Nonlocal dispersion

Fractional derivatives model fast spreading via long movements.

\[
\frac{\partial P}{\partial t} = C \frac{\partial^{1.7} P}{\partial x^{1.7}} + D \frac{\partial^2 P}{\partial y^2} + rP \left( 1 - \frac{P}{K} \right)
\]

Fractional diffusion jumps the barrier.

Real invasive species data shows this behavior.