Broad Band tomography data

Velocity contrasts at different crustal levels: An explanation of individual depth slices through the lithosphere (to 350 km) and their implications for geodynamics

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JAMES COOK UNIVERSITY
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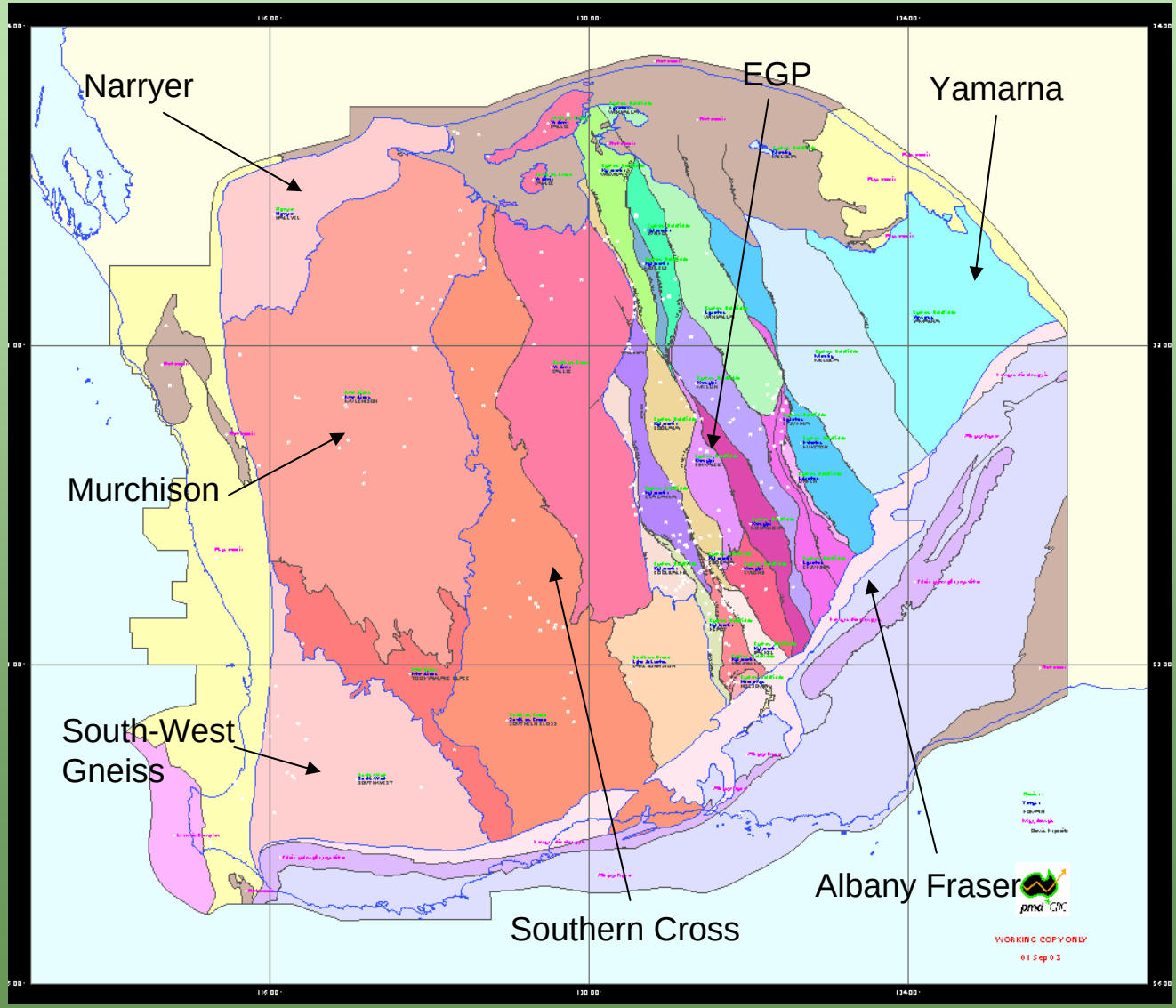
Location Map



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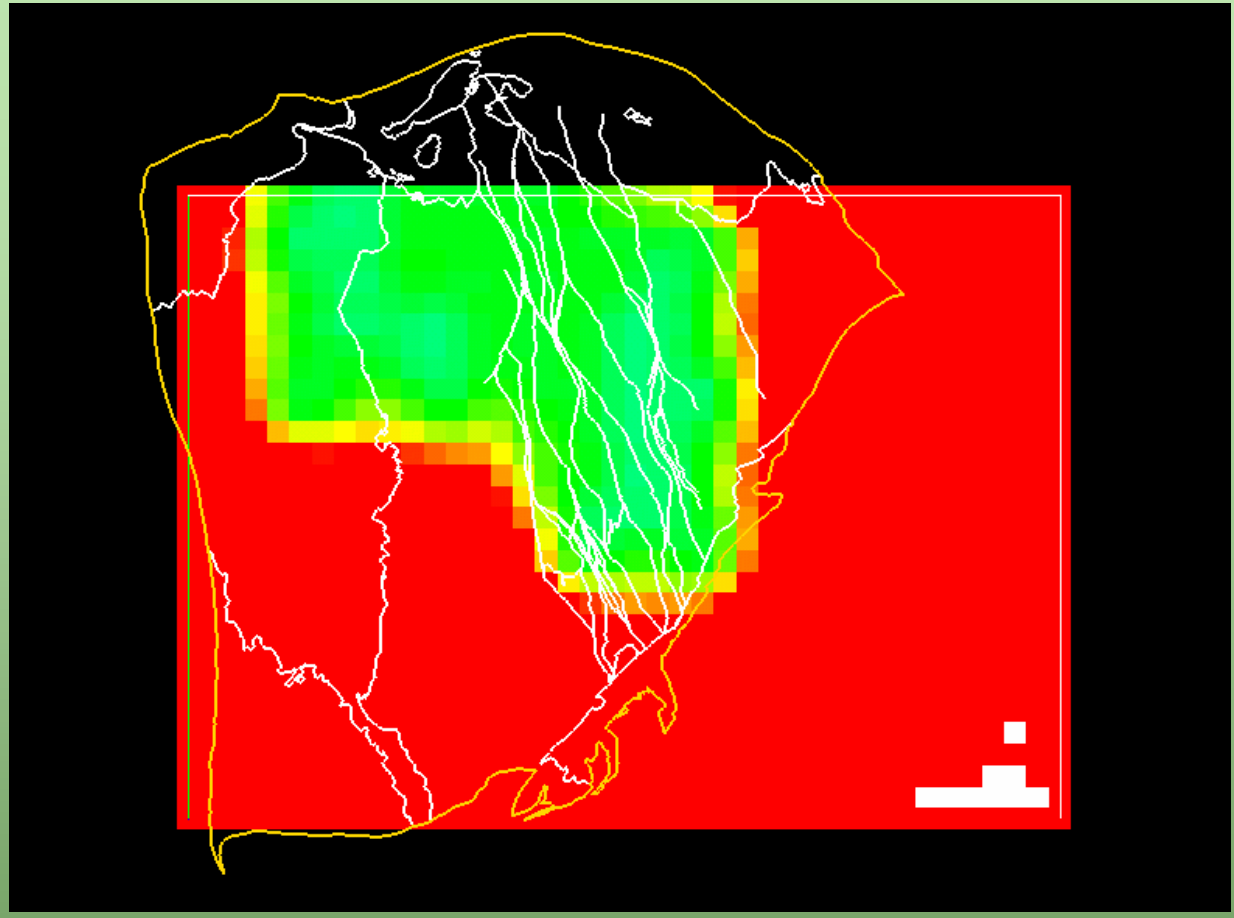
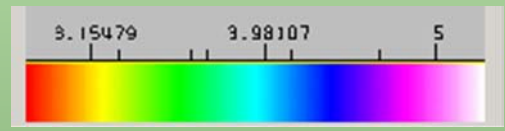


Colour ramp



0: Top 6.25km, displaying fast velocities in the Eastern Goldfields Province (EGP) and the northern Murchison Province. N-S grain at the Yamarna and Ida Fault boundaries. E-W boundary in the Murchison Province. Albany Fraser Province is slow, due to no sample locations in that region(?).

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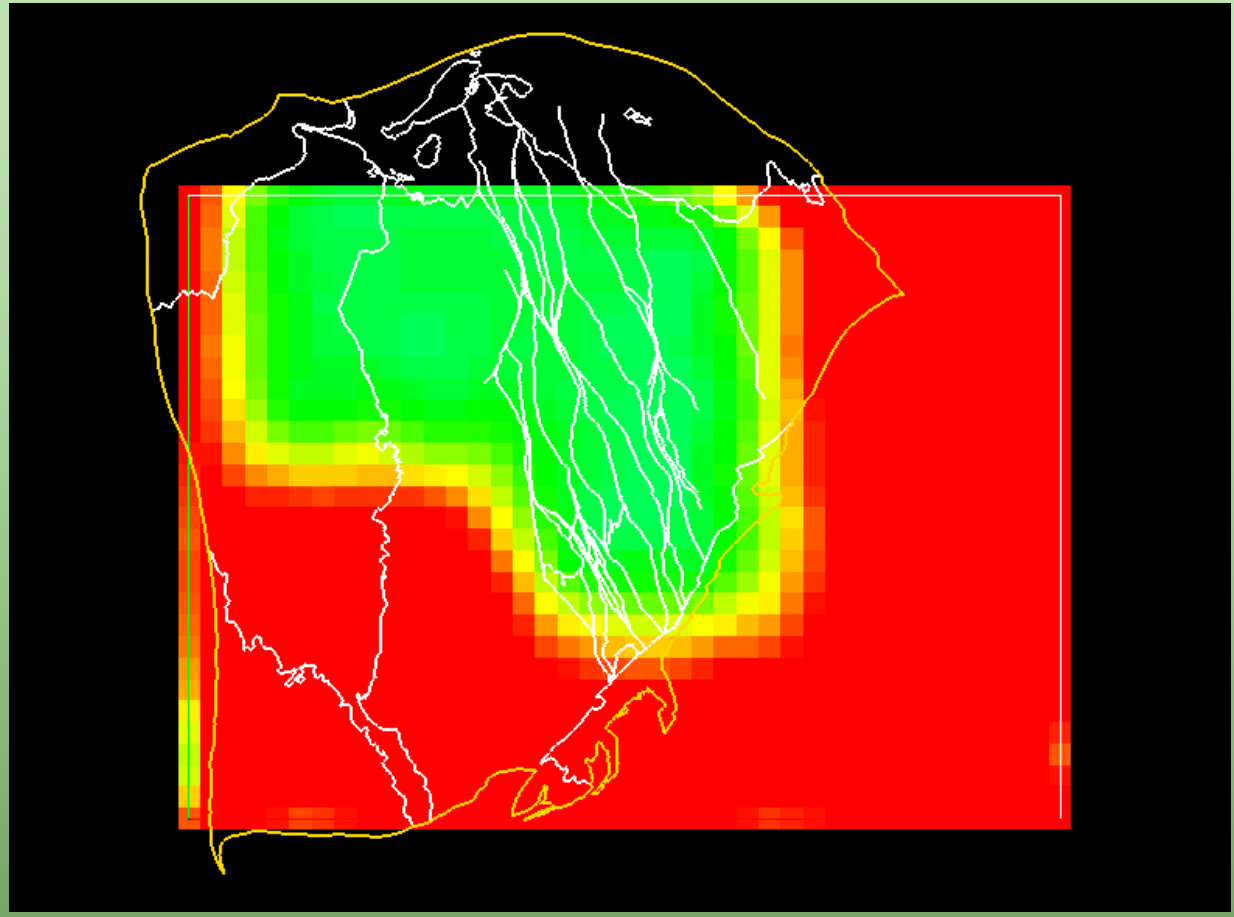

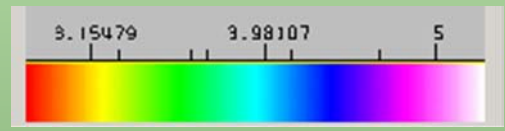

1: Middle crust: Same as the previous slide although there is a slightly broader fast velocity region.

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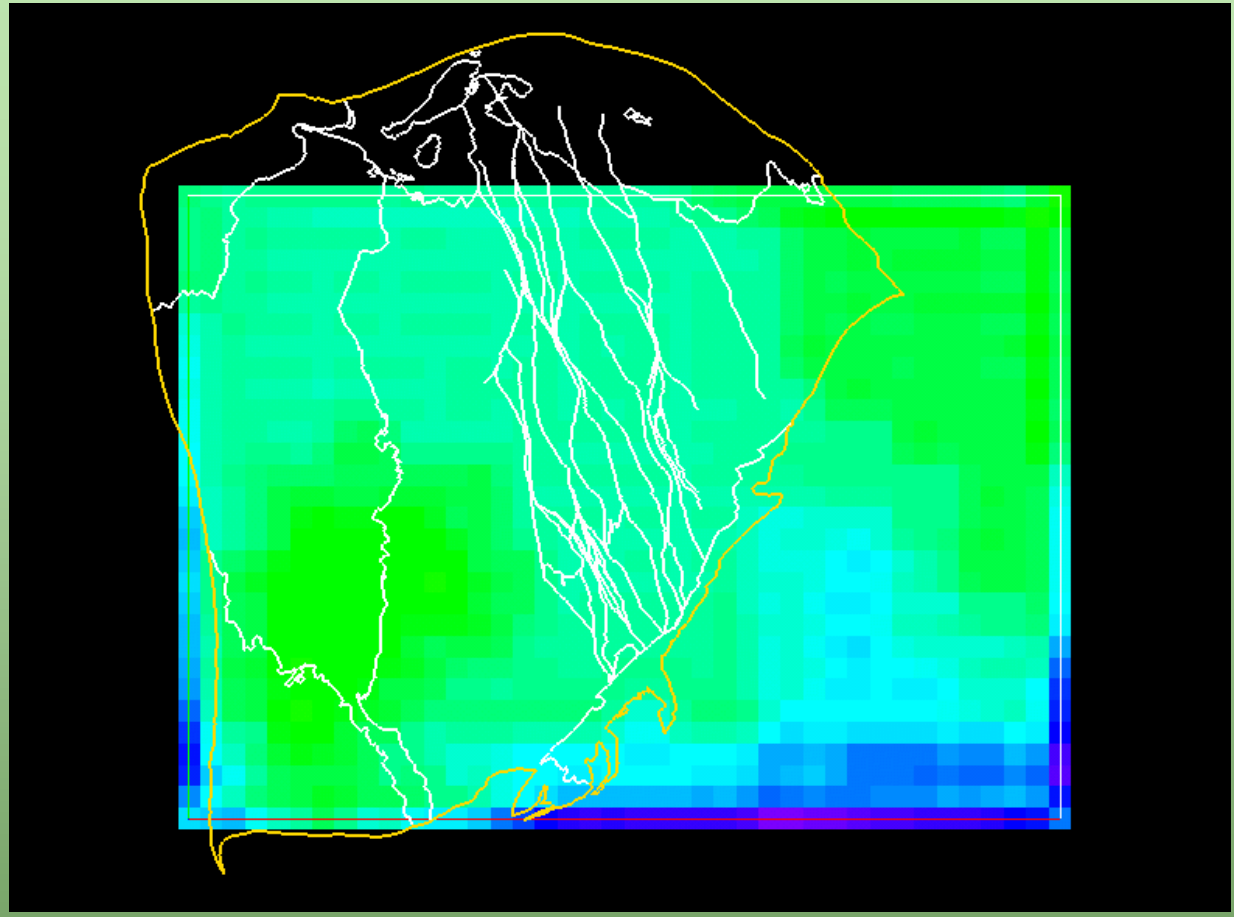

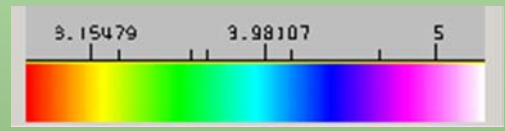

2: Just below the moho: same patterns as 0, 1, Yamarna, Ida and Menzies west lines visible. Albany Fraser Province displays slightly faster velocities than the EGP.

