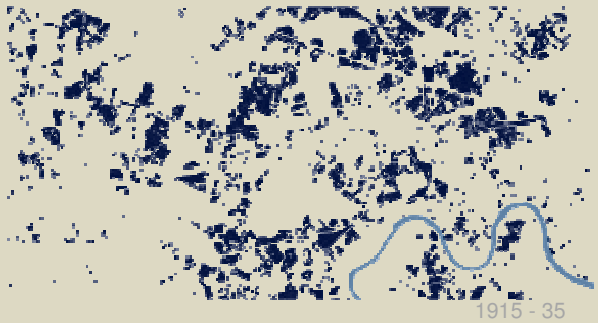
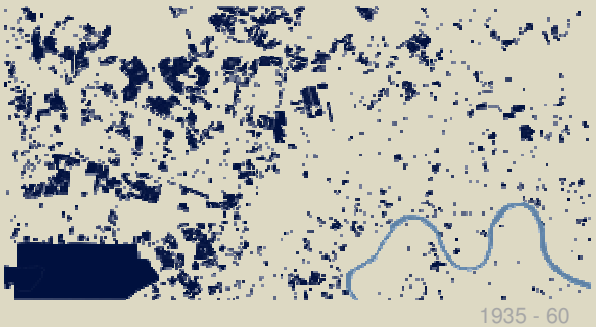
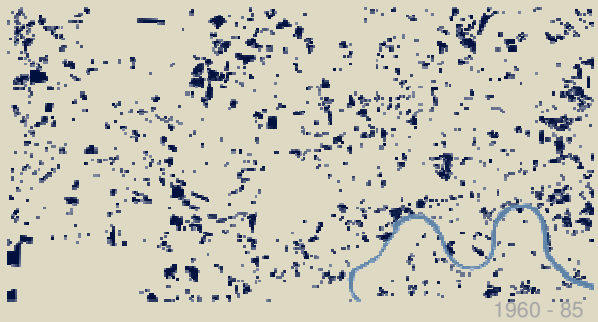
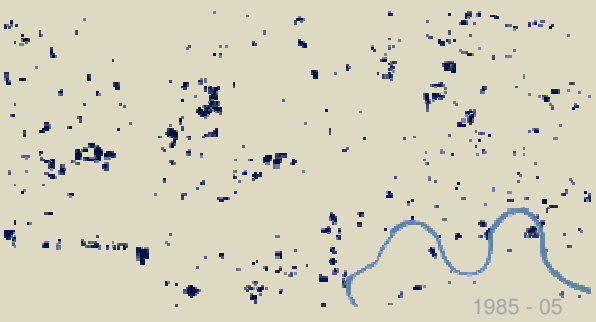
nucleation





