

Towards a Quantification of Uncertainty in Magnetic Maps and Models

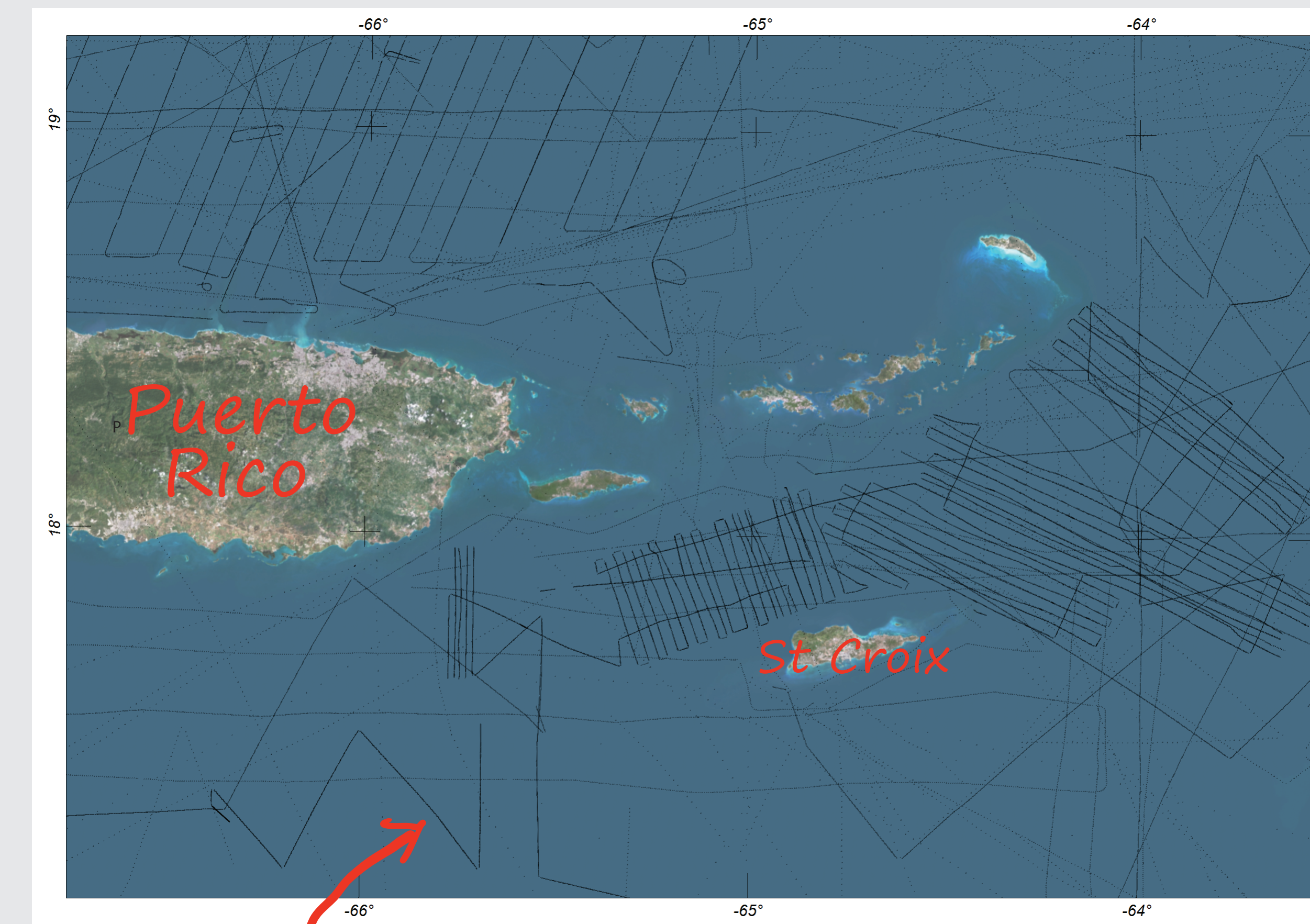
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Advances in Exploration Geophysics III
Poster NS25A-0421

All magnetic maps
are wrong, some are
potentially useful.

