

# Sampler arguments

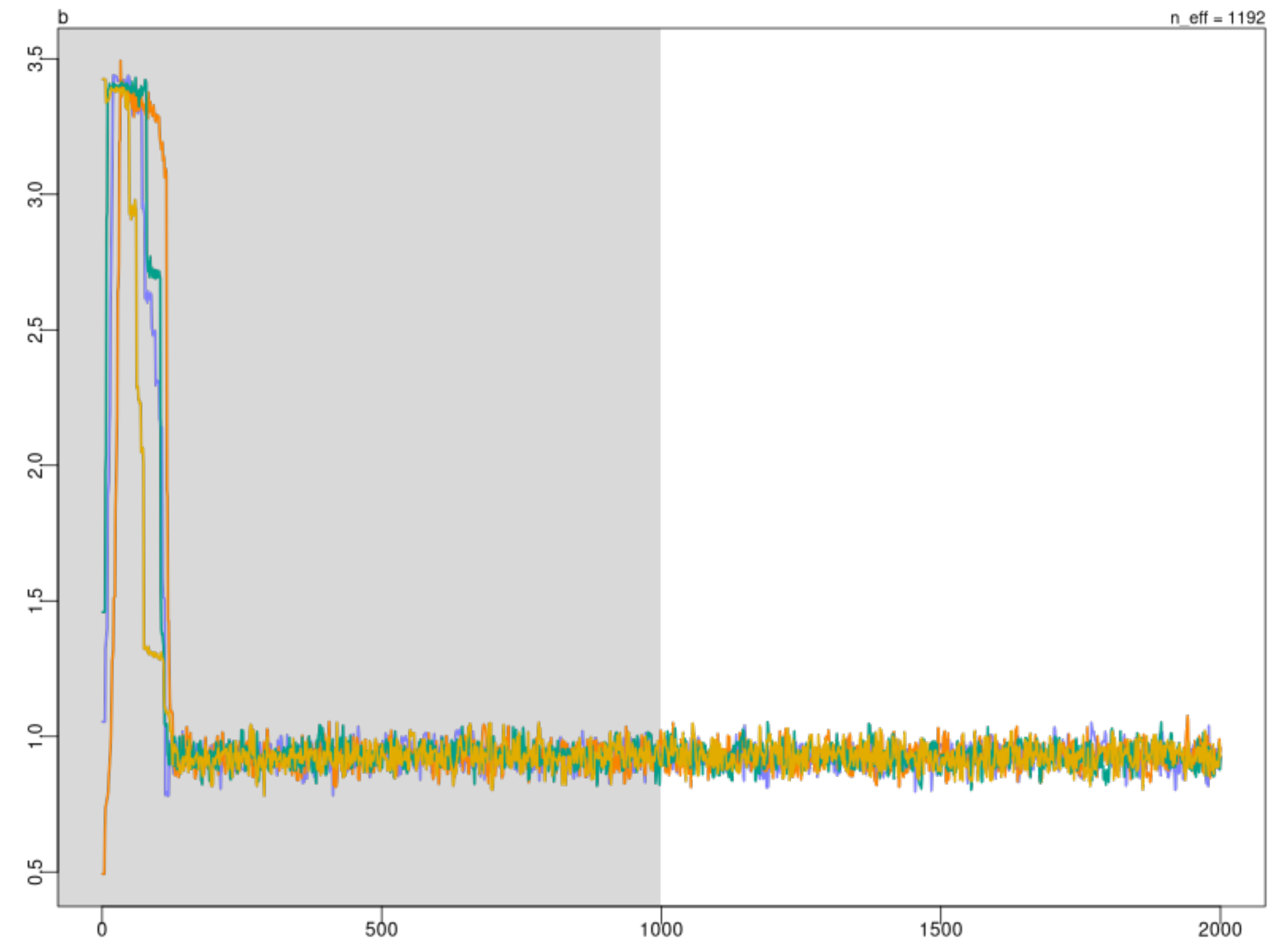
- Chains: fit the model several times
- Cores: do the fits in parallel
- Iterations: how many total samples
- Warm-up (or burn-in): starting samples that get discarded

## Model summary

```
> precis(fit)
```

|       | mean   | sd   | 5.5%   | 94.5%  | n_eff | Rhat4 |
|-------|--------|------|--------|--------|-------|-------|
| a     | 112.97 | 2.00 | 109.83 | 116.19 | 1013  | 1.01  |
| b     | 0.92   | 0.04 | 0.86   | 0.99   | 1004  | 1.01  |
| sigma | 5.08   | 0.20 | 4.78   | 5.40   | 1543  | 1.00  |

## Chains and convergence



# Model checking

After fitting the model, we can use the posterior to simulate synthetic data and compare to the data used to fit the model. Discrepancies can suggest paths to improve the model.

$$y_{sim} \sim P(y_{sim} | y) = \sum_{\theta} P(y_{sim} | \theta) P(\theta | y)$$

For each value of the parameters ( $\theta_i = \{a_i, b_i, \sigma_i\}$ ) we can simulate a synthetic dataset  $y_{sim}$  and compare to the observed data  $y$ .

$$y_{sim} = \text{Normal}(a_i + b_i x, \sigma_i)$$