diffusion

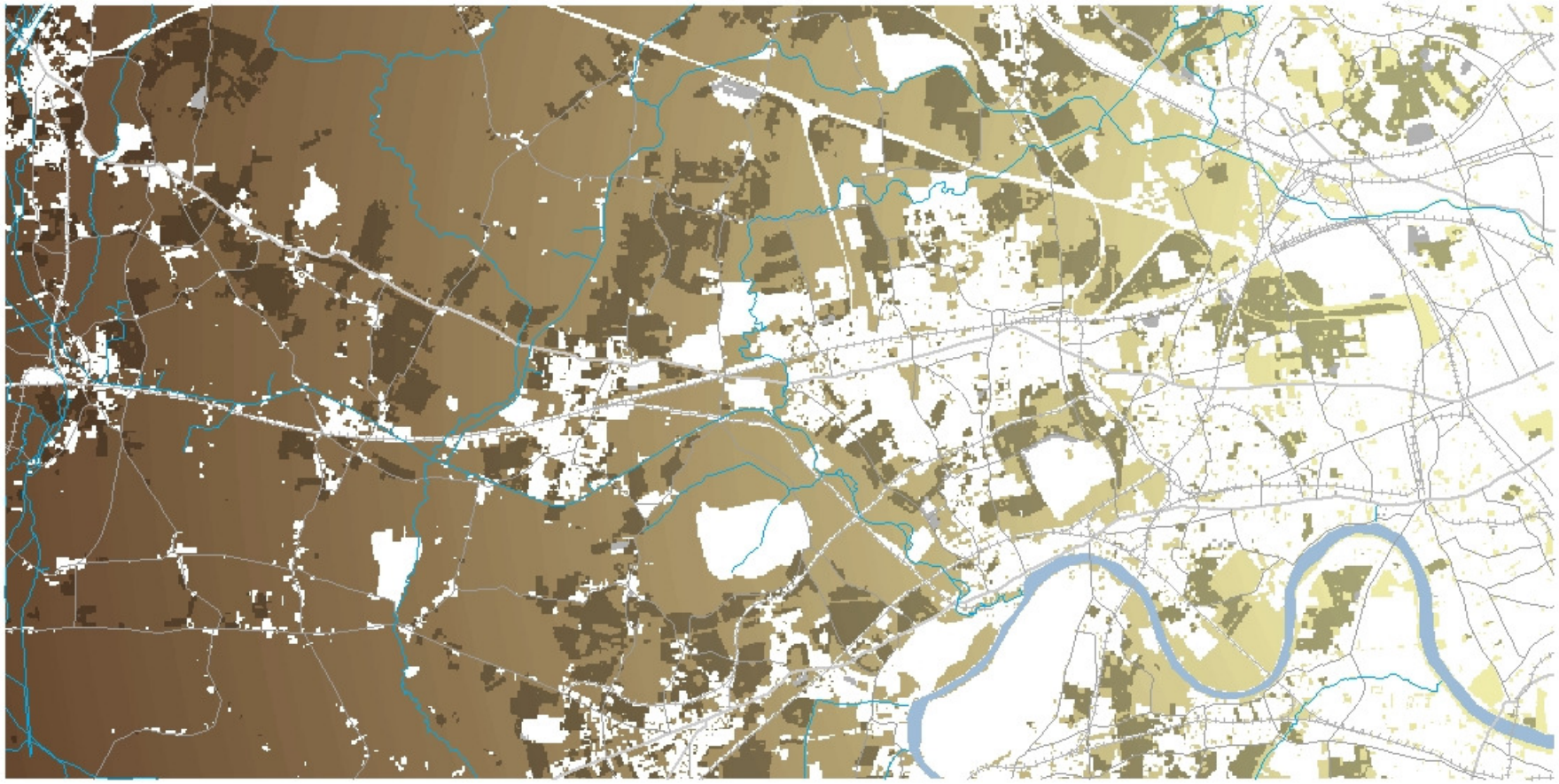




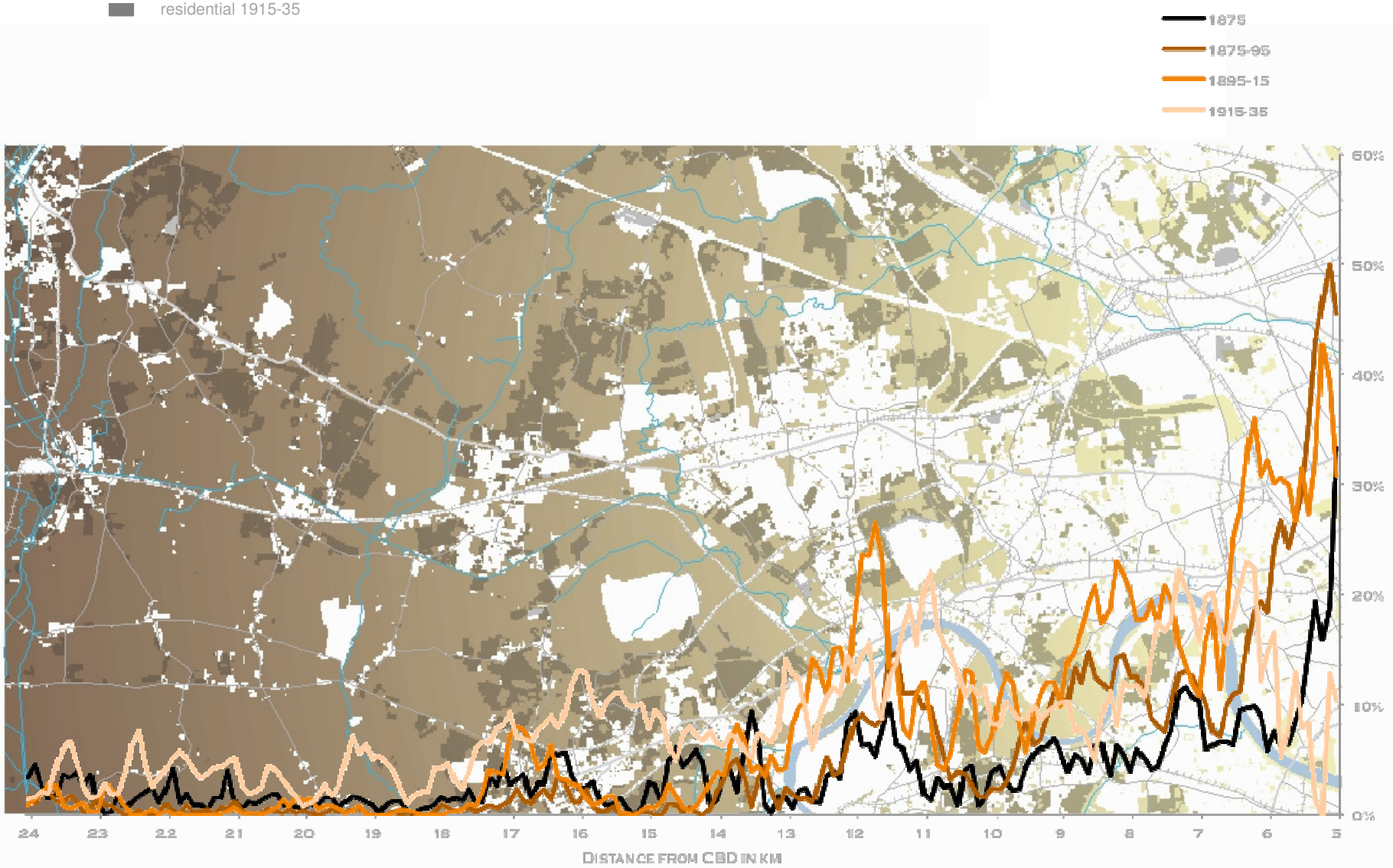
infill

residential 1915-35

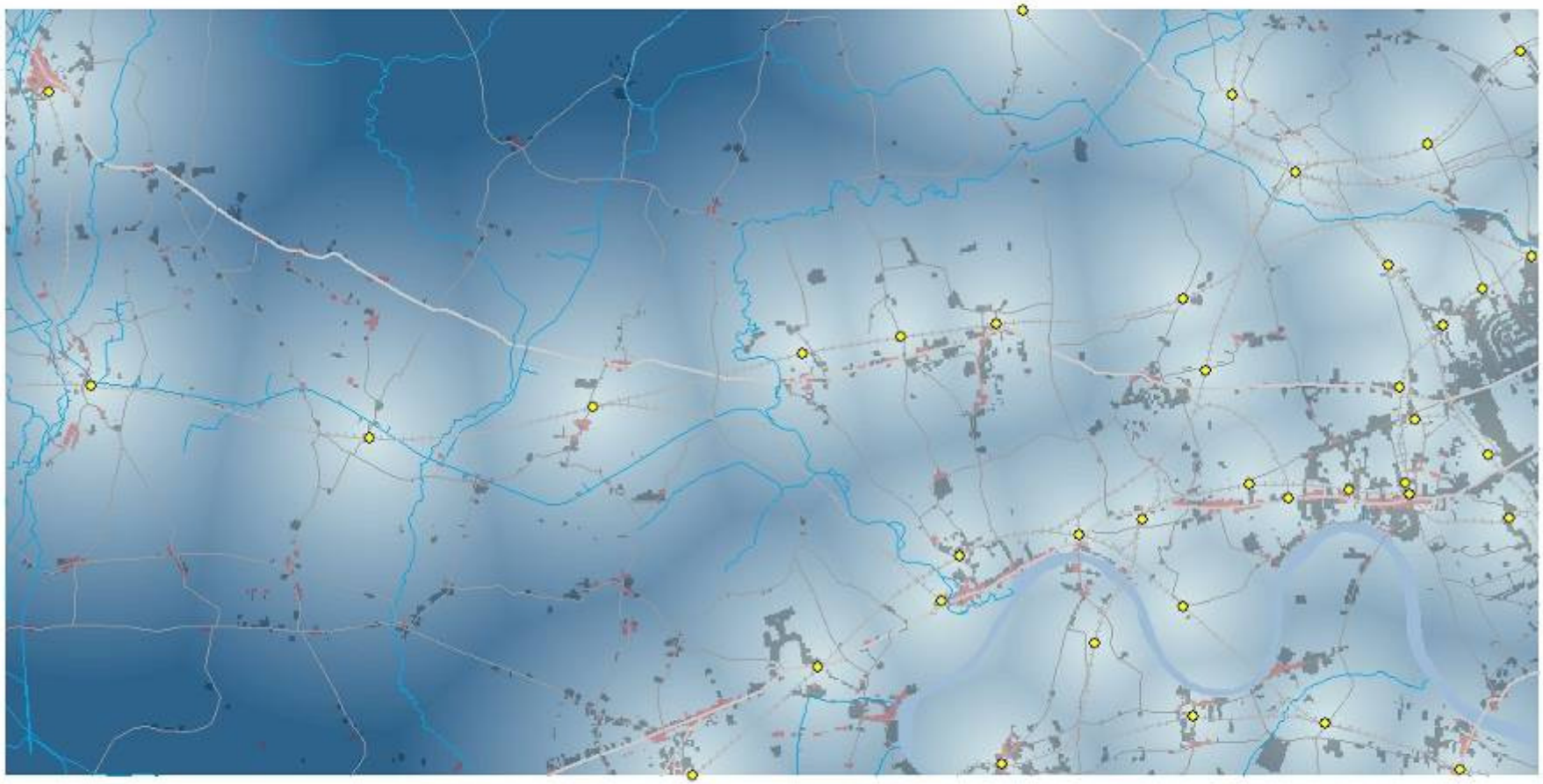
residential 1915-35



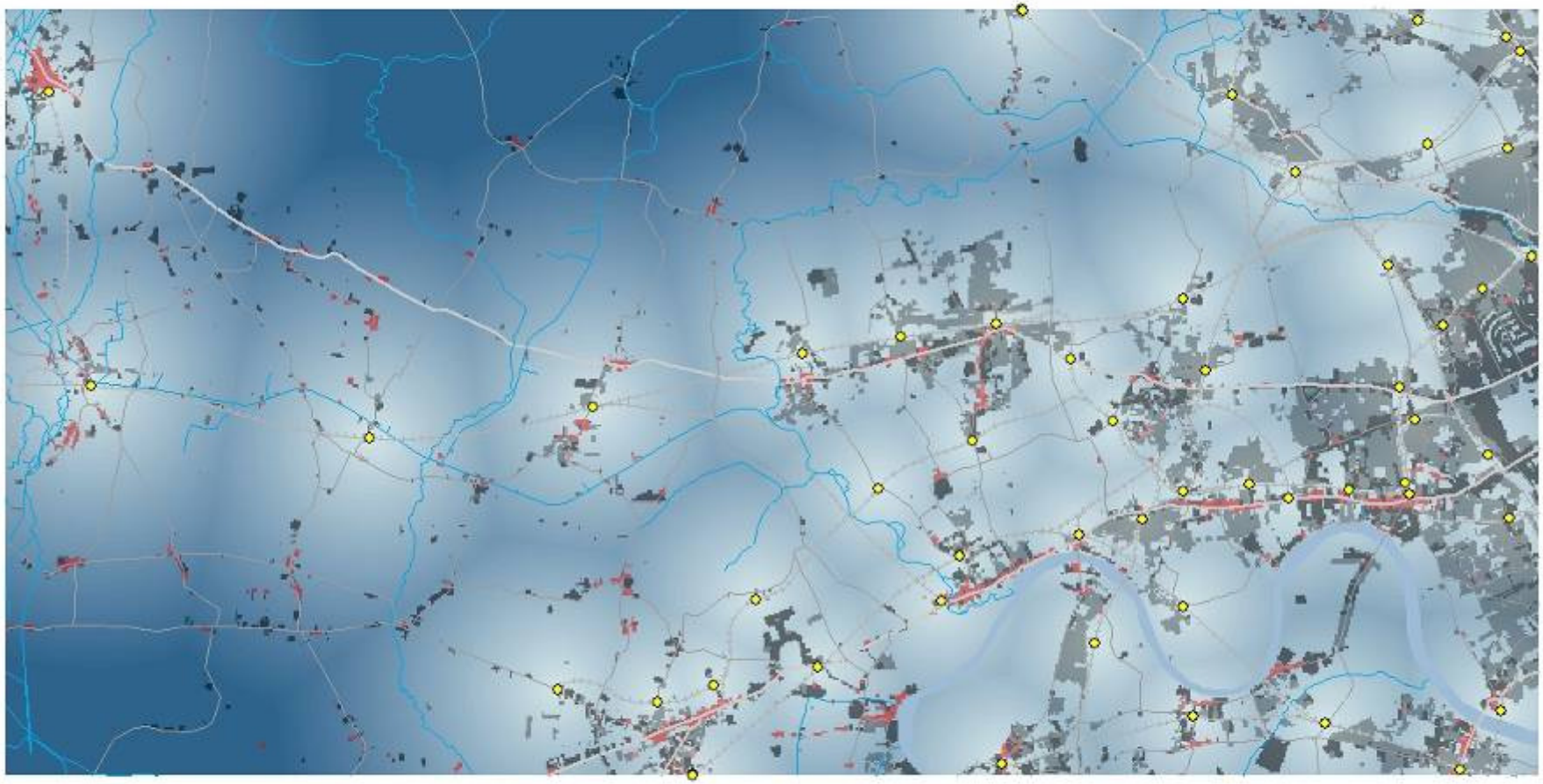