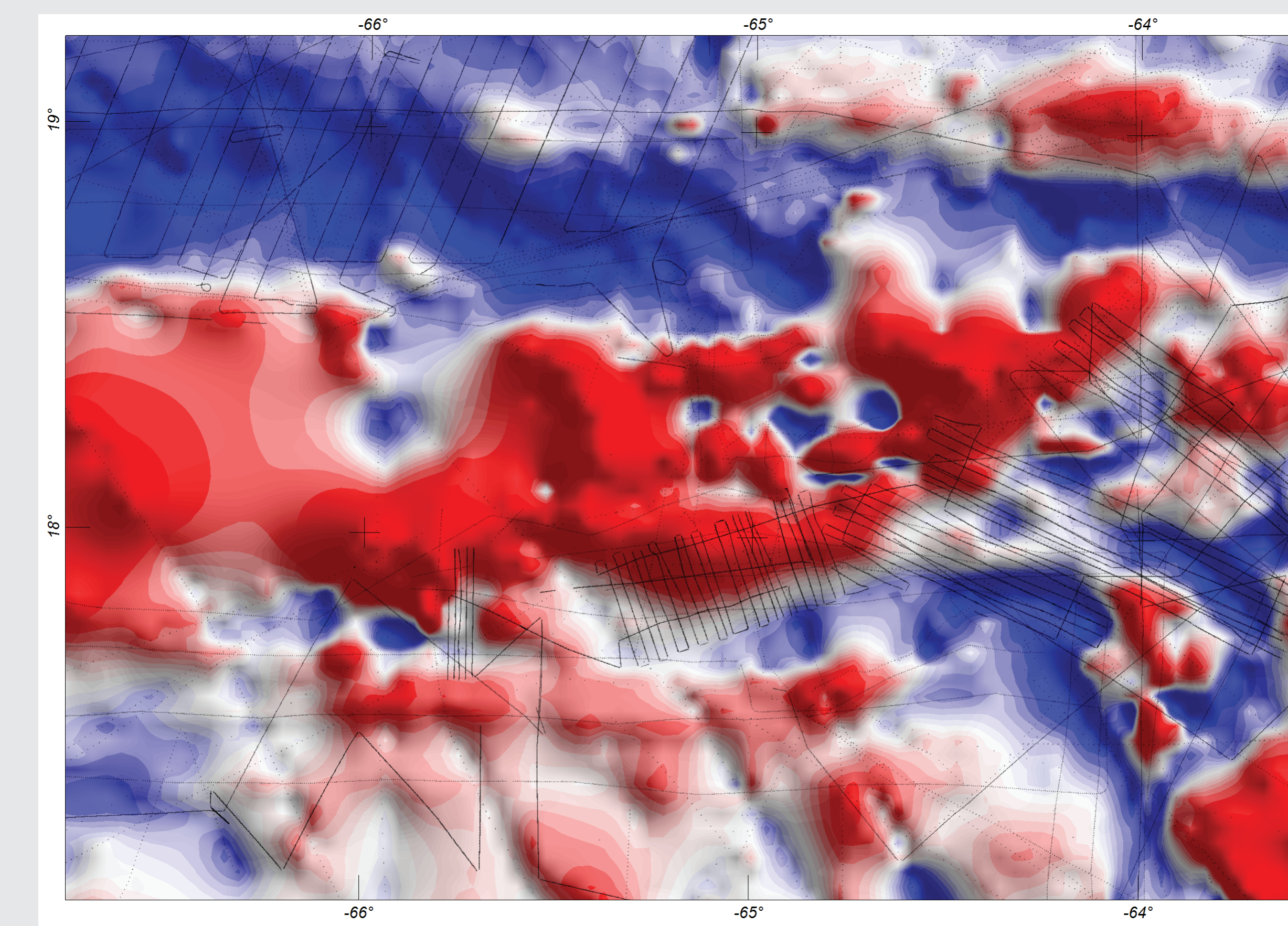
Uncertainty makes
the difference.

