dev., standard deviation; Min, minimum; Max, maximum]

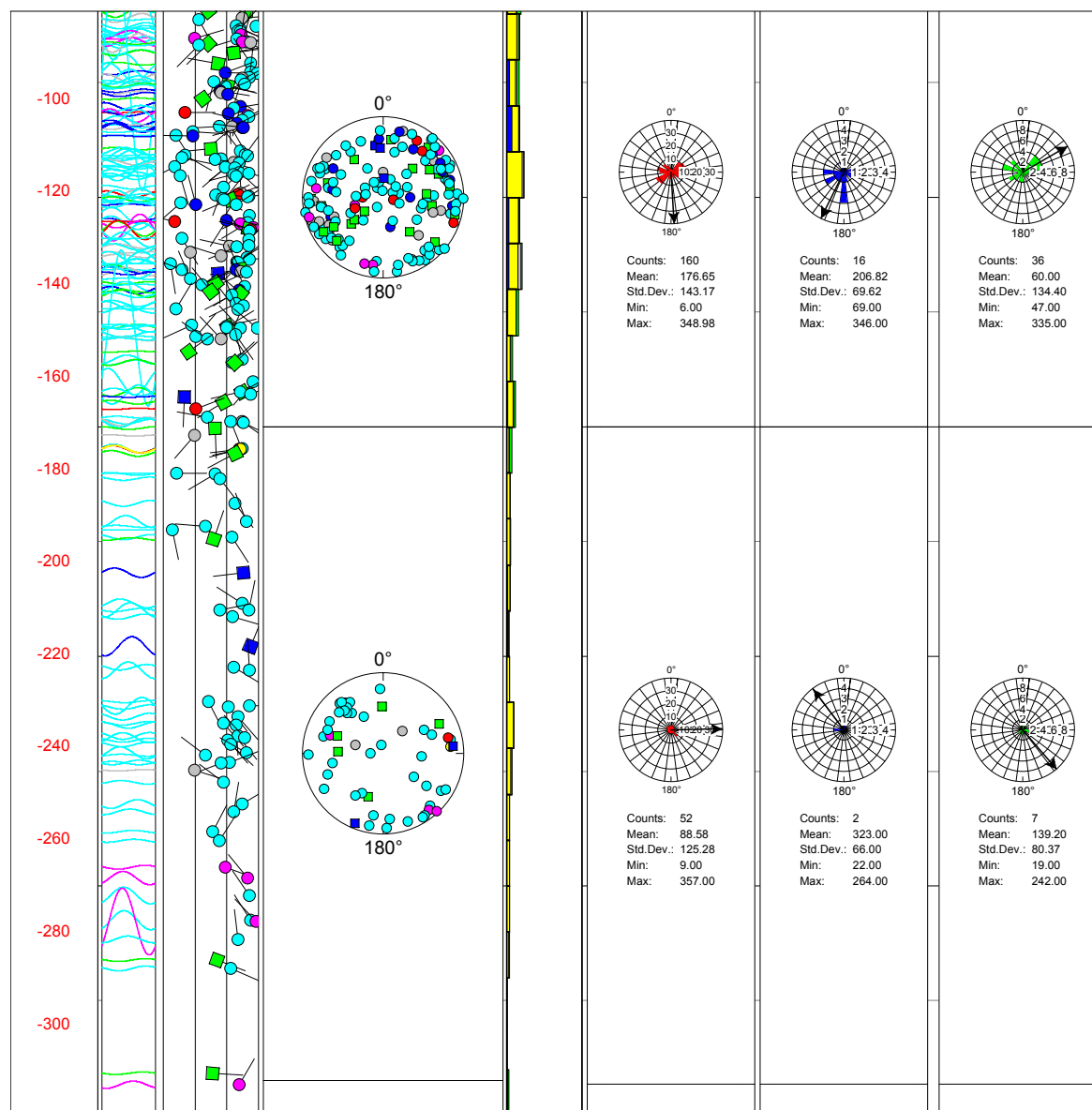


Figure 6B-3. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine. In elevation above NAVD 88-projection and tadpole plots for all features at 100-foot intervals; fracture density plots (all fractures and