Sprawozdanie
Geostatystyka ćw 10
Estymacje jednozmienne. Kriging.
Natalia Gadocha 304165
Geoinformatyka II


```
#z poprzednich zadań
var <- variogram(pH ~ x + y, ca_geo[!miss, ])
                nugget <- 0.15
                psill <- 0.15
                range <- 10000
model <- fit.variogram(var, model = vgm( model = "Ste", nugget, psill, range, kappa
                = 0.5 ))


ca_geo_miss <- as.data.frame(ca_geo)[miss, ]
trend <- lm(pH ~ x + y, as.data.frame(ca_geo))
predictions <- predict(trend, newdata = ca_geo_miss, se.fit = TRUE)


geoB<-readRDS("C:/Users/natal/Downloads/ca_geo_bounds.rds")


kring <- krige(pH ~ x + y, ca_geo[!miss, ], newdata = ca_geo[miss, ],
                model)
                names(kring)
            spplot(kring, "var1.pred")
```
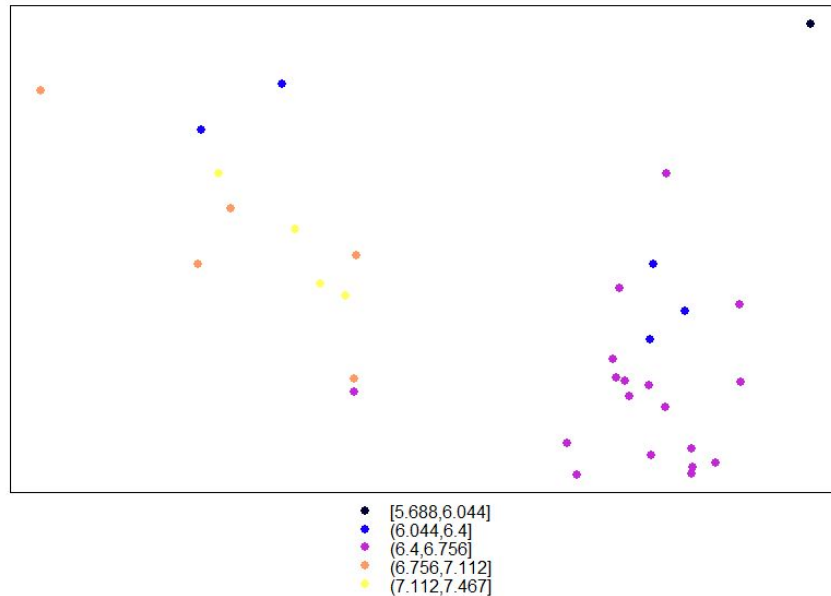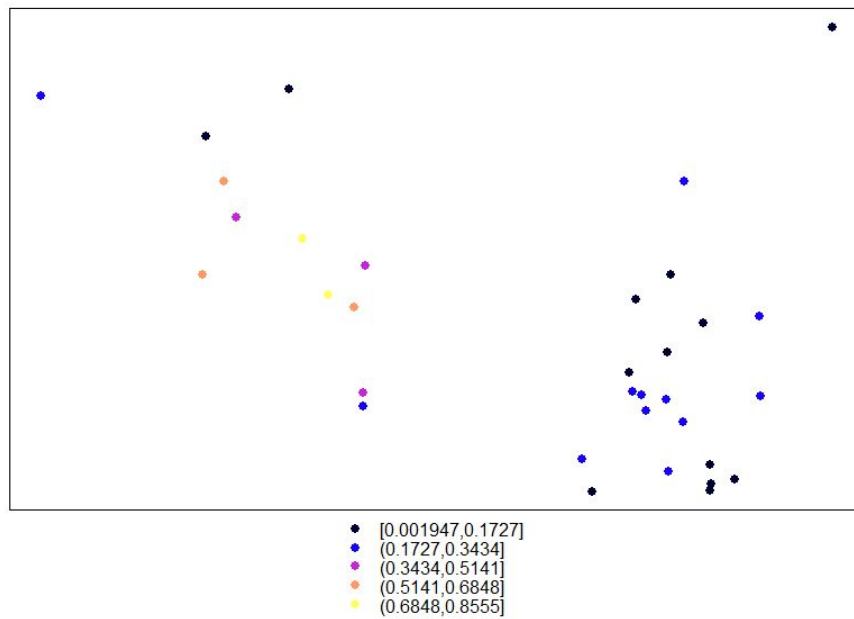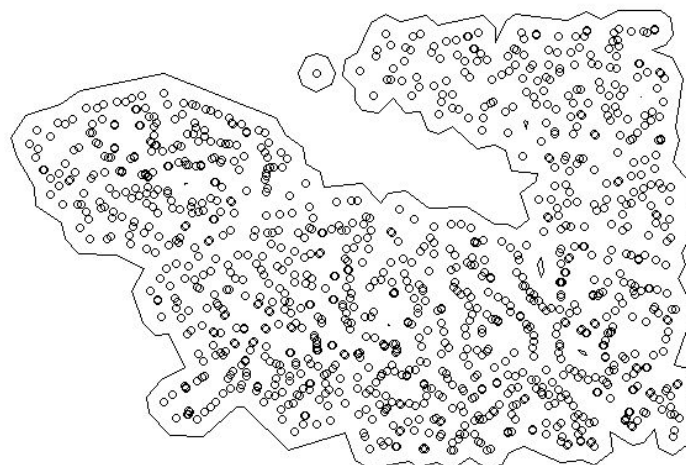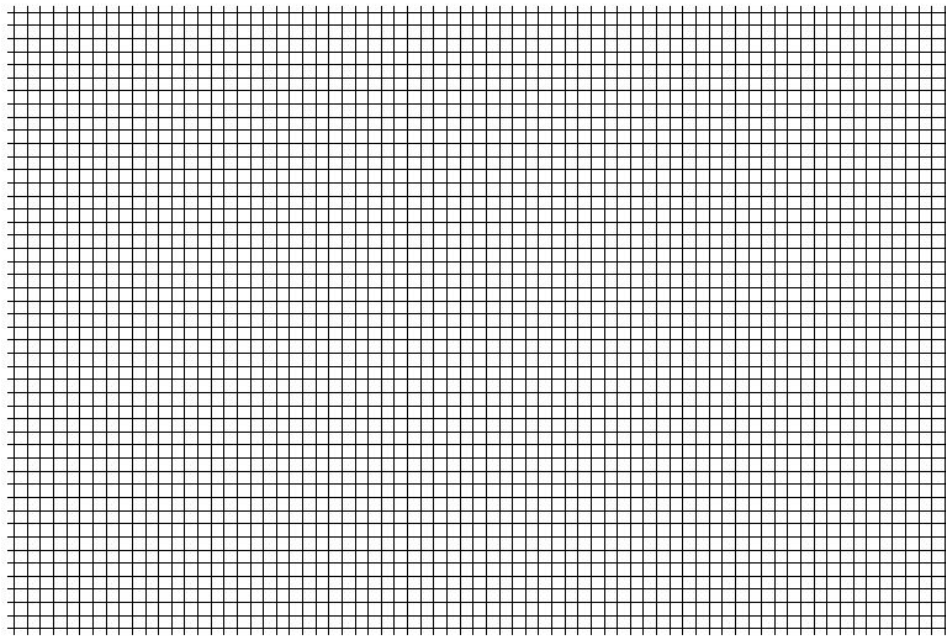
kring$pAlkaline <- 1 - pnorm(7, mean = kring$var1.pred, sd = sqrt(kring$var1.var))
spplot(kring, "pAlkaline")