US Virgin Islands test area



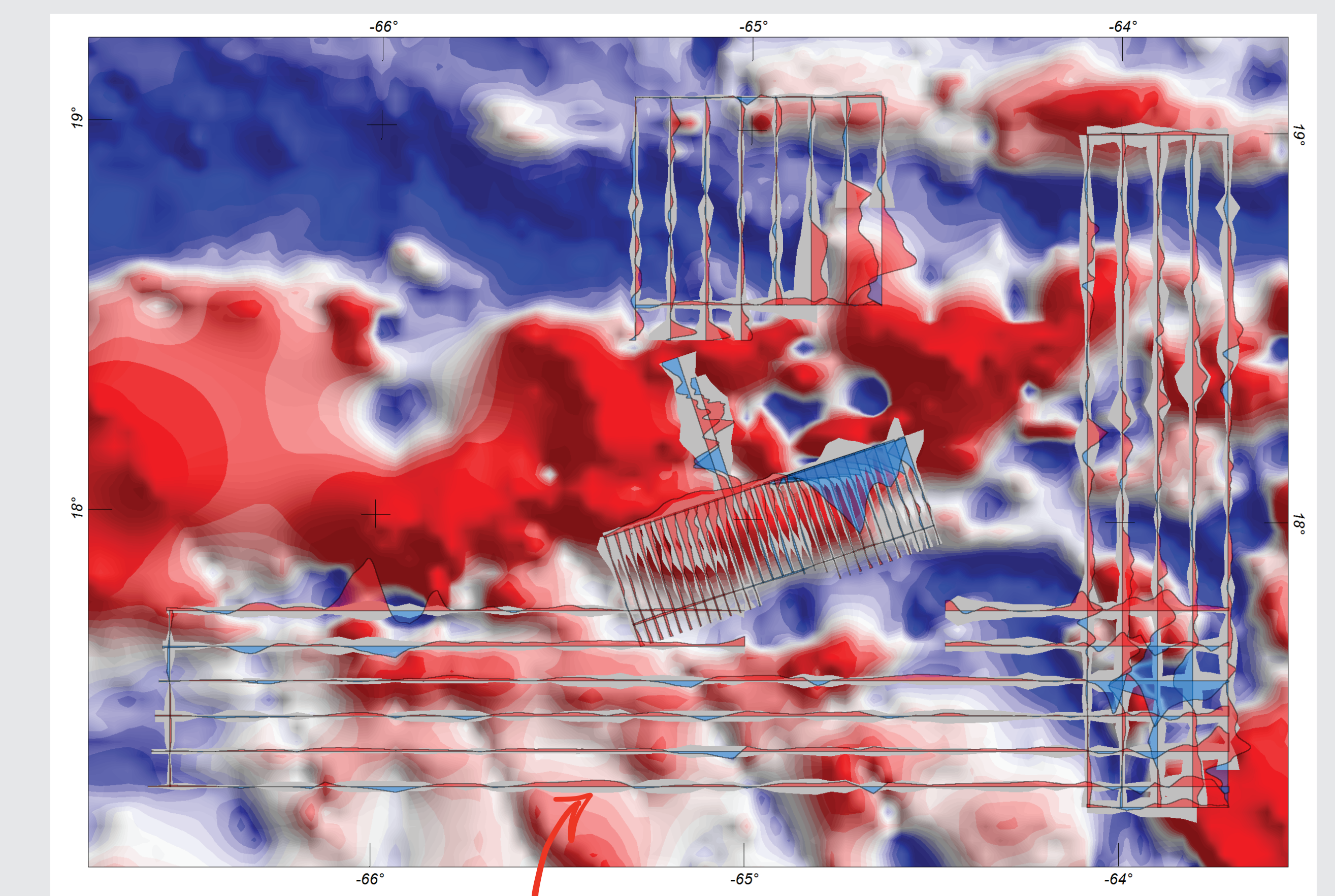
Marine trackline data from
NOAA/NCEI data center.