transmissive fractures) at 10-foot intervals; rose diagrams of dip direction at 100-foot intervals.—Continued
[Frax, fracture; Std. Dev., standard deviation; Min, minimum; Max, maximum]

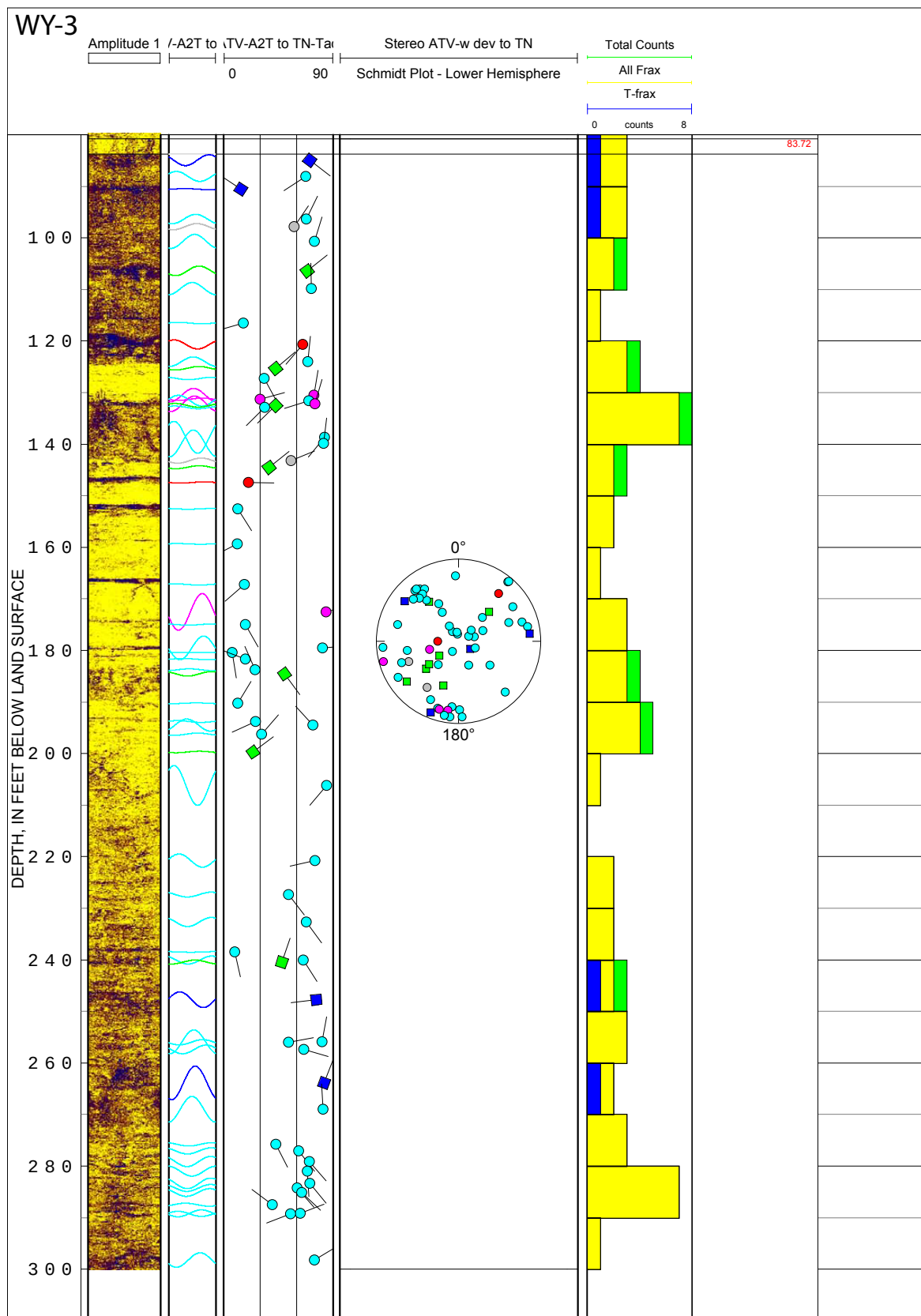


Figure 6B-4. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine. Fracture density