

Environmental Transmission Chronic Wasting Disease

Spatial Modeling Project



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Mathematics of Biosystems

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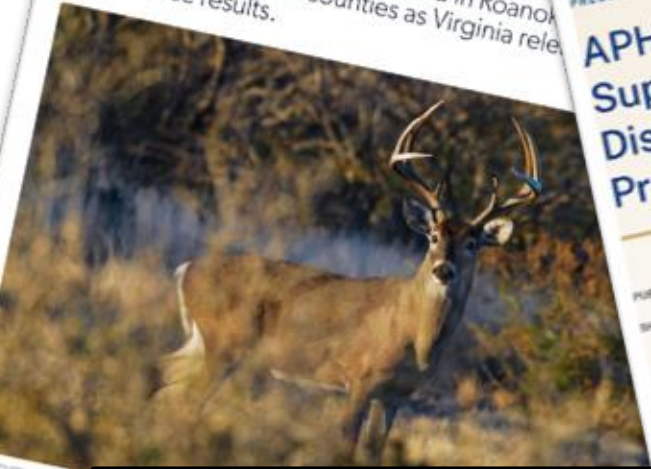
The New York Times

Targeted Hunts Were Supposed to Curb 'Zombie Deer Disease.' Now What?

In Illinois and other states, officials hoped that culls could halt the progress of chronic wasting disease. Now they are losing hope.

Virginia reports 126 deer positive for chronic wasting disease in 2025-26 surveillance

Chronic wasting disease detected in Roanoke, Montgomery, Pulaski counties as Virginia releases surveillance results.



APHIS Announces Funding to Support Chronic Wasting Disease Control and Prevention

PRESS RELEASE
PUBLISHED: May 15, 2026
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(Washington, D.C., May 15, 2026) – The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) will provide approximately \$12 million to support efforts by State, Tribal governments, research institutions, and universities to control and prevent chronic wasting disease (CWD) in wild and farmed cervids (e.g., deer, elk).

