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#Diagrama de Walter y Lieth
#<<07307: Se dibuja P y T después de los periodos de helada (para que éstos no tapen
la gráfica de T en climas fríos), y se limita la trama de P para que no se dibuje
para T<0)
diagwl <- function( dat, est="", alt=NA, per="", margen=c(4,4,5,4),
  mlab="", pcol="#005ac8", tcol="#e81800", pfcoll="#79e6e8",
  sfcol="#09a0d1", shem=FALSE, ...) {
  plot.new()
  old.par <- par(no.readonly = TRUE)
  on.exit(par(old.par))
  par(mar=margen, pty="s", las=1, new=FALSE)
  nr <- nrow(dat) #no. de filas de datos mensuales
  if(nrow(dat) < 4) { cat("Debe haber 4 filas de datos mensuales\n"); break; }
  #etiquetas de los meses
  if(mlab=="es") mlab=c("E","F","M","A","M","J","J","A","S","O","N","D")
  else if(mlab=="en") mlab=c("J","F","M","A","M","J","J","A","S","O","N","D")
  else mlab=c(1:12) #etiquetas numéricas
  dat <- as.matrix(dat)
  if(shem) { #Hemisferio sur: desplazar los datos medio año
    m1 <- dat[,1:6]
    m2 <- dat[,7:12]
    dat <- cbind(m2,m1)
    mlab <- c(mlab[7:12],mlab[1:6])
  }
  p <- dat[1,] #precipitaciones medias mensuales
  if(nr==2) tm <- dat[2,]
  else tm <- apply(dat[2:3,],2,mean) #temperaturas medias mensuales
  pmax <- max(p) #precipitación máxima
  ymax <- 60 #máxima ordenada por defecto
  #cat("ymax=",ymax,"\n");
  if(pmax > 300) ymax <- 50 + 10*floor((pmax+100)/200)
  #cat("pmax=",pmax,"ymax=",ymax,"\n");
  ymin <- min(-1.5,min(tm)) #mínima ordenada sin redondear
  #ejes:
  if(ymin < -1.5) {
    ymin=floor(ymin/10)*10 #mínima ordenada redondeada
  #cat("ymin=",ymin,"\n")
  labT <- paste(ymin)
  labP <- ""
  if(ymin < -10) {
    for(i in (ymin/10+1):-1) {
      labT <- c(labT,i*10)
      labP <- c(labP,"")
    }
  #cat(i,i*10,"\n",labT,"\n",labP,"\n")
  }
  labT <- c(labT,"0","10","20","30","40","50","")
  labP <- c(labP,"0","20","40","60","80","100","300")
  }
  else {
    labT <- c("0","10","20","30","40","50","")
    labP <- c("0","20","40","60","80","100","300")
  }
  if(ymax > 60) {
    for(i in 6:(ymax/10-1)) {
      labT <- c(labT,"")
      labP <- c(labP,100*(2*i-7))
    }
  }
  }
# plot(0:13-
0.5,c(tm[12],tm[1:12],tm[1]),xlim=c(0,12),ylim=c(ymin,ymax),type="l",col=tcol,xaxs="i
",yaxs="i",xaxp=c(0,12,12),xlab="",ylab="",xaxt="n",yaxt="n",bty="n",...)
# <<Quizá se pueda simplificar la orden anterior...:
plot(0:13-
0.5,c(tm[12],tm[1:12],tm[1]),xlim=c(0,12),ylim=c(ymin,ymax),type="n",xaxs="i",yaxs="i
",xaxp=c(0,12,12),xlab="",ylab="",xaxt="n",yaxt="n",bty="n")

