

Time-varying decadal trends from Arctic ozonesonde time series in the years 1994 to 2022: supplementary file

Estimated parameter	Prior mean	Prior Scale
σ_{level}	0	0
σ_{tr}	1/10% of O ₃ obs. mean	1
σ_{sea}	1% of O ₃ obs. mean	2
σ_{ar}	20% of O ₃ obs. mean	1
σ_{pro}	0	0

Table S1. Prior values for the auxiliary model parameters estimated by MCMC.

	Alert	Eureka	Resolute	Ny Ålesund	Ittoqqortoormiit	Sodankylä
L4	0.20	0.20	0.05	0.30	0.10	0.10
L3	0.40	0.35	0.30	0.60	0.10	0.25
L2	0.20	0.30	0.20	0.35	0.20	0.10
L1	0.05	0.30	0.20	0.35	0.20	0.20

Table S2. Initial values for the auto-regressive component.

References

1. Pawlowicz, R. M_map: A mapping package for matlab, version 1.4m [Computer software] (last accessed: 4 april 2023) (2020). www.eoas.ubc.ca/~rich/map.html.

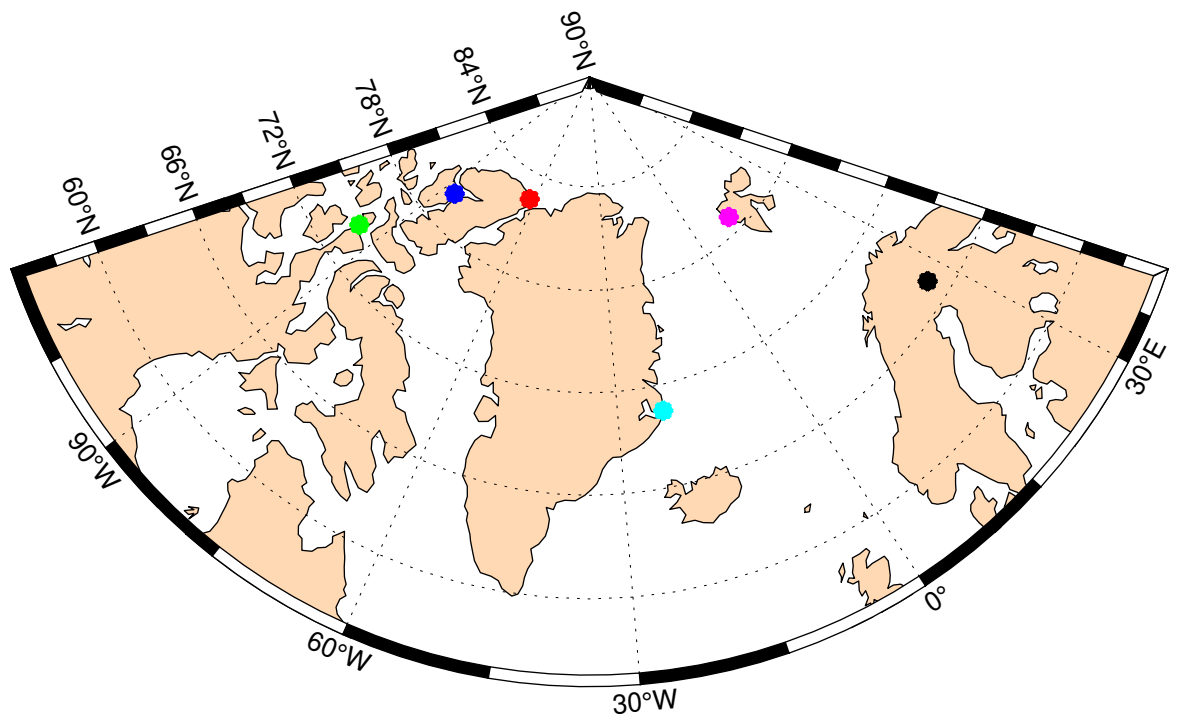


Figure S1. Geographic locations of the Arctic ozonesonde stations. This figure was generated by using the Matlab library `M_Map`¹. The colored dots marks the stations: Alert (red), Eureka (blue), Resolute (green), Ny Ålesund (magenta), Ittoqqortoormiit (Scoresbysund, cyan) and Sodankylä (black).

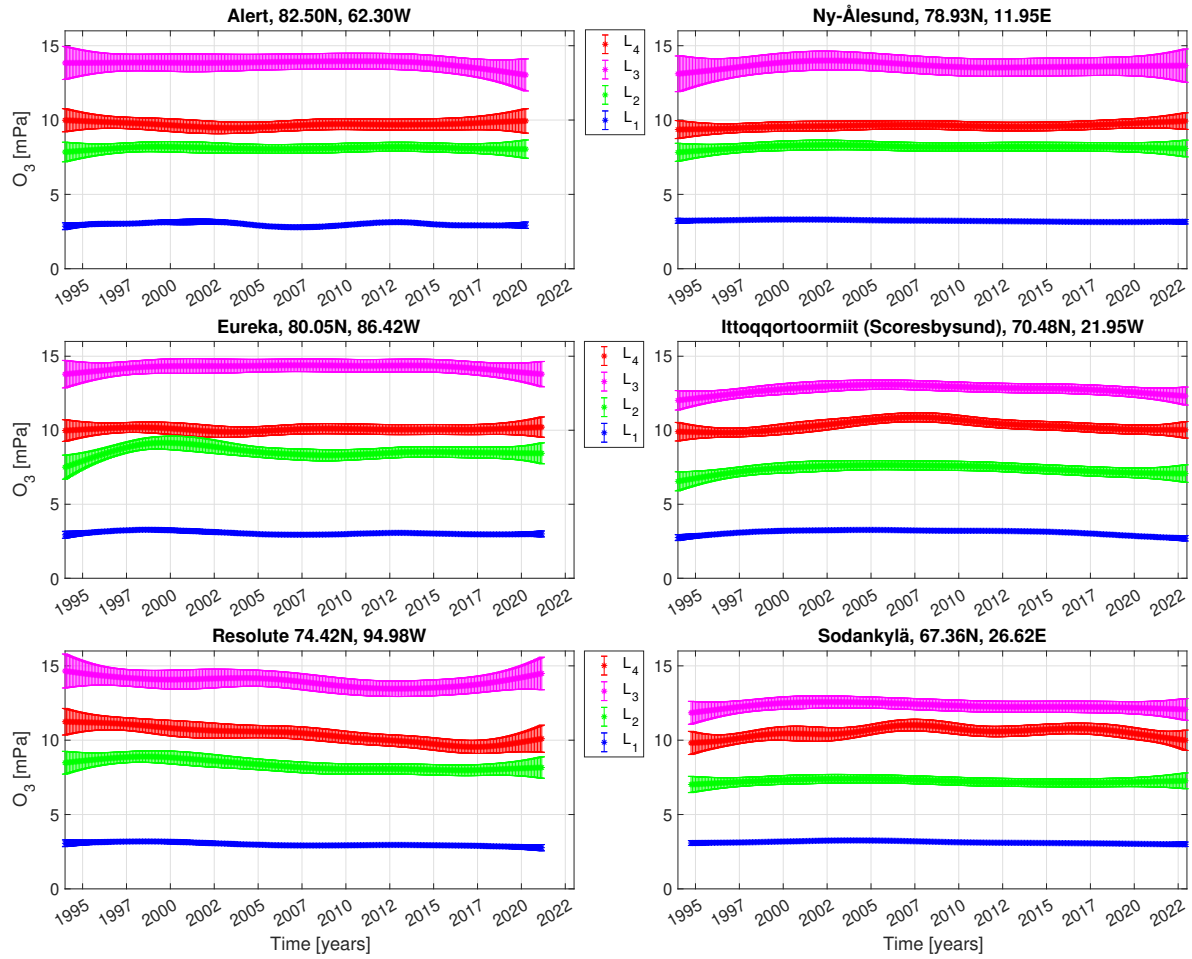


Figure S2. Local level components from the DLM fitted to the time series. The altitude layers are: L₁ surface – tropopause; L₂ tropopause – 150 hPa; L₃ 150 – 40; L₄ 40 – 15.

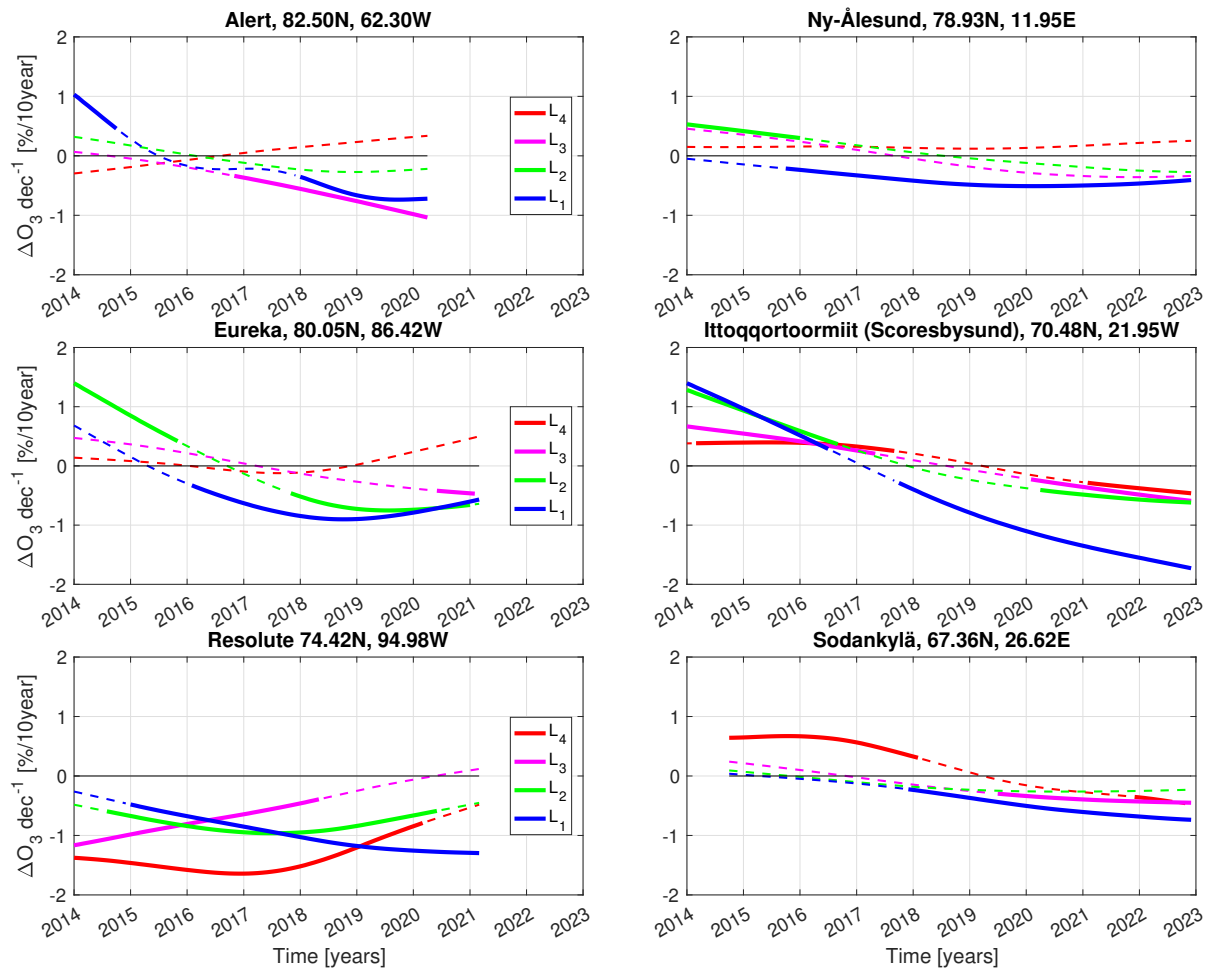


Figure S3. Time-varying 20 year trends with de-trended solar cycle proxy. Thick solid lines indicates 95% statistical significant while thin dashed lines indicates not significant. The altitude layers are: L₁ surface – tropopause; L₂ tropopause – 150 hPa; L₃ 150 – 40; L₄ 40 – 15.