Marine trackline mag map

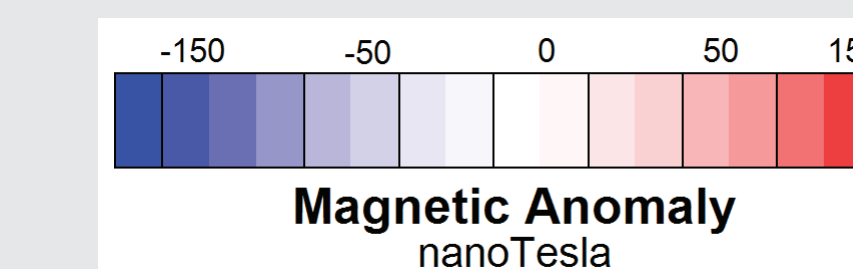


Magnetic anomaly map from
trackline data (4 km interval)

Test survey lines



Test lines flown by Sander
Geophysics.



Two basic grid cell uncertainty categories:

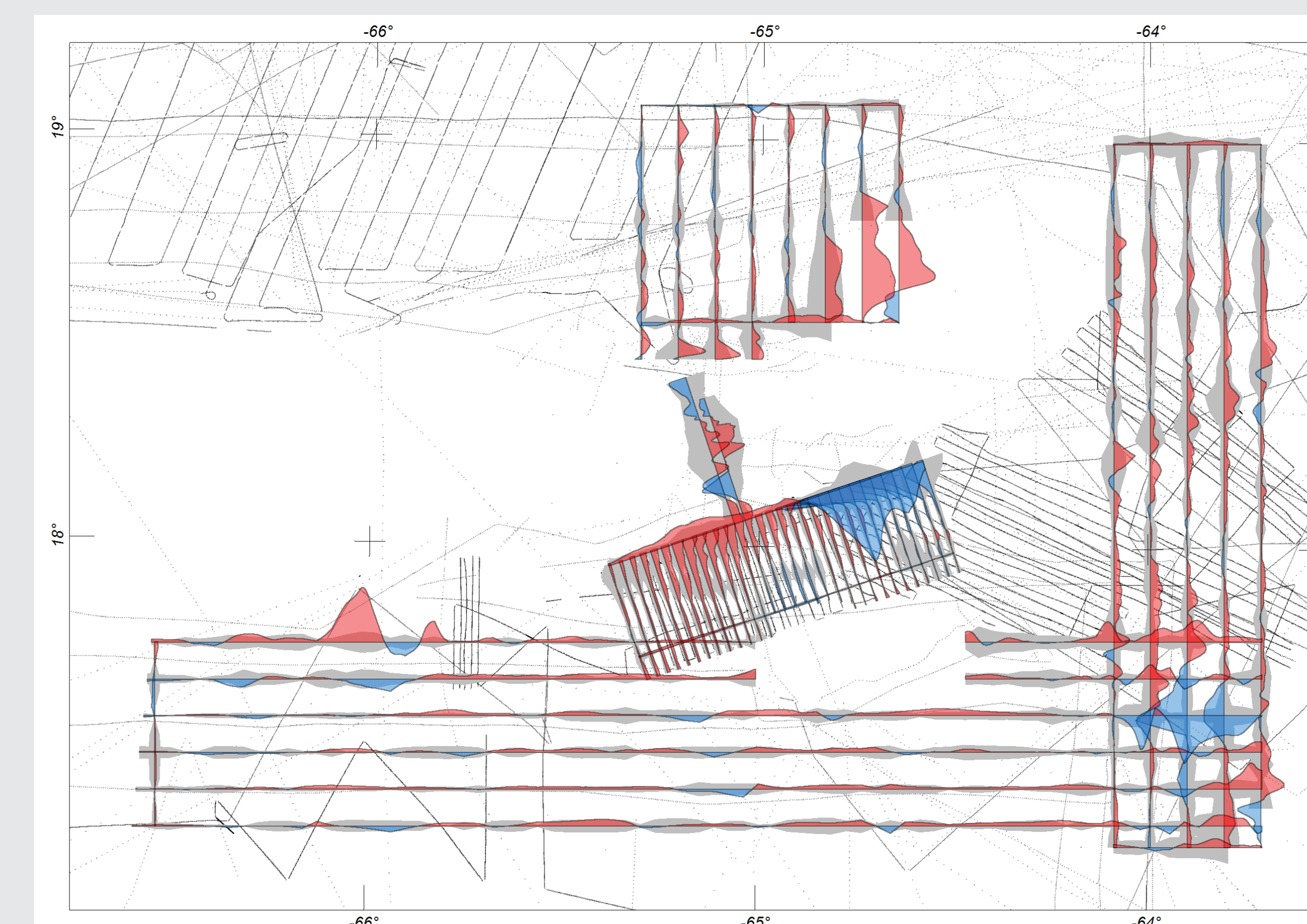
(U1) Cells with data (propagated point uncertainty)