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lmin <- ymin #mínima ordenada a rotular
if(lmin==-1.5) lmin=0
axis(2,((lmin/10):(ymax/10))*10,labels=labT,col.axis=tcoll)
axis(4,((lmin/10):(ymax/10))*10,labels=labP,col.axis=pcoll)
mtext("°C",2,col=tcoll,las=1,line=3,adj=0,at=55)
mtext("mm",4,col=pcoll,las=1,line=3,adj=1,at=55)
abline(0,0)
abline(50,0)
#rótulos:
if(is.na(alt)) mtext(est,line=2,adj=0)
else mtext(paste(est,"(",alt," m)",sep=""),line=2,adj=0)
mtext(per,line=1,adj=0)
mtext(paste(round(mean(tm*10))/10,"°C",round(sum(p)),"
mm",sep=""),line=1,adj=1)
x <- 0:13-0.5
p2 <- c(p[12],p[1:12],p[1])
if(pmax<=100) {
  x1 <- x
  y1 <- c(p[12],p[1:12],p[1])/2
  n2 <- 14
}
else { #cambio de escala en prec. > 100
  xp <- numeric(30)
  yp <- numeric(30)
  x1 <- numeric(25)
  y1 <- numeric(25)
  n <- 0
  n2 <- 0
  gr <- FALSE
  if(p2[1]>100) { #primer punto
    n <- n+1
    xp[n] <- x[1]
    yp[n] <- 50
    n <- n+1
    xp[n] <- x[1]
    yp[n] <- 50 + (p2[1]-100)/20
    n2 <- n2+1
    x1[n2] <- x[1]
    y1[n2] <- 50
    gr <- TRUE
  }
  else {
    n2 <- n2+1
    x1[n2] <- x[1]
    y1[n2] <- p2[1]/2
  }
  for(i in 2:14) { #demás puntos
    if(gr) { #si p anterior > 100
      n <- n+1
      if(p2[i]>100) {
        xp[n] <- x[i]
        yp[n] <- 50 + (p2[i]-100)/20
      }
      else {
        xp[n] <- x[i-1] + (100-p2[i-1])/(p2[i]-p2[i-1])
        yp[n] <- 50
        n2 <- n2+1
        x1[n2] <- xp[n]
        y1[n2] <- 50
        n <- n+1
        xp[n] <- NA
        yp[n] <- NA
        n2 <- n2+1
        x1[n2] <- x[i]
        y1[n2] <- p2[i]/2
        gr <- FALSE
      }
    }
  }
}

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    }
  }
else { # p anterior <=100
  if(p2[i]>100) { #si p > 100
    n <- n+1
    xp[n] <- x[i-1] + (100-p2[i-1])/(p2[i]-p2[i-1])
    yp[n] <- 50
    if(xl[n2]!=x[i-1]) { #no repetir puntos!
      n2 <- n2+1
      xl[n2] <- x[i-1]
      yl[n2] <- p2[i-1]/2
    }
    n2 <- n2+1
    xl[n2] <- xp[n]
    yl[n2] <- 50
    n <- n+1
    xp[n] <- x[i]
    yp[n] <- 50 + (p2[i]-100)/20
    gr <- TRUE
  }
  else { # p <=100
    n2 <- n2+1
    xl[n2] <- x[i]
    yl[n2] <- p2[i]/2
  }
}
}
if(!is.na(yp[n])) { #cerrar último polígono
  n <- n+1
  xp[n] <- xp[n-1]
  yp[n] <- 50
  n2 <- n2+1
  xl[n2] <- 12.5
  yl[n2] <- 50
}
polygon(xp[1:n],yp[1:n],col=pcol,border=pcol)
}
#tramas:
pi <- approx(xl[1:n2],yl[1:n2],n=66)$y
ti <- approx(x,c(tm[12],tm[1:12],tm[1]),n=66)$y
ti[ti<0] <- 0 #no poner tramas por debajo del cero
d <- pi - ti
xi <- (1:66)/5-0.7
xw <- subset(xi,d>0) #periodo húmedo
y1 <- subset(pi,d>0)
y2 <- subset(ti,d>0)
if(length(xw)>0) segments(xw,y1,xw,y2,col=pcol,lty=1,lwd=1)
xw <- subset(xi,d<0) #periodo seco
y1 <- subset(pi,d<0)
y2 <- subset(ti,d<0)
if(length(xw)>0) segments(xw,y1,xw,y2,col=tcol,lty=3,lwd=2)
#heladas seguras
for(i in 1:12) if(dat[3,i]<=0) rect(i-1,-1.5,i,0,col=sfcol)
#heladas probables
for(i in 1:12) if(dat[4,i]<=0 && dat[3,i]>0) rect(i-1,-1.5,i,0,col=pfcol)
#curvas de P y T:
lines(xl[1:n2],yl[1:n2],col=pcol,lwd=2)
lines(x,c(tm[12],tm[1:12],tm[1]),col=tcol,lwd=2)
#media de las máximas del mes más cálido
mtext(formatC(max(as.matrix(dat[2,])),digits=1,format="f"),2,las=1,
  line=2,at=35)
#media de las mínimas del mes más frío
mtext(formatC(min(as.matrix(dat[3,])),digits=1,format="f"),2,las=1,
  line=2,at=15)
#marcar límites de los meses:
for(i in 0:13) segments(i,0,i,-1.5)

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#rótulos meses:  
mtext(mlab,1,las=1,line=0.5,adj=0.5,at=x[2:13])  
#reset old.par (restablecemos parámetros gráficos anteriores):  
invisible()  
}
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