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Warming Climate Changes Vermont Disease

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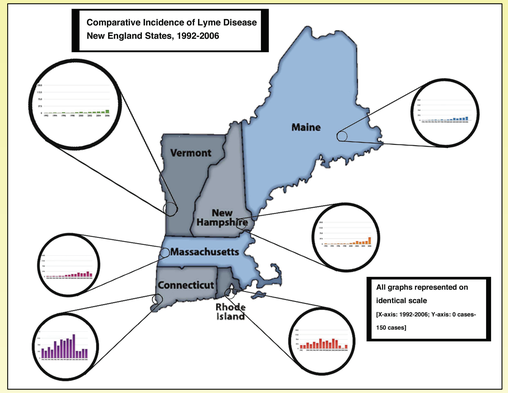
Introduction

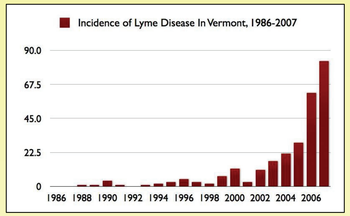
- The average annual temperature in Vermont has gradually increased roughly 1° Centigrade with an increase of 1.16 inches of annual precipitation over the past 112 years. [i]
- According to expert analysis, humans are responsible for 60% of the warming over the past 140 years. [ii]
- Projected greater than 1° Centigrade increase in global temperature by 2100 and a correlated rise in precipitation. [v]
- Climate changes result in the introduction and reproduction of non-endemic flora and fauna.
- Vector-borne diseases accompany warming trends and can become endemic and cause new illnesses in areas which were previously uninhabitable. [ii]

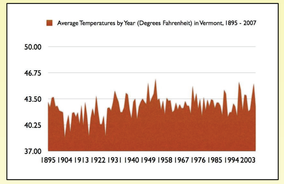
Methods

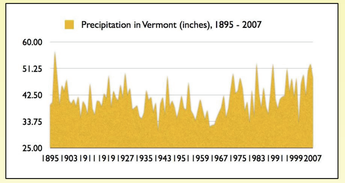
- Research of global climate change, temperature, weather patterns seen in Vermont and vector-borne diseases as potential threats to Vermont was completed.
- Current temperature projections were used to approximate Vermont's future climate.
- An analysis of vector-borne disease in states with climates similar to that projected for Vermont was conducted.
- Lyme disease was investigated in depth as an example of how climate change has lead to the invasion of new vectors and their diseases.
- The precedent set by the migration of Lyme disease into Vermont was used as a model to create a list of other vector-borne diseases that could be seen in Vermont in the near future.
- Information was condensed to be distributed to local physicians and general public to raise awareness.

Results

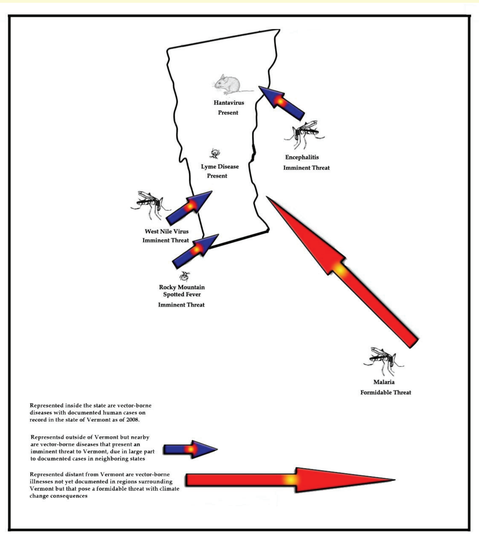


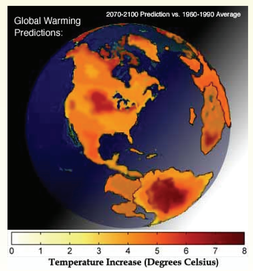