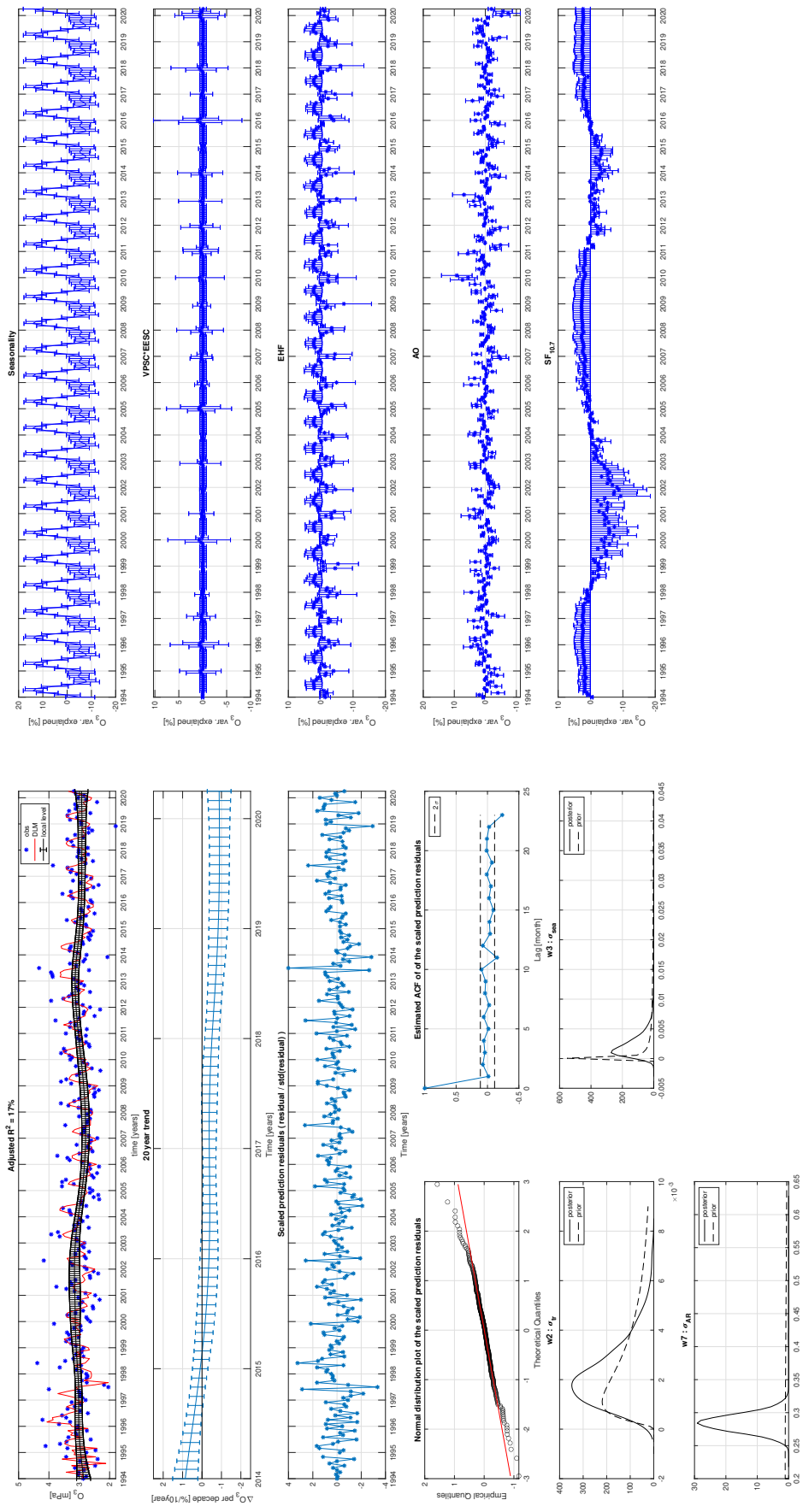


Figure S4. Alert at L_1 altitude layer.

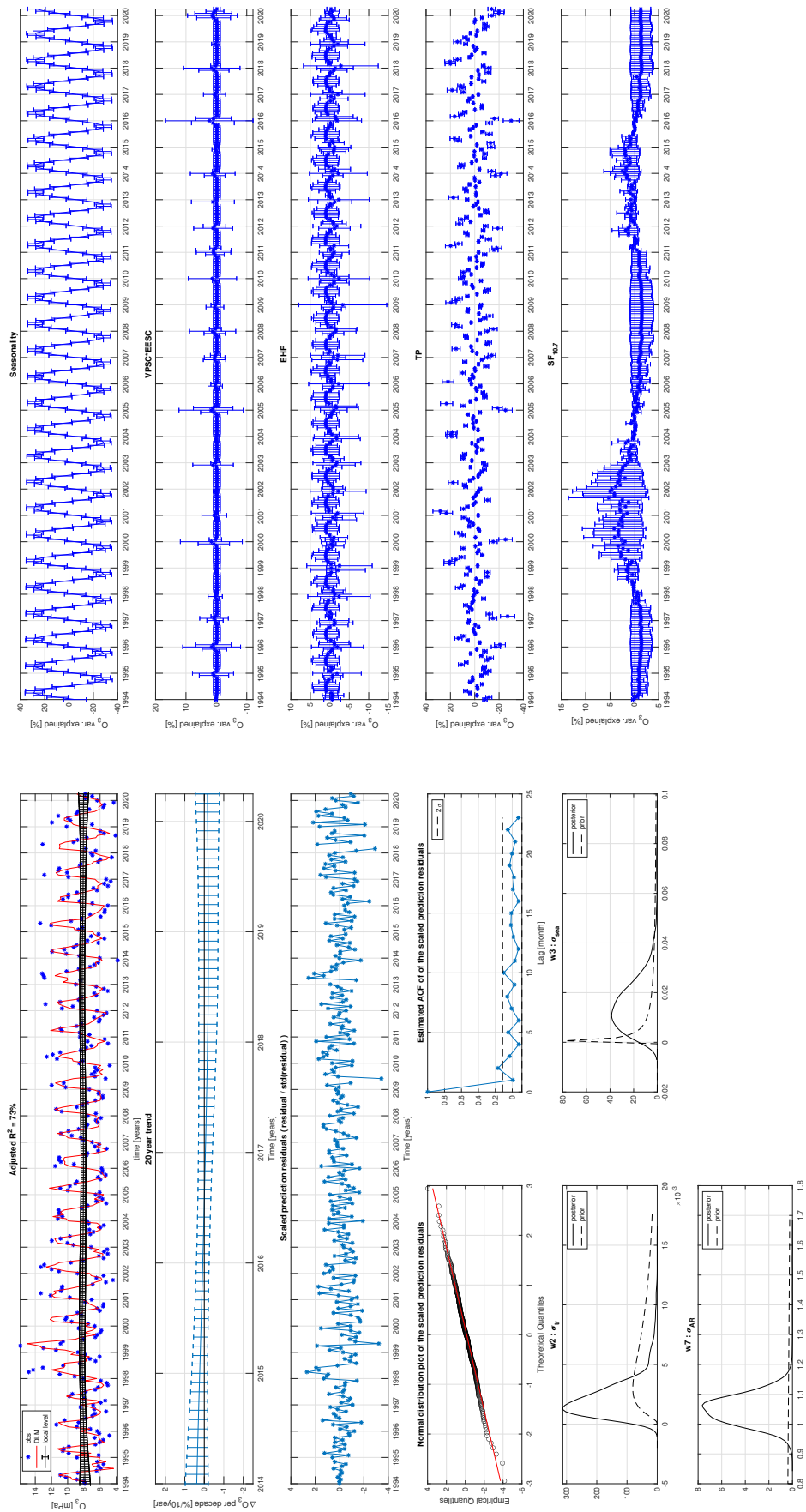


Figure S5. Alert at L_2 altitude layer.

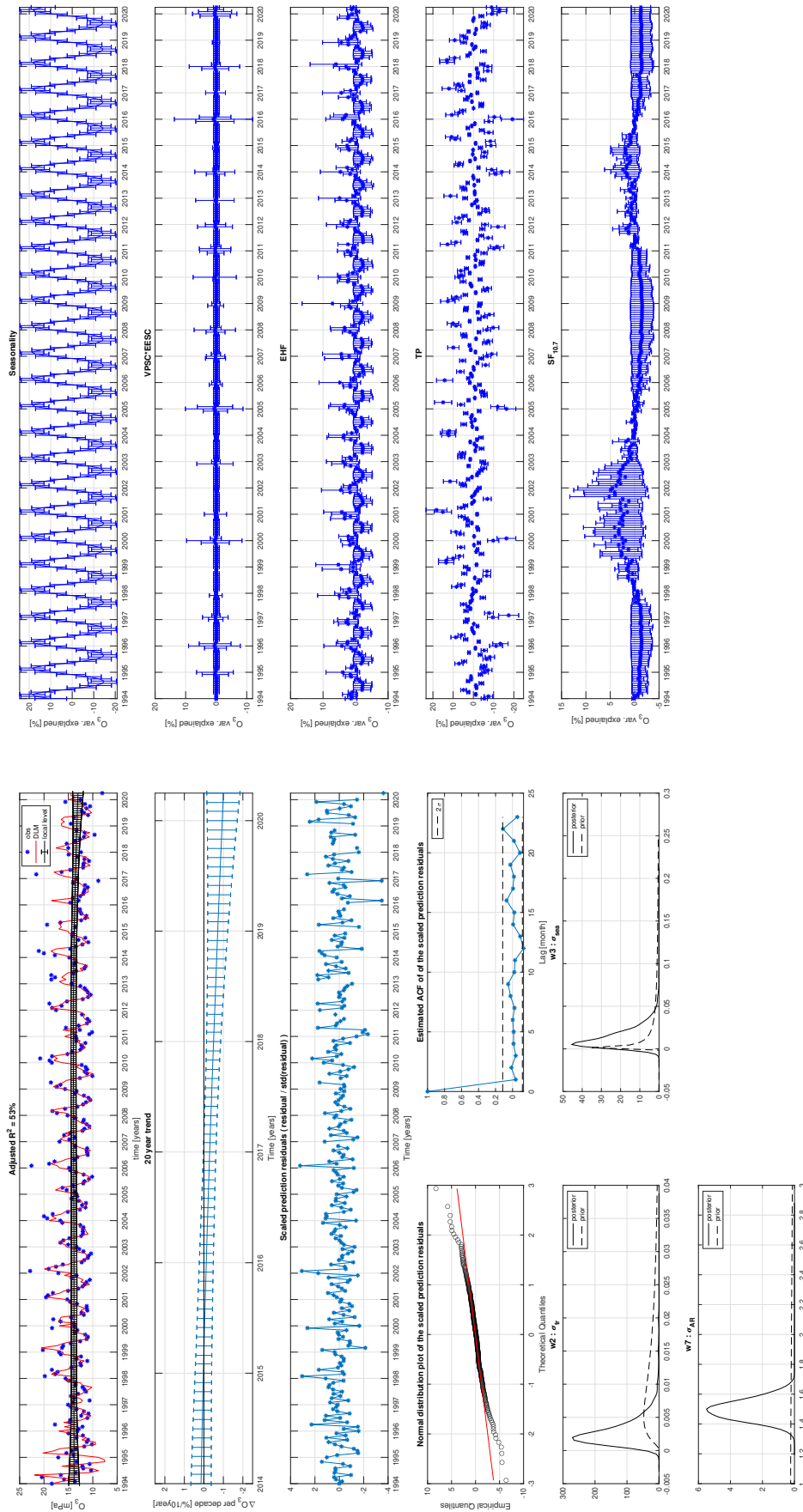


Figure S6. Alert at L3 altitude layer.

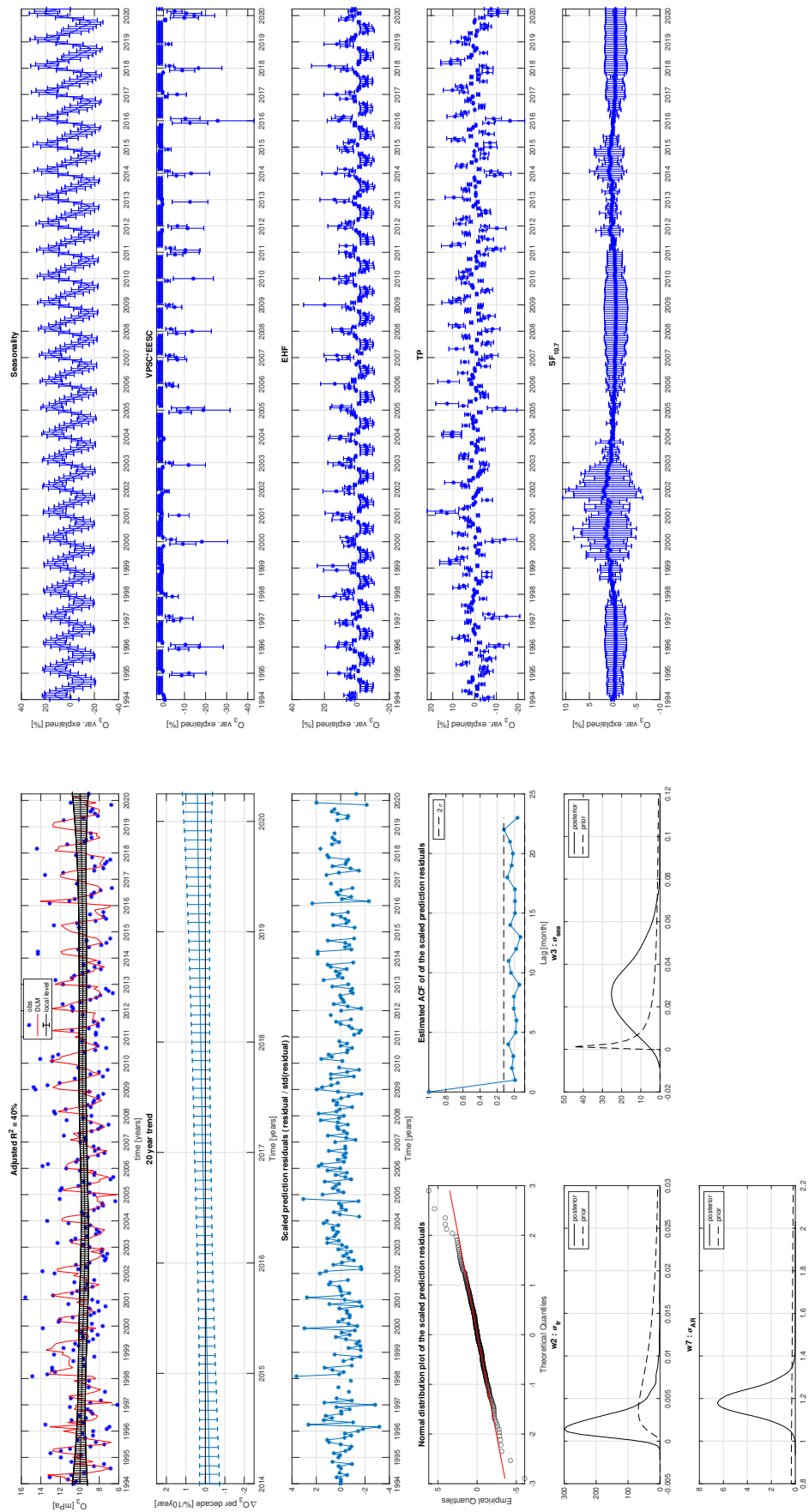


Figure S7. Alert at L_4 altitude layer.