PRESS RELEASE
Release No.: 006726

Chronic Wasting Disease Rising in Virginia Deer

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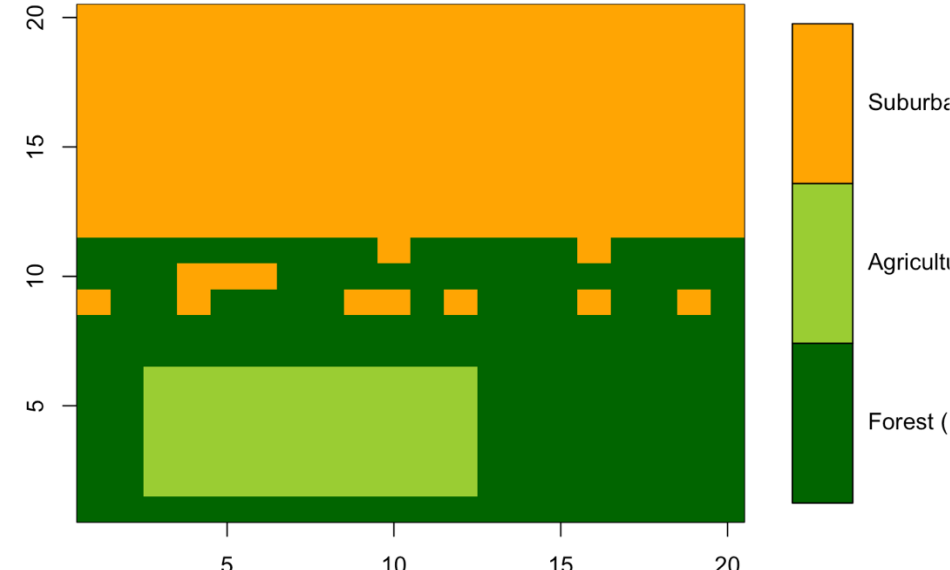
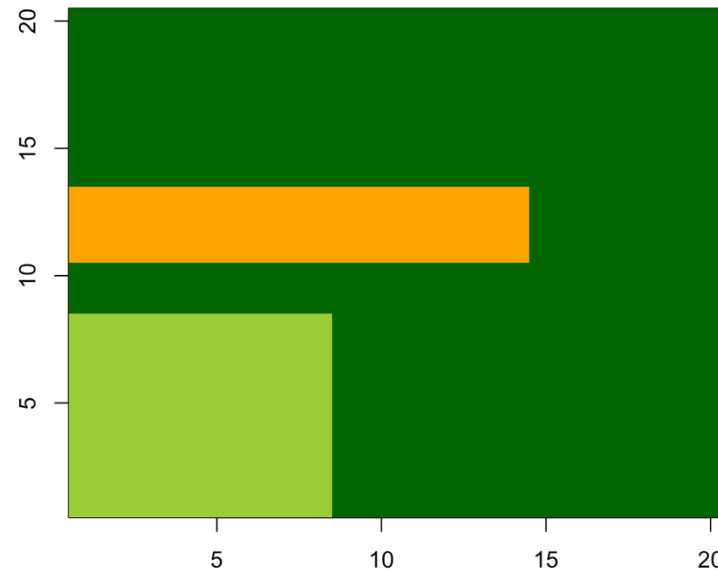
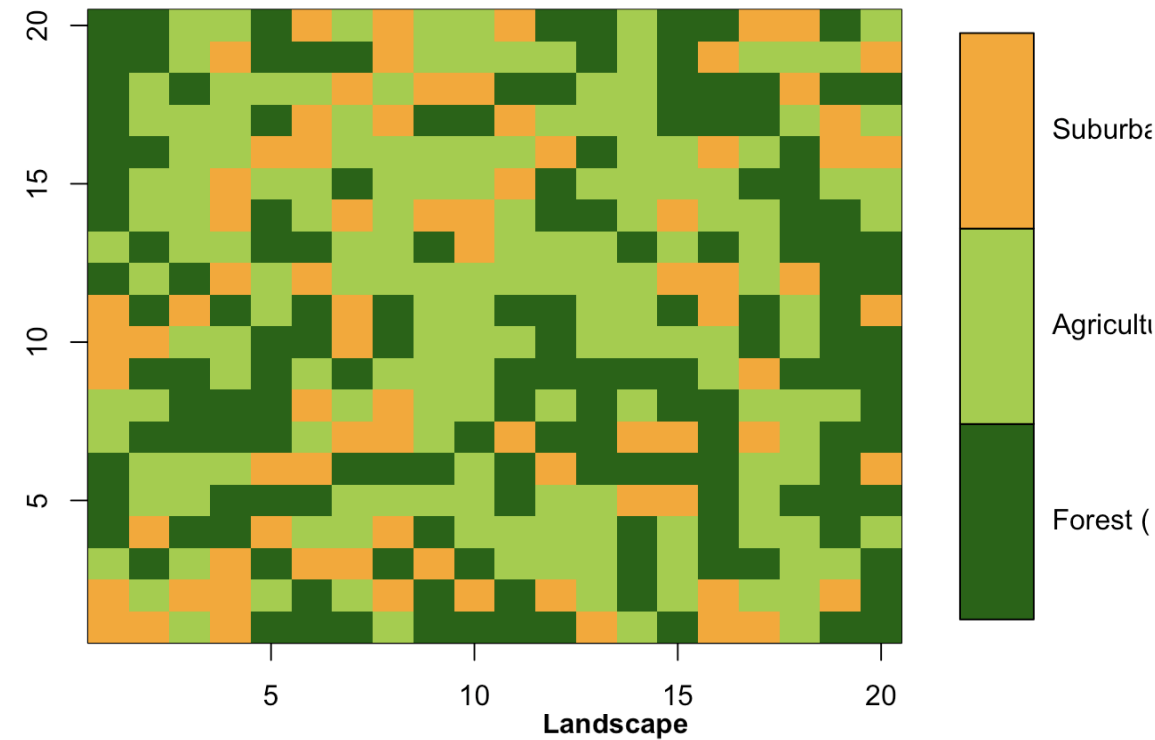
CWD is a 100% fatal neurological illness affecting deer, elk, and moose.

It causes progressive brain degeneration. Animals experience drastic weight loss, tremors, listlessness, and loss of fear, quite literally wasting away.

It is caused by prions, misfolded proteins that are practically indestructible. They resist heat, radiation, and traditional disinfectants.

Spatial Computational Model

- **Grid-Based Spatial Modeling:** Track populations of healthy (S) and infected (I) deer as they interact across dynamic, cell-by-cell landscape grids.
- **The Soil Reservoir (P):** Code tracks how environmental prion accumulation spread.
- **Simulation Outputs:** movement and prevalence plots, compiles and exports a .mp4 video animation mapping the epidemic's spread.



[STATE DEPARTMENT OF NATURAL RESOURCES] [CLASSIFIED: BRIEFING]

POSITION ASSIGNED: Lead Wildlife Epidemiologist

TARGET THREAT: Chronic Wasting Disease (CWD) Prion

CRITICAL MISSION OBJECTIVE:

Evaluate competing disease-management policies to dampen epidemic acceleration. You must balance immediate herd survival against long-term generational topsoil contamination.

TACTICAL SIMULATION TOOLKIT:

- * R-Based Spatial Grid Matrix Models
- * Tracking: S/I Demographics & Environmental Prion Shedding (P)
- * Outputs: Movement and prevalence Plots & .mp4 Spatial Videos

FINAL DELIVERABLE:

Strategic Policy Recommendation Matrix for the DNR Director.