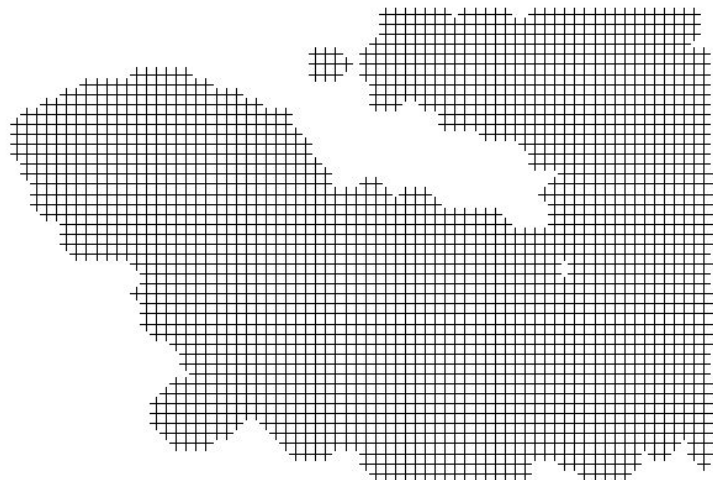

- [0.001947,0.1727]
- (0.1727,0.3434]
- (0.3434,0.5141]
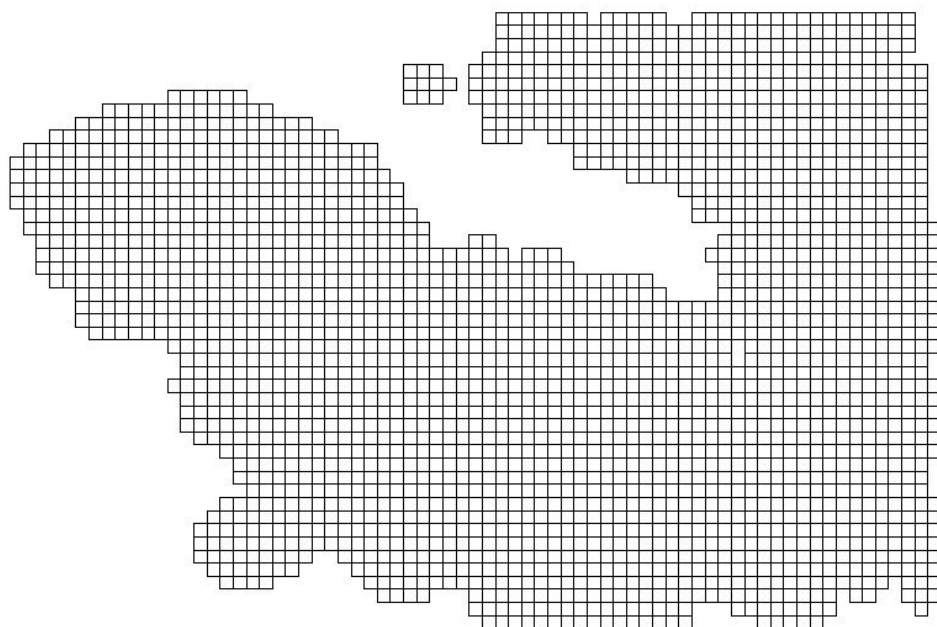- (0.5141,0.6848]
- (0.6848,0.8555]

points(ca_geo)
geoB

bbox(geoB)
grid <- GridTopology(c(537853, 5536290), c(2500, 2500), c(72, 48))

