# Supplementary Material

We employ a simple utility function to define the local suitability of the land-use classes. All land-use classes have the same model structure, but with different parameter values. The utility of parcel *c* for land-use class *j* follows the logic below:

**Algorithms for calculating local suitability**

calculate flood severity on parcel *c:* $F_c = \beta_j * \frac{W_c}{0.5}$
if $F_c < T$ :
    utility of parcel *c* for land-use *j:* $S_{cj} = f(A_{cj})$
else :
    calculate same-class utility on parcel *c* for land-use *j*: $E_{cj} = \alpha_j * \frac{A_{cj}}{900}$
    calculate distance decay utility on parcel *c* for land-use *j*: $D_{cj} = \gamma_j * d_{cj}$
    utility of parcel *c* for land-use class *j:* $S_{cj} = f(E_{cj} - F_c + D_{cj})$

where:

| | |
|---|---|
| $S_{cj}$ | Local suitability of land-use class *j* on parcel *c* |
| $A_{cj}$ | Total area of land-use class *j* on parcel *c* ($m^2$) |
| $F_c$ | Perceived flood severity on parcel *c* |
| $E_{cj}$ | Same-class utility on parcel c for land-use j |
| $D_{cj}$ | Distance decay utility on parcel *c* for land-use *j* |
| $W_c$ | Average water depth on parcel *c* over a ten-year period (m) |
| $T$ | Flood sensitivity threshold of the society |
| $d_{cj}$ | Distance decay value of land-use class *j* on parcel *c* |
| $\alpha_j$ | Sensitivity parameter of land-use class *j* for the presence of the same land-use class within a parcel |
| $\beta_j$ | Sensitivity parameter of land-use class *j* for the flood water depth |
| $\gamma_j$ | Sensitivity parameter of land-use class *j* for the distance decay factor |