plots at 10-foot intervals for boreholes WY-3, WY-3B, and WY-15, the deepest boreholes in the group. [T-frax, transmissive fracture; Tx, transmissive; TN, true north; dev, deviation]

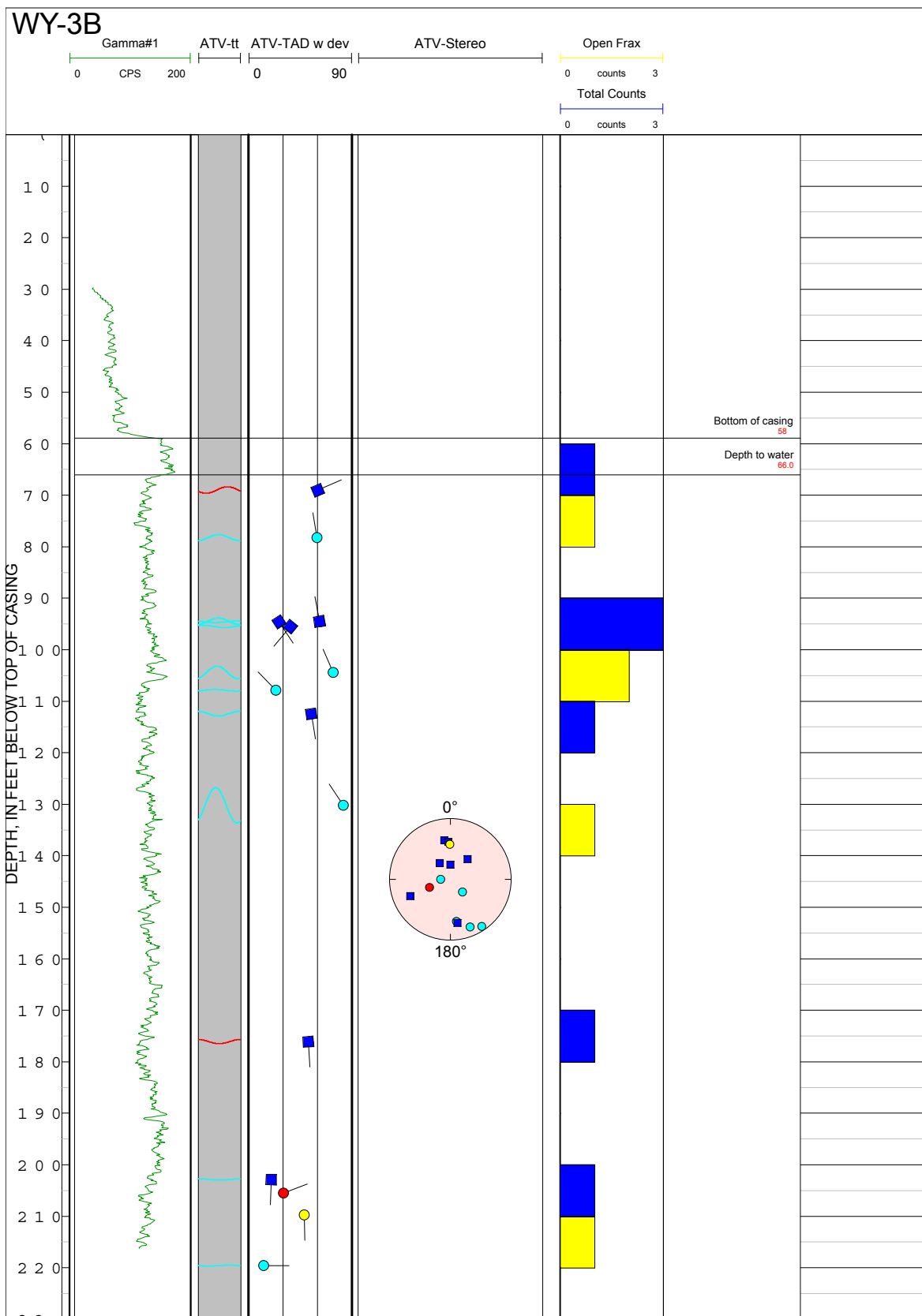


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[T-frax, transmissive