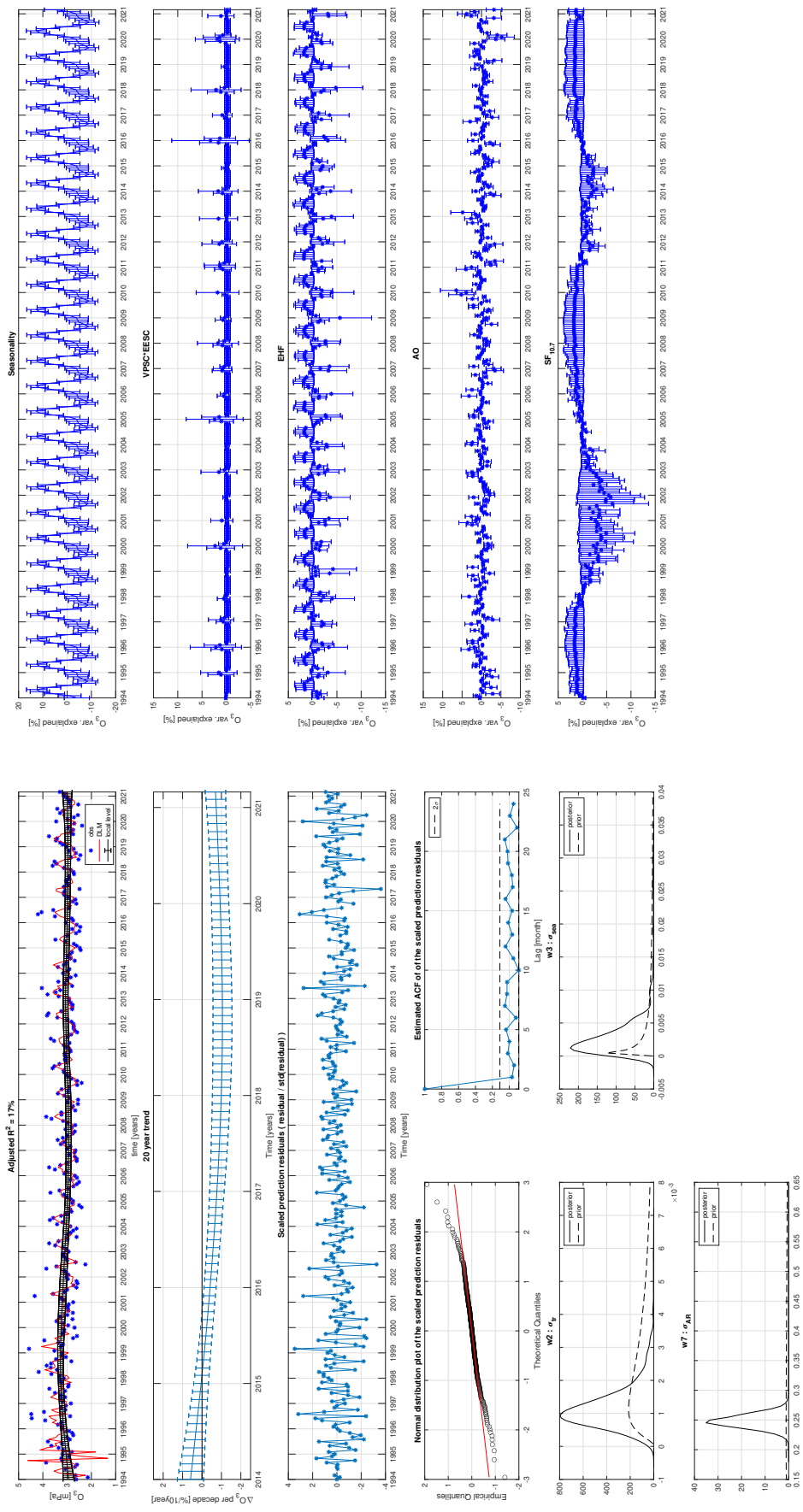


Figure S8. Eureka at L_1 altitude layer

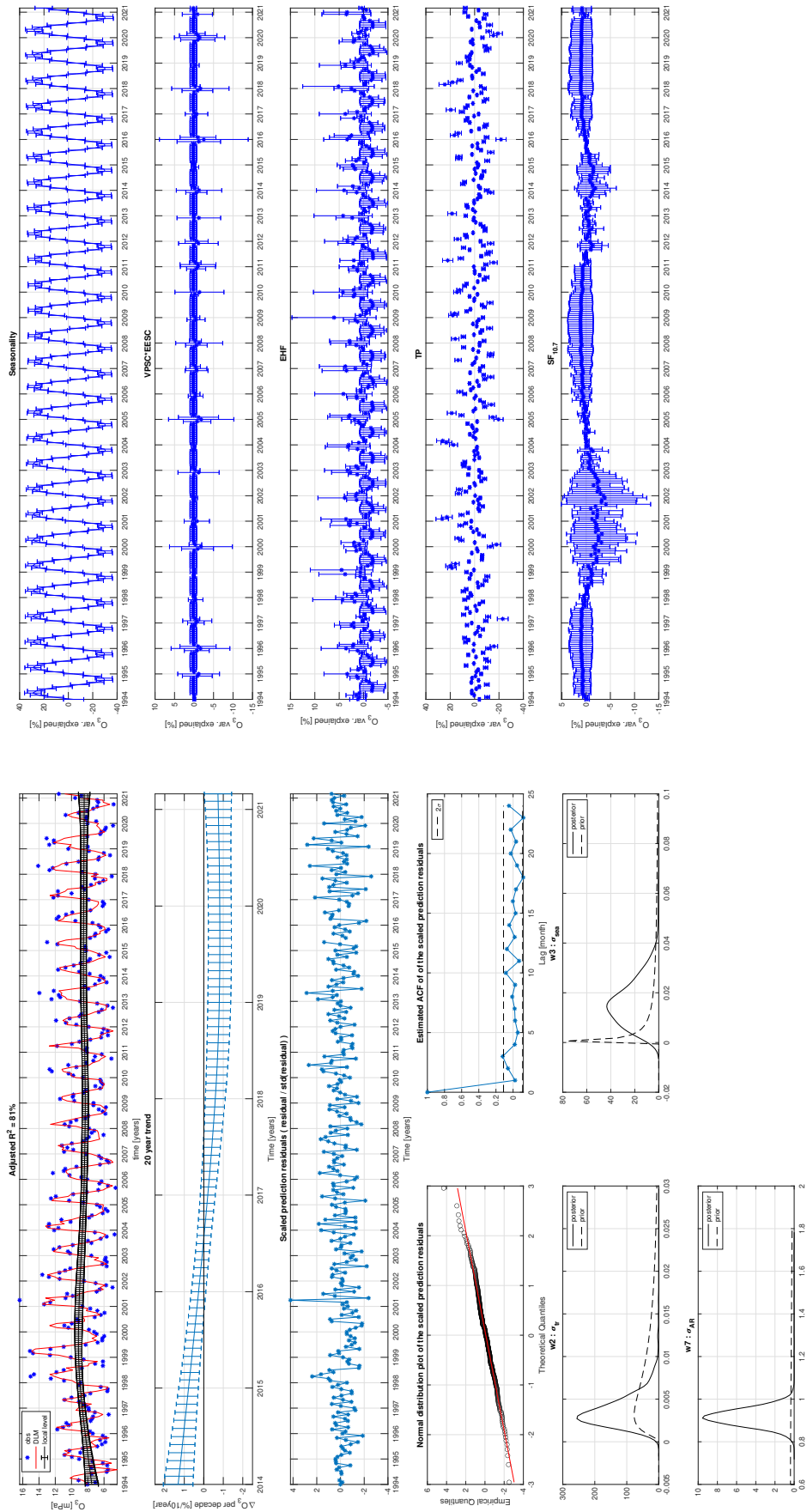


Figure S9. Eureka at L₂ altitude layer

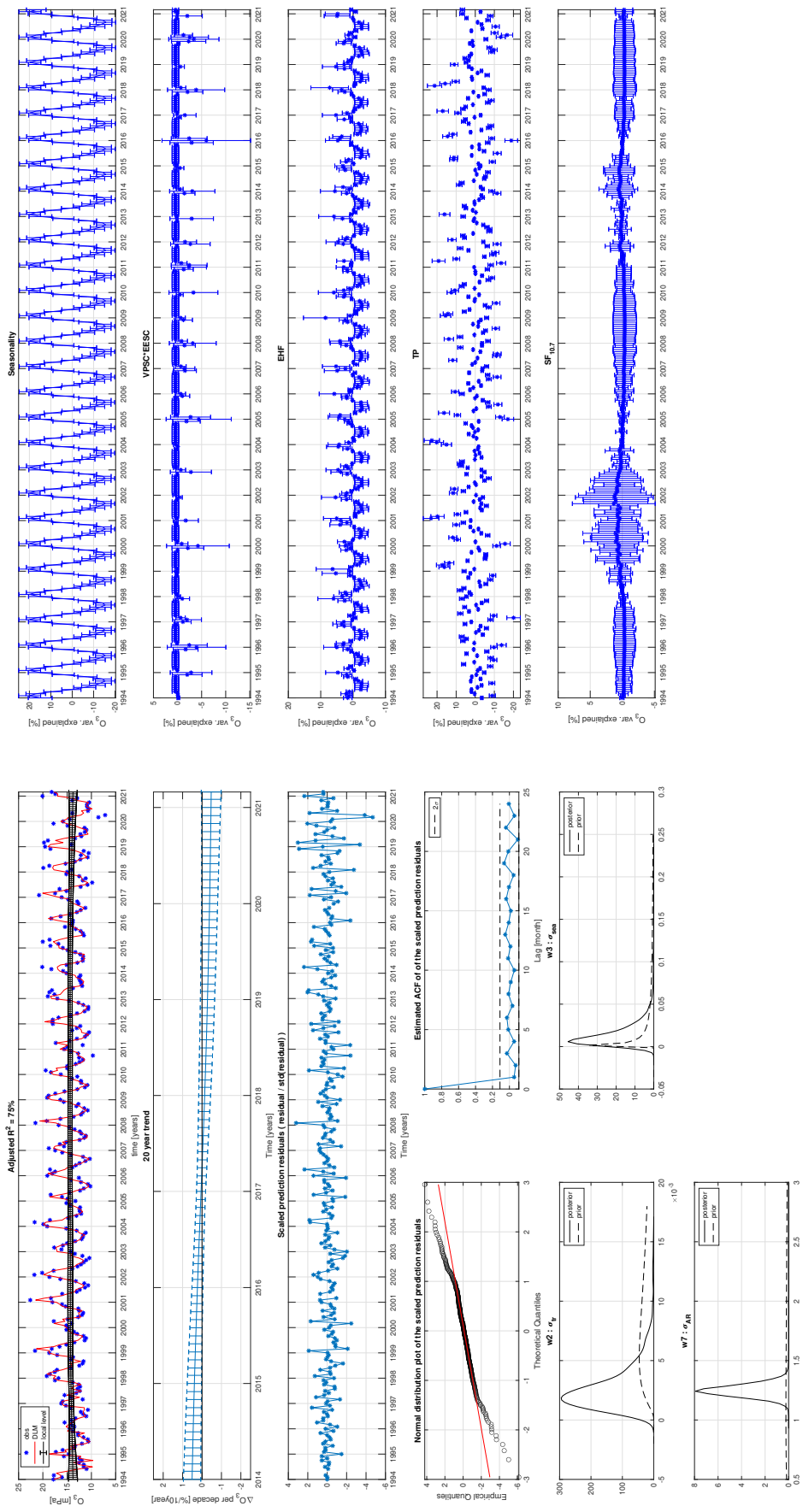


Figure S10. Eureka at L₃ altitude layer

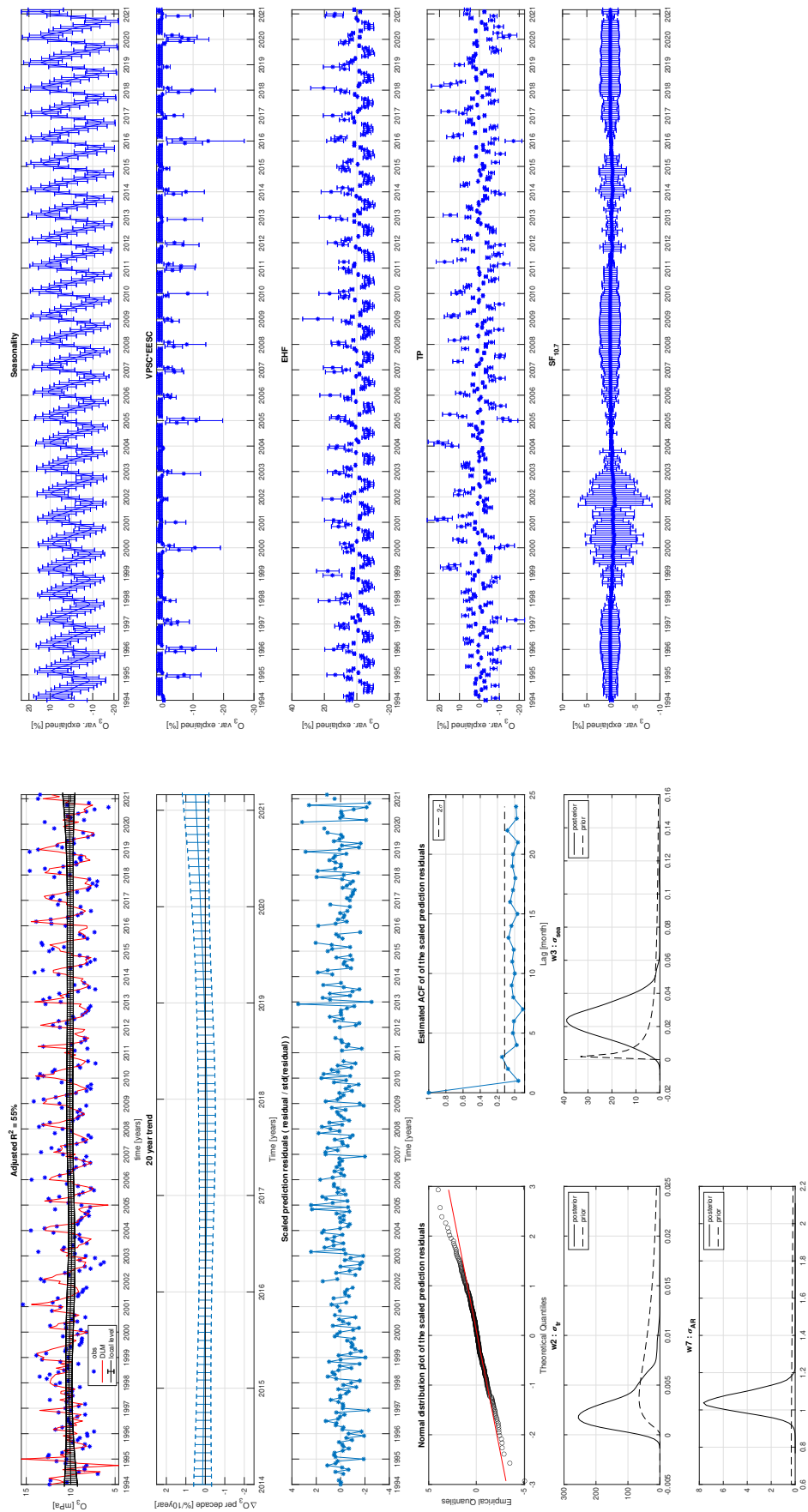


