Reproducible code for manuscript figure 04 – Monte Carlo convergence test

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```
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```

Compile Rmarkdown file

```
library("rmarkdown")
rmarkdown::render("Main_reproducible_MC_convergence.R")
```

Setup

```
library(knitr)
library(tikzDevice)
library(stUPscales)

Sys.setenv("LANGUAGE"="En")
Sys.setlocale("LC_ALL", "en_GB.UTF-8")
```

```
## [1] "LC_CTYPE=en_GB.UTF-8;LC_NUMERIC=C;LC_TIME=en_GB.UTF-8;LC_COLLATE=en_GB.UTF-8;LC_MONETARY=en_GB.U
```

```
timing.ini <- Sys.time()

folder.current <- getwd()
```

Plot function

```
Plot.Convergence <- function(summ1, summ2, var.name, label, n){
  eval <- cbind.data.frame(mc1=summ1[[var.name]][,"Sd"], mc2=summ2[[var.name]][,"Sd"])
  gof <- round(GoF(eval, col_sim = 1 , col_obs = 2, name = var.name), digits = 3)

  tikz(paste0("output/MC_convergence/Convergence_",var.name,"_", n, "sims", ".tex"), width = 10, height

  par(mar = c(9, 9, 2, 2), cex.axis = 3.3,  padj = 2)
  ylim <- c(0, 1.1*max(summ1[[var.name]][,"Sd"], summ2[[var.name]][,"Sd"]))
  xlim <- ylim
  plot(x = summ1[[var.name]][,"Sd"], y = summ2[[var.name]][,"Sd"],
       xlim = xlim, ylim = ylim, ann = FALSE, xaxt='n')
  abline(a=0, b=1, lty=2, pch=0, col="blue")
  # abline(a=120, b=0, lty=2, pch=0, col="blue")
```

```
  # abline(v=120, lty=2, pch=0, col="blue")
  axis(side=1, las = 1, cex.axis=3.3, las = 1, padj = 0.6)
  mtext(side = 1, text = paste("SD MC1 (", label, ")", sep = ""), line = 6,
        cex = 3.8)
  mtext(side = 2, text = paste("SD MC2 (", label, ")", sep = ""), line = 5,
        cex = 3.8)
  legend("topleft", paste(n, " simulations ", "\n(NSE = ",gof[9], ")",sep=""),
         lty=NULL, col=c("blue"), cex=3.8, bty="n")
  dev.off()

  gof[9]
}
```

Load data and plot by tikzDevice (MC = 250 runs)

Load data and plot by tikzDevice (MC = 1000 runs)

Load data and plot by tikzDevice (MC = 1500 runs)

Render latex file to pdf (final)

Include pdf

Timing

```
timing.end <- Sys.time()
(timing.elapsed <- timing.end - timing.ini)
```

```
## Time difference of 41.53678 secs
```

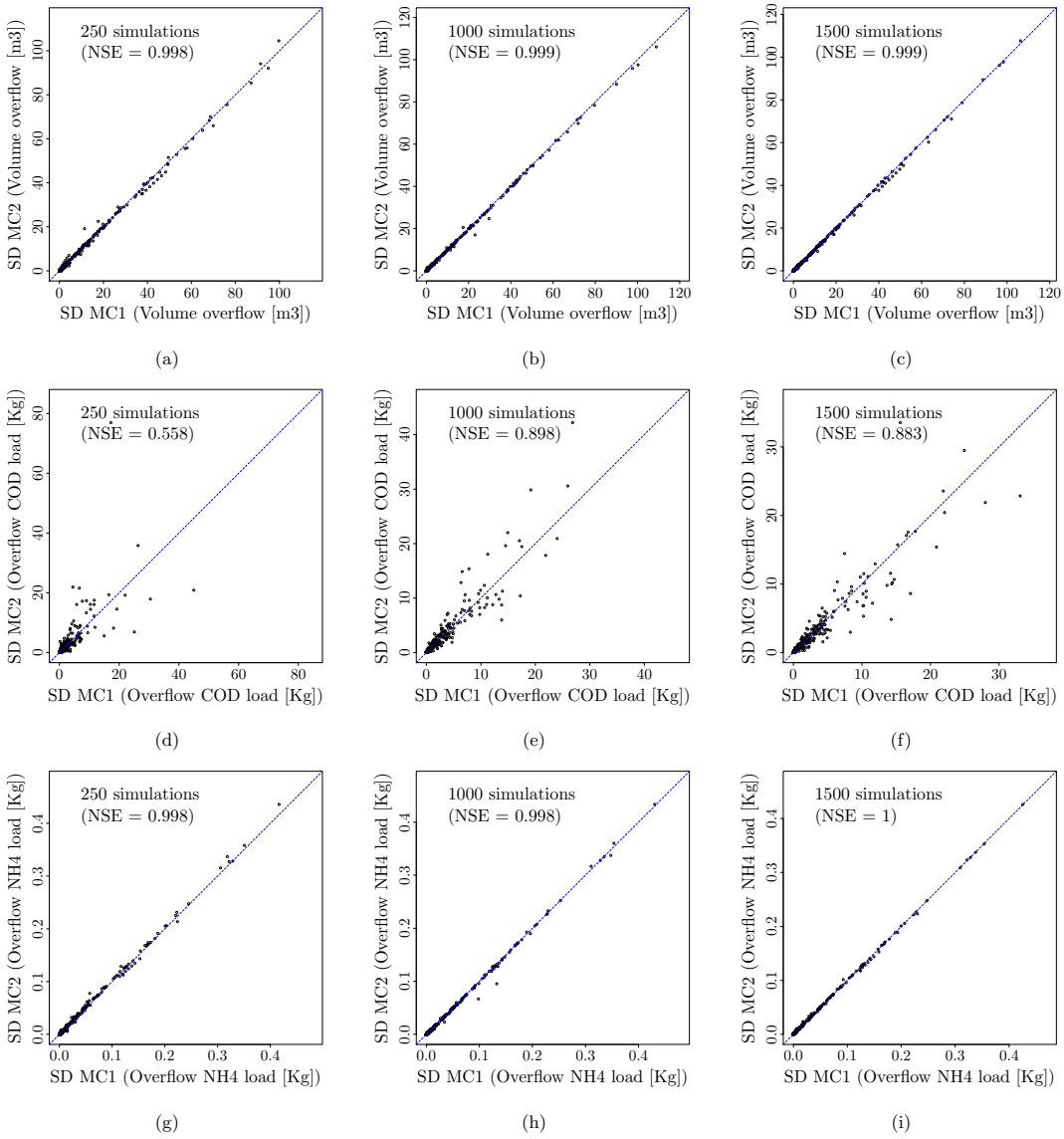

Figure 1: Figure 04.