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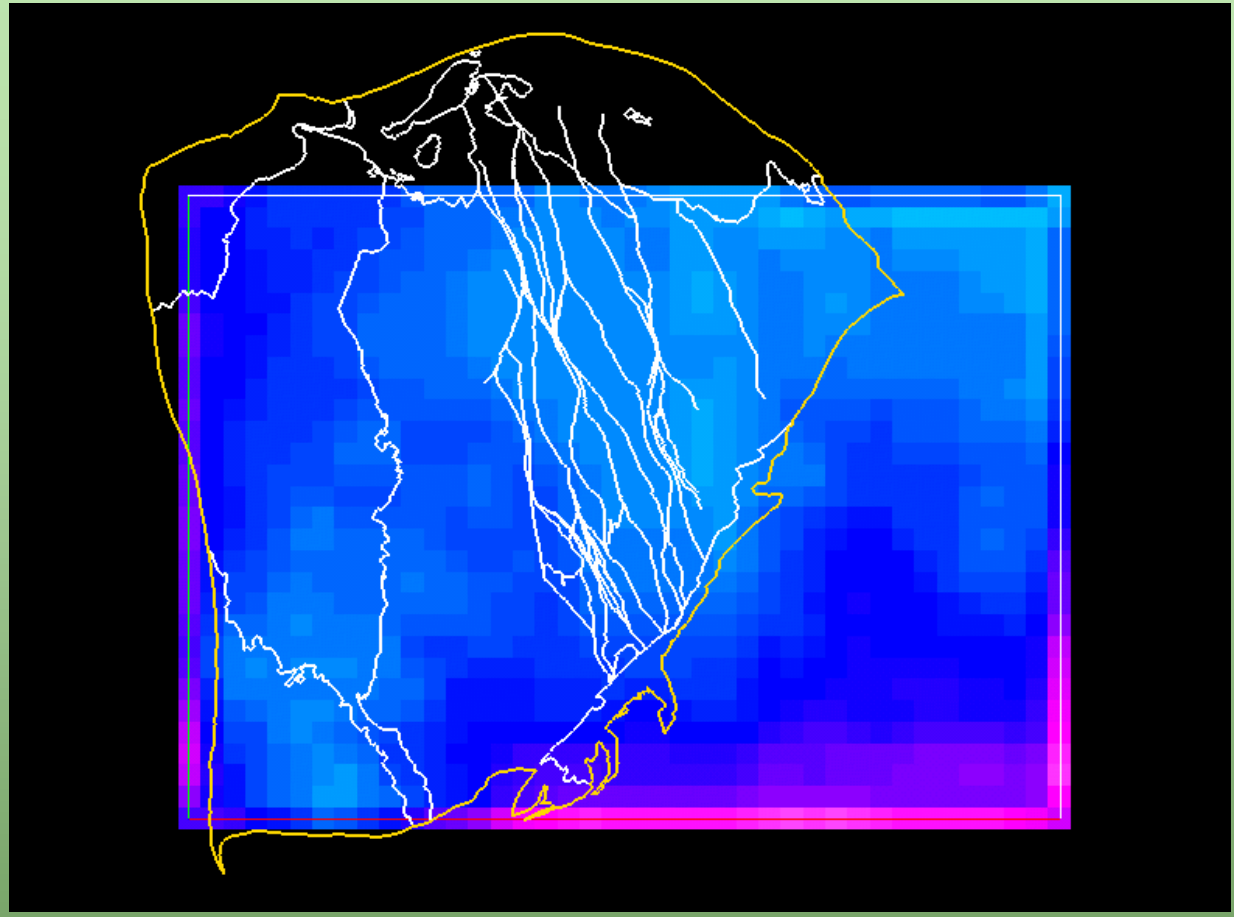

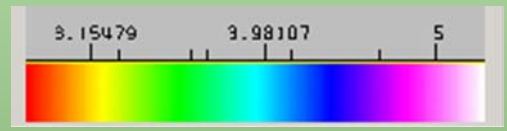

3: Albany Fraser boundary well imaged and the EGP delineated by slower velocities with a N-S grain. Slower velocities around the South-West Gneiss region.

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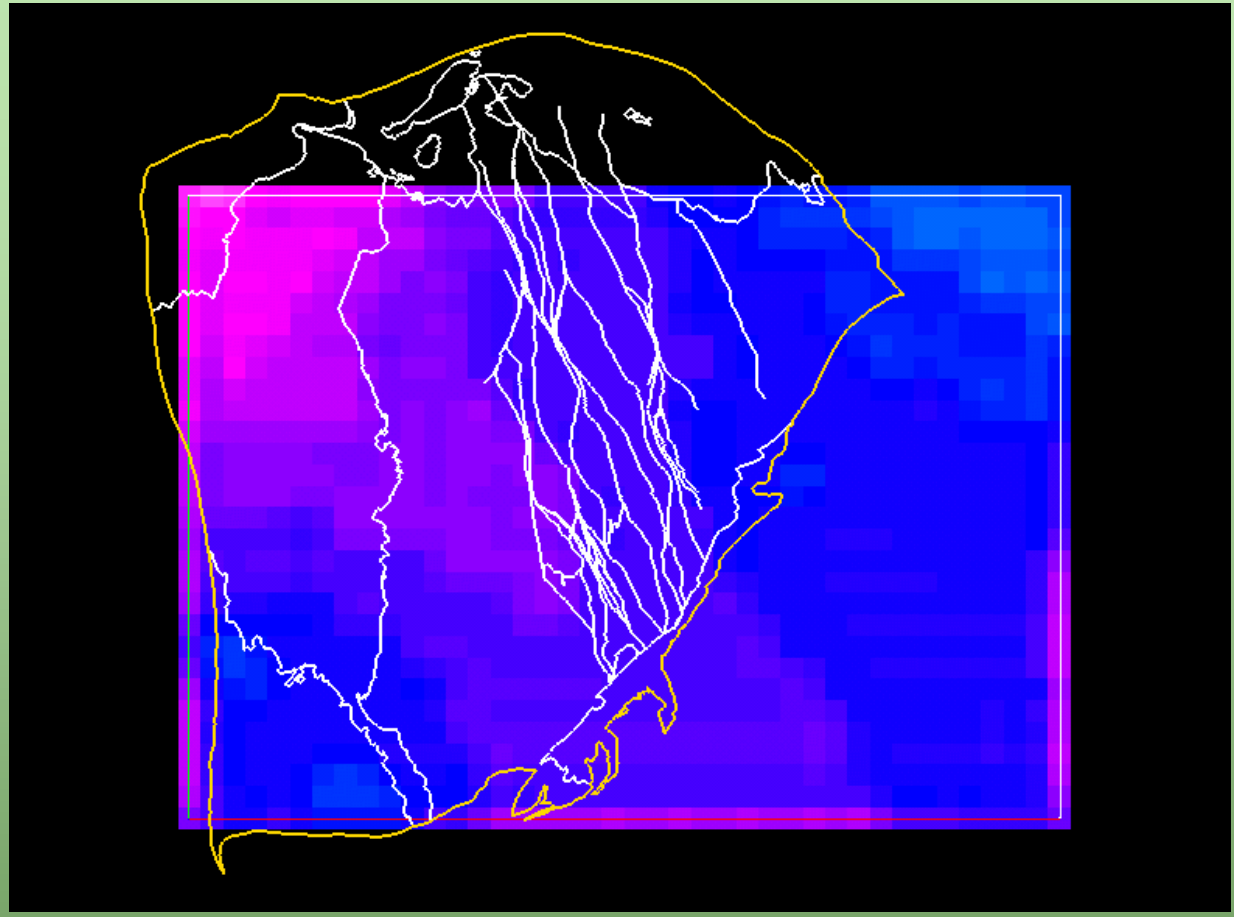

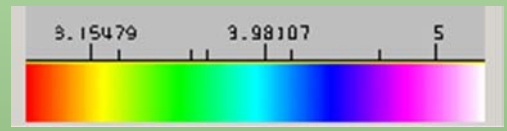

4: Fast velocities in the Narryer region NW Yilgarn, suggesting a SE dipping high velocity anomaly within the crust. This high velocity anomaly extends to the Ida.

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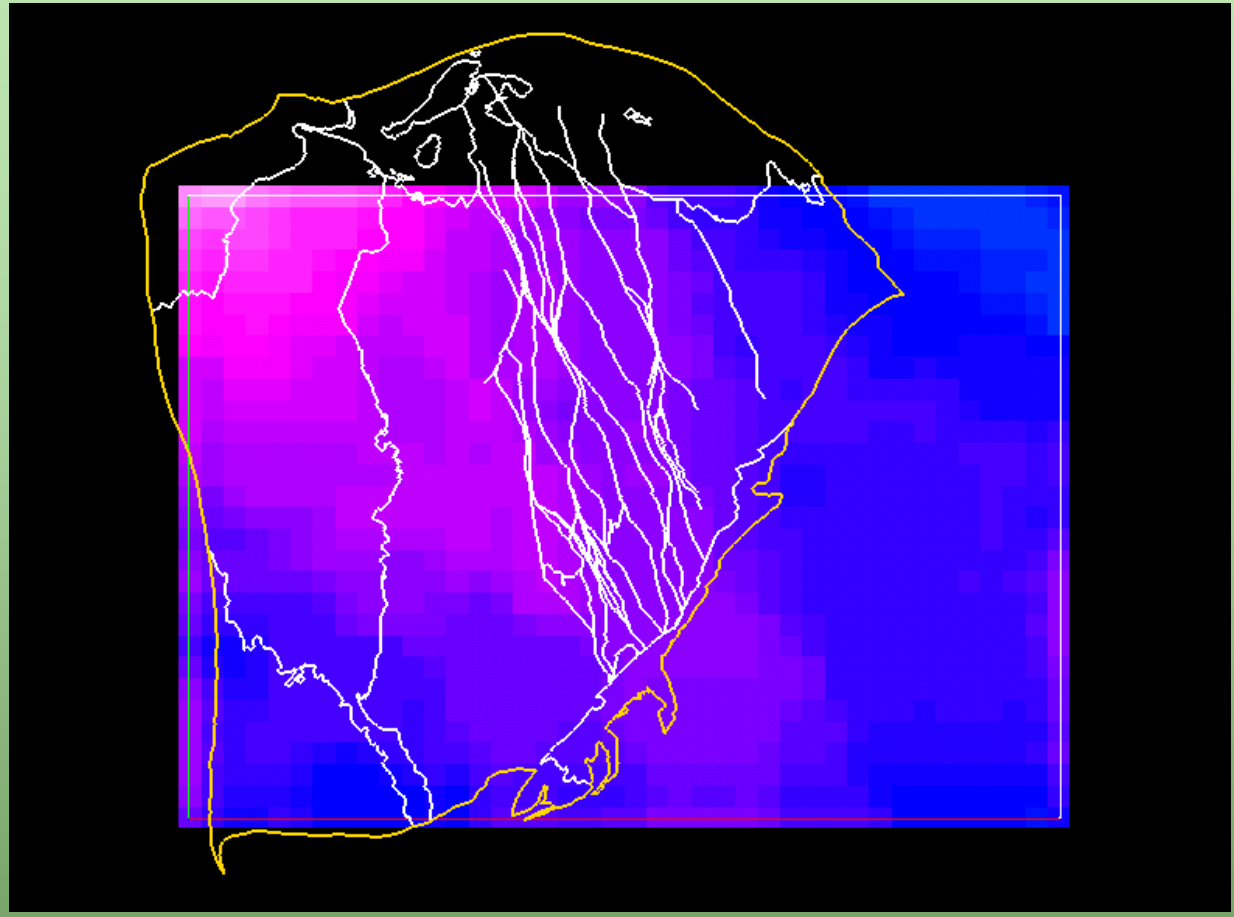

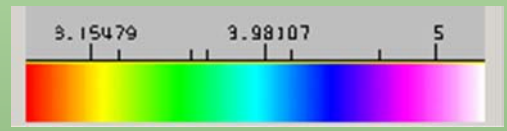

5: Same as 4, depicting the same SE plunging velocity anomaly.

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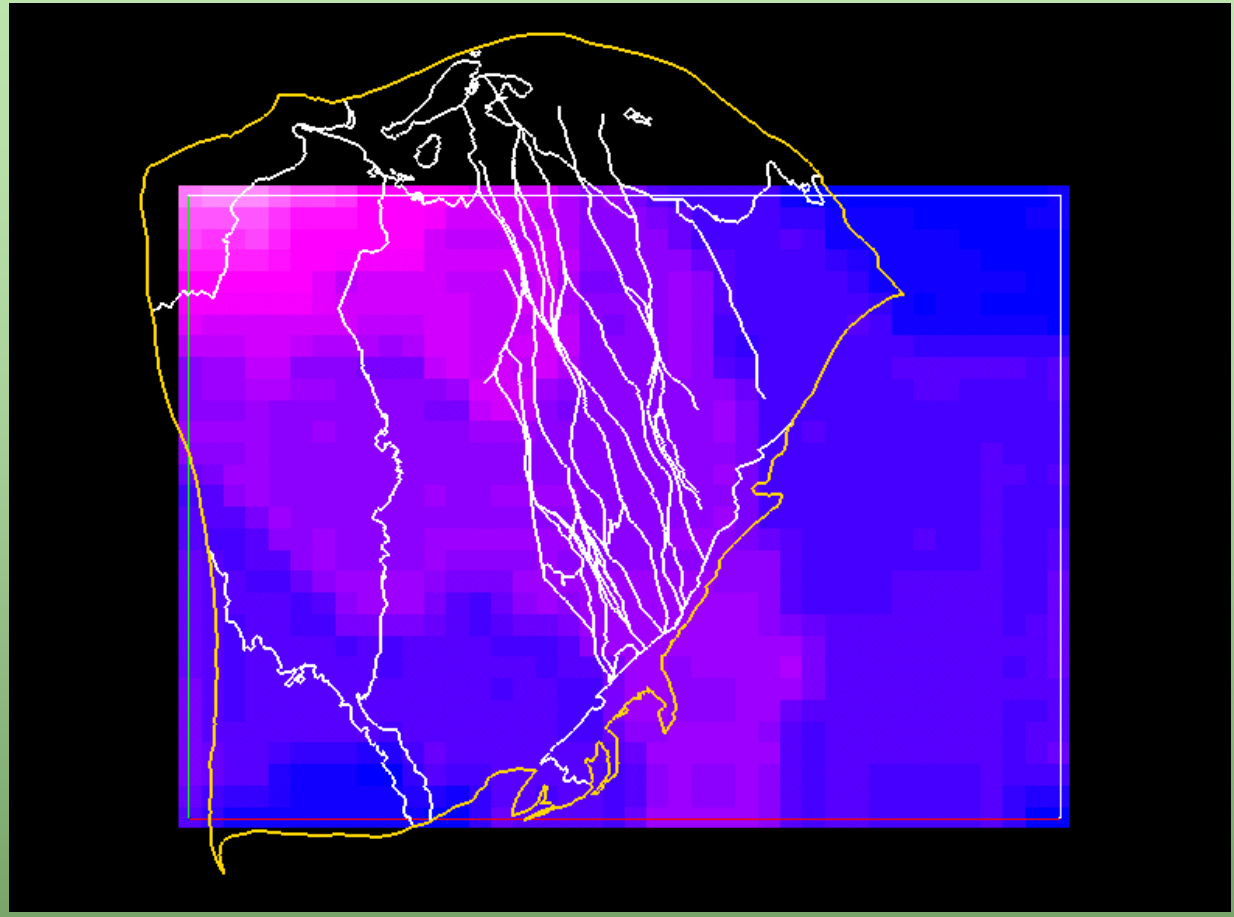

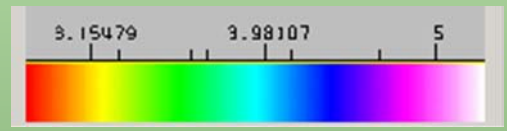

6: High velocity in the Narryer, displaying boundary steps with a NE trend. The SE dipping high velocity region extends into the Albany Fraser.