residential 1915-35



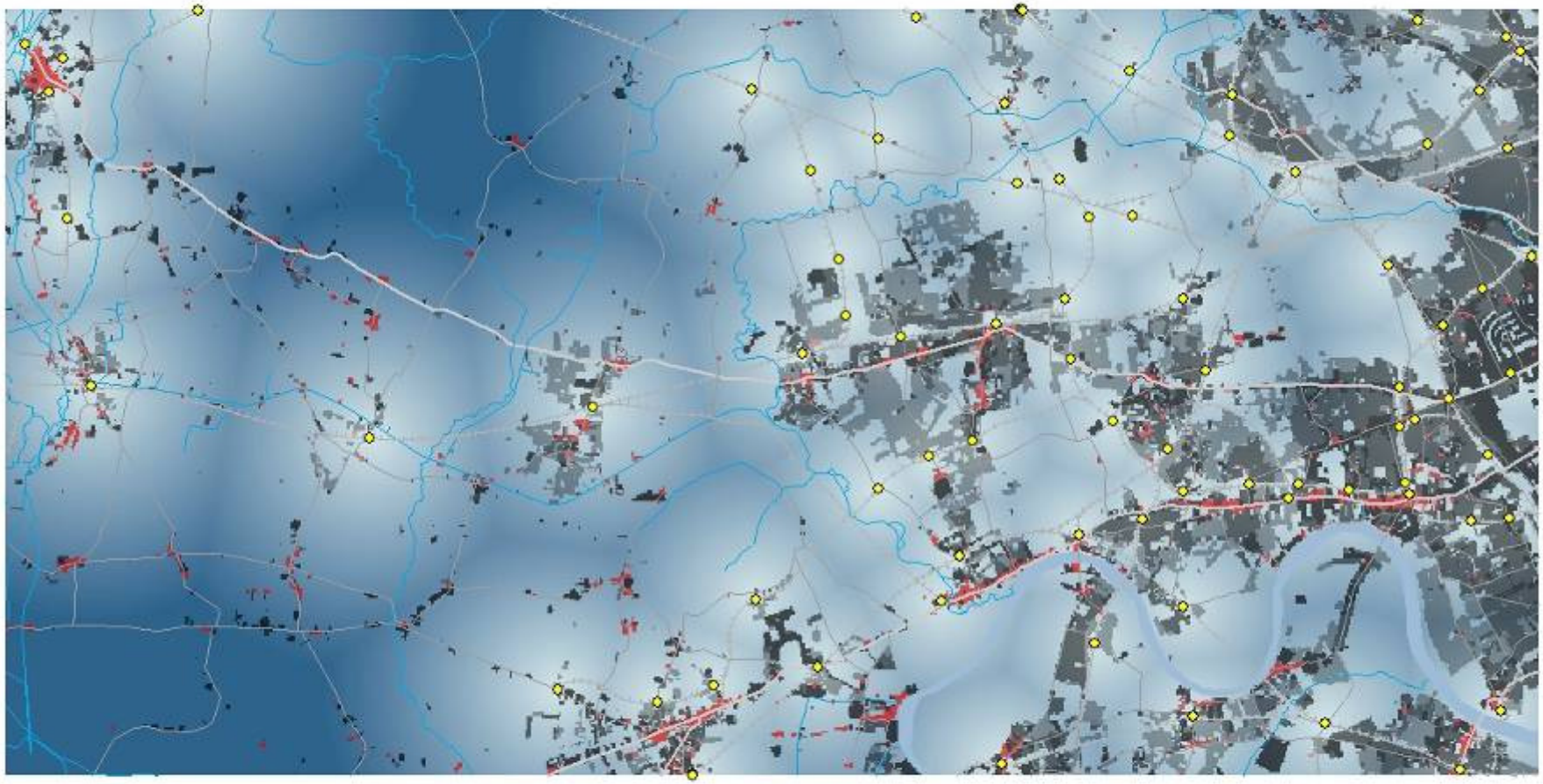
residential
commercial
rail station



residential
commercial
rail station

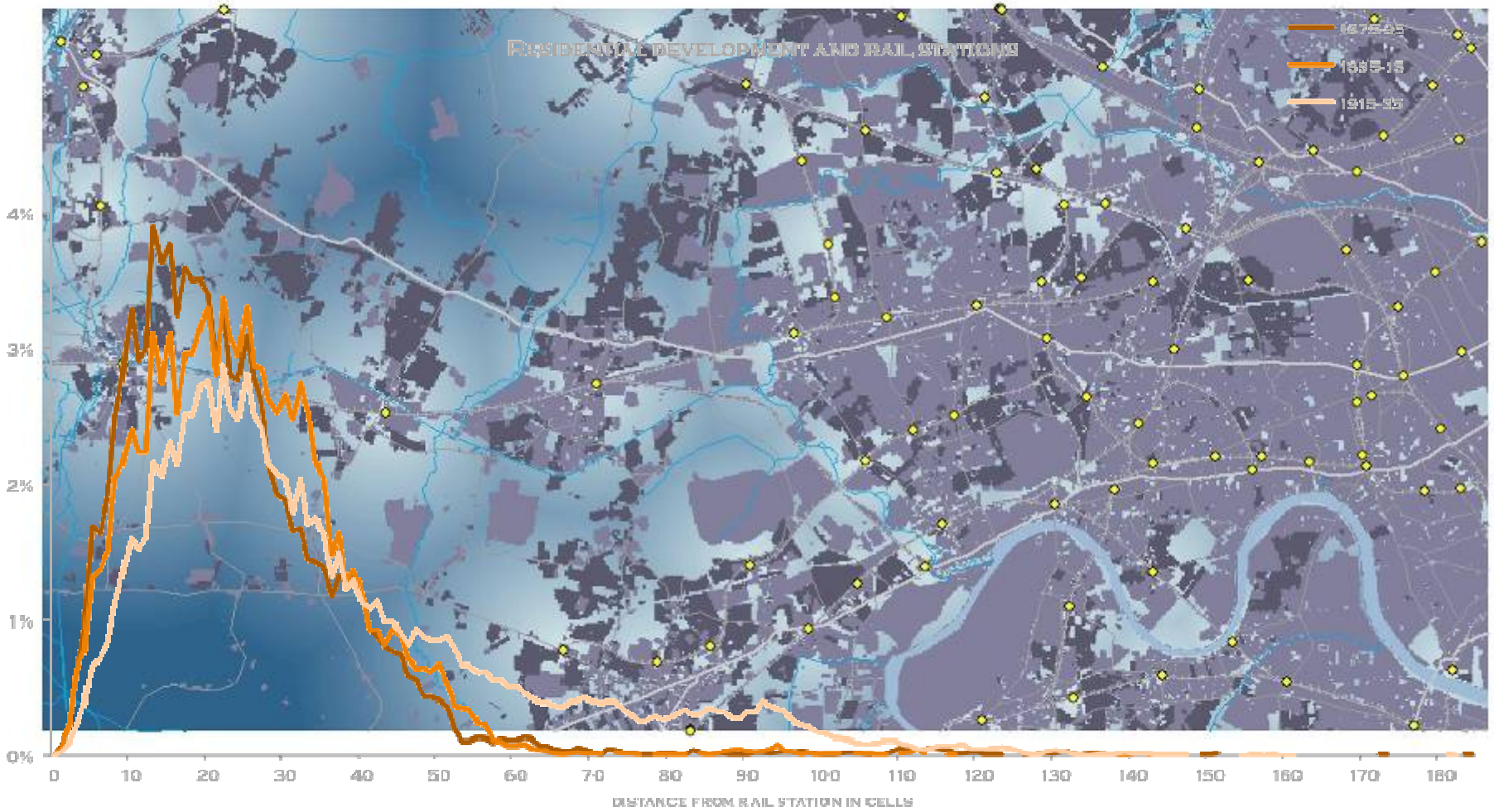


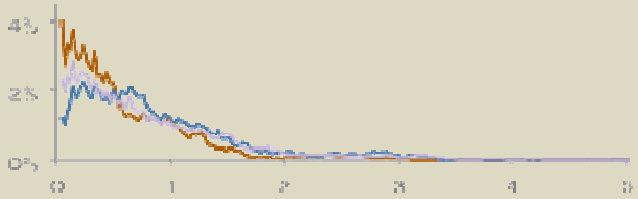
residential
commercial
rail station



residential development 1915-35
rail station

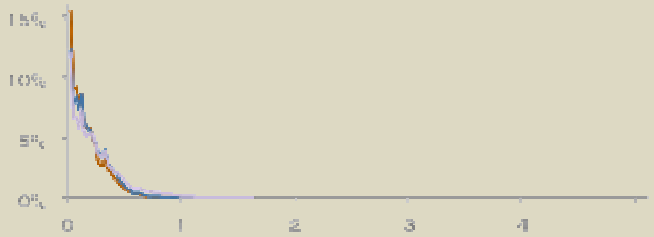
residential 1915-35
developed land
1915
rail station



