

Atmospheric CO₂ forecasts: January 2020

The longest time series for atmospheric CO₂ is for the Pacific island of Mauna Loa. Based on this time series, the development of the CO₂ level can be forecasted on a monthly basis, using a methodology developed for macroeconomic modelling of broad sense non-stationarity time series.¹

Figure 1 shows that the CO₂ level is expected to continue its typical cyclical evolution, combined with secular growth.

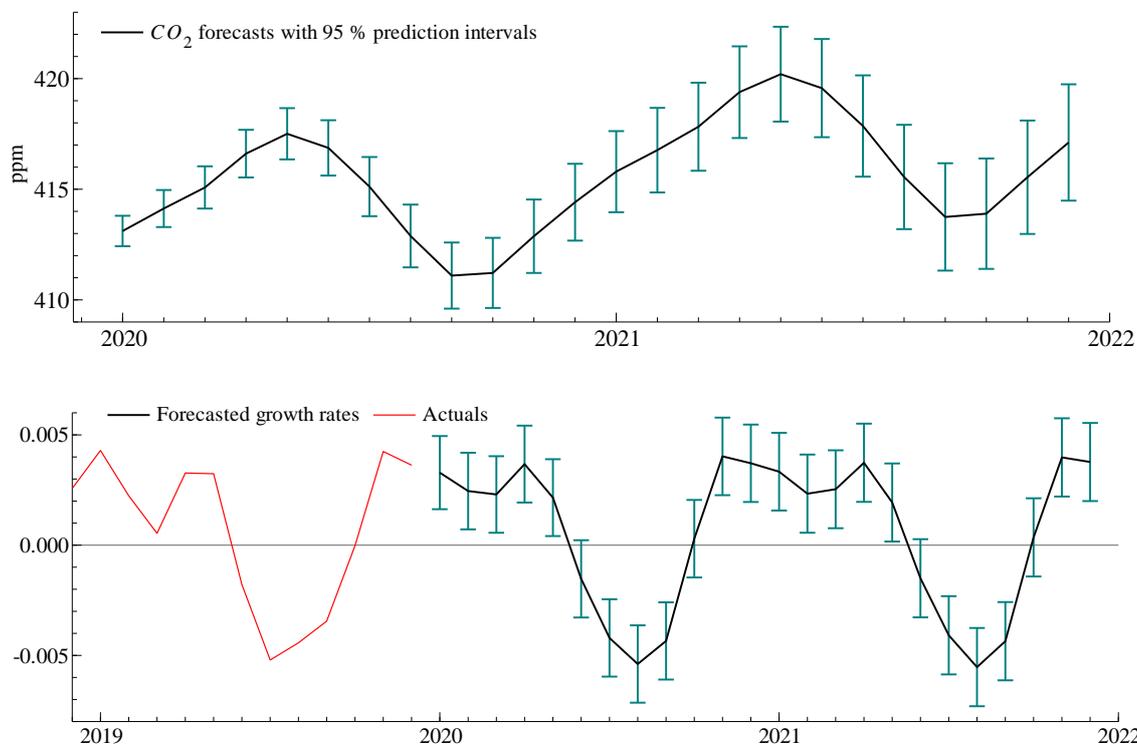


Figure 1: Upper panel shows monthly forecasts CO₂ level from January 2020 to December 2021. The bars represent 95 % prediction intervals. The lower panel shows forecasted growth rates over the same period, and with actual growth rates during 2019 for comparison.

Figure 2 shows the forecasted CO level for the first 12 months of the forecast period. Since all the CO₂ levels of the previous 12 months are located outside the forecast bound, the predicted secular increase in CO₂ is significant. For example in May 2020 the forecasted level of CO is 417.51 ppm, while the historical peak in May 2019 it was 414.66 ppm. The difference (0.69 percent) is statistically significant. The increase from December 2019 to December 2020 is forecasted to become 0.65 percent.