fracture; Tx, transmissive; TN, true north; dev, deviation]

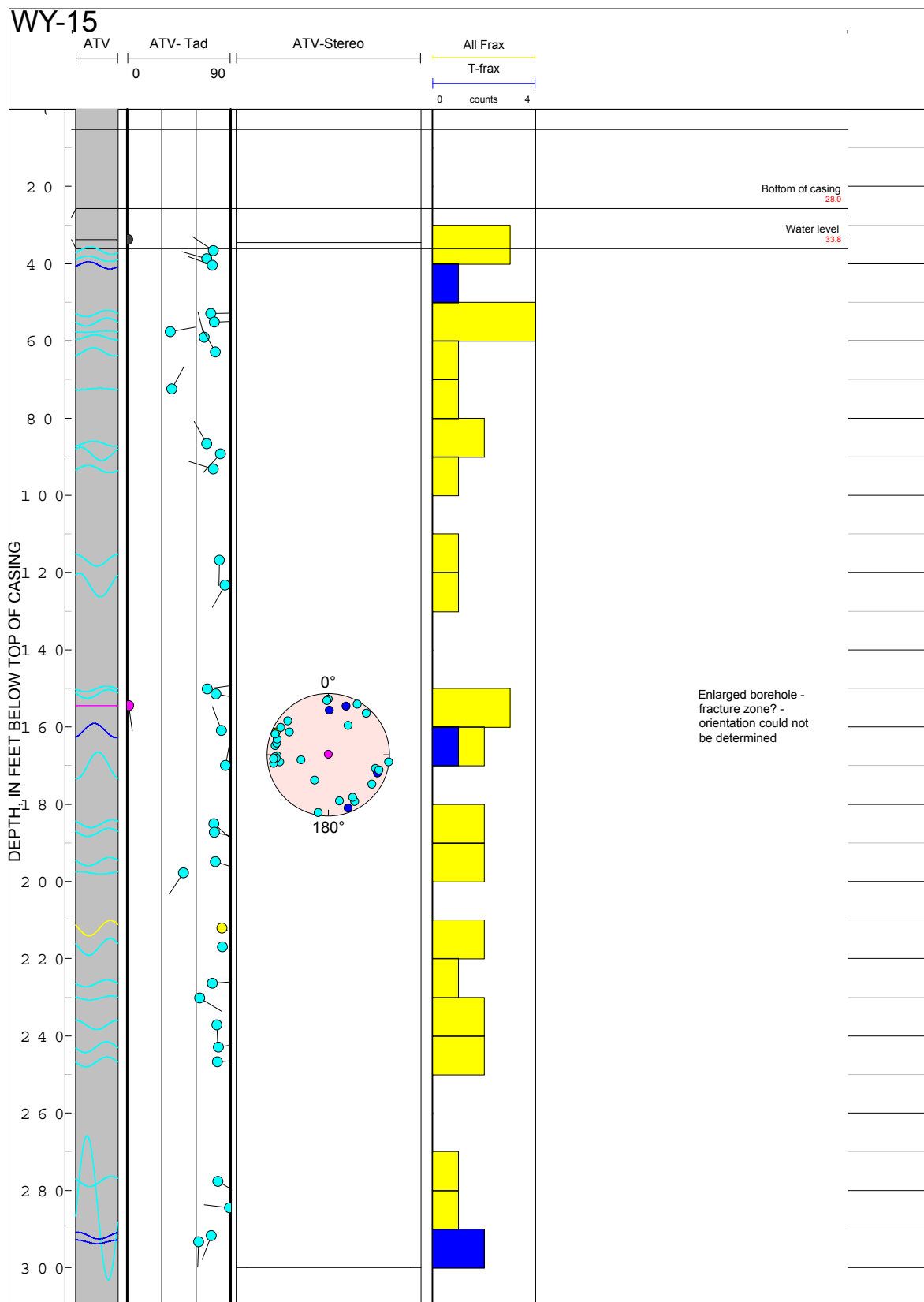
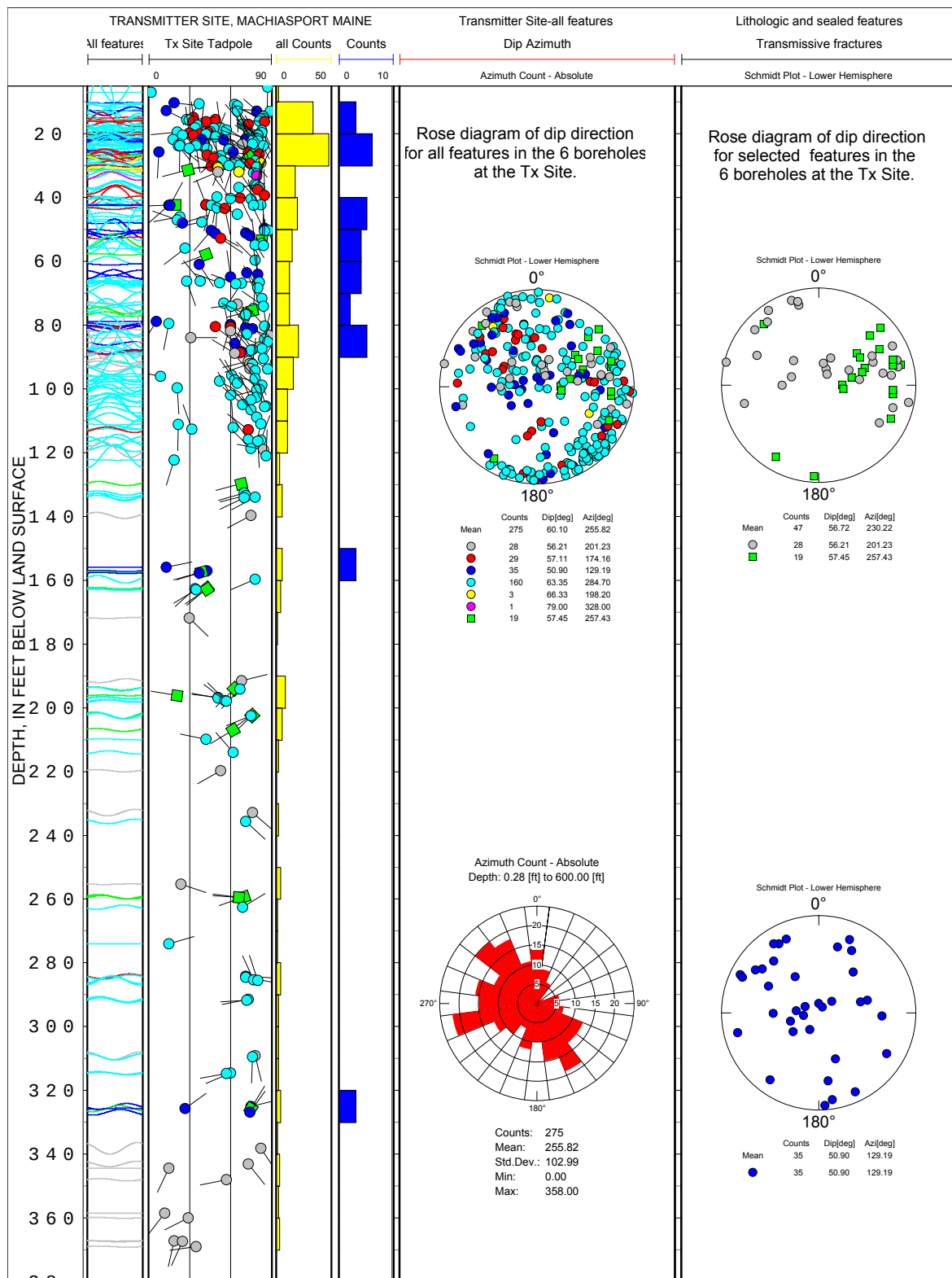


Figure 6B-4. Summary of structure interpreted from geophysical logs of boreholes near the Air Force Radar Tracking Station on Howard Mountain, near Machiasport, Maine. Fracture