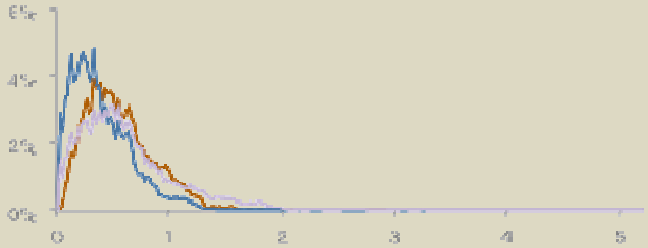


distance to ***arterial roads***

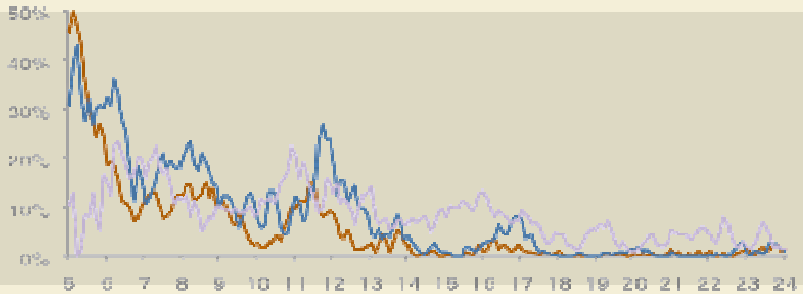
1875 - 95
1895 - 15
1915 - 35



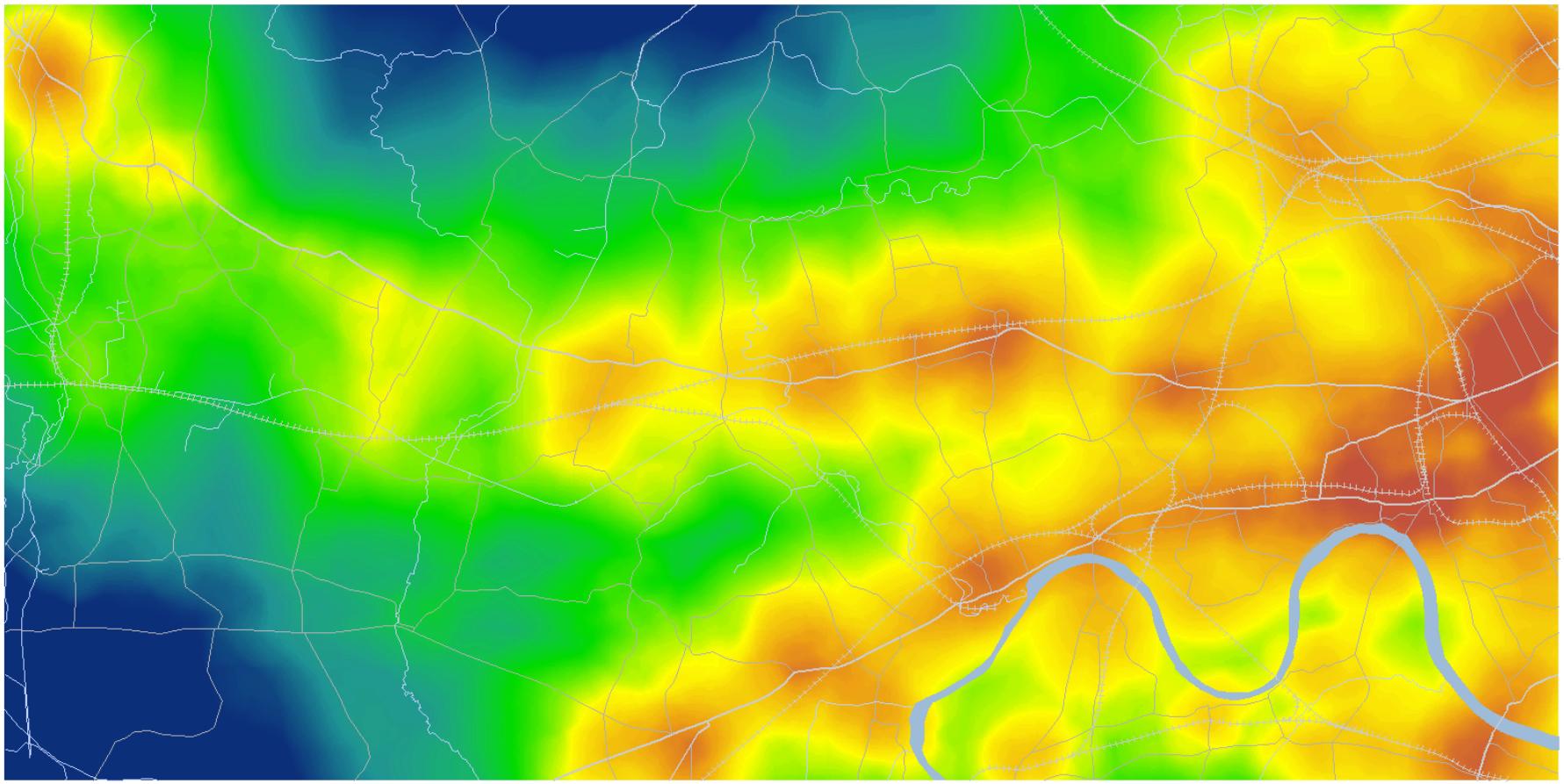
distance to *connector roads*

