Simulation of population growth and diffusion in resource-specified areas

Assume there is a restricted area for target animals to live in, and the land itself has an attribute "resource" which can differ due to the location (fig.1). The "resource" just literally means the richness of the land, and of course, population tends to increase and migrate with respect to this; for example, when animals have enough food, they tend to grow better and travel less.

Figure 1 An example of 2D resource map

Equation for growth https://en.wikipedia.org/wiki/Population_dynamics

for diffusion https://en.wikipedia.org/wiki/Diffusion_equation

For example, equations such as

$$\frac{dN}{dt} = r\big(resource(x,y)\big)N(1 - \frac{N}{K})$$

$$\frac{\partial N}{\partial t} = D\big(resource(x,y)\big)\left(\frac{\partial^2 N}{\partial x^2} + \frac{\partial^2 N}{\partial y^2}\right) + \frac{\partial D \partial N}{\partial x^2} + \frac{\partial D \partial N}{\partial y^2}$$

can be established where r and D are getting the influence from the "resource".

Programming won't be hard if using explicit method (FTCS), basically what we've done in PDE class.