density plots at 10-foot intervals for boreholes WY-3, WY-3B, and WY-15, the deepest boreholes in the group.—Continued
 [T-frax, transmissive fracture; Tx, transmissive; TN, true north; dev, deviation]



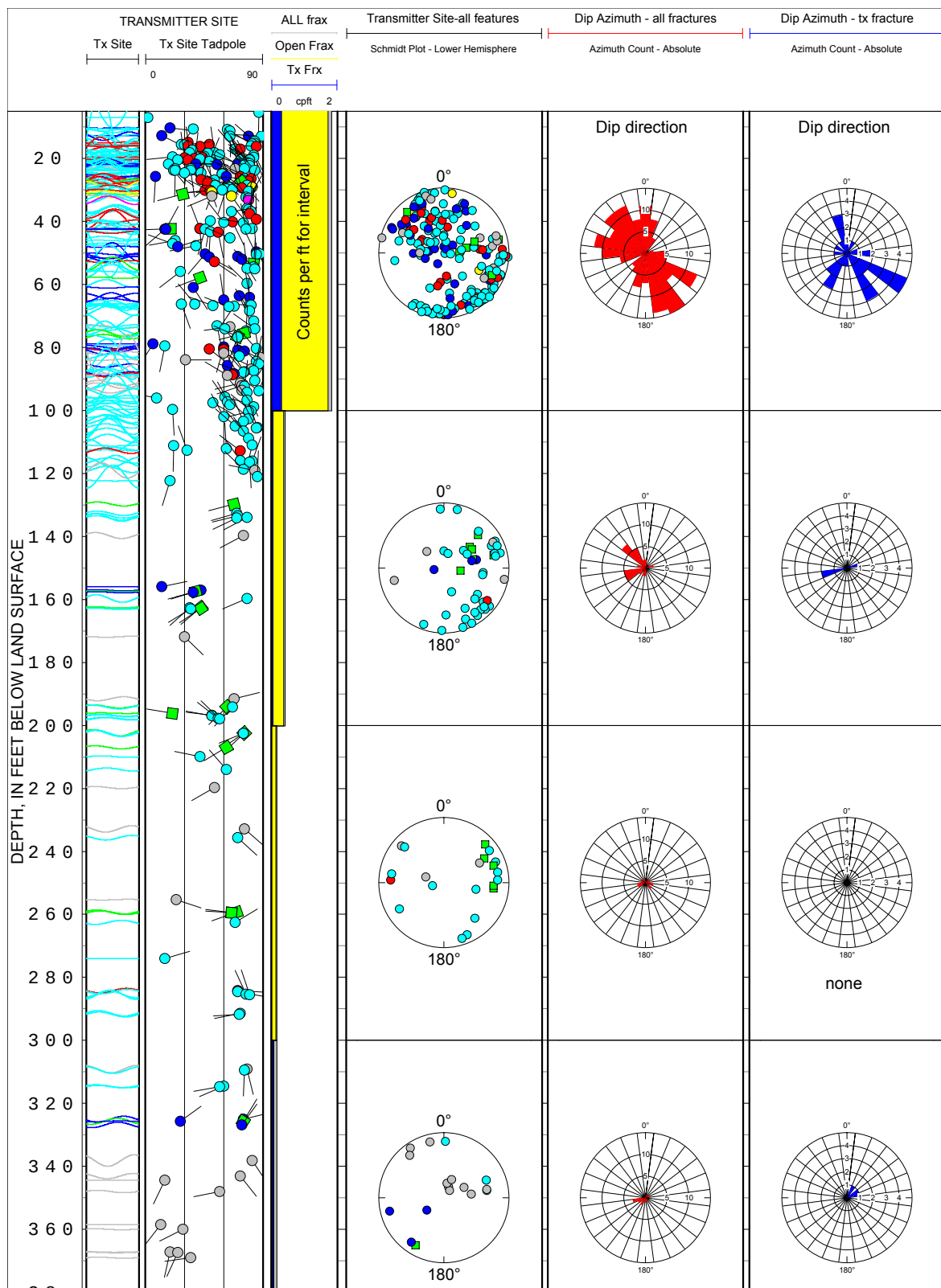


Figure 6C-2. Summary of structure interpreted from geophysical logs of boreholes near the Transmitter Site on Howard Mountain, near Machiasport, Maine. In depth below land surface-projection and tadpole plots for all features; fracture density plots; stereoplots for all features the entire boreholes; rose diagrams for the entire boreholes, all at 100-foot intervals.