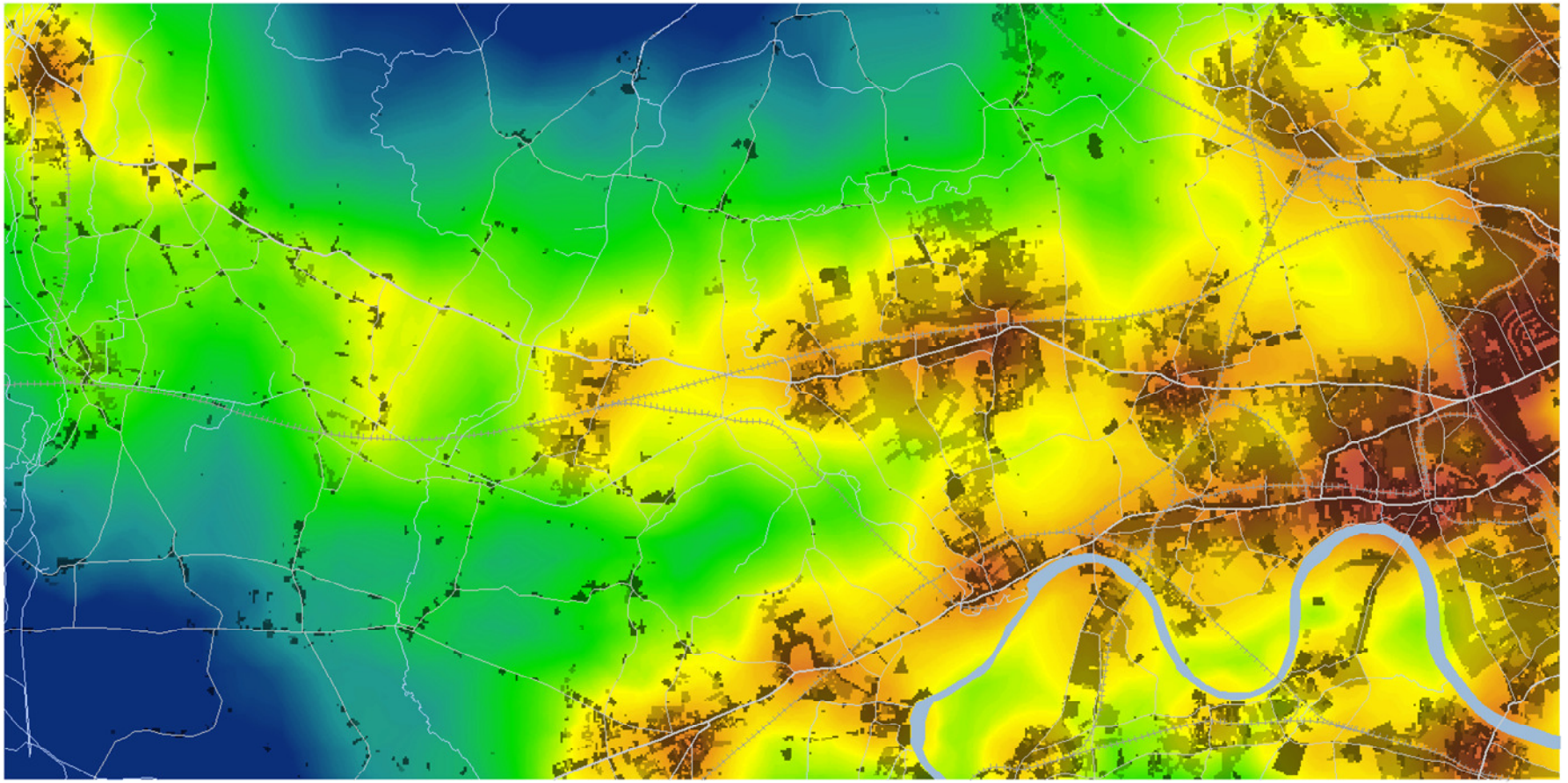


distance to *rail stations*



distance to *CBD*

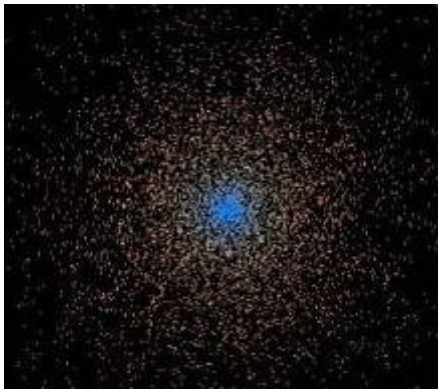


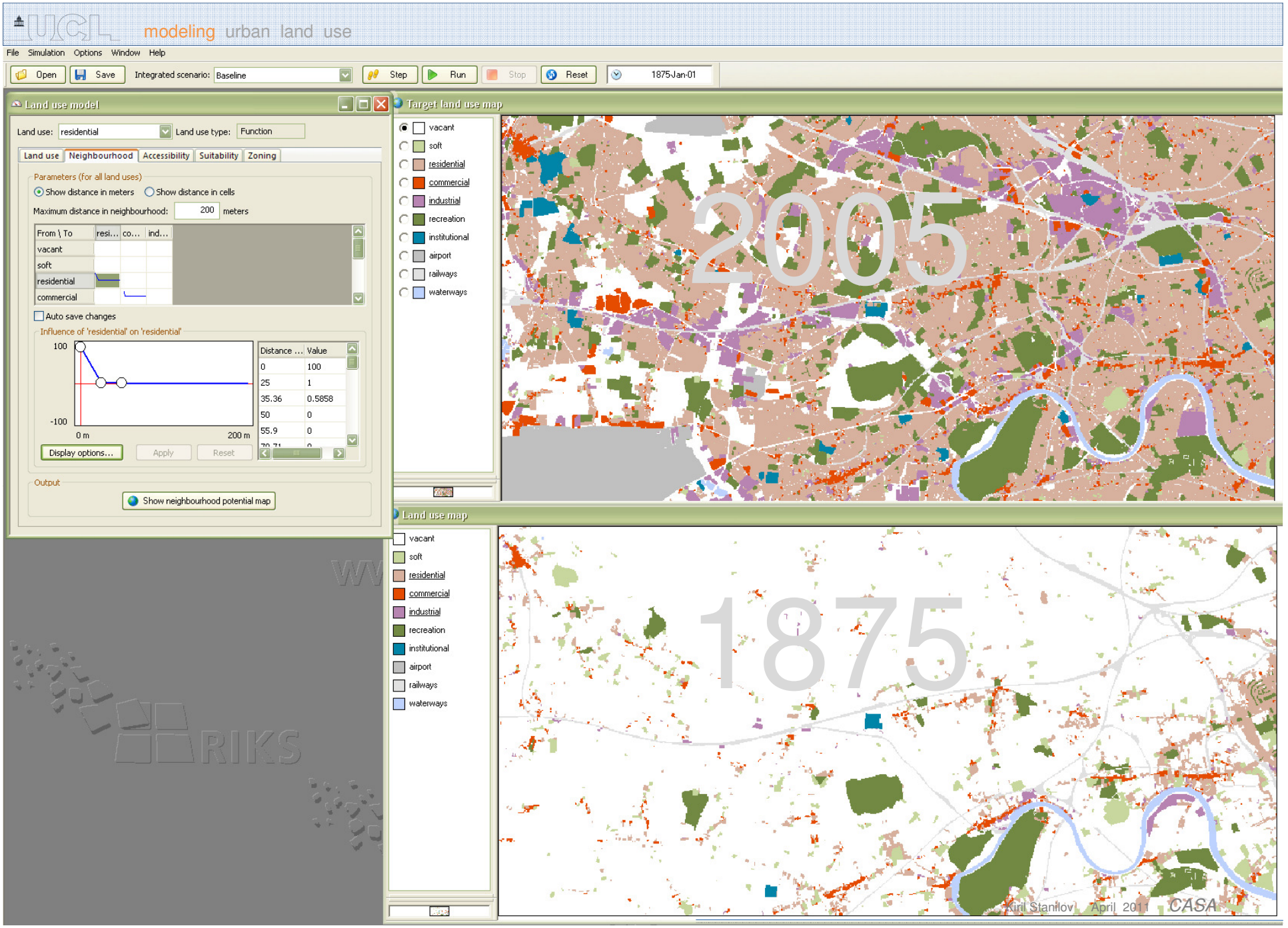


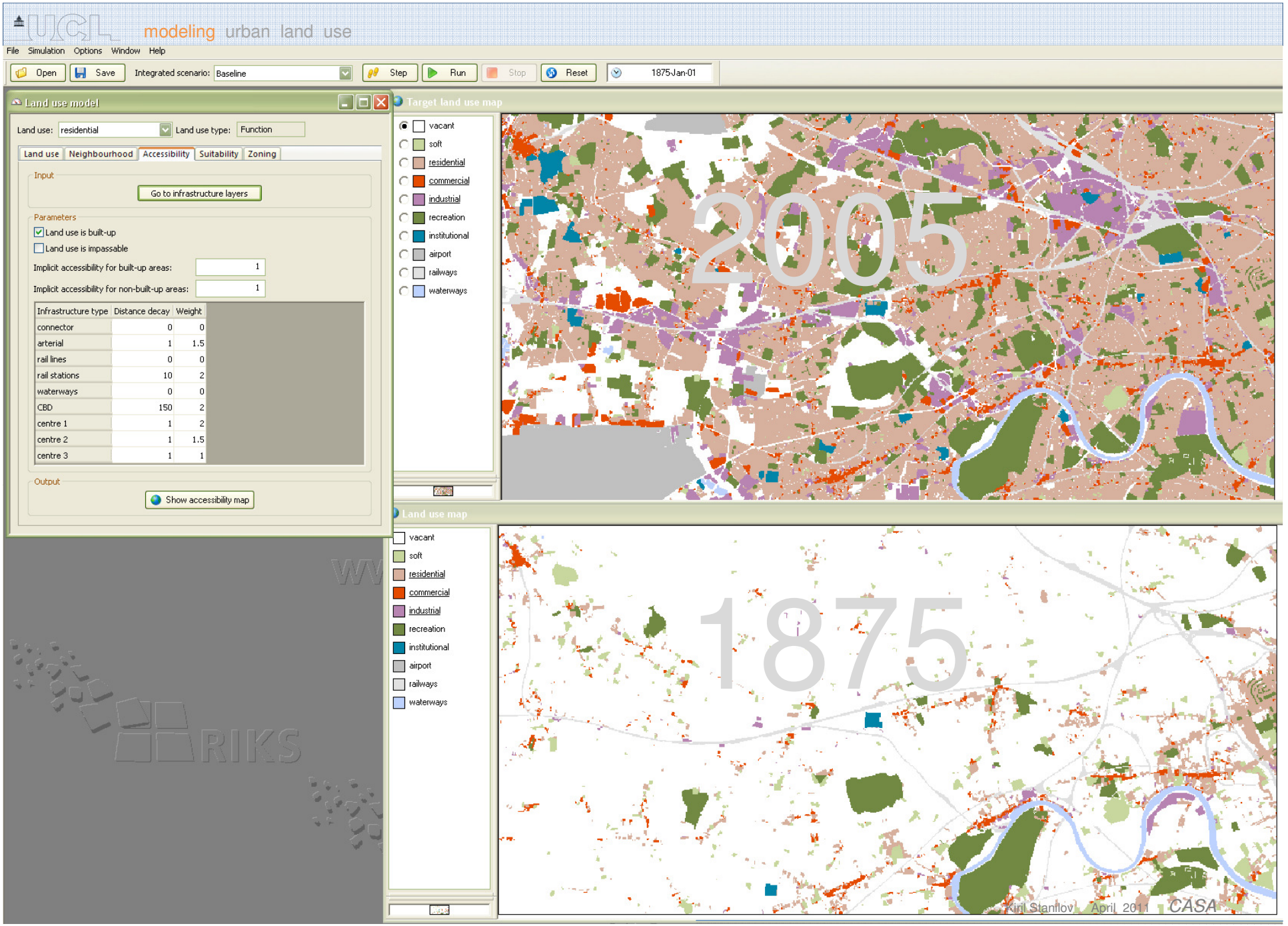
why cellular automata?