(U2) Cells with no data (interpolation uncertainty)

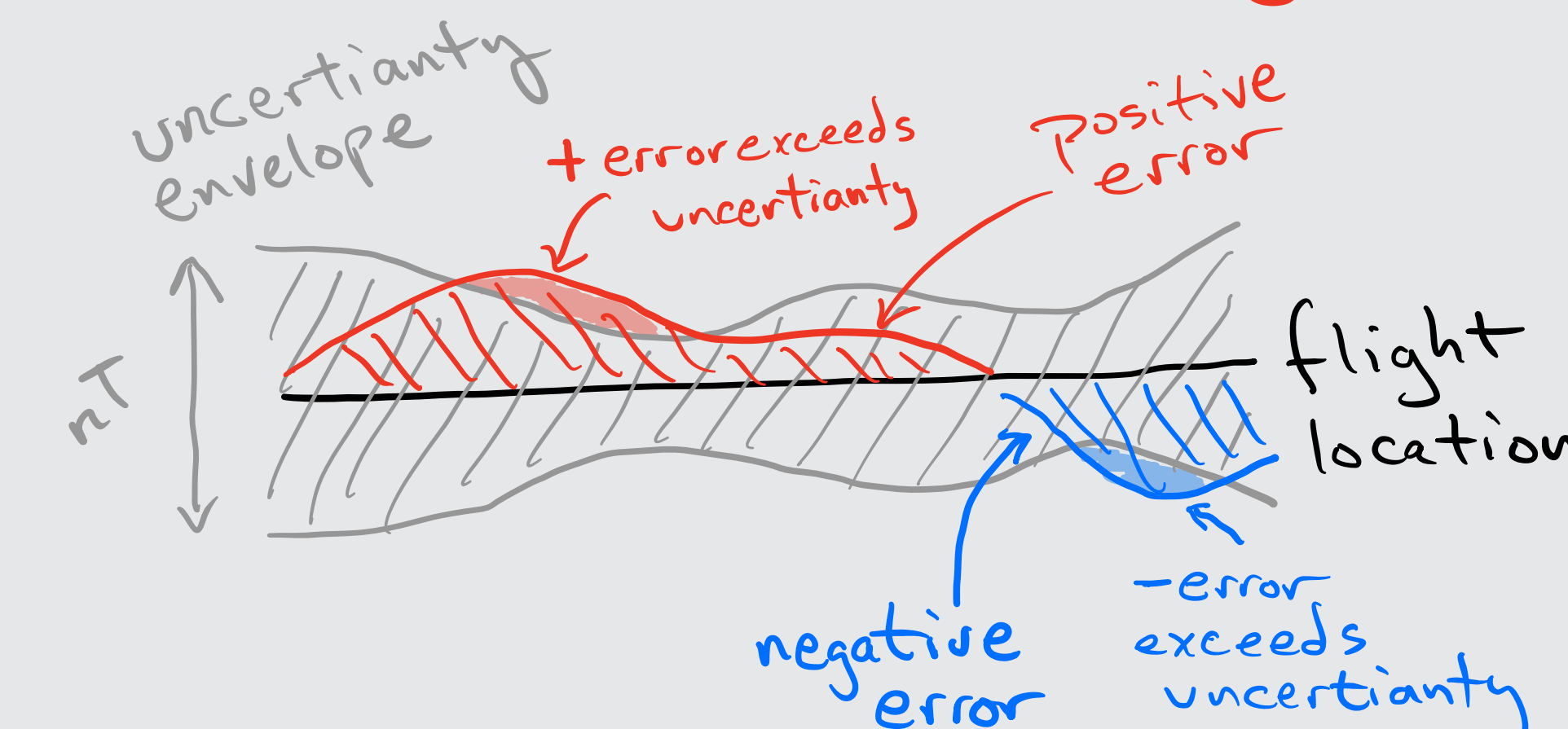
Uncertainty for grid cells with
data is a function of
original data uncertainty,
data distribution, and
expected true variation
of the field.