[Tx, transmissive; Frax, fracture]

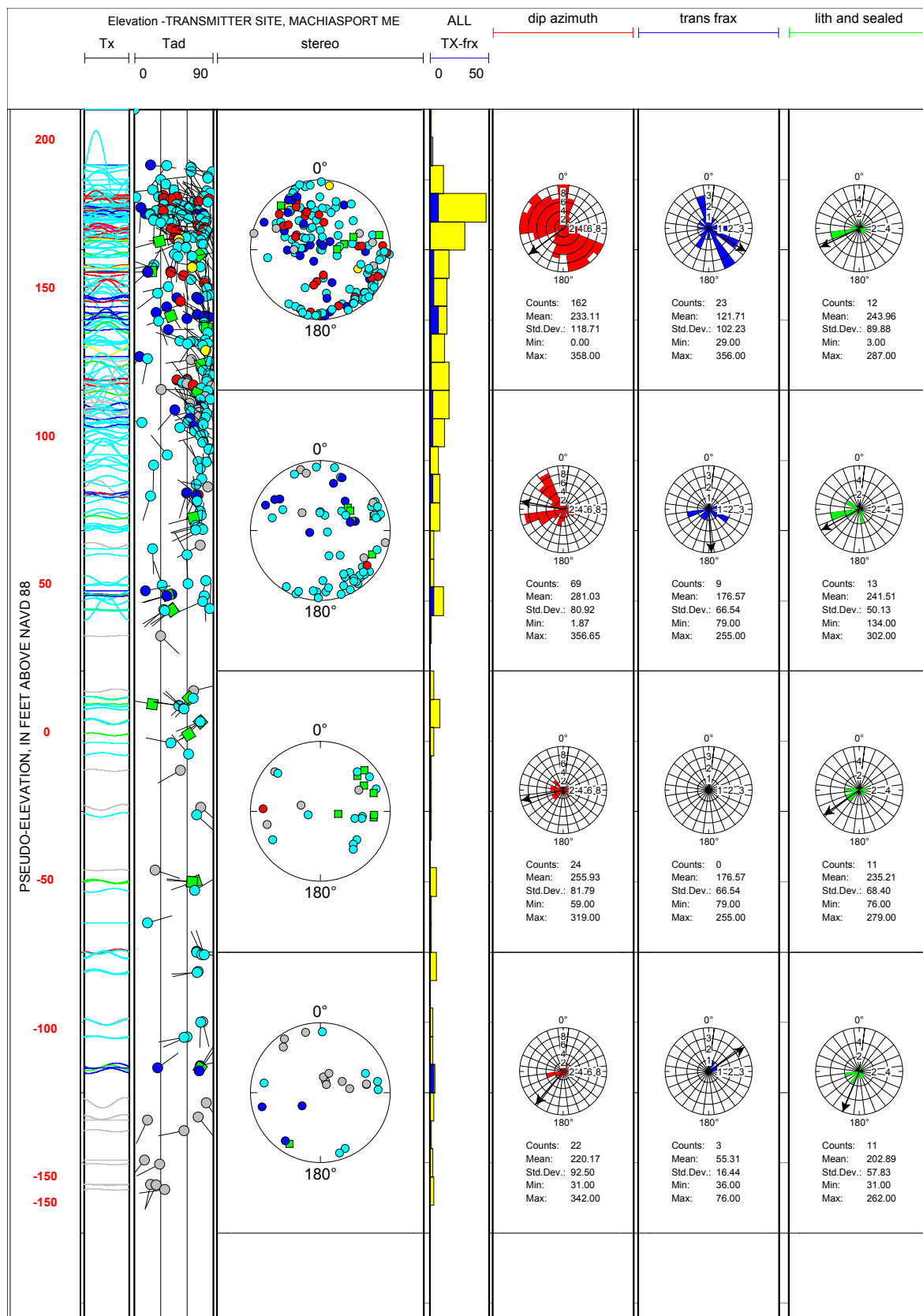


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[Tx, transmissive; Tad, tadpole; trans frax, transmissive