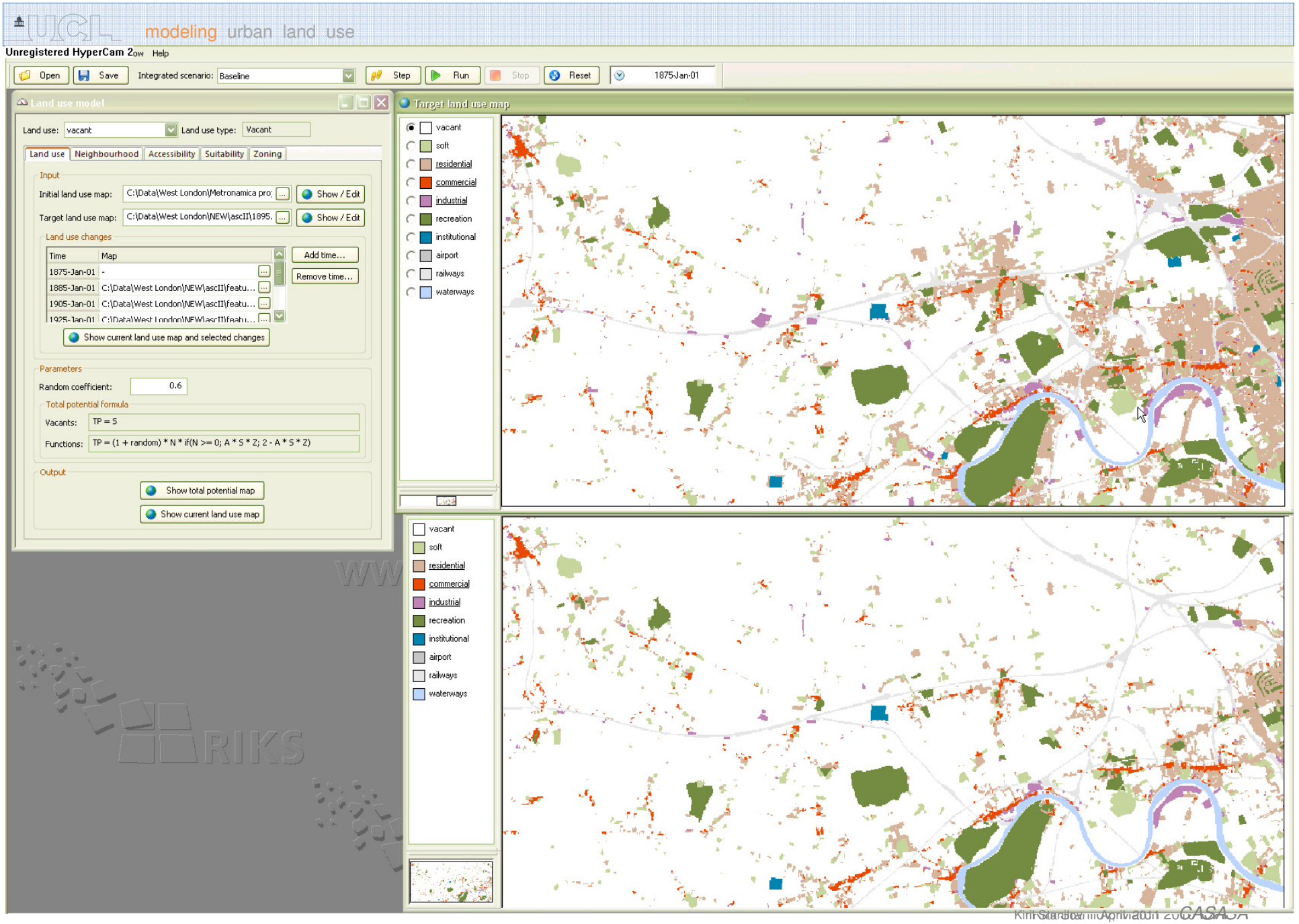
CA/CS models are:

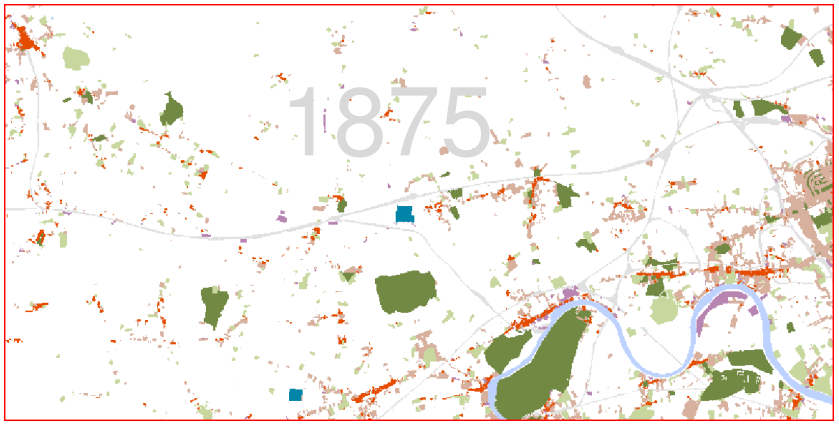
- ü particularly adept at dealing with spatial phenomena
- ü able to capture fine-scale dynamic adaptations
- ü able to capture complex behavior
  - decentralized self-organization
  - emergence
  - abrupt change
- ü highly adaptable for a variety of contexts
- ü open to outside influences (constraints)
- ü highly visual environments




UCL modeling urban land use
File Simulation Options Window Help
Open Save Integrated scenario: Baseline Step Run Stop Reset 1875-Jan-01
Land use model
Land use: residential Land use type: Function
Land use Neighbourhood Accessibility Suitability Zoning
Parameters (for all land uses)
Show distance in meters Show distance in cells
Maximum distance in neighbourhood: 200 meters
From \ To resi... co... ind...
vacant
soft
residential
commercial
Auto save changes
Influence of 'residential' on 'residential'
100
-100
0 m
200 m
Distance ... Value
0 100
25 1
35.36 0.5858
50 0
55.9 0
Display options... Apply Reset
Output
Show neighbourhood potential map
Target land use map
vacant
soft
residential
commercial
industrial
recreation
institutional
airport
railways
waterways
2005
Land use map
vacant
soft
residential
commercial
industrial
recreation
institutional
airport
railways
waterways
1875
Kiril Stanilov April 2011 CASA

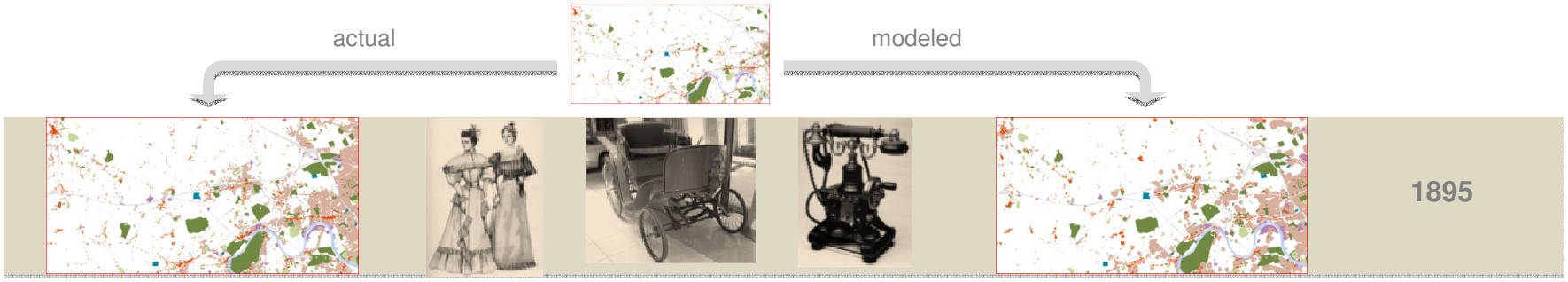

modeling urban land use
File Simulation Options Window Help
Open
Save
Integrated scenario:
Baseline
Step
Run
Stop
Reset
1875-Jan-01
Land use model
Land use:
residential
Land use type:
Function
Land use
Neighbourhood
Accessibility
Suitability
Zoning
Input
Go to infrastructure layers
Parameters
Land use is built-up
Land use is impassable
Implicit accessibility for built-up areas:
1
Implicit accessibility for non-built-up areas:
1
Infrastructure type
Distance decay
Weight
connector 0 0
arterial 1 1.5
rail lines 0 0
rail stations 10 2
waterways 0 0
CBD 150 2
centre 1 1 2
centre 2 1 1.5
centre 3 1 1
Output
Show accessibility map
Target land use map
vacant
soft
residential
commercial
industrial
recreation
institutional
airport
railways
waterways
2005
Land use map
1875
RIKS
Kirl Stanilov April 2011 CASA