gridpoints <- SpatialPoints(grid, proj4string = CRS(projection(geoB)))
plot(gridpoints)

```
cropped_gridpoints. <- crop(gridpoints, geoB)
          plot(cropped_gridpoints.)
```
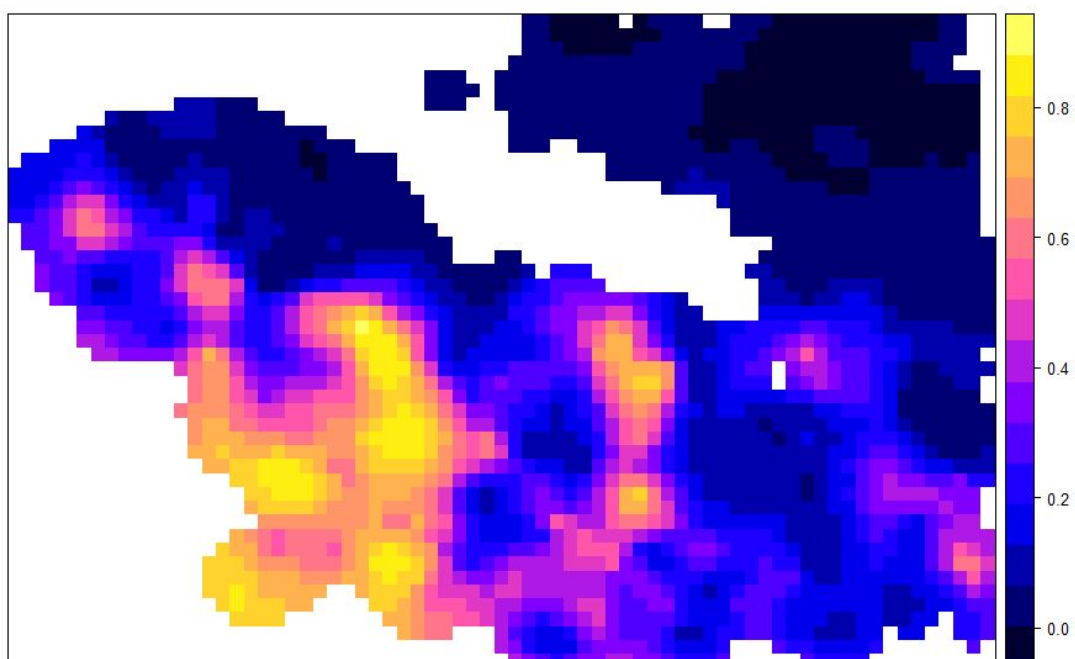


```
spgrid <- SpatialPixels(cropped_gridpoints.)
      coordnames(spgrid) <- c("x", "y")
                plot(spgrid)
```
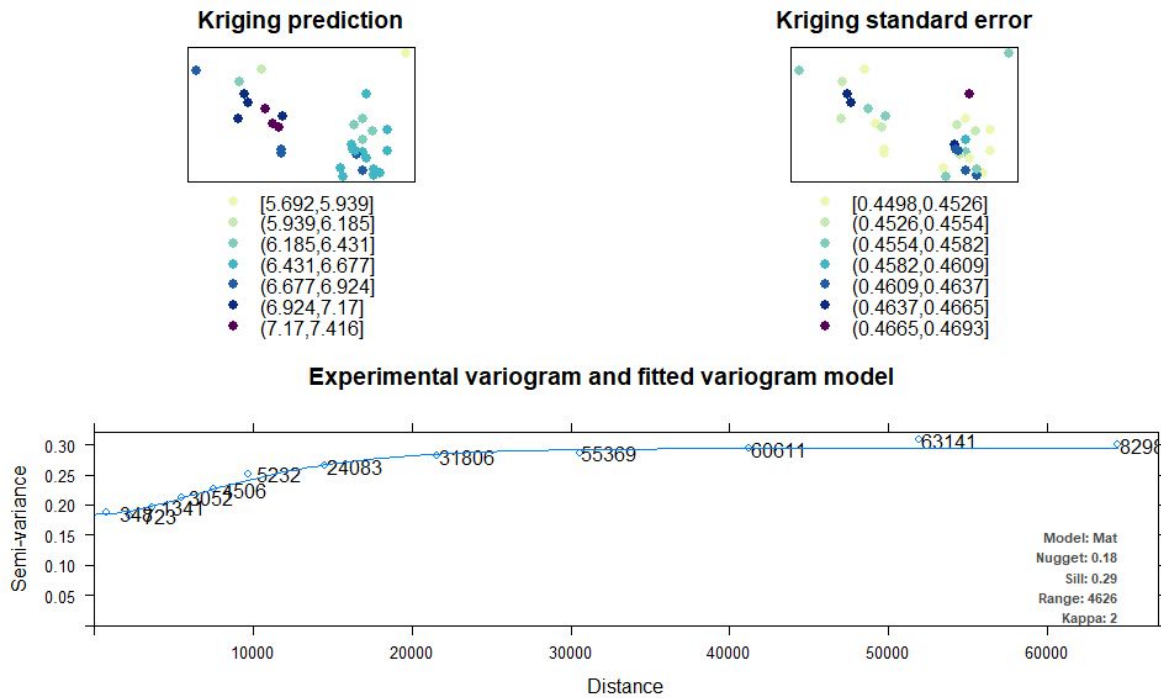
```
pHgrid <- krige(pH ~ x + y, ca_geo[!miss, ], spgrid, model)

pHgrid$pAlkaline <- 1 - pnorm(7, mean = pHgrid$var1.pred, sd
                    =sqrt(pHgrid$var1.var))

spplot(pHgrid, zcol = "pAlkaline")
```

```
sph_auto <- autoKrige( pH ~ x + y,input_data = ca_geo[!miss, ],new_data =
                              ca_geo[miss, ], "Mat")
                           plot(sph_auto)
```
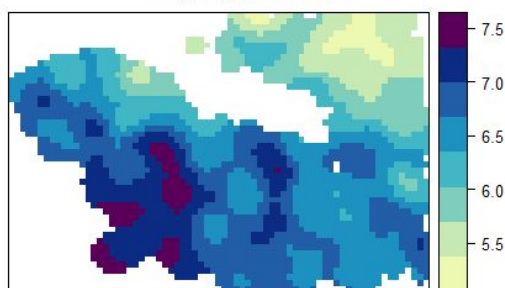
Kriging prediction


```
[5.692,5.939]
(5.939,6.185]
(6.185,6.431]
(6.431,6.677]
(6.677,6.924]
(6.924,7.17]
(7.17,7.416]
```