Figure S11. Eureka at L₄ altitude layer

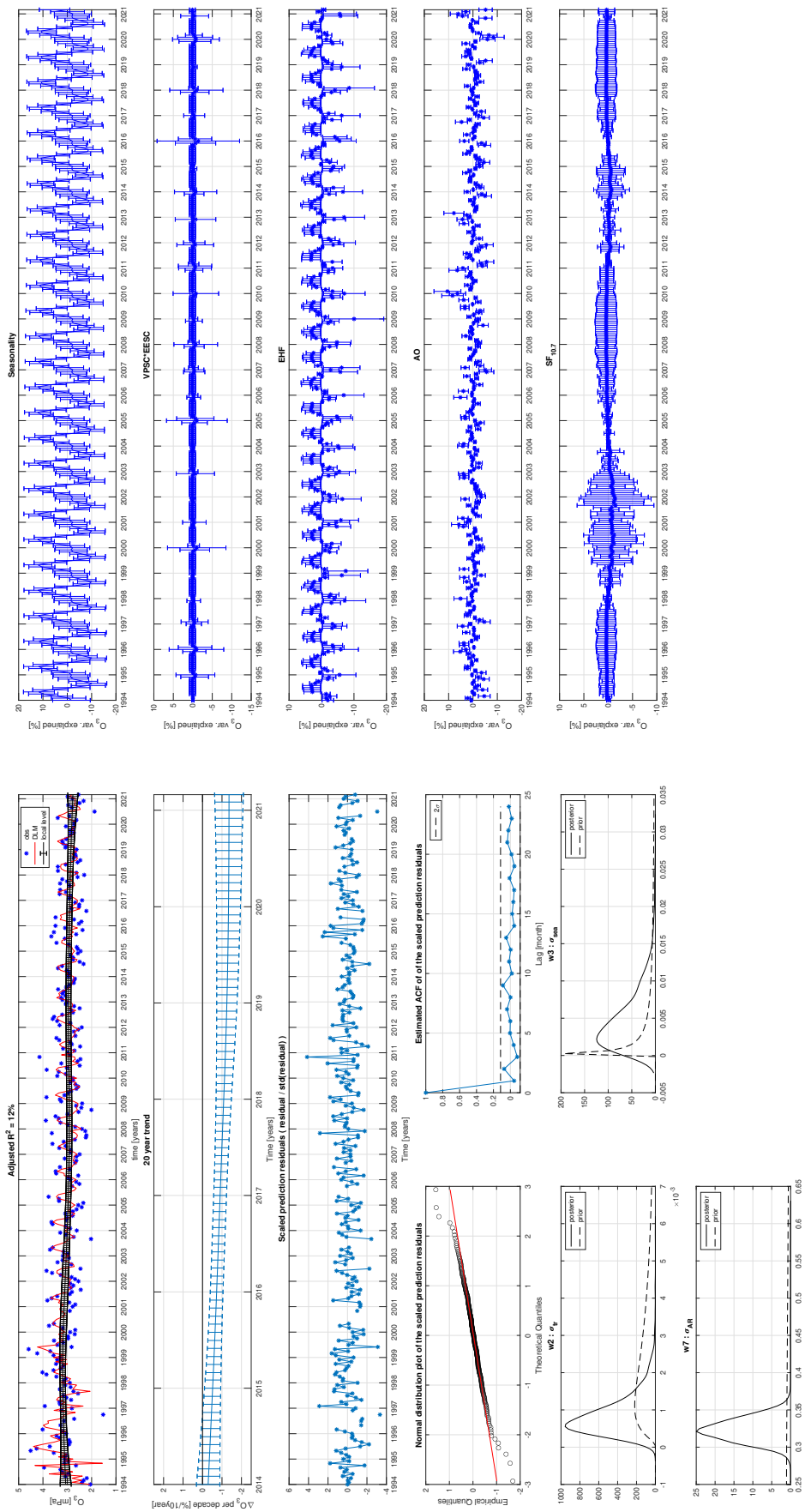


Figure S12. Resolute at L_1 altitude layer

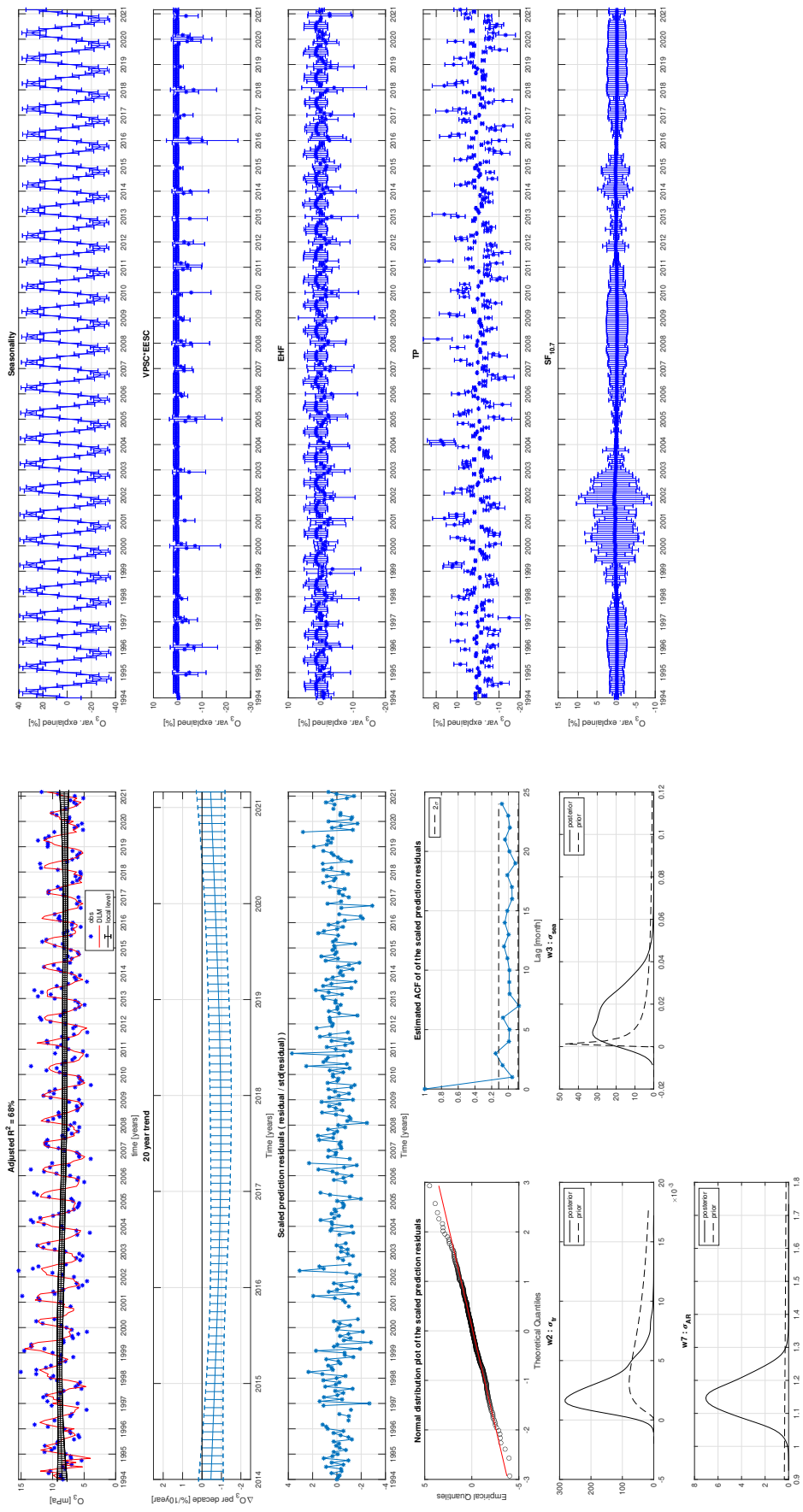


Figure S13. Resolute at L₂ altitude layer

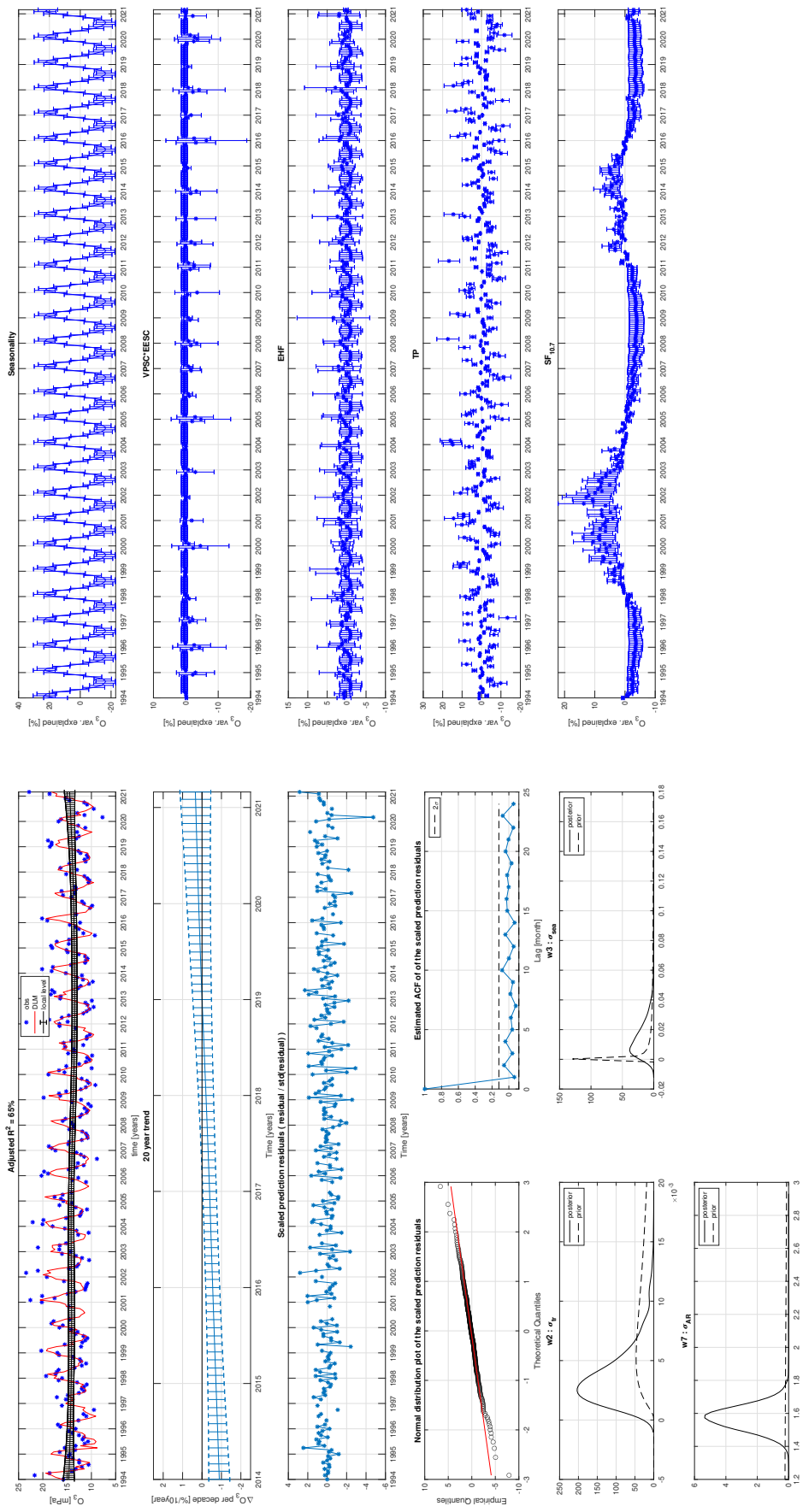


Figure S14. Resolute at L3 altitude layer