fracture; lith, lithologic feature; Std. Dev., standard deviation; Min, minimum; Max, maximum]

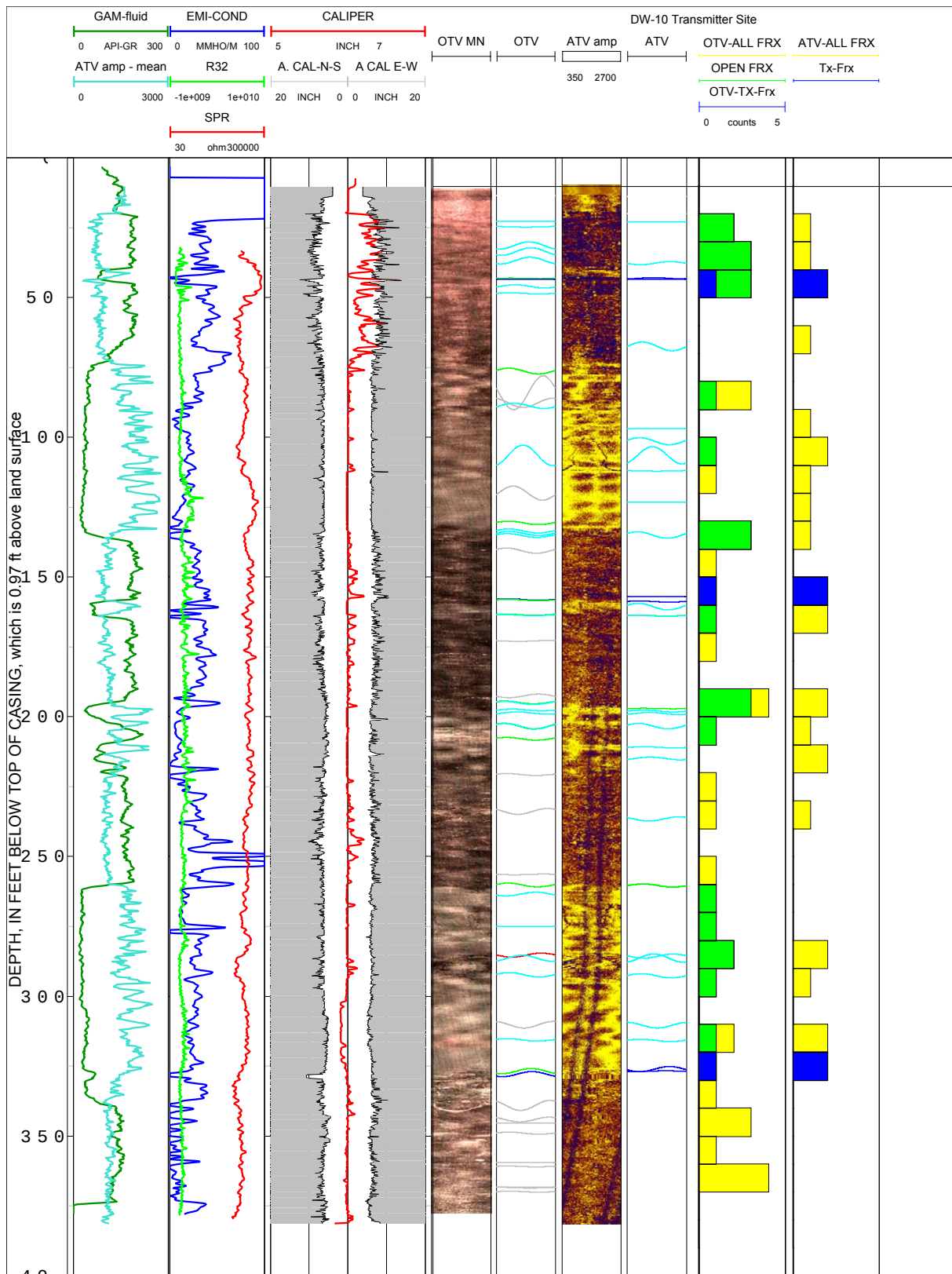


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