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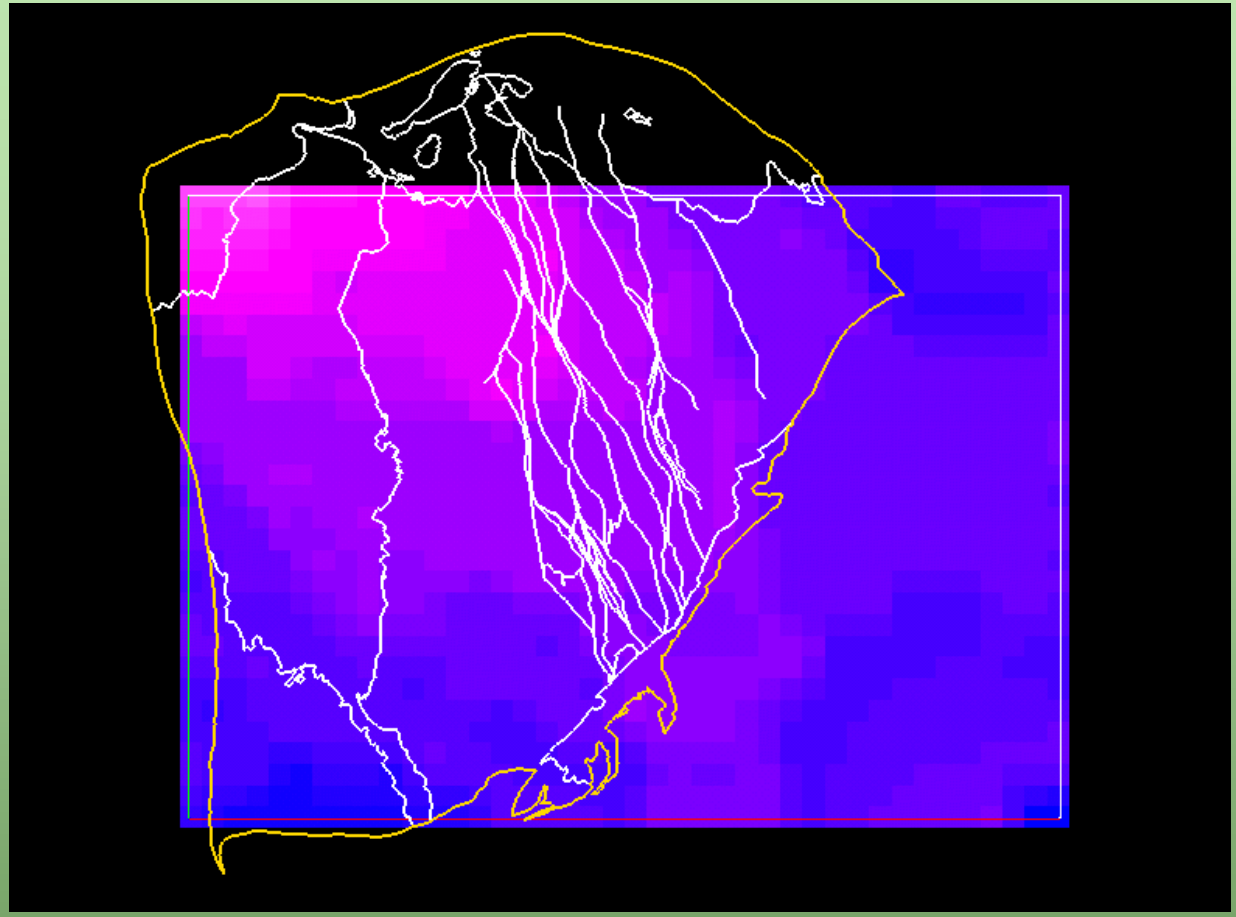

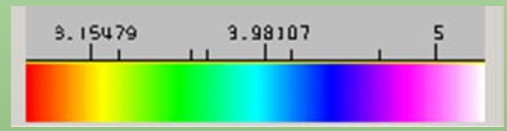

7: Same as 6

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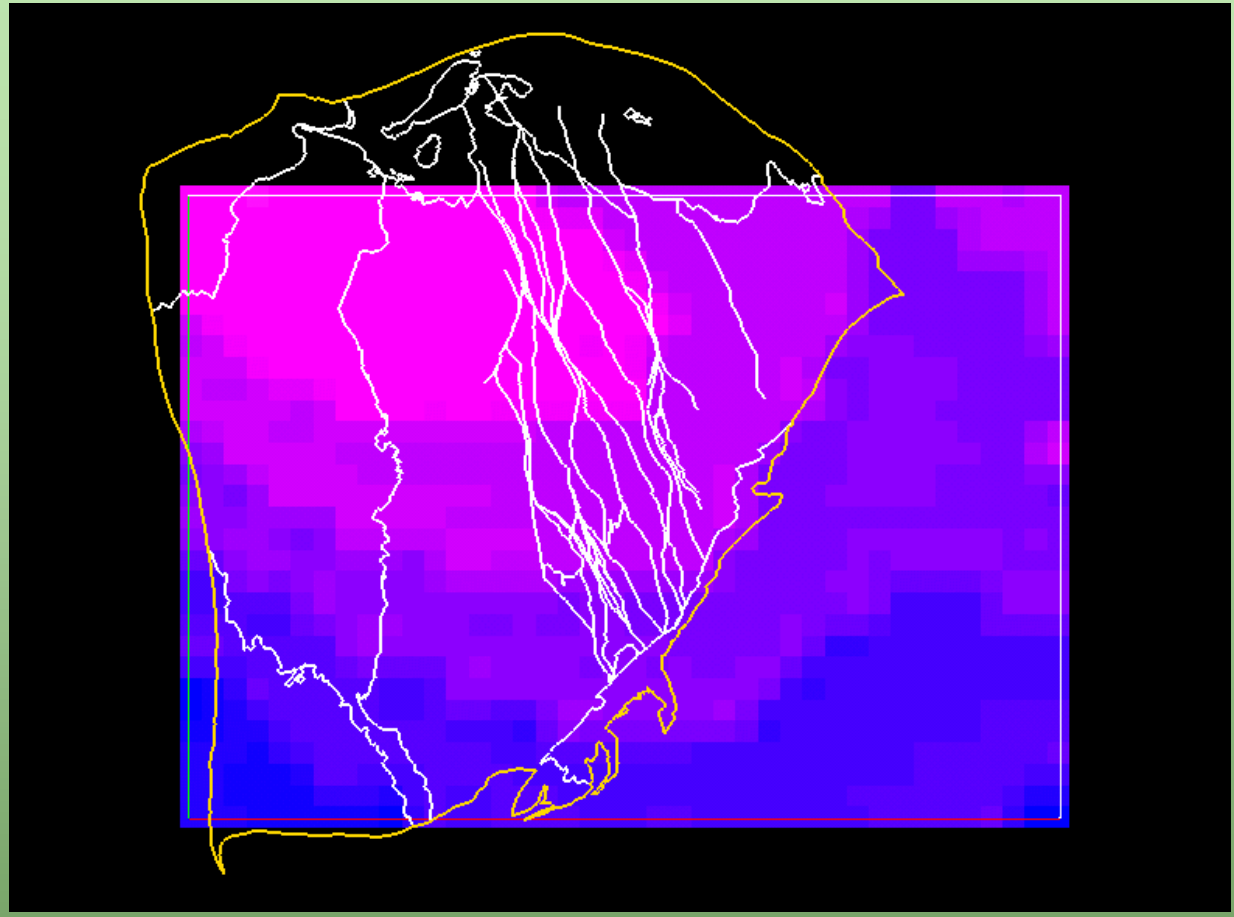

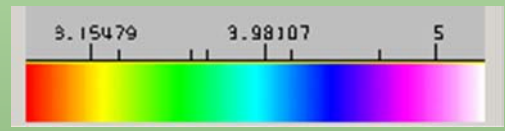

8: Same as 6 and 7 although the high velocity anomaly is broader. Strong grain along the Albany Fraser boundary.

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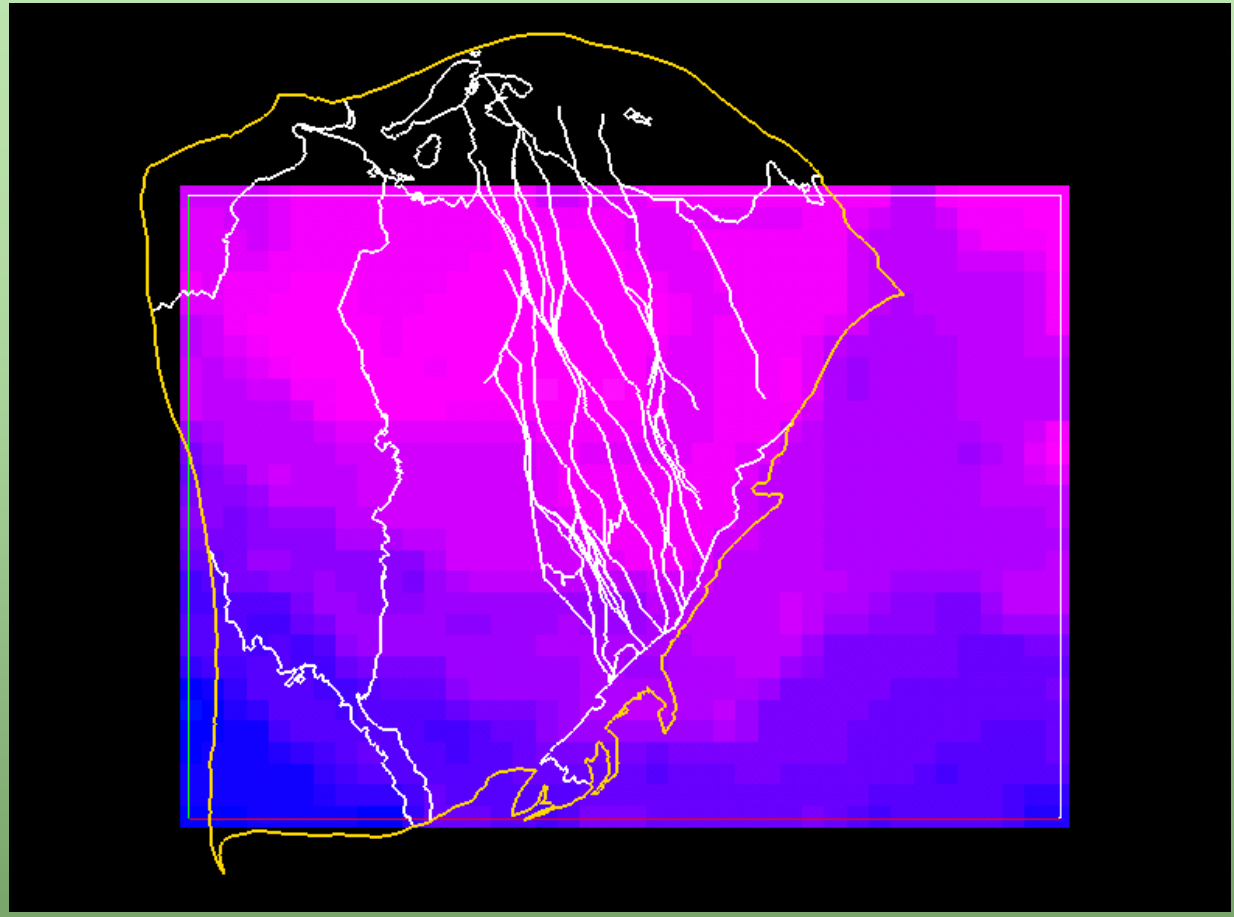

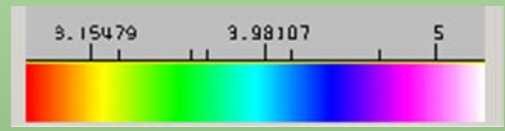

9: Same as 8 although this level also displays a grain parallel to the South-West Gneiss terrane boundary. High velocity layer extends into/under the surface expression of the Albany Fraser Province.