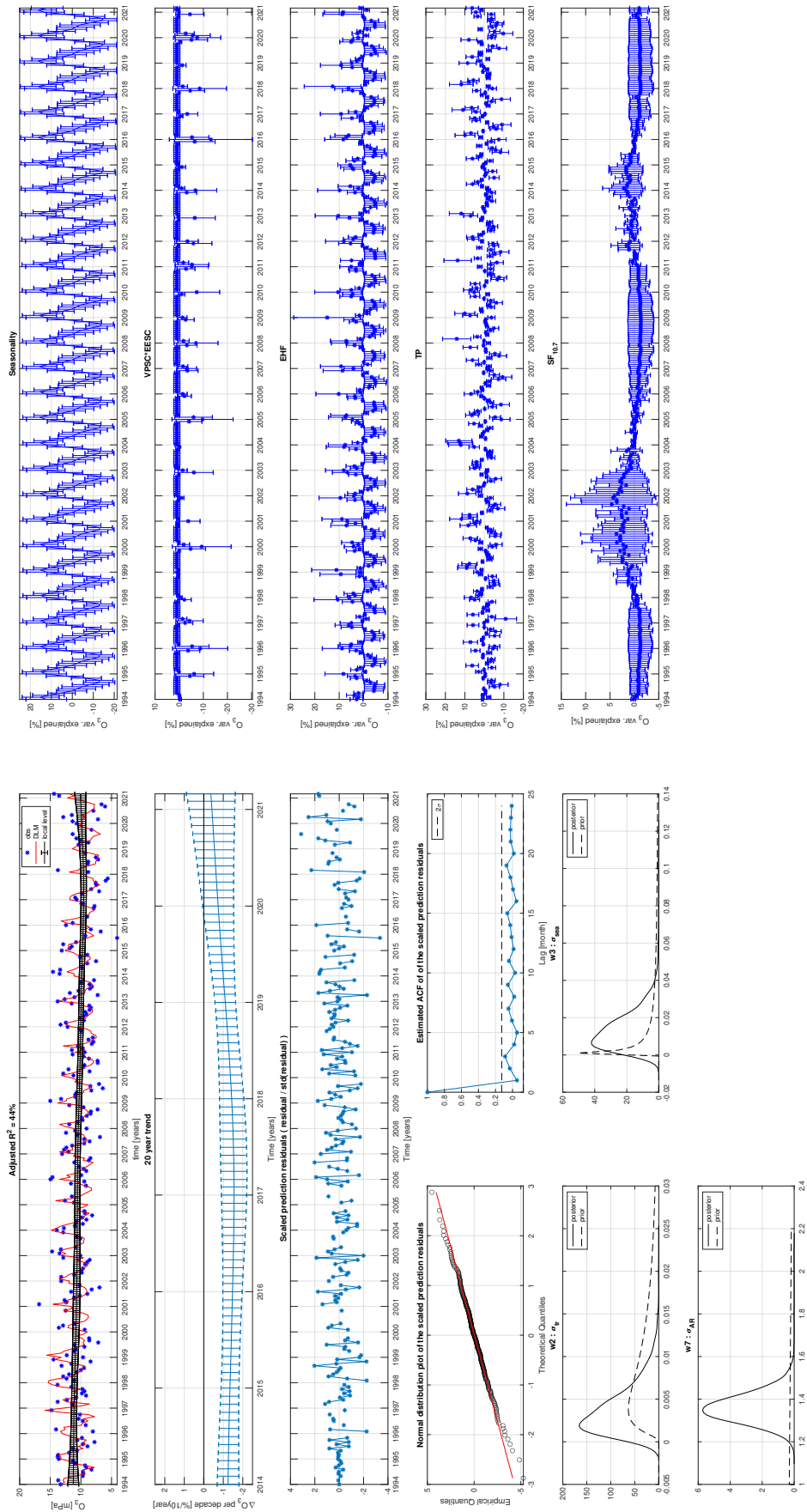


Figure S15. Resolute at L₄ altitude layer

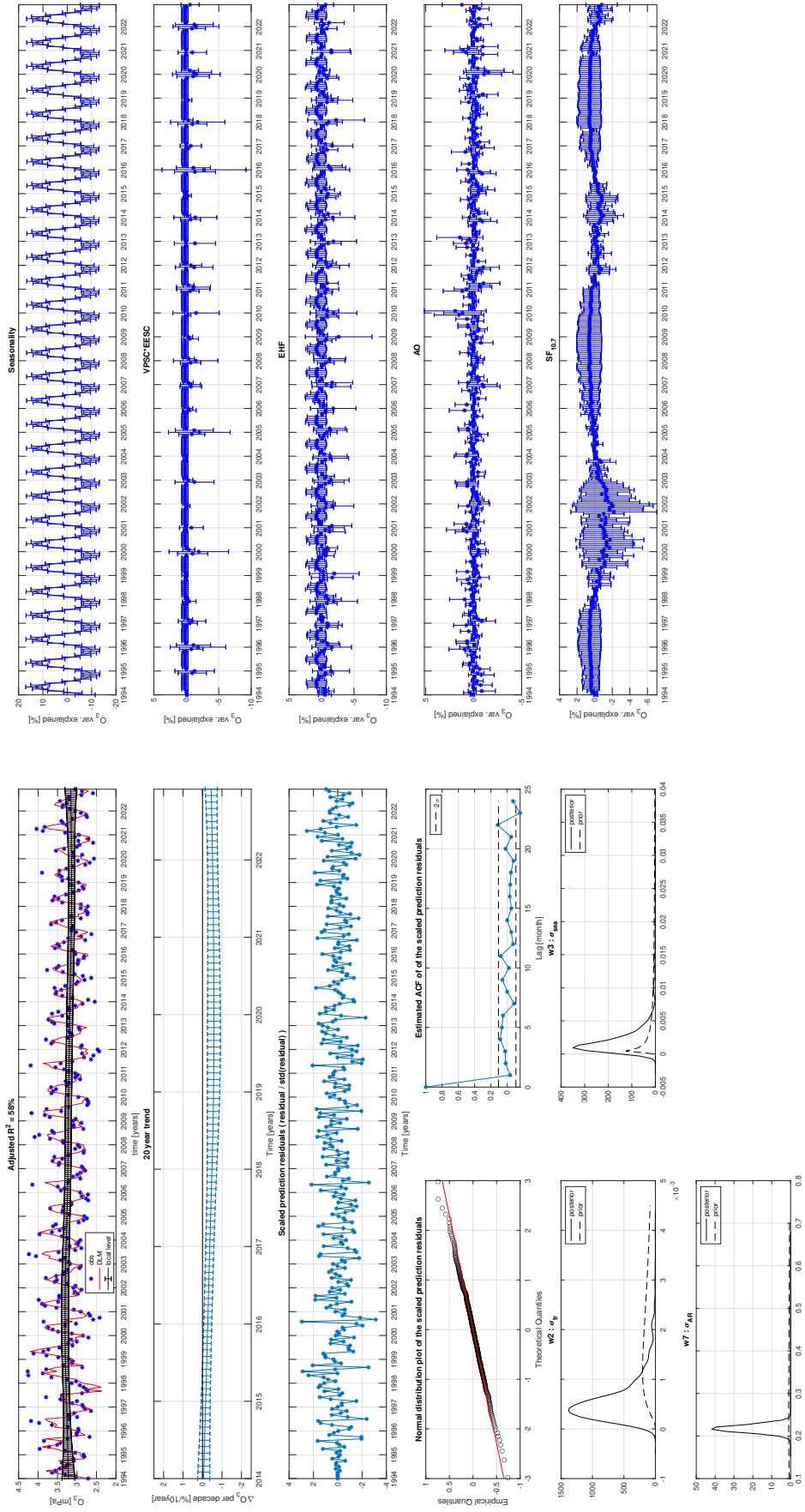


Figure S16. Ny-Ålesund at L_1 altitude layer

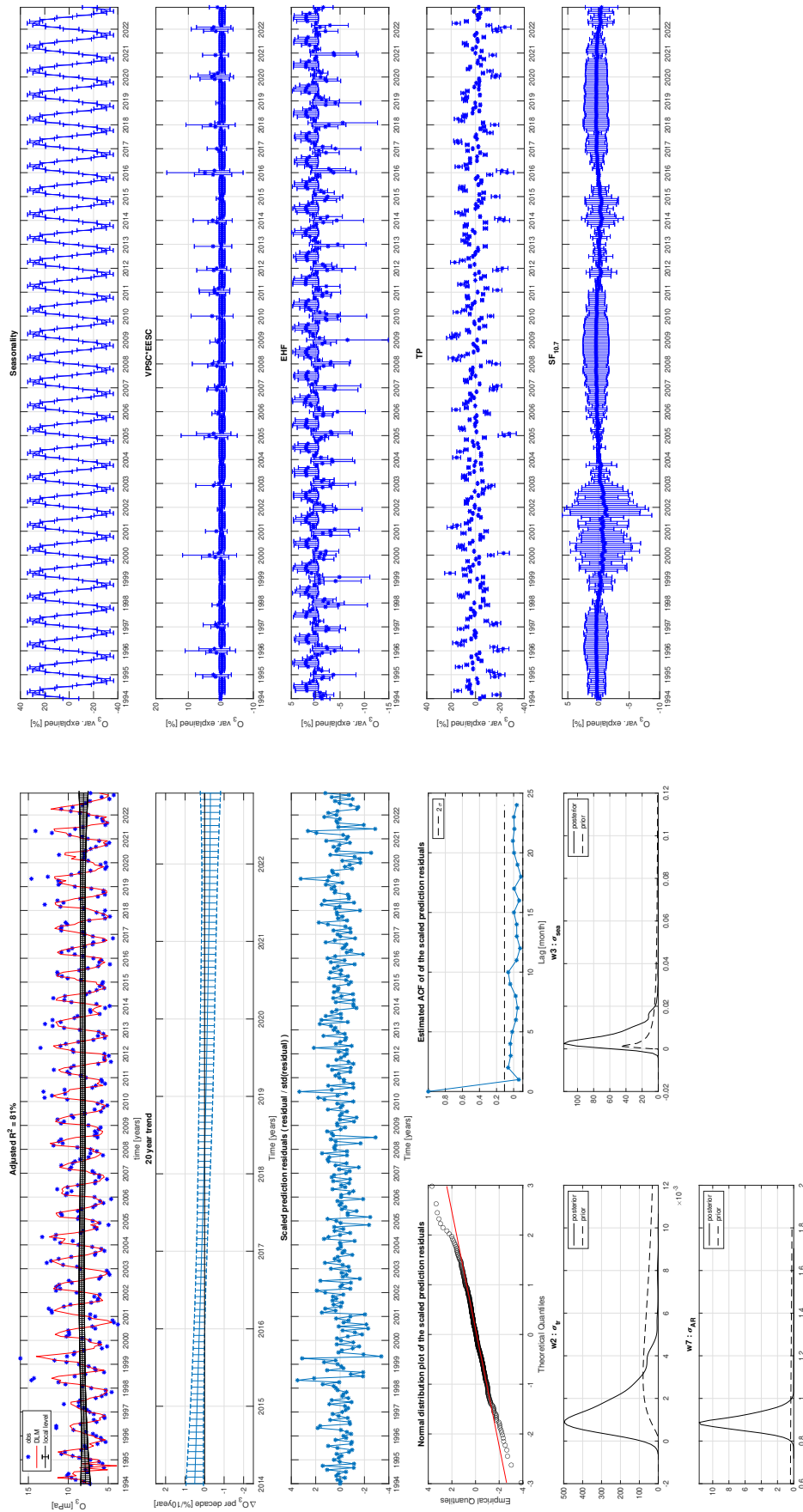


Figure S17. Ny-Ålesund at L₂ altitude layer

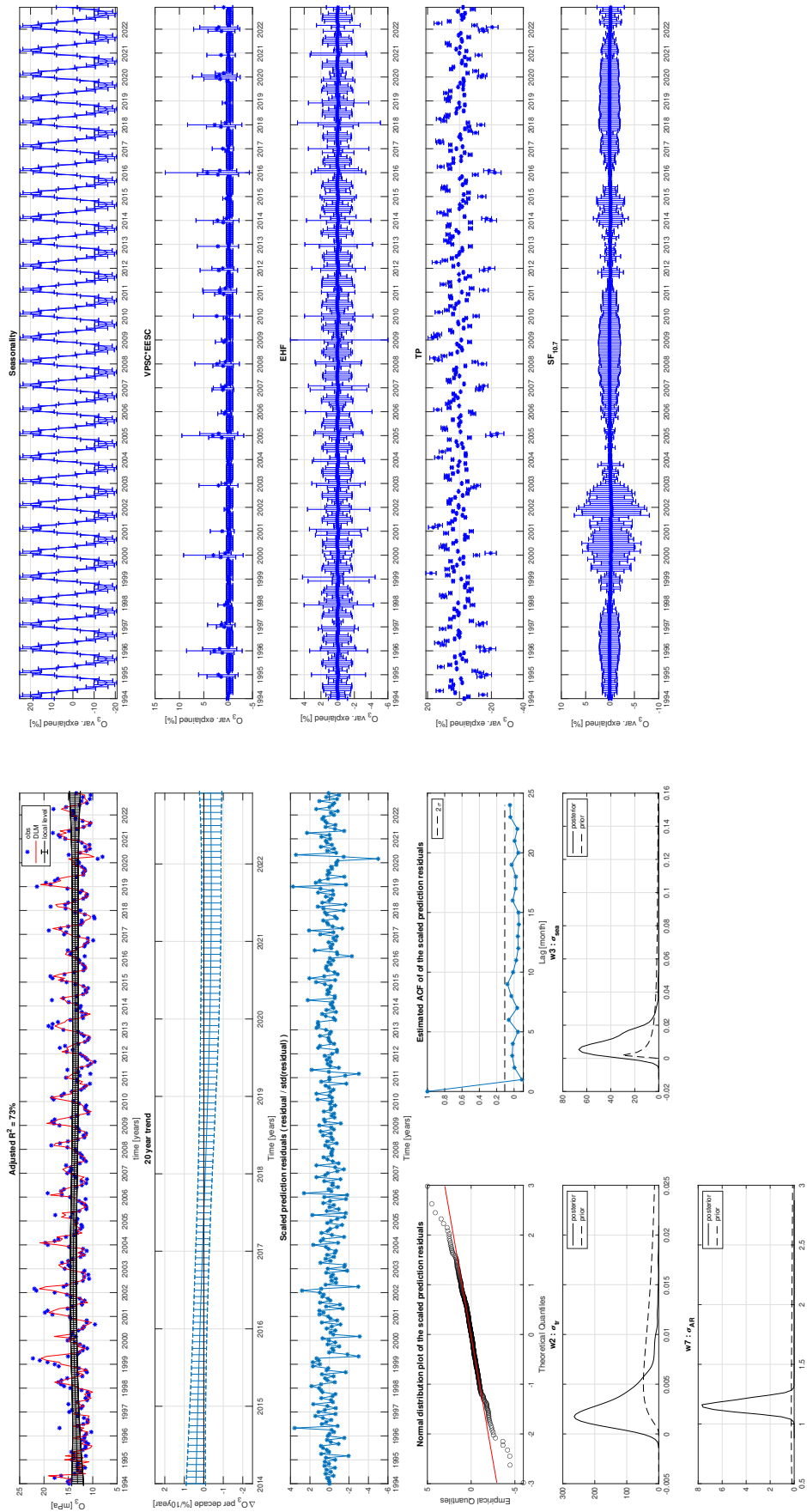