Uncertainty for interpolated
cells is a function of
typical field variation
and distance to measured
data.

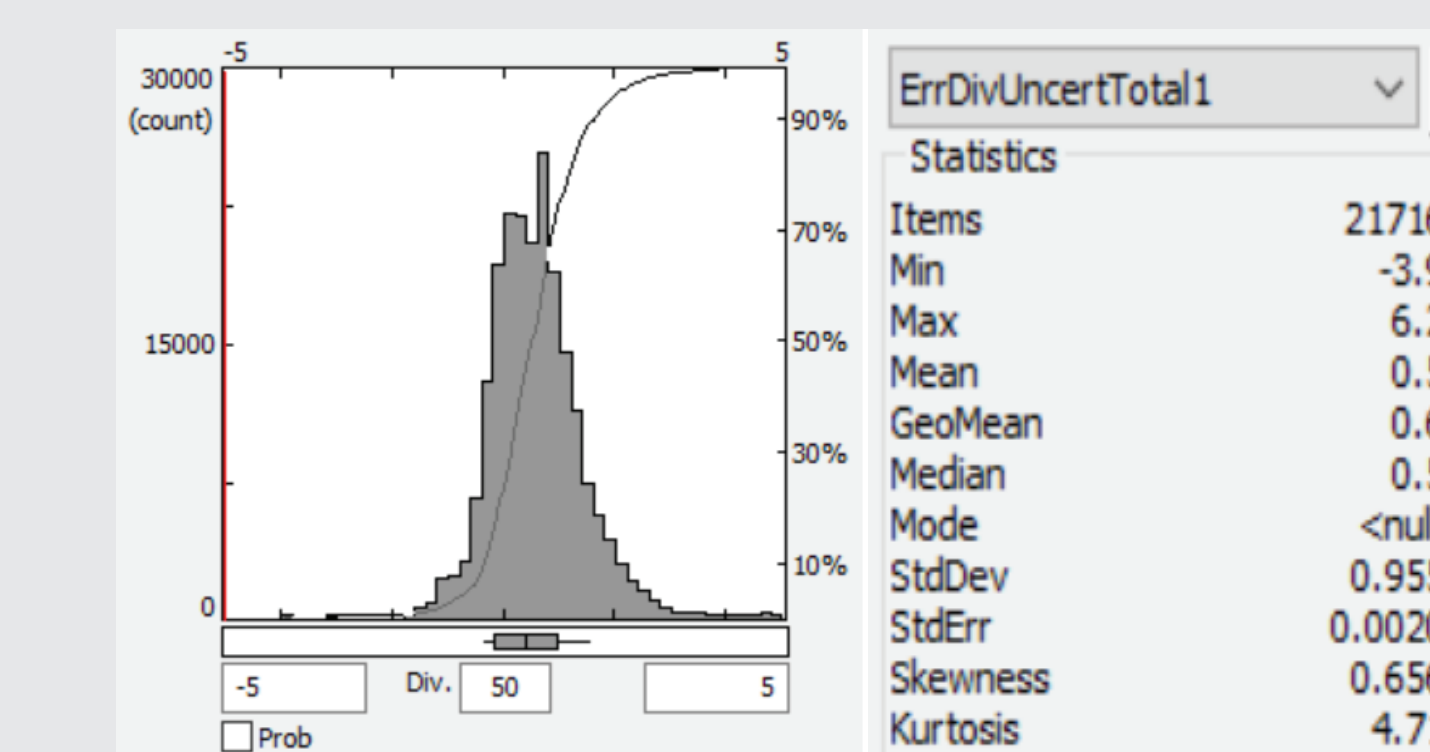
Test result map



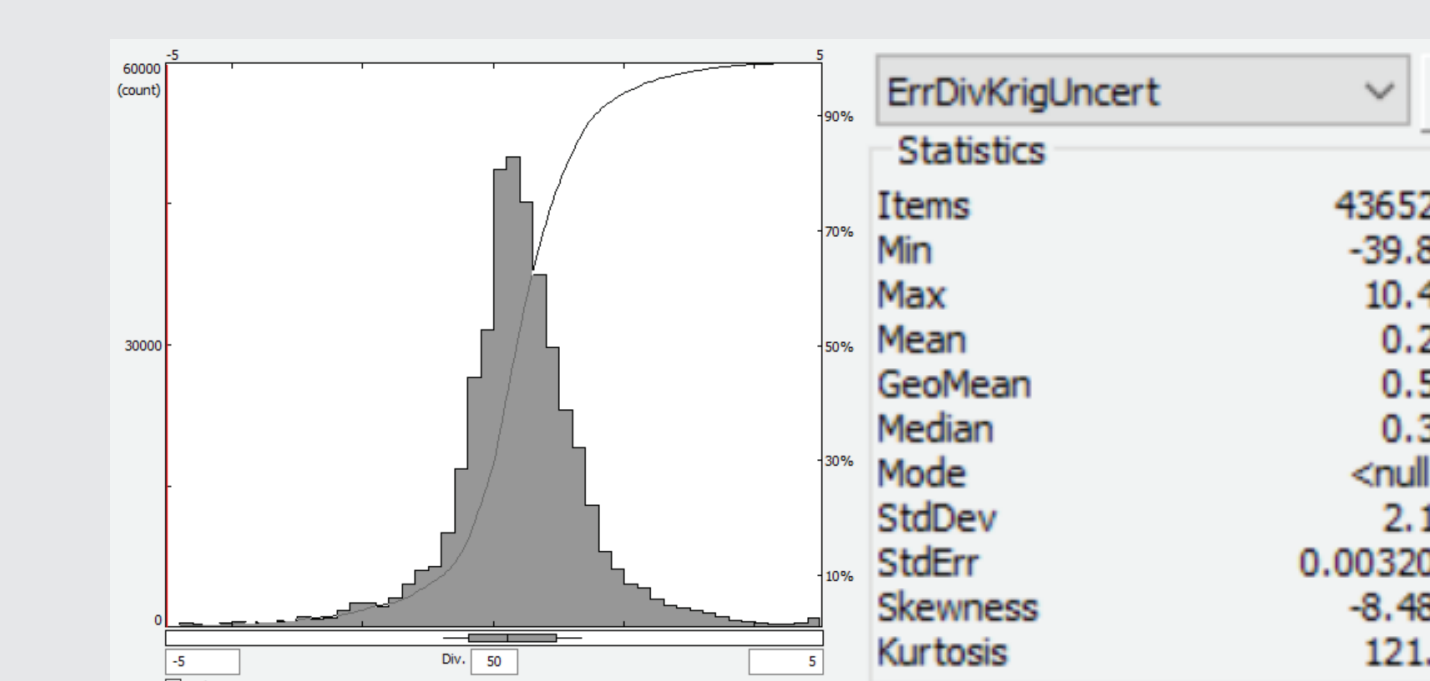
Test result Profile legend



Test result statistics



U1 (got data)



U2 (interpolated)

Histogram statistics are
for error/uncertainty.

Error = trackline grid value
minus test flight
value

For cells with data
standard deviation is
close to 1 as expected
for 1 sigma agreement.

For interpolated cells
standard deviation is about 2,
indicating 2 sigma agreement.

CIRES = Cooperative Institute for
Research in the Environmental
Sciences (University of Colorado)

NOAA = National Oceanic and Atmospheric
Administration

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