Model and sampling errors are taken into account using:

- “Relaxation-to-Prior Spread” Multiplicative Inflation according to Whitaker et al. (2010)

\[
\text{an. pert. } x_{\text{ bg}} = x_{\text{ bg}} + \sqrt{\frac{\sigma^2}{\sigma^2_n}} + \frac{\sigma^2}{\sigma^2_n}
\]

- Climatological Additive Noise

\[
\text{an. memb. } x_{\text{ bg}}^i = x_{\text{ bg}}^i + \alpha x_{\text{ bg}}^i, \quad \alpha N(0, Q)
\]