Figure S18. Ny-Ålesund at L₃ altitude layer

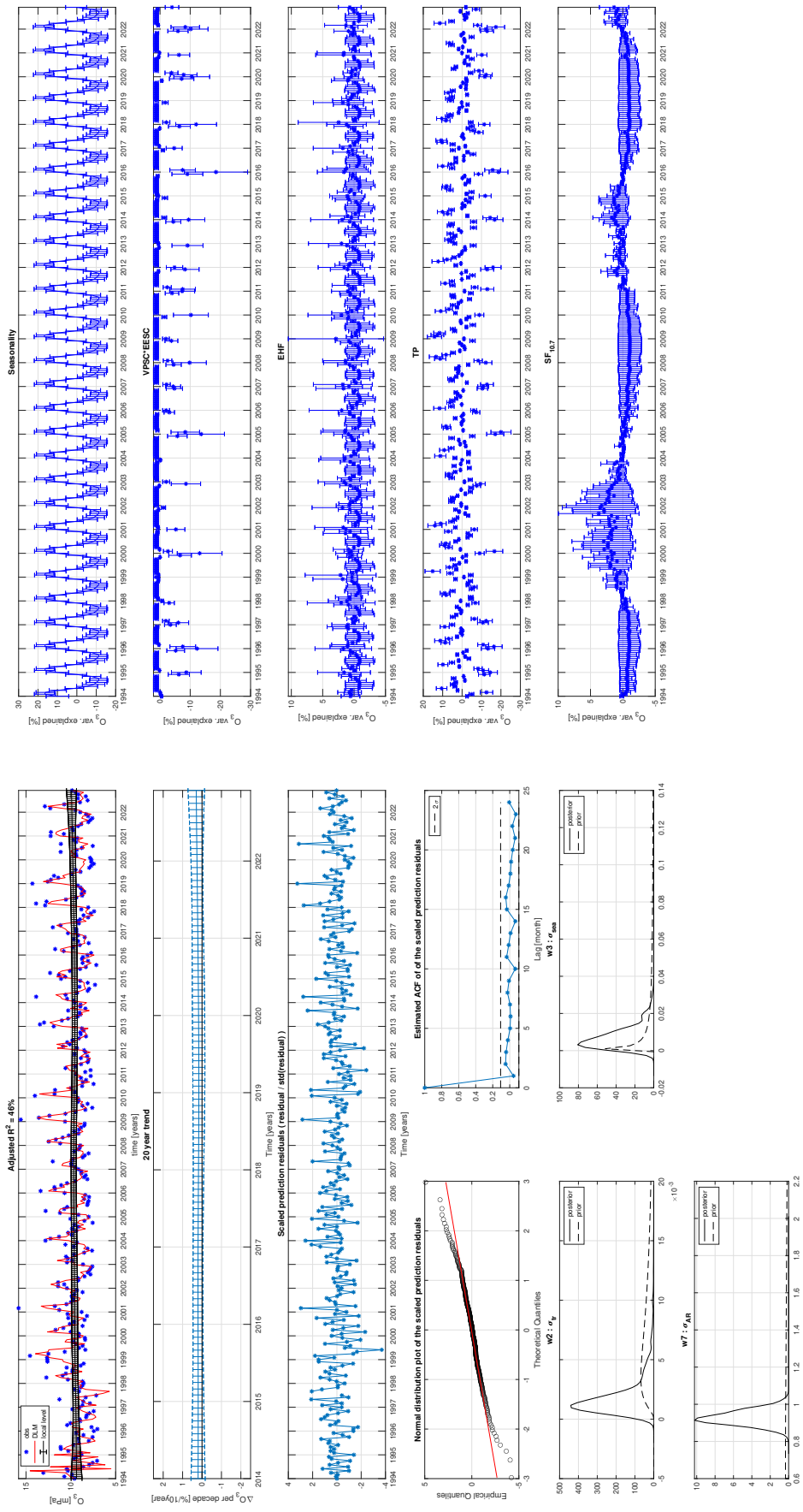


Figure S19. Ny-Ålesund at L₄ altitude layer

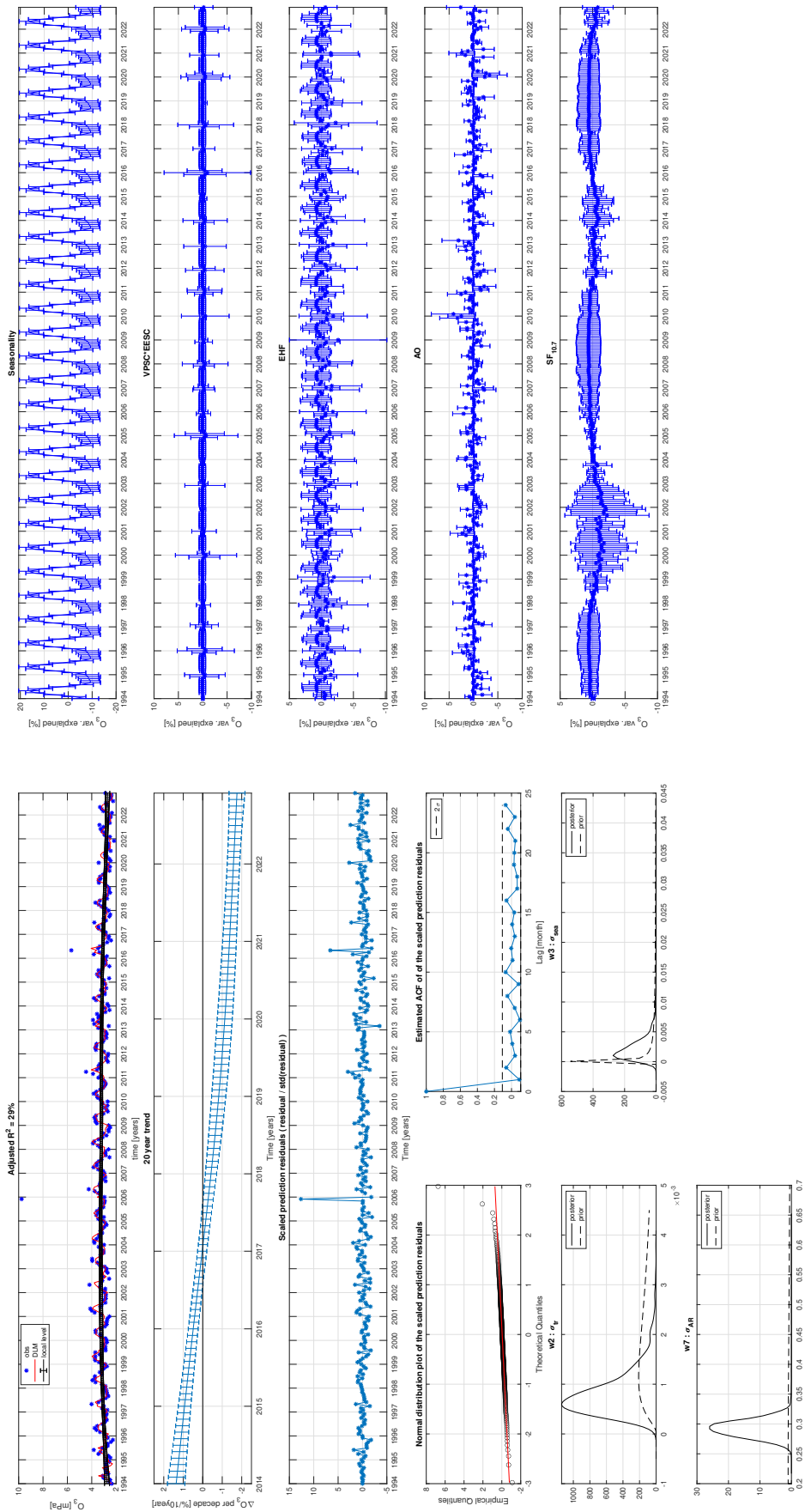


Figure S20. Ittoqqortoormiit (Scoresbysund) at L_1 altitude layer

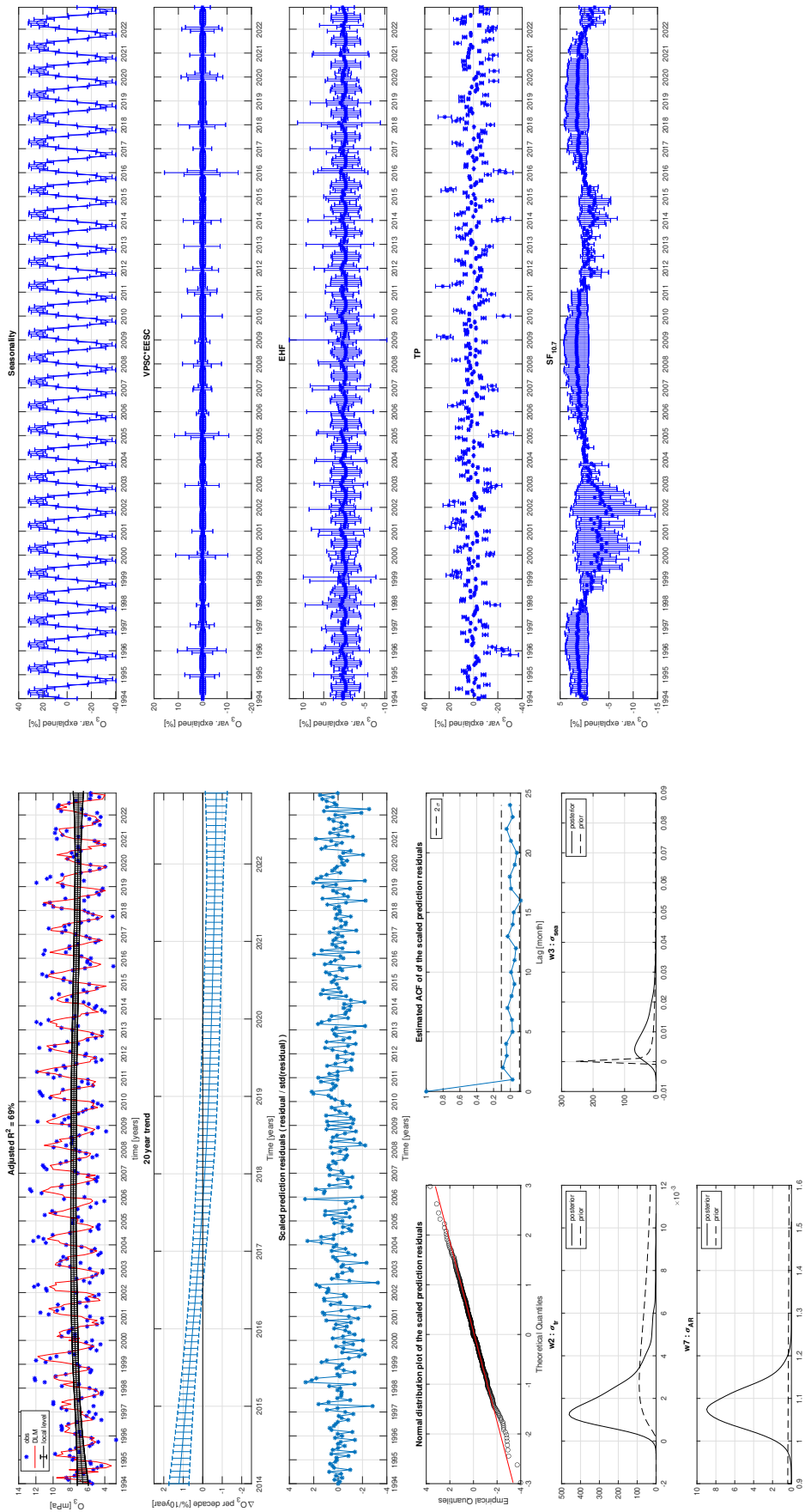