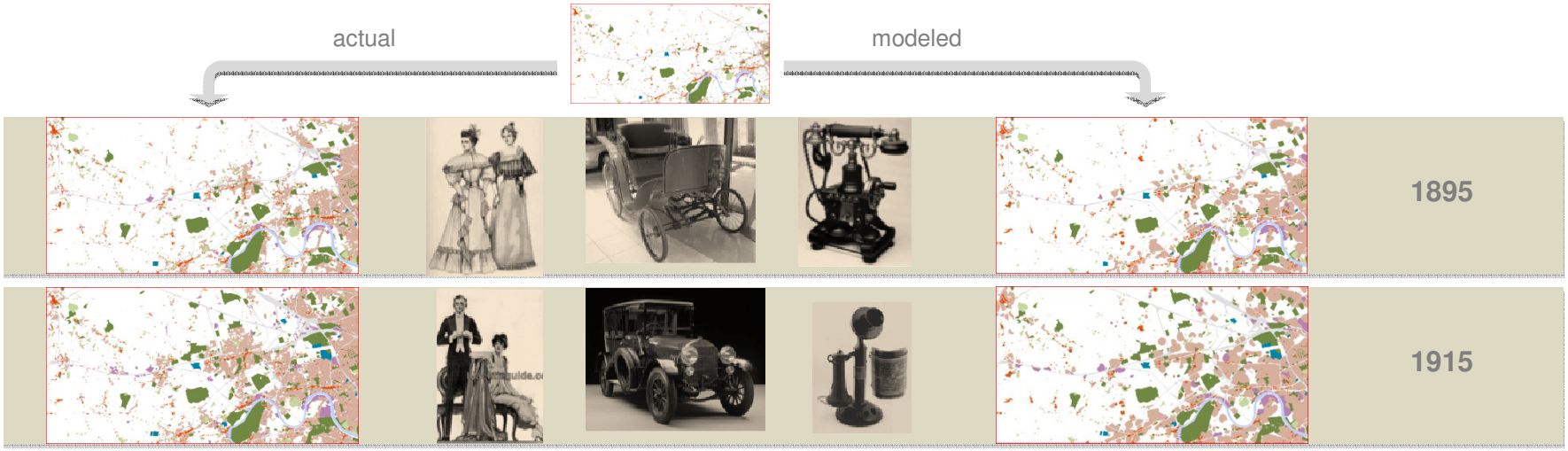

modeling urban land use
Unregistered HyperCam 2ow Help
Open
Save
Integrated scenario:
Baseline
Step
Run
Stop
Reset
1875-Jan-01
Land use model
Land use:
vacant
Land use type:
Vacant
Land use
Neighbourhood
Accessibility
Suitability
Zoning
Input
Initial land use map:
C:\Data\West London\Metronamica pro
Show / Edit
Target land use map:
C:\Data\West London\NEW\ascII\1895.
Show / Edit
Land use changes
Time
Map
Add time...
Remove time...
1875-Jan-01
1885-Jan-01
C:\Data\West London\NEW\ascII\featu...
1905-Jan-01
C:\Data\West London\NEW\ascII\featu...
Show current land use map and selected changes
Parameters
Random coefficient:
0.6
Total potential formula
Vacants:
TP = S
Functions:
TP = (1 + random) * N * if(N >= 0; A * S * Z; 2 - A * S * Z)
Output
Show total potential map
Show current land use map
Target land use map
vacant
soft
residential
commercial
industrial
recreation
institutional
airport
railways
waterways
RIKS
CASA



2005 actual

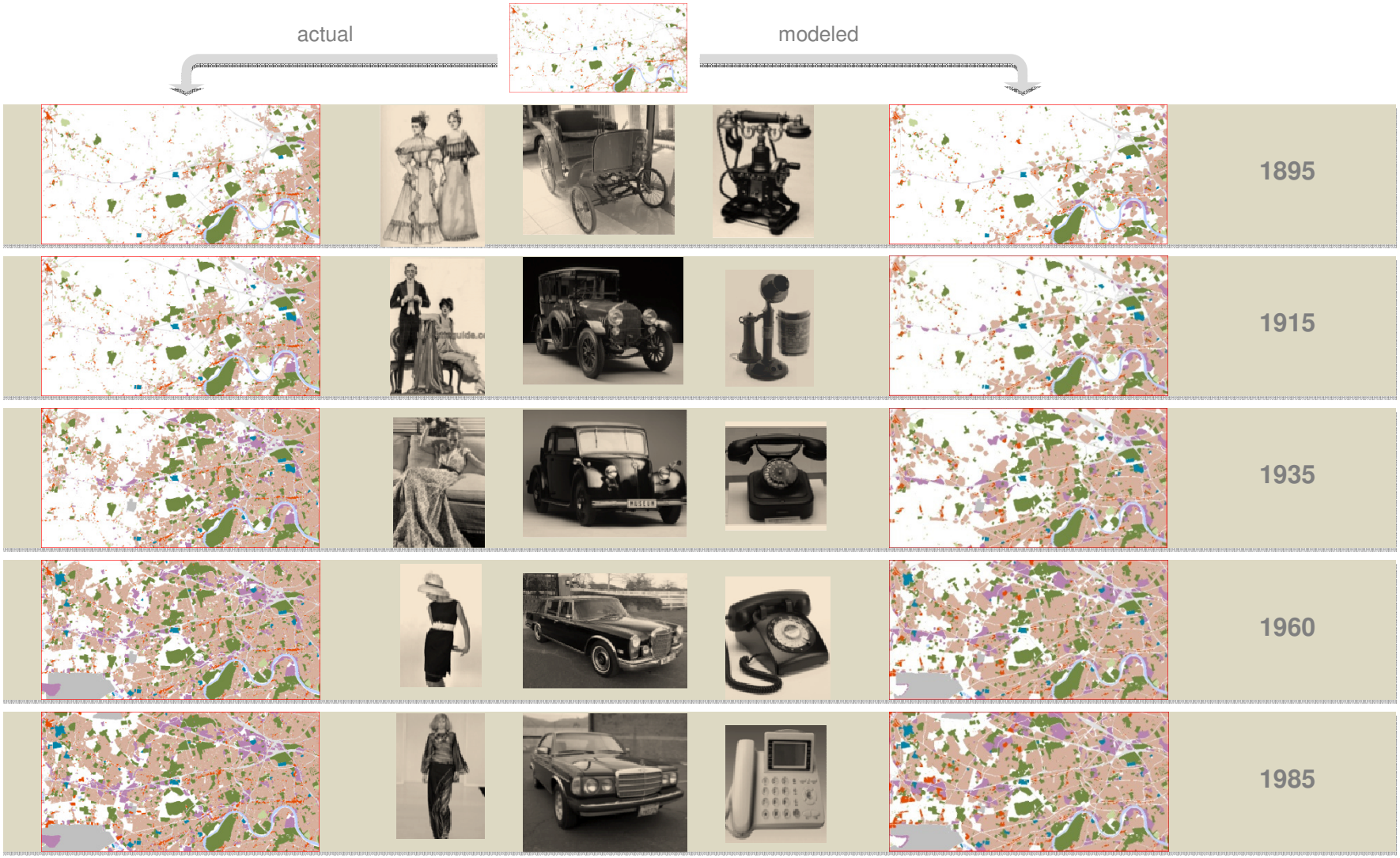
2005 modeled


actual
modeled
1895


actual
modeled
1895
1915


actual
modeled
1895
1915
1935


actual
modeled
1895
1915
1935
1960


actual
modeled
1895
1915
1935
1960
1985


actual
modeled
1895
1915
1935
1960
1985
2005