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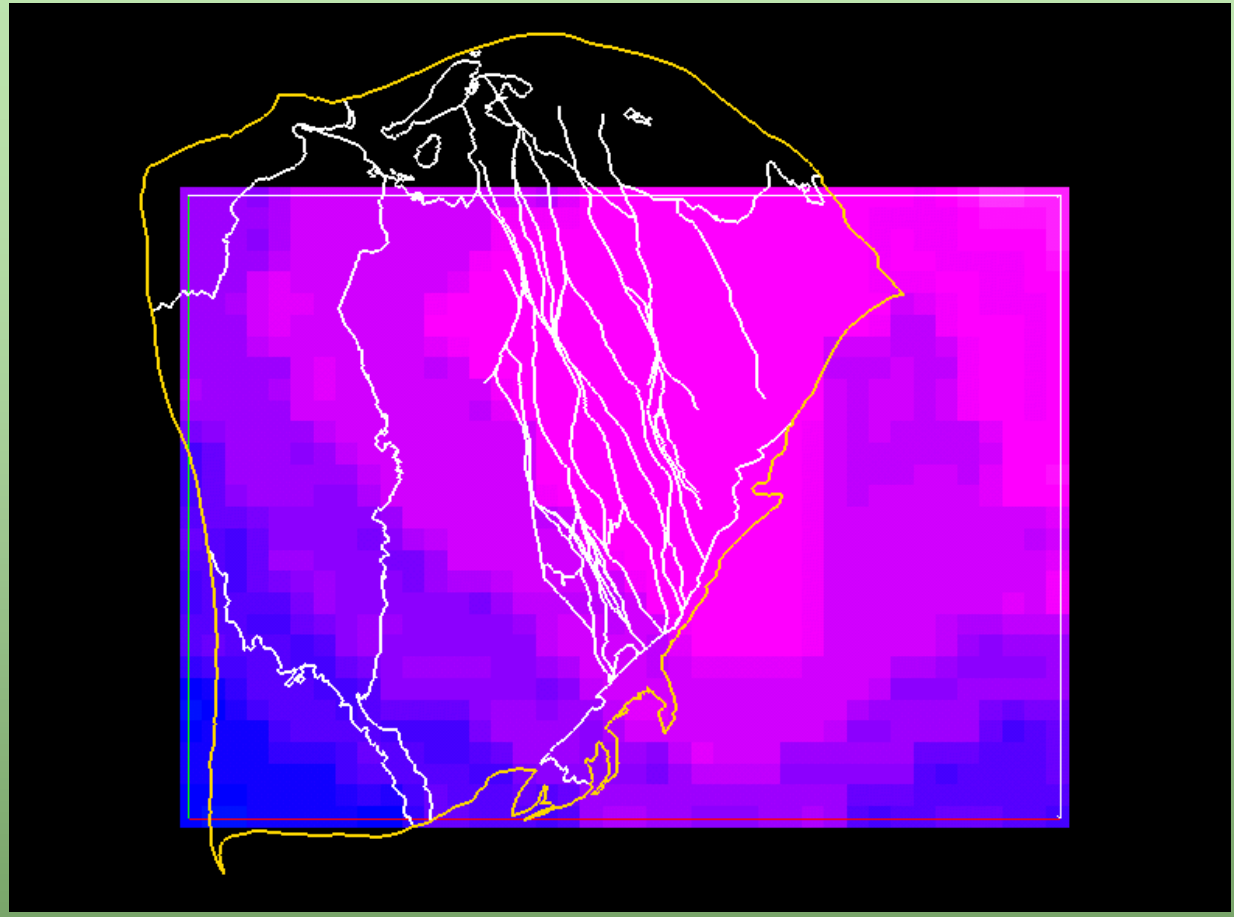

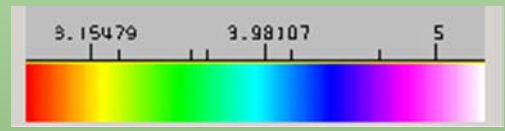

10: High velocities in the far east separated by those in the EGP by a N-S trending velocity low. Well developed NNW (NW) grain in the EGP and the Southern Cross Province.

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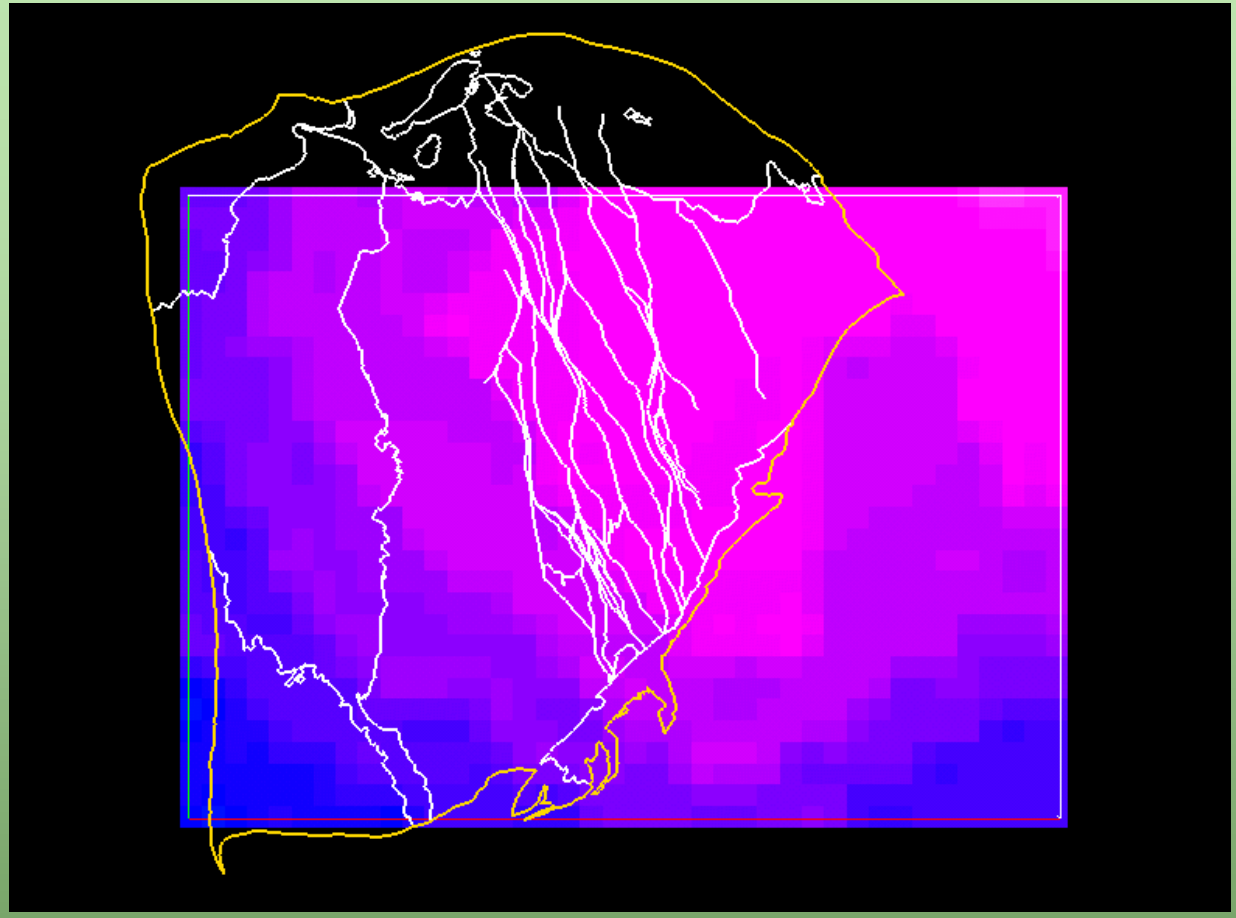

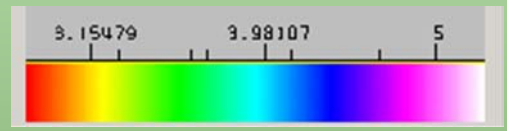

11: Same as 10

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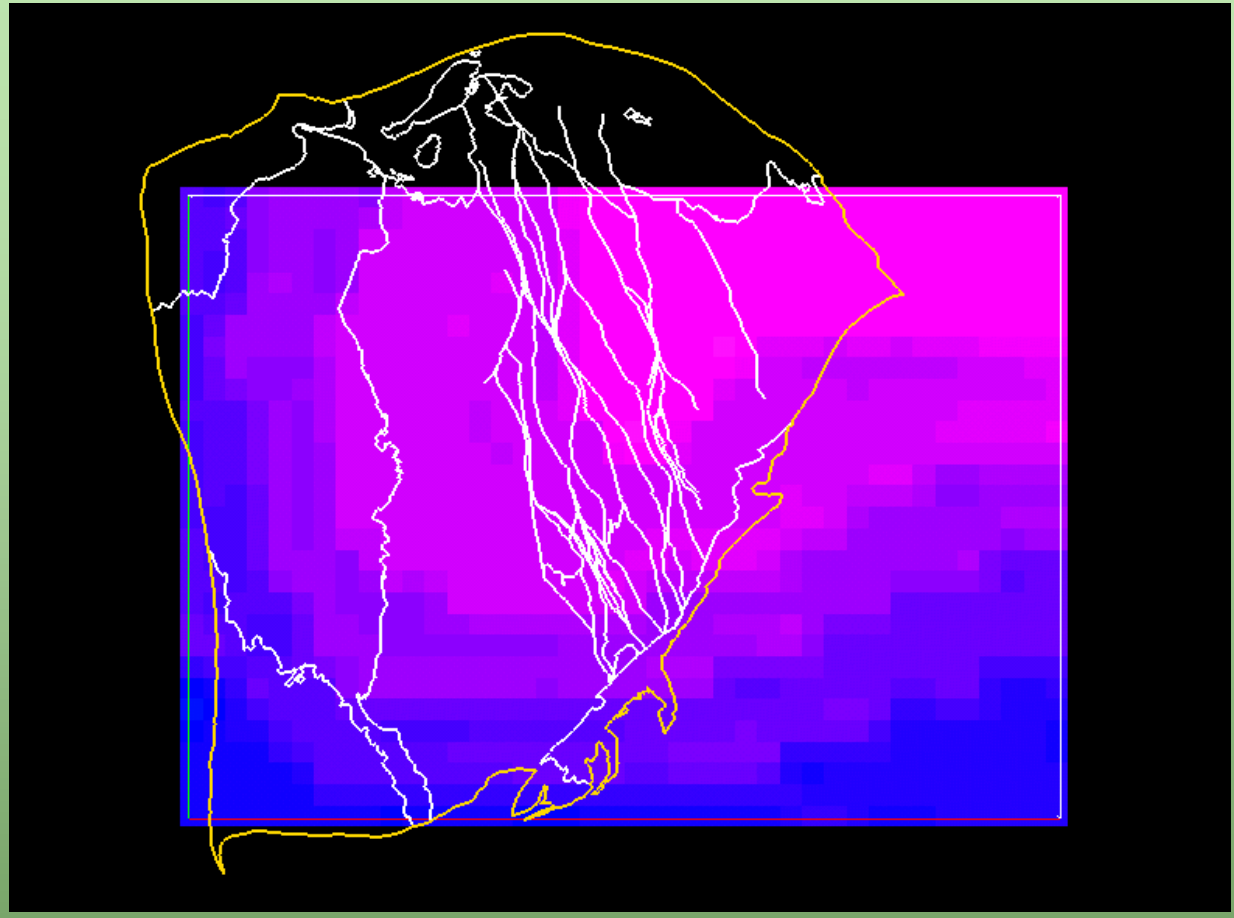

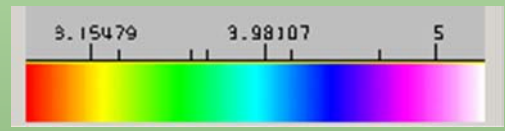

12: Grain south of the continent trends ENE, which is oblique to the margin of the Albany Fraser. Velocity anomaly extends past the margin which has implications for a shallow SE-dipping terrane boundary with the Yilgarn lithosphere.

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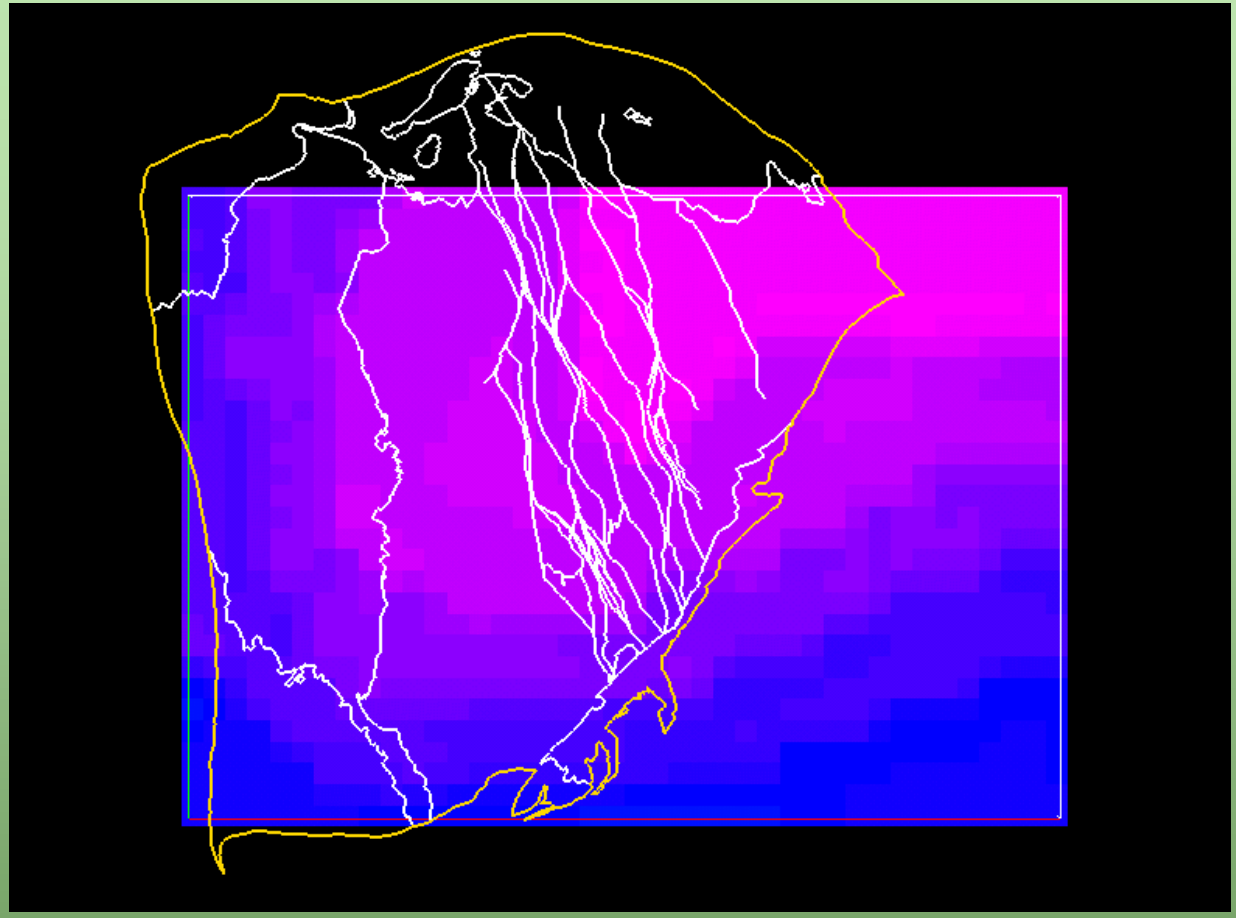