Figure S21. Ittoqqortoormiit (Scoresbysund) at L₂ altitude layer

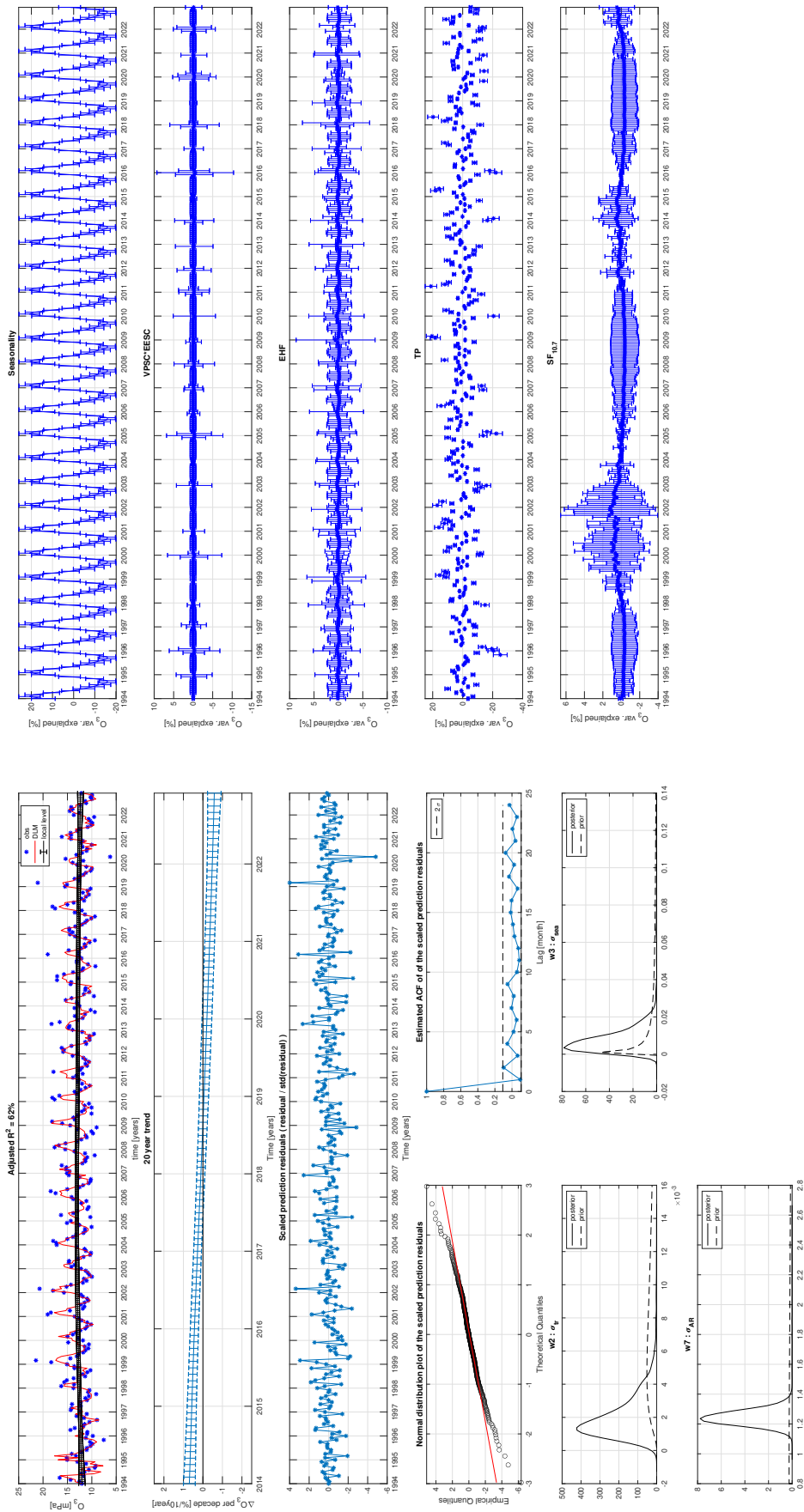


Figure S22. Ittoqqortoormiit (Scoresbysund) at L₃ altitude layer

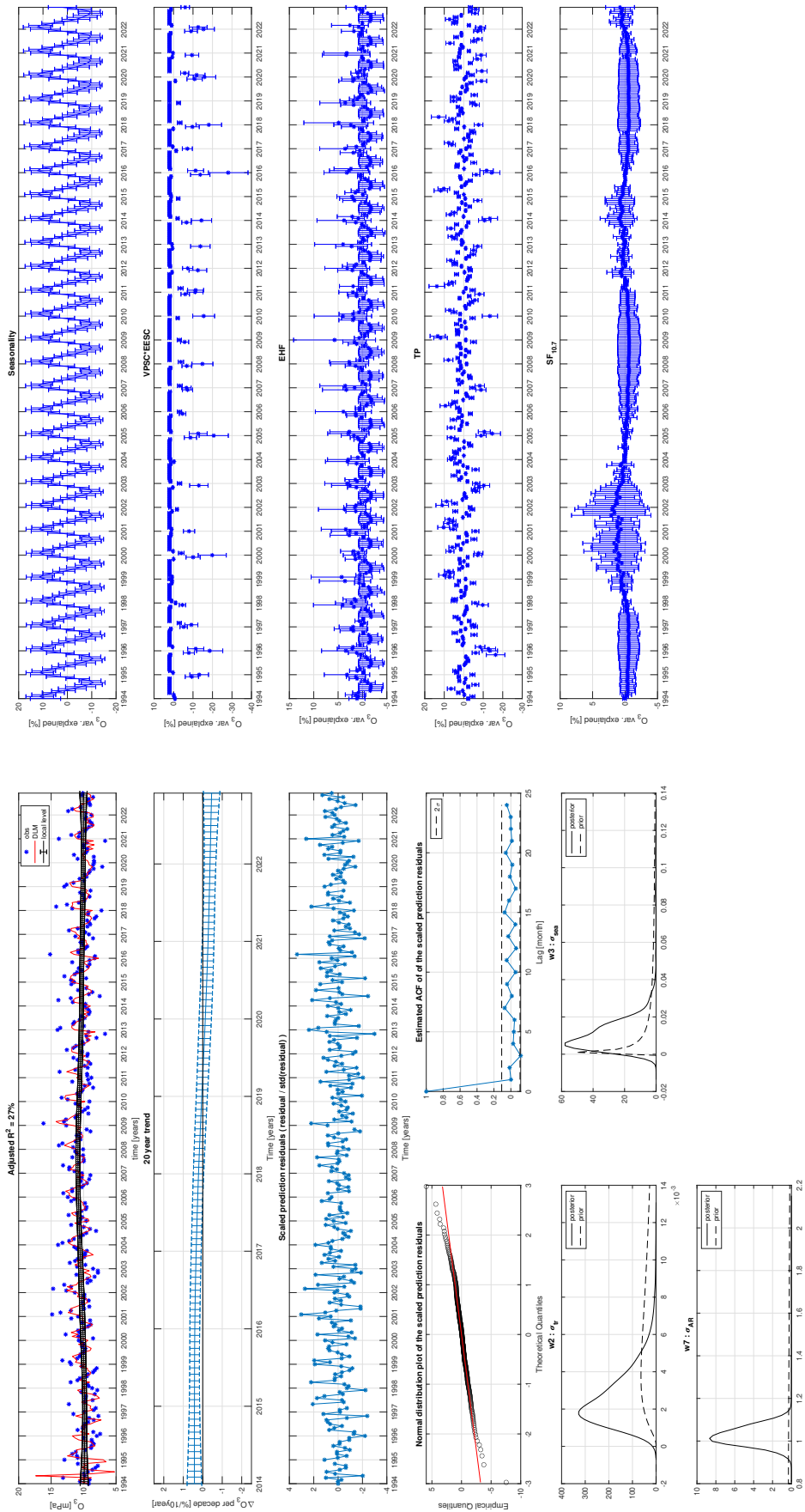


Figure S23. Ittoqqortoormiit (Scoresbysund) at L₄ altitude layer

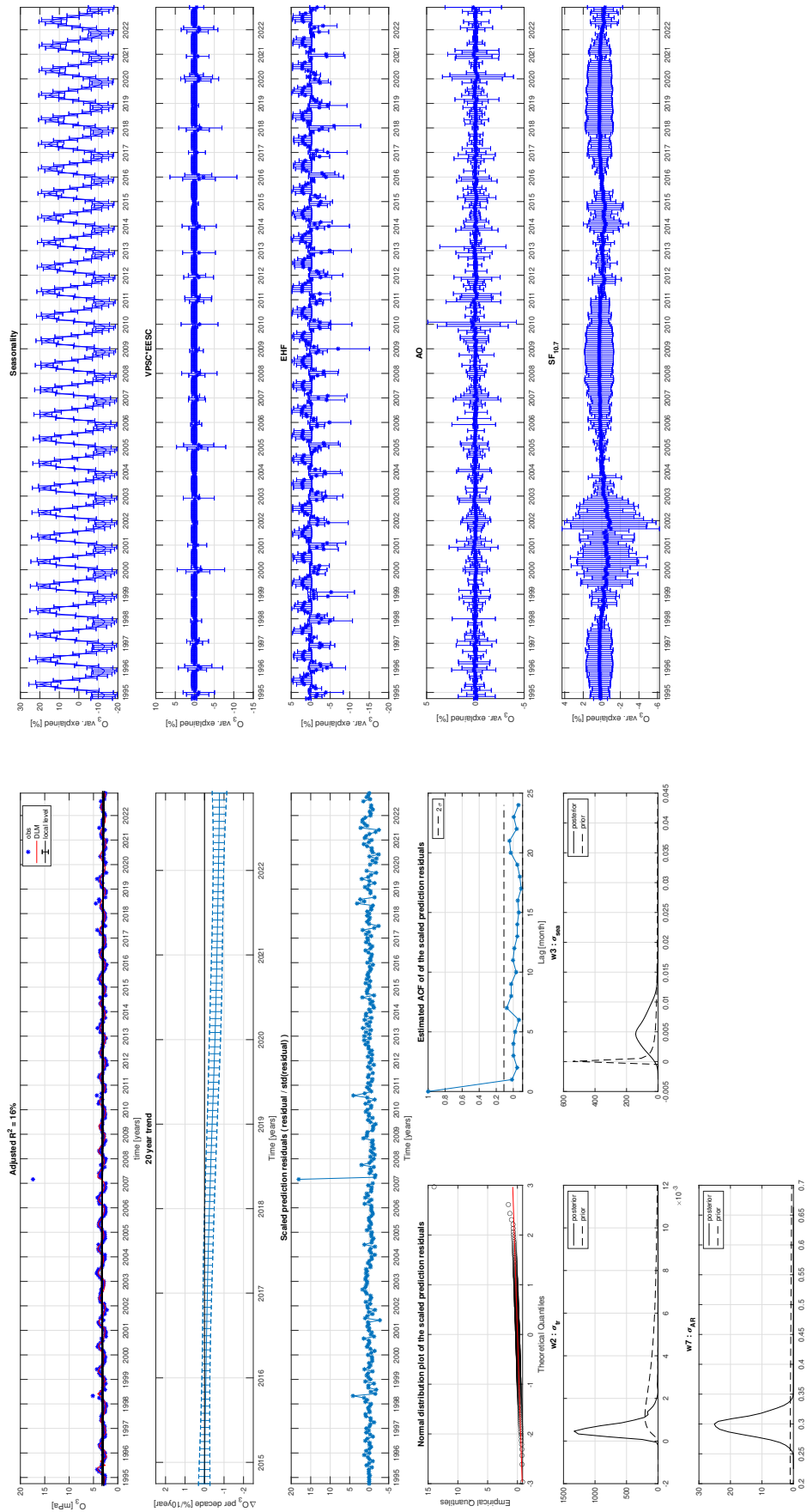


Figure S24. Sodankylä at L₁ altitude layer

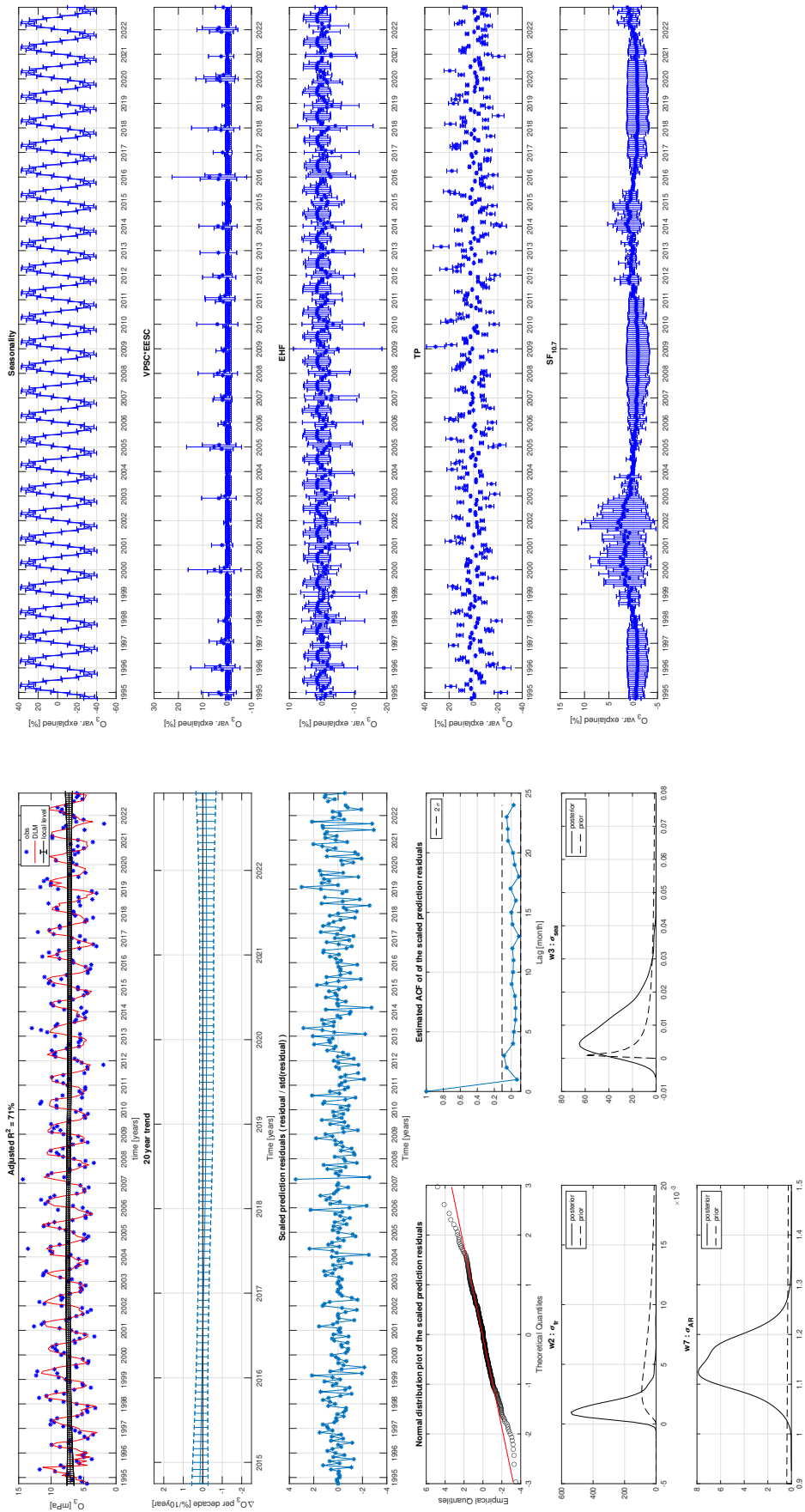


Figure S25. Sodankylä at L₂ altitude layer

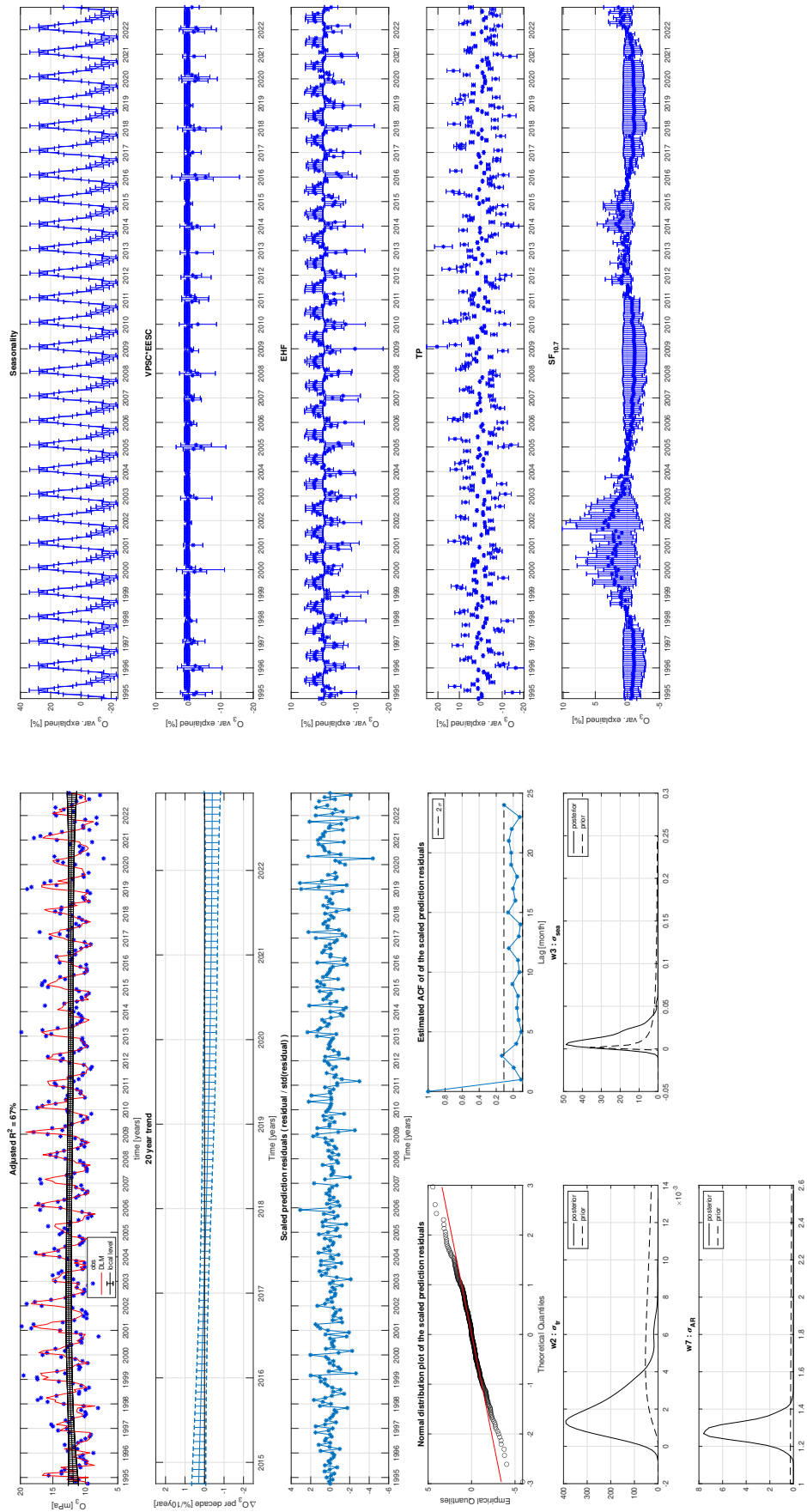


Figure S26. Sodankylä at L₃ altitude layer

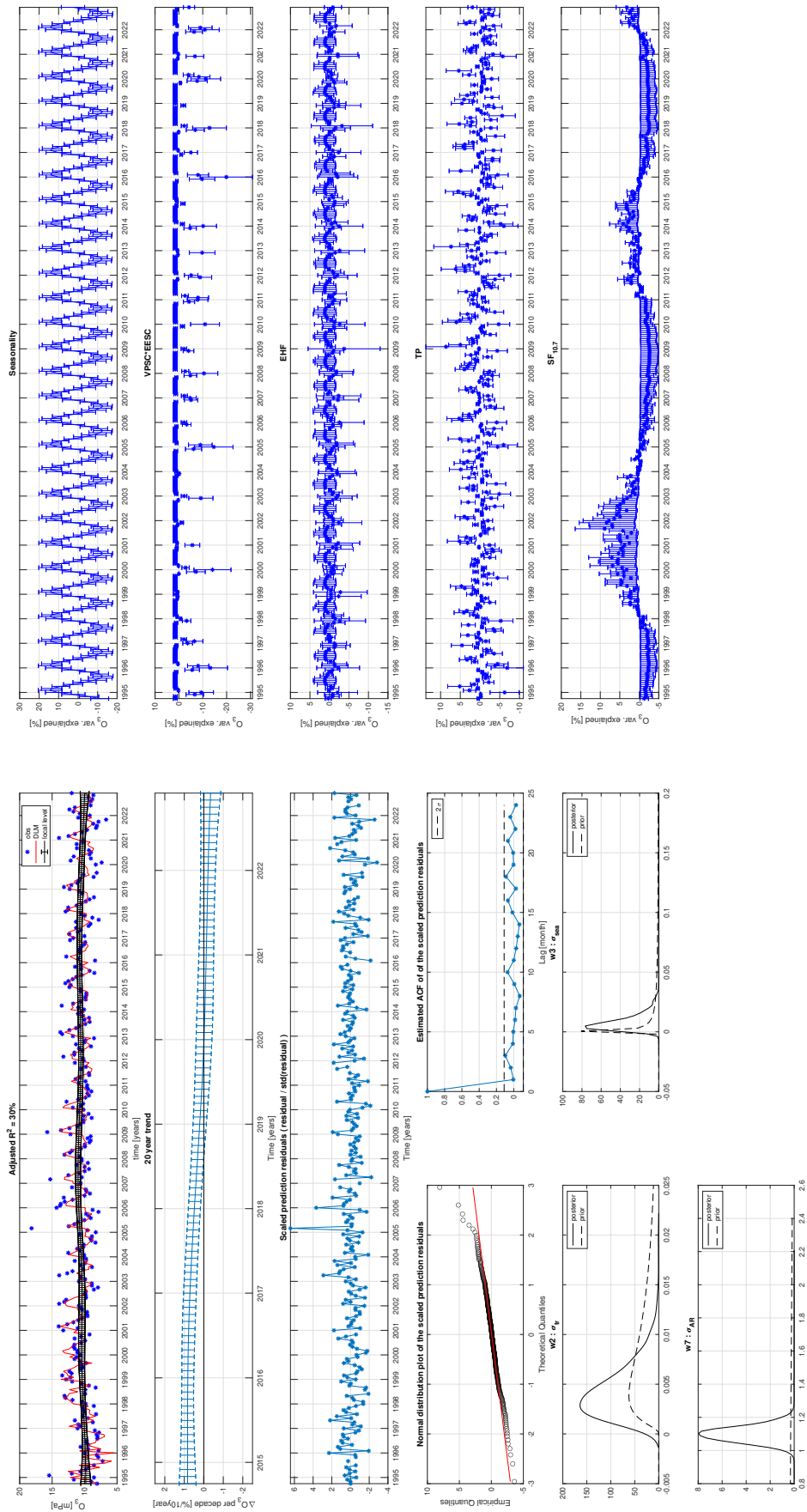


Figure S27. Sodankylä at L₄ altitude layer