Kriging standard error


```
[0.4498,0.4526]
(0.4526,0.4554]
(0.4554,0.4582]
(0.4582,0.4609]
(0.4609,0.4637]
(0.4637,0.4665]
(0.4665,0.4693]
```

Experimental variogram and fitted variogram model

Model: Mat
Nugget: 0.18
Sill: 0.29
Range: 4626
Kappa: 2

```
ph_auto_grid <- autoKrige(pH ~ x + y, input_data = ca_geo[!miss,], spgrid)
                           plot(ph_grid)

ph_auto <- autoKrige(pH ~ x + y, input_data = ca_geo[!miss, ], new_data =
                              ca_geo[miss, ], "Mat")

                           plot(ph_auto)
                         plot(ph_auto_grid)
```
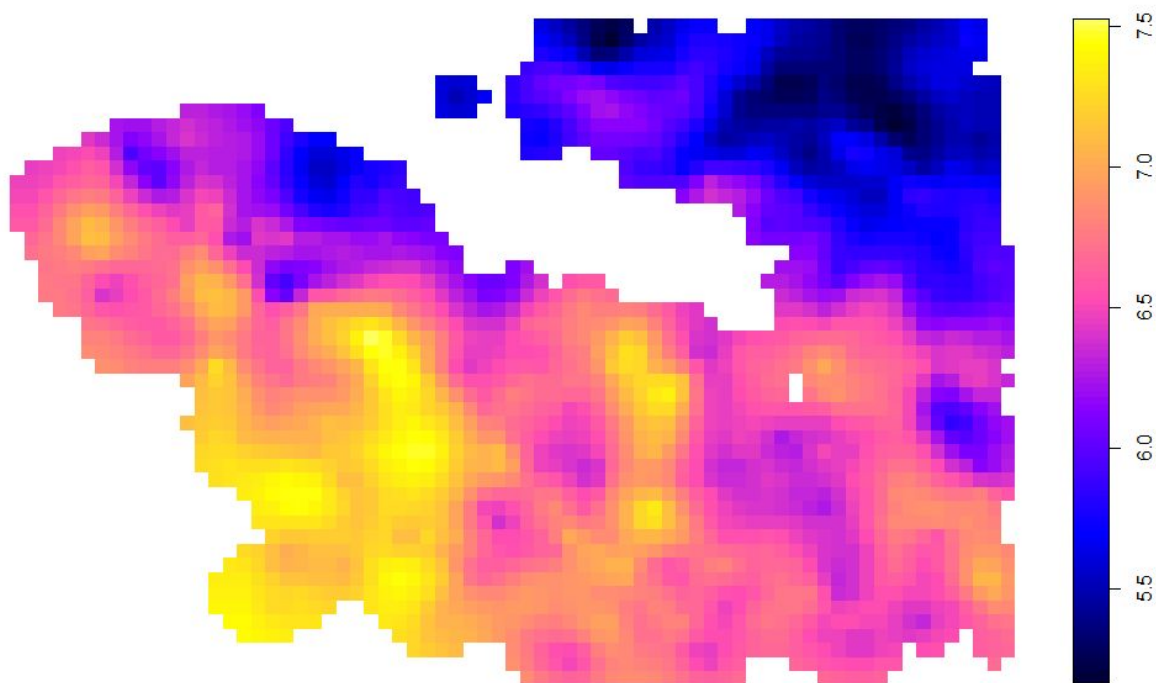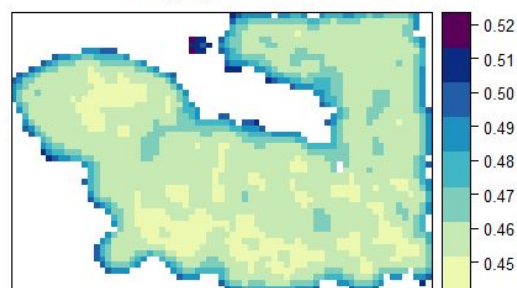
Kriging prediction

Kriging standard error

Experimental variogram and fitted variogram model

Model: Ste
Nugget: 0.18
Sill: 0.29
Range: 13085
Kappa: 2

Semi-variance

Distance