¹ See <http://normetrics.no/co2-forecasts/>

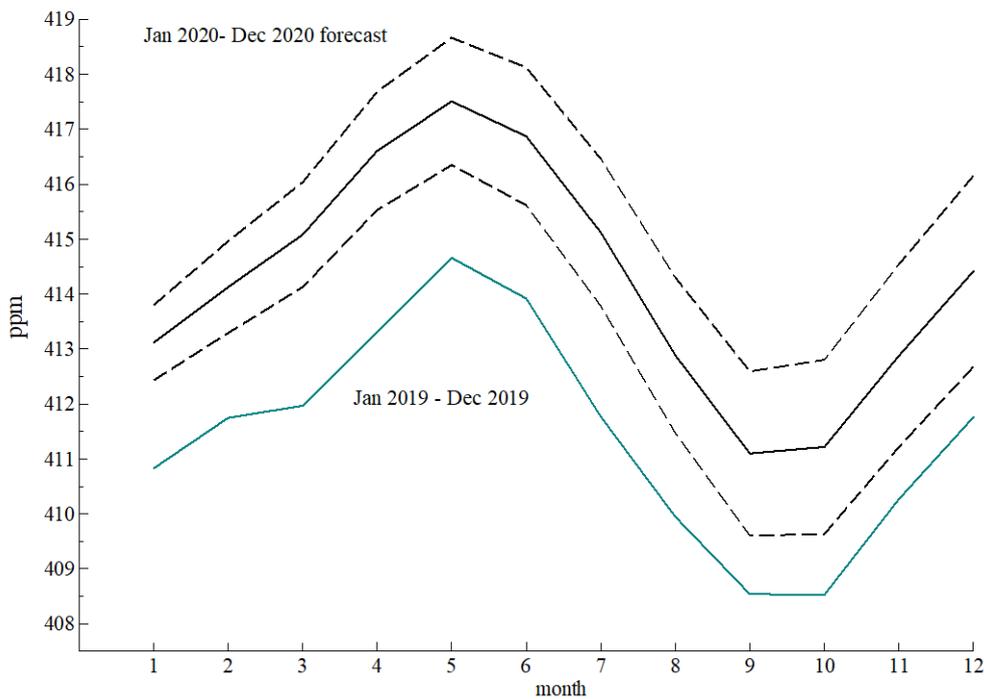


Figure 2: CO2 forecast for the 12-month period from January 2020 to December 2020 with 95 % forecast bounds shown as dashed lines. The actual CO2 levels for the same months in 2019 are shown for comparison.

Figure 3 shows the actual CO2 measurement from 2019 together with the family of forecasts produced so far in this project. Starting with the projection from September 2019 and ending with the January 2020 forecast.

There is not a lot of difference between the five projections. The graphs show that the forecast from September 2019 has under-predicted CO2 evolution in the four last months of 2019 somewhat. The three other forecast from 2019 appear to be very precise (but there are also fewer observations to compare with).

Four of the five projections agree that a new “all time high” in atmospheric CO2 can become a reality already in March or April 2020.

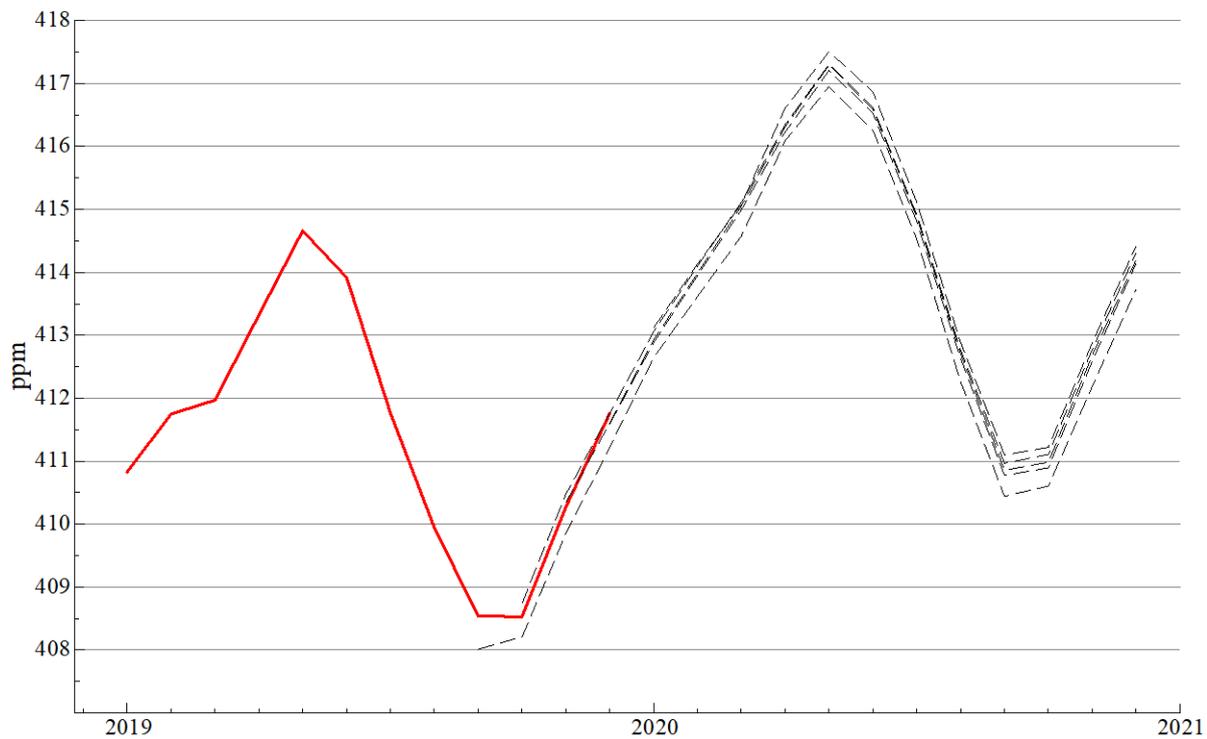


Figure 3 Atmospheric CO2 from January to December 2019 (thick (red) graph) shown together with a sequence of five forecasts. Starting with the projection from September 2019 and ending with the current one, from January 2020.