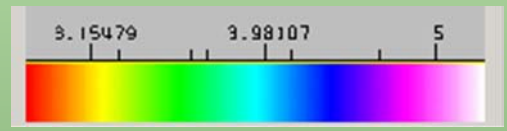

13: Same as 12

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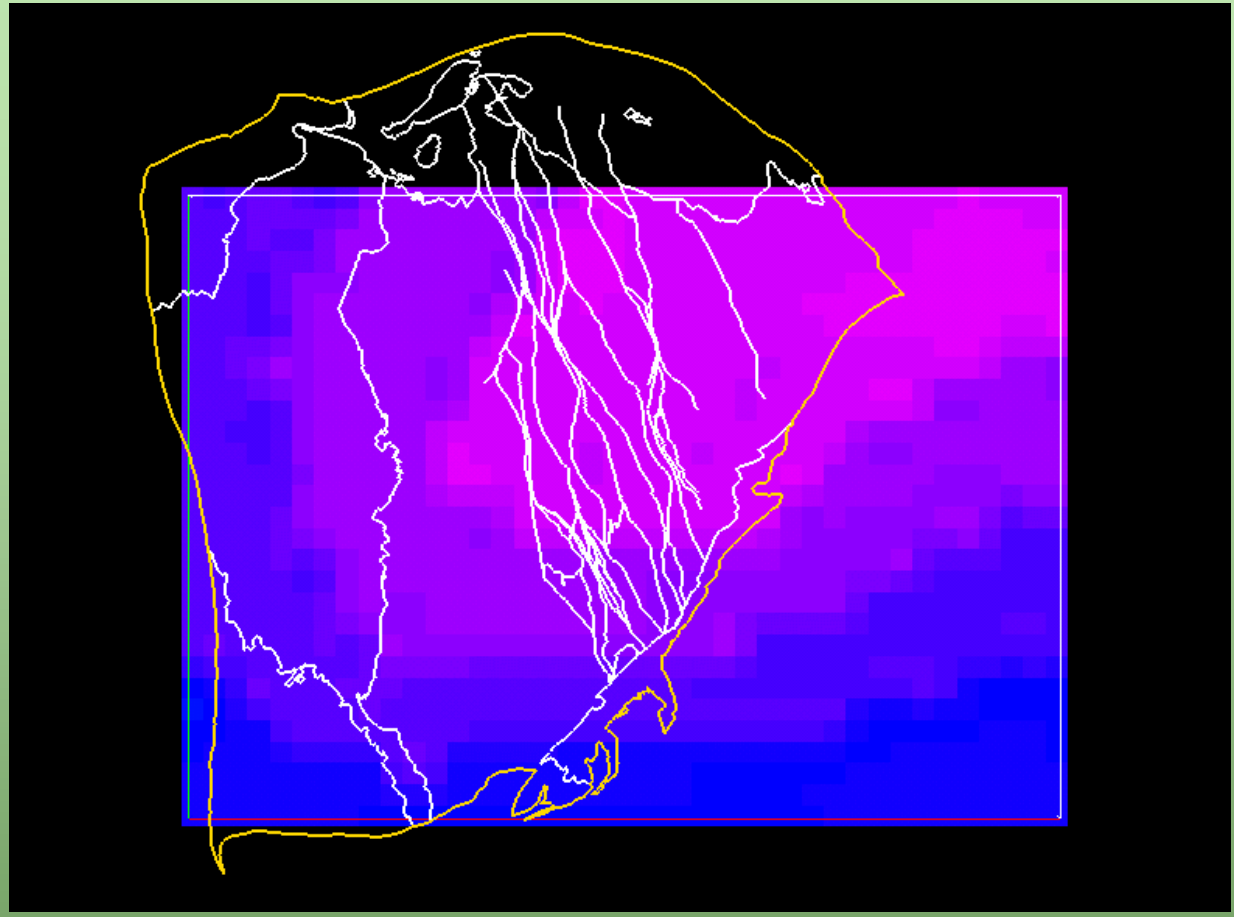

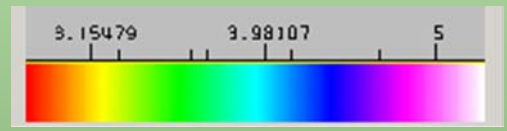

14: Same as 12 and 13, although now getting below the high velocity anomaly. Still featuring the NE grain.

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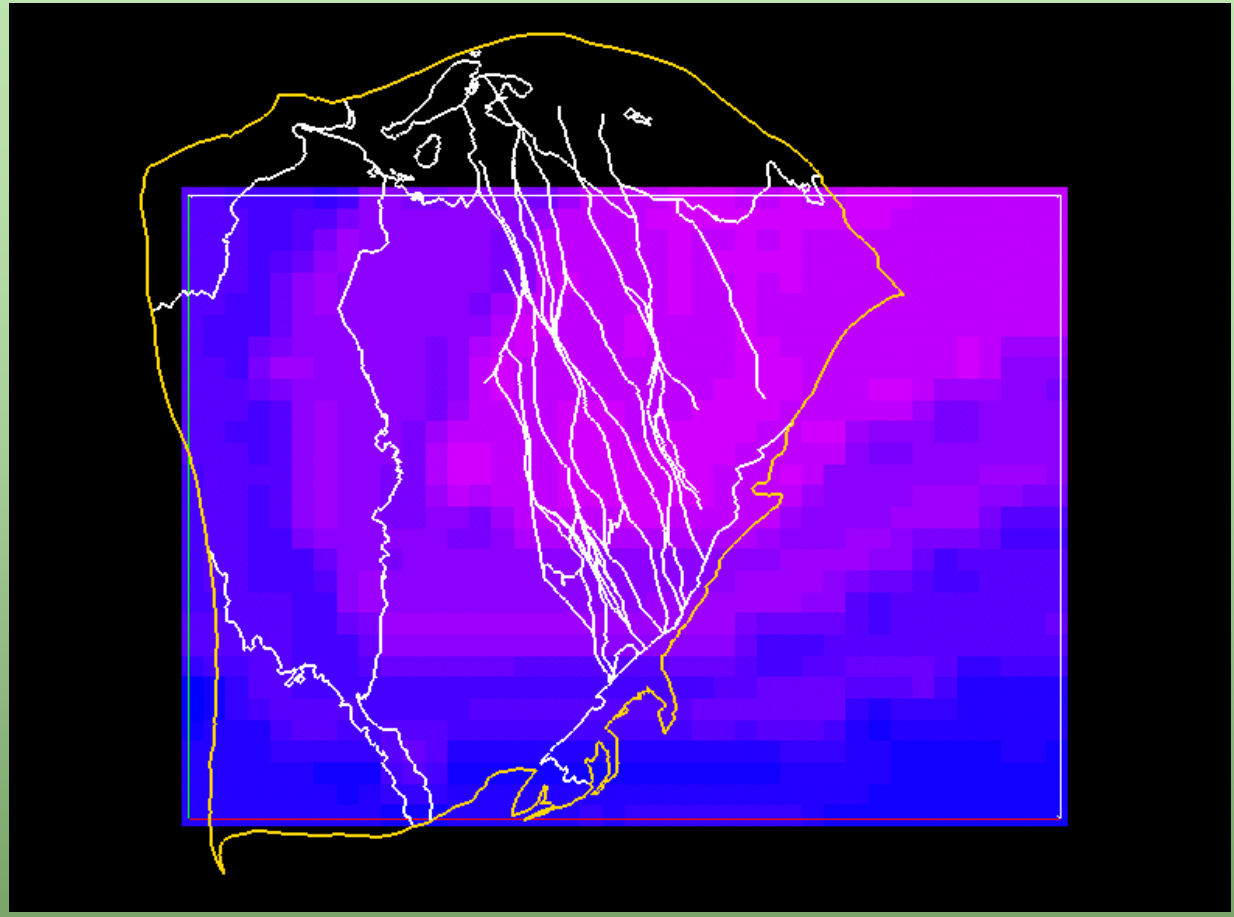

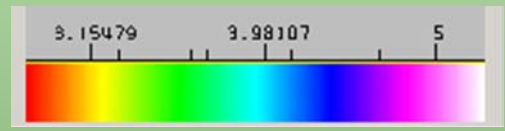

15: High velocity layer with an ENE grain

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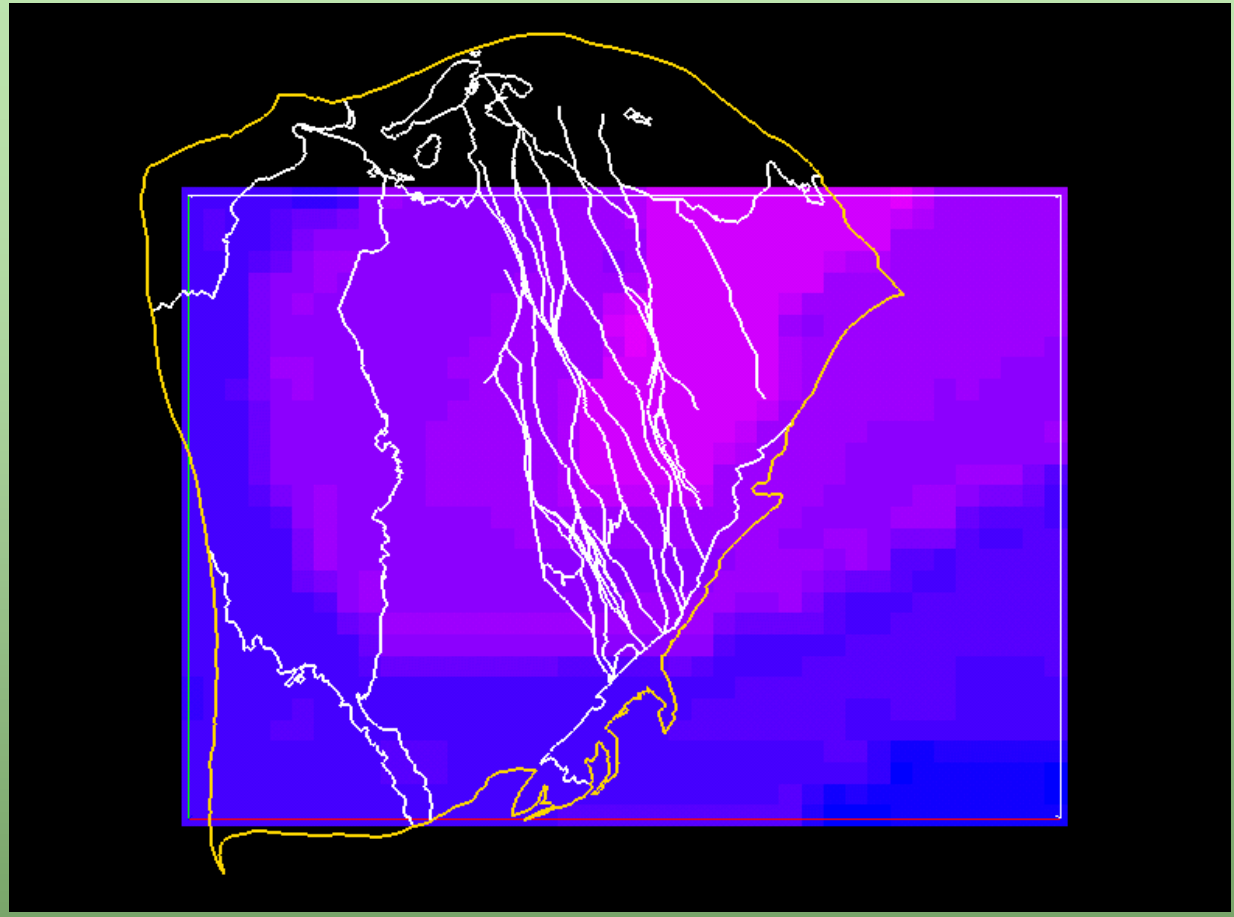

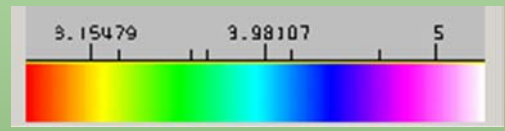

16: Same as 15

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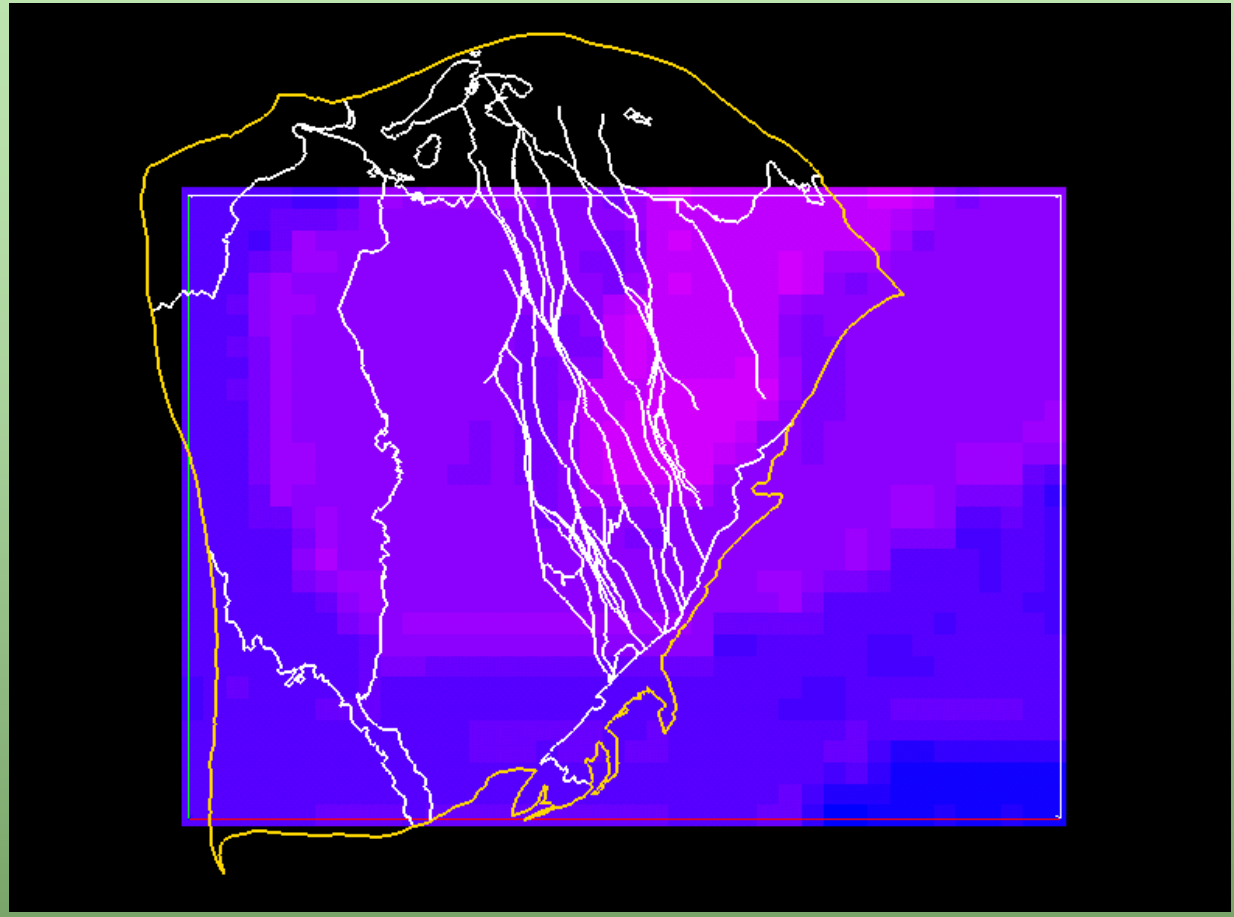

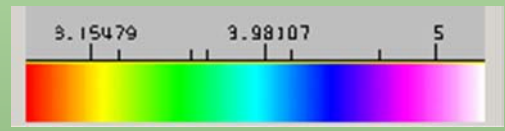

17: Same as 15 and 16, with minor perturbations of the slow velocity layer. This theme continues in the two following slides.

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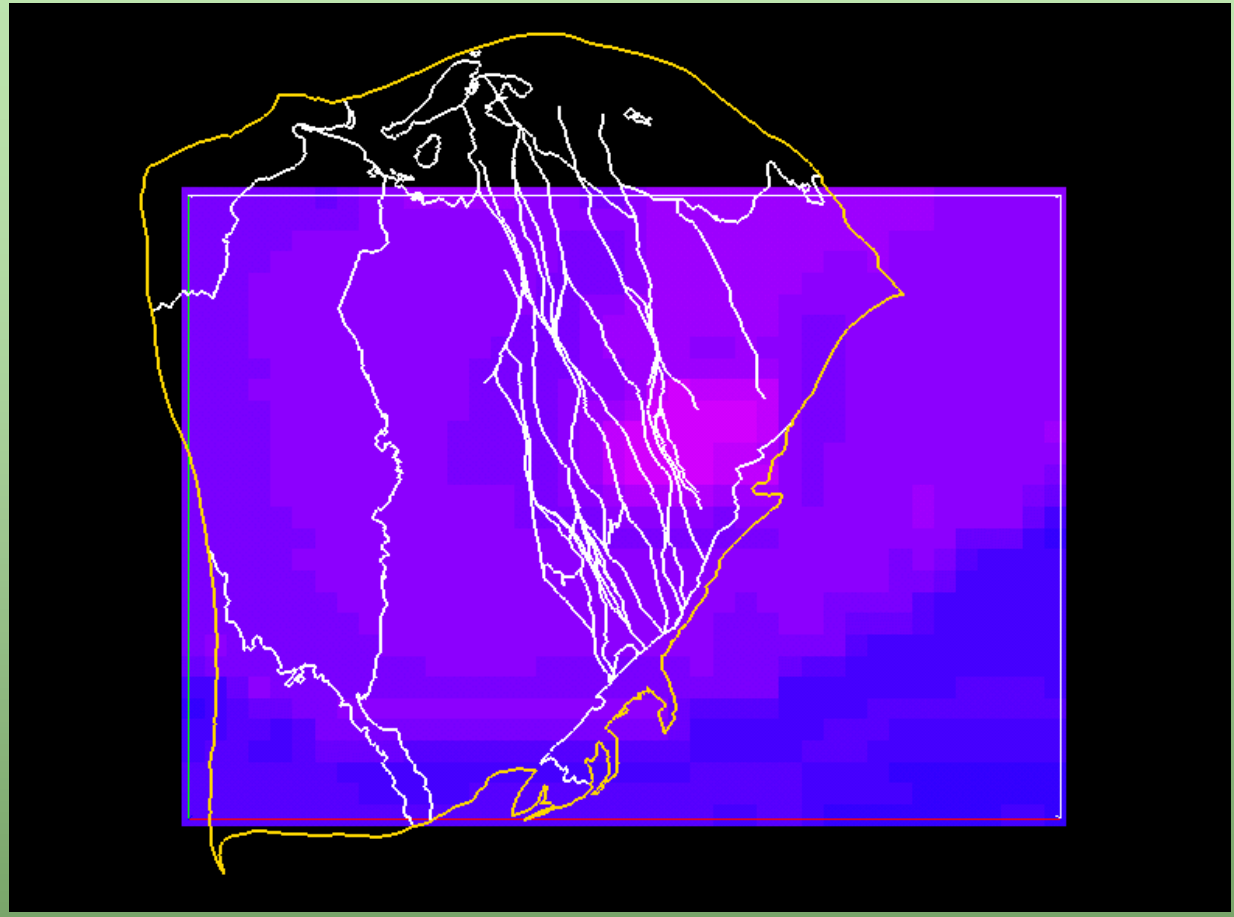

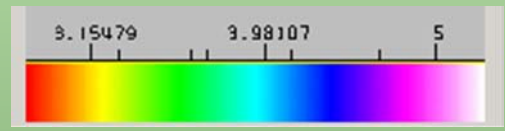

18:

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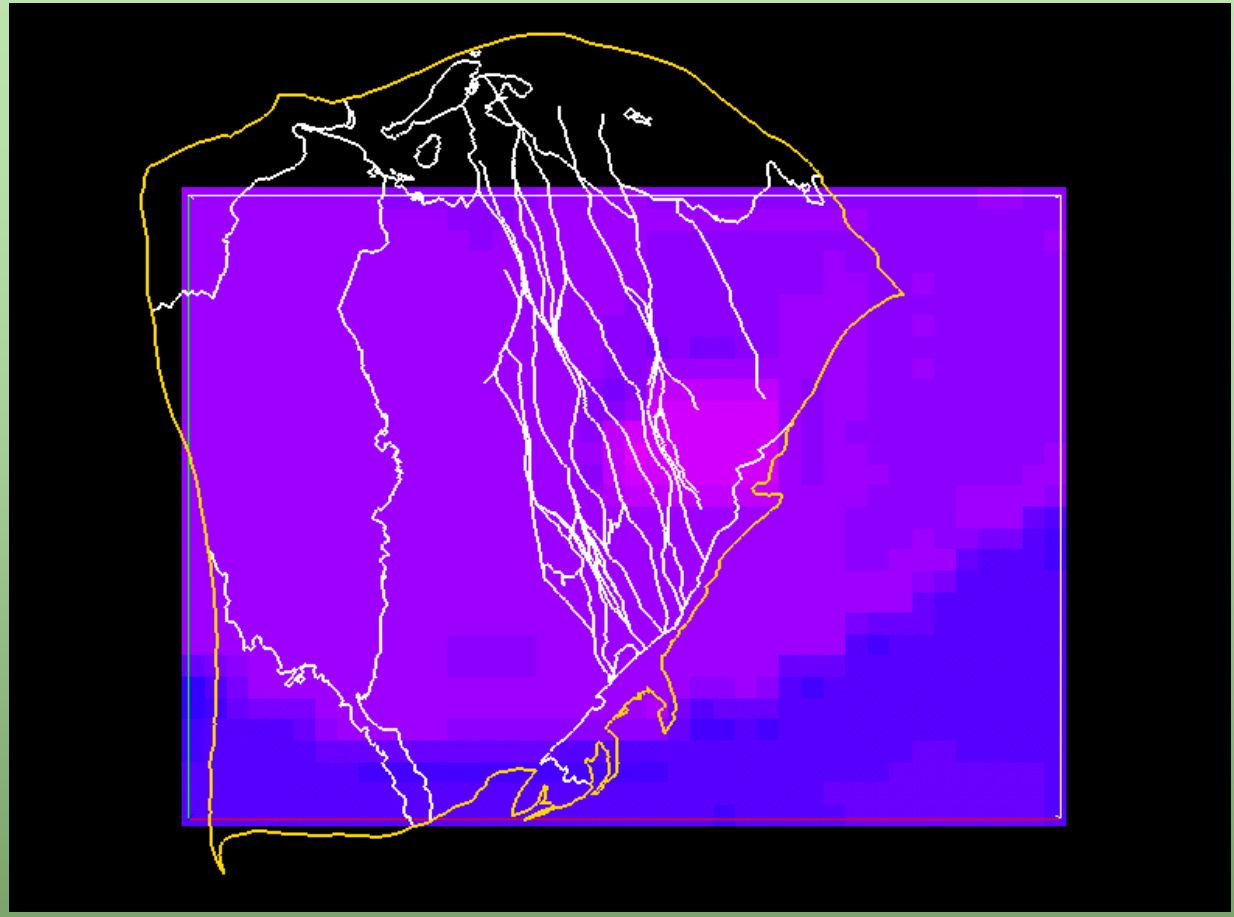

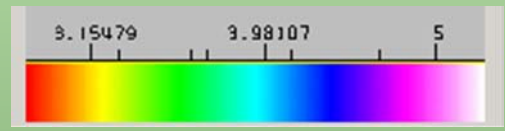

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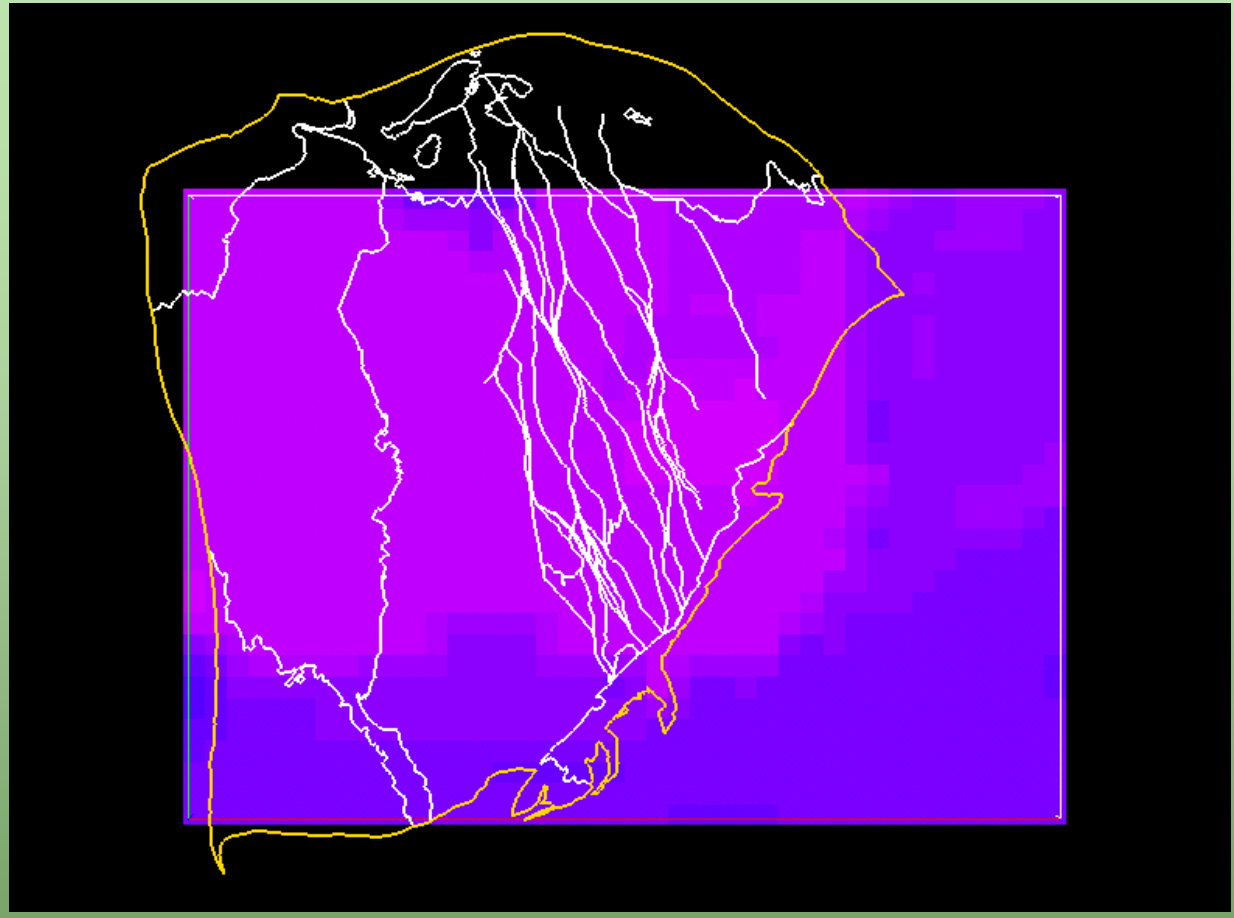

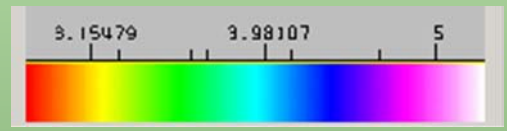

20: Beginning of the top of the ‘lower’ high velocity layer. Originates in the Narryer terrane in the NW Yilgarn.

Is this the top of the asthenosphere under the Yilgarn Craton?

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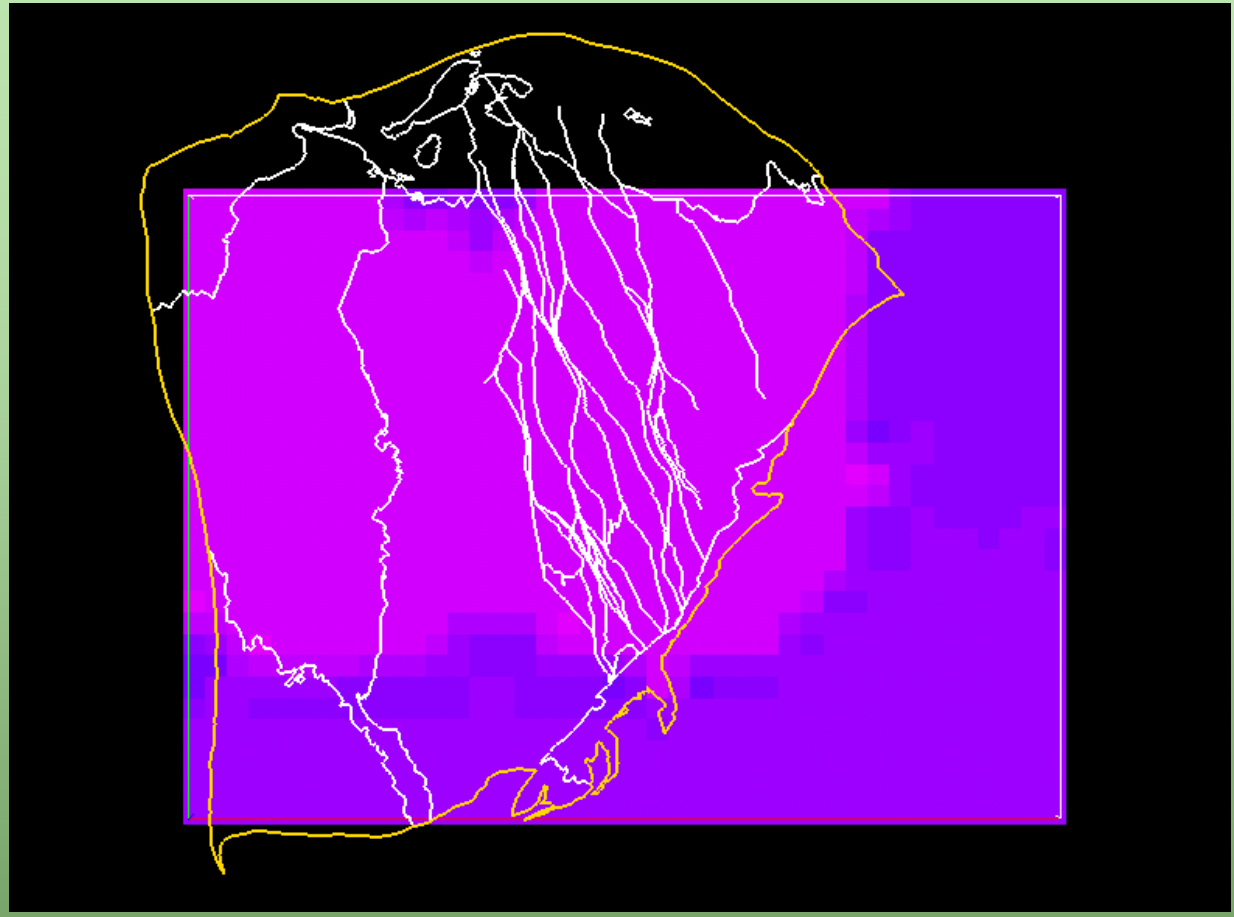

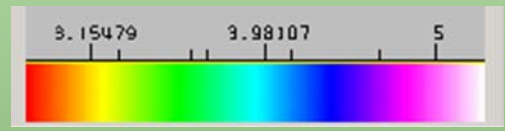

21:

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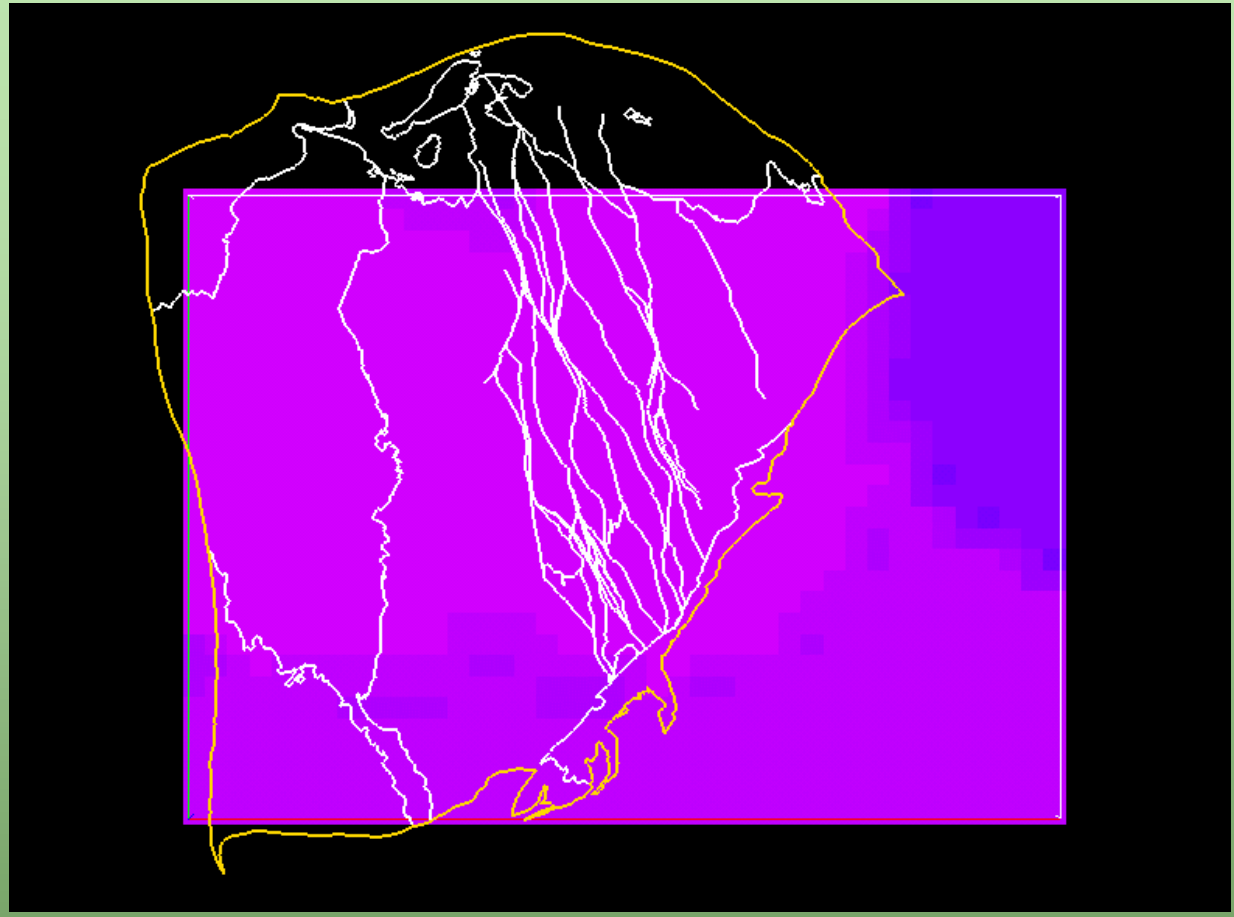

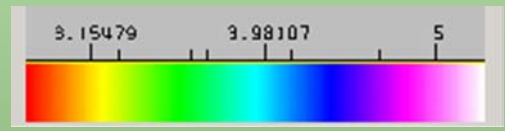

22: High velocity except for the far NE.

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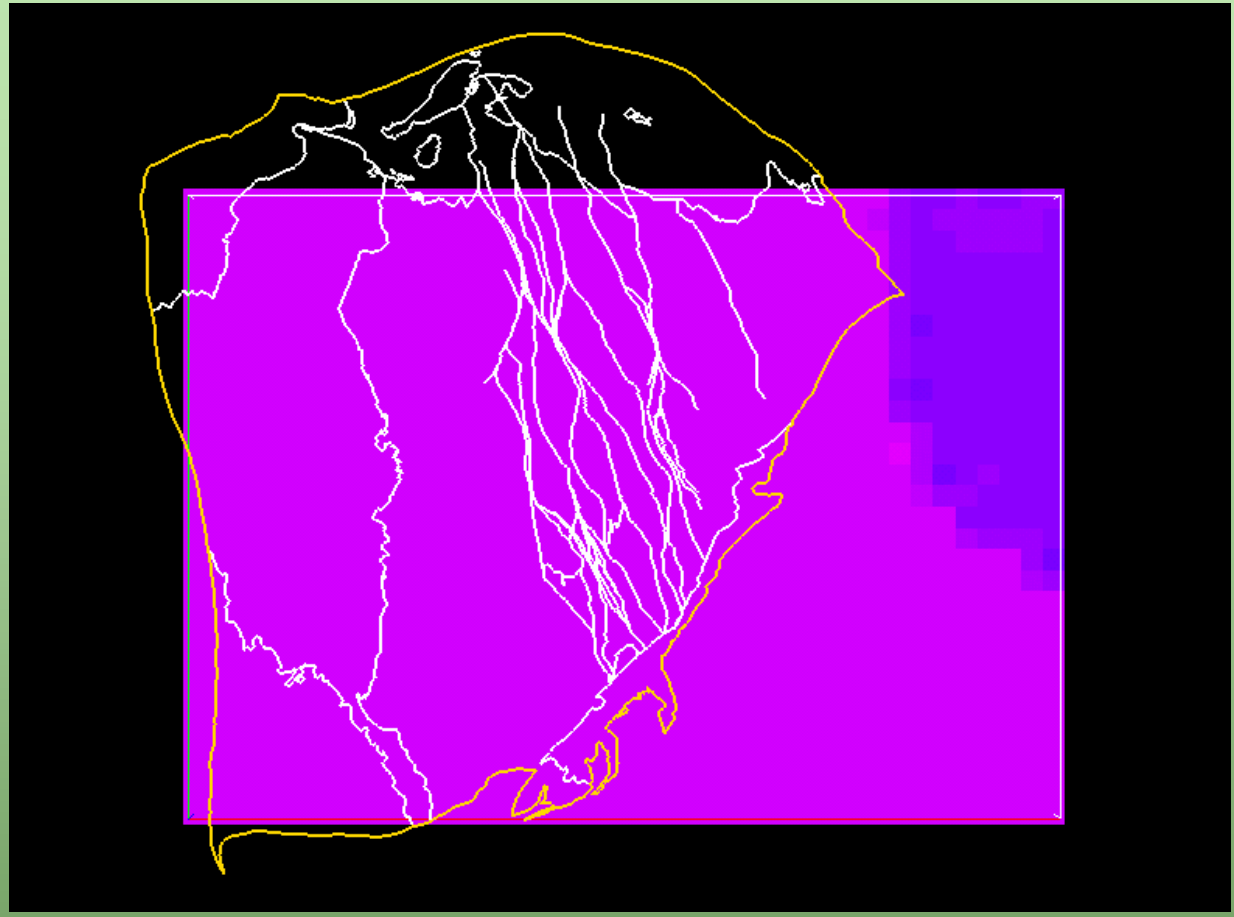

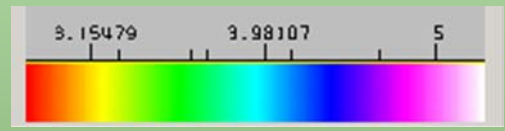

23: same as 22

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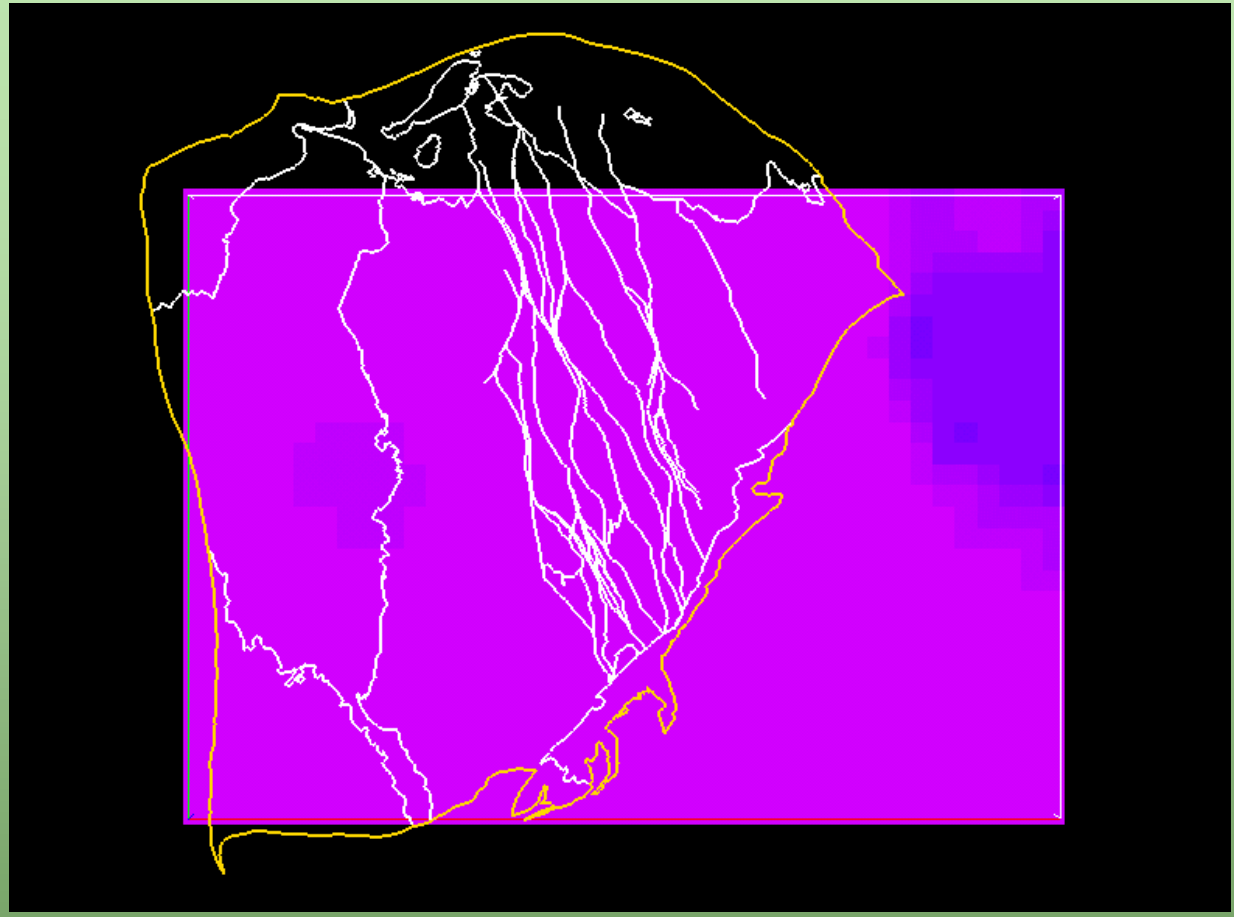

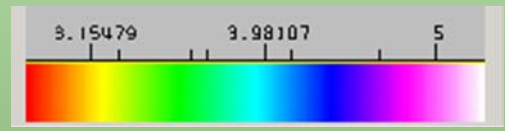

24: Within the asthenosphere

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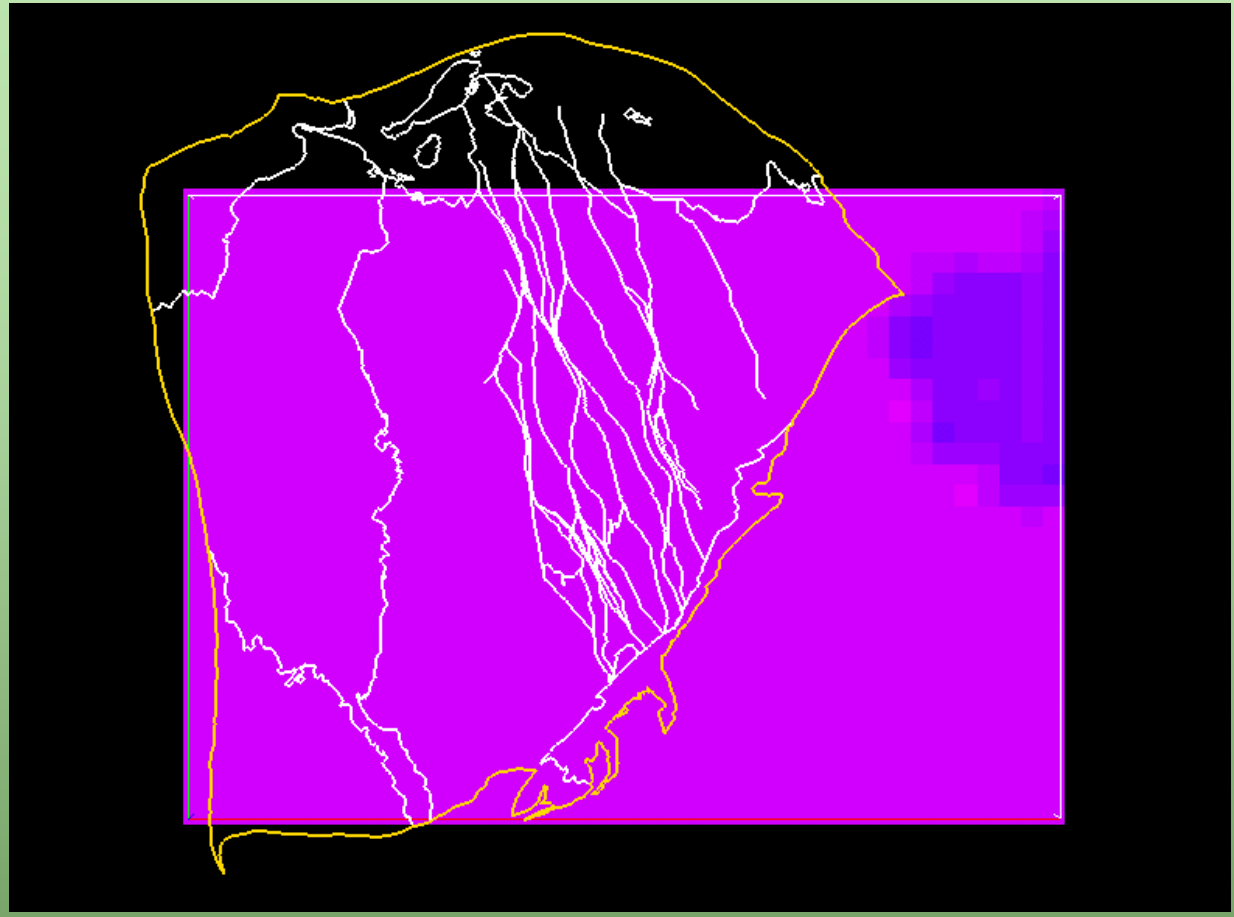

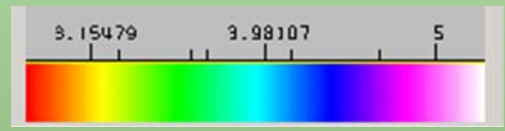

25:

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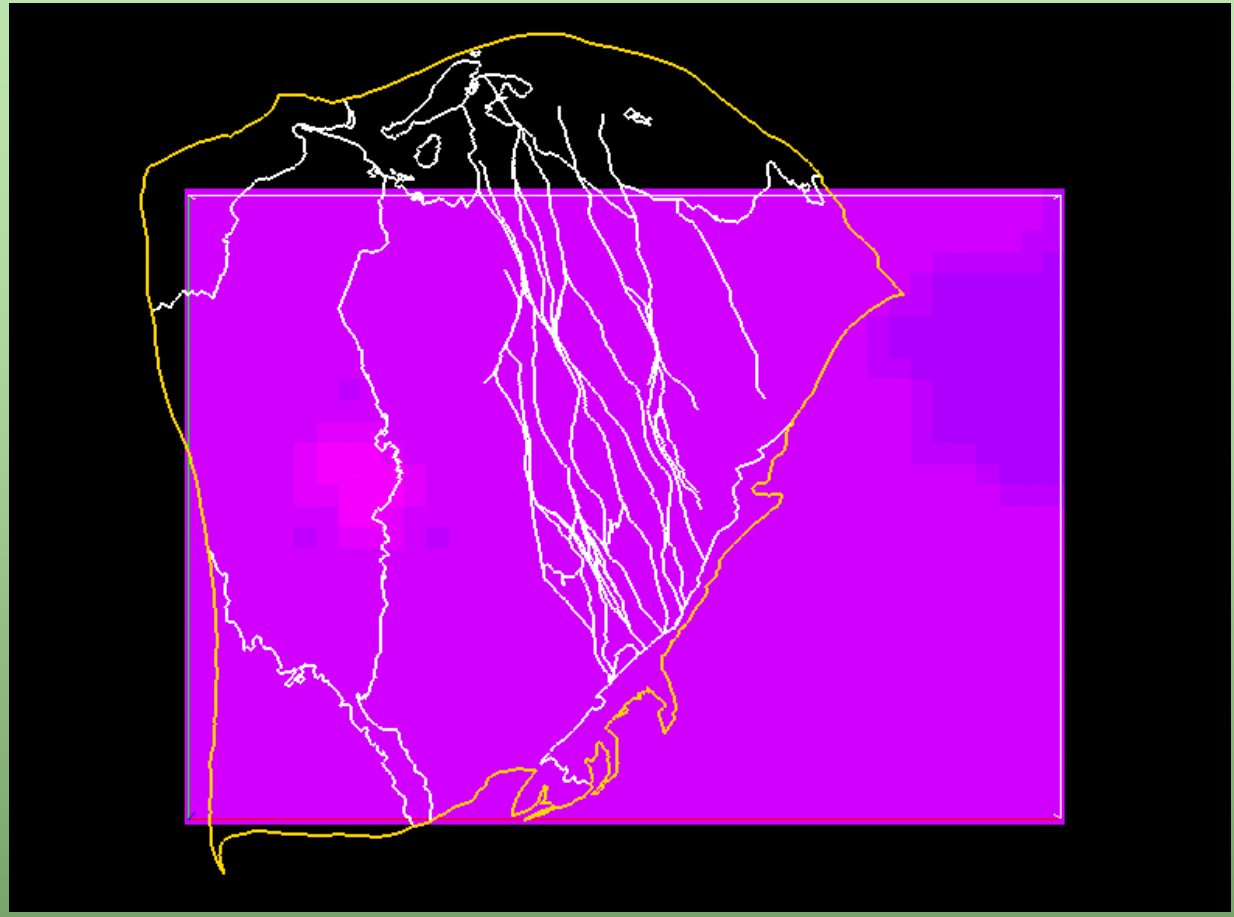
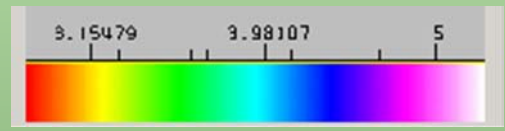
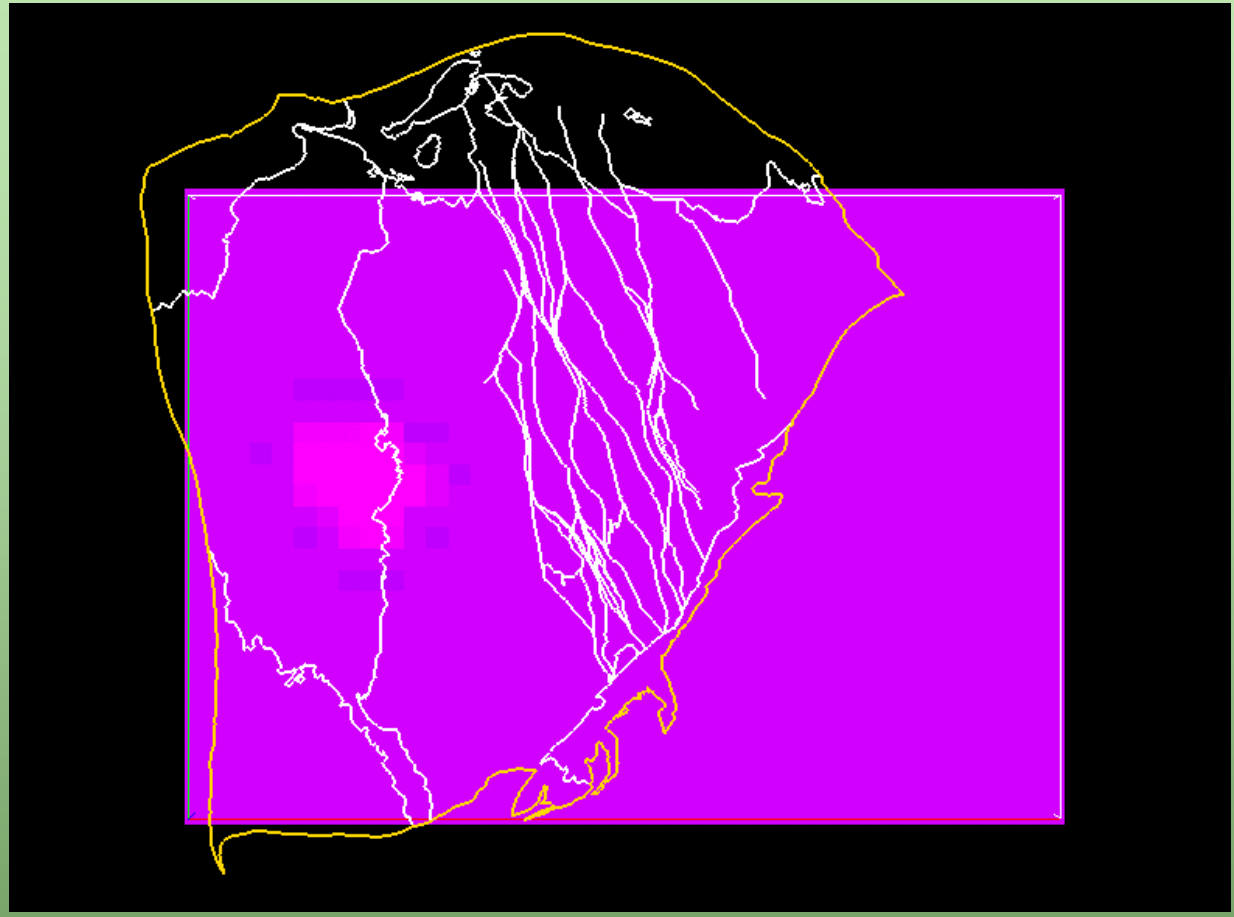
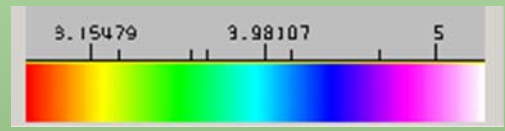




26:

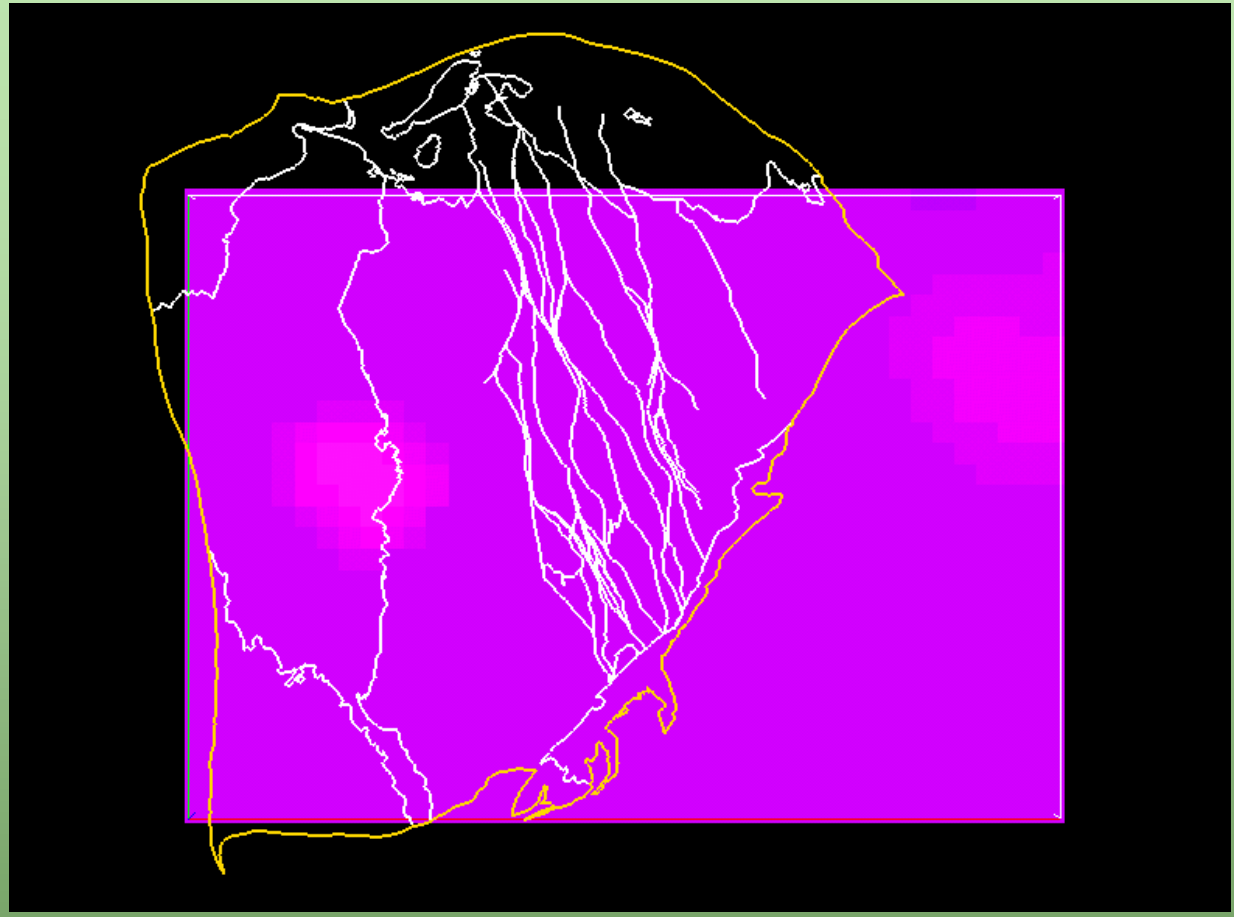
pmd*CRC

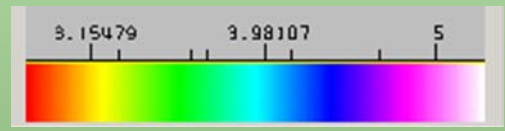




27: Possible artefact in from processing at these depths (sampling issue means that one fast velocity can bias the image on gridding).

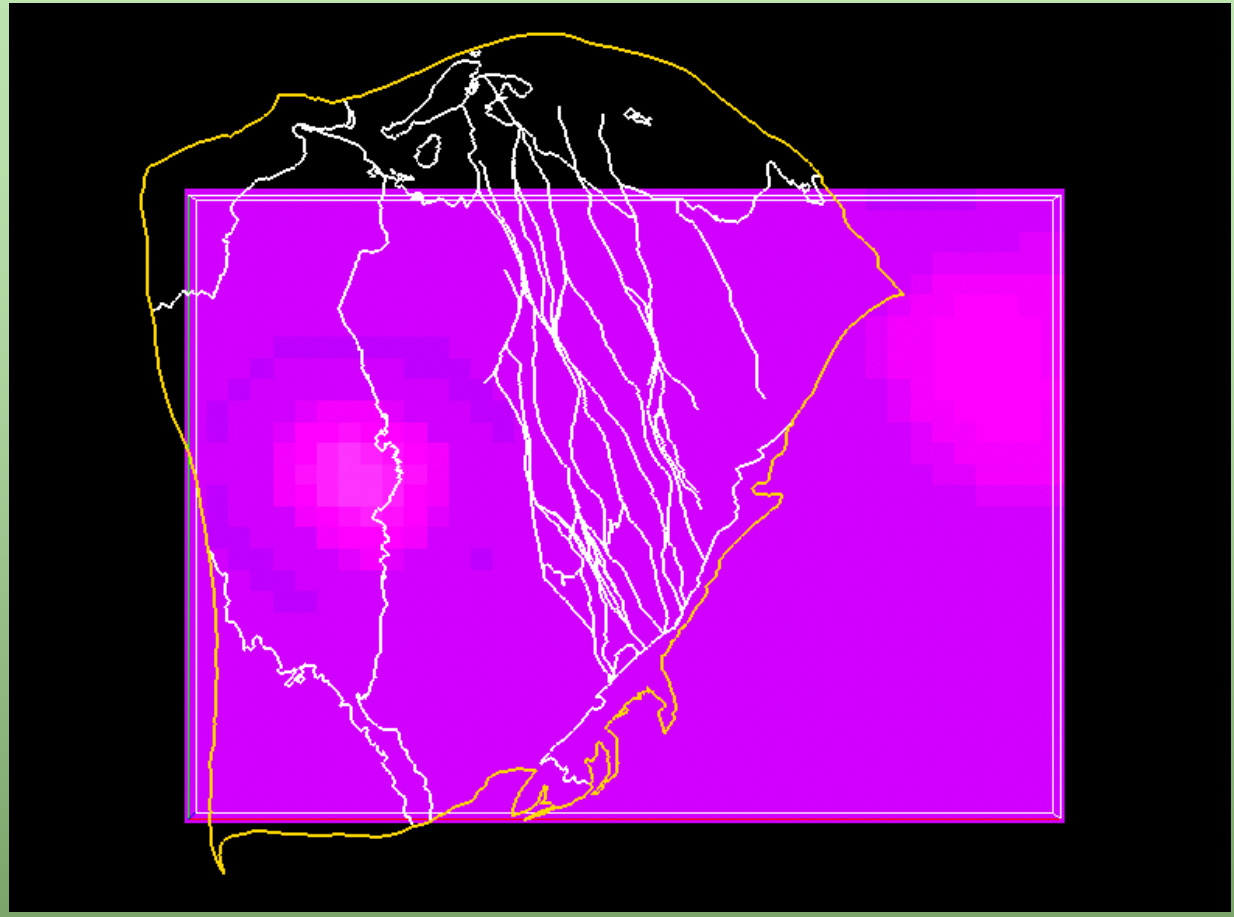
pmd*CRC

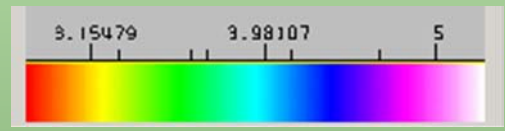




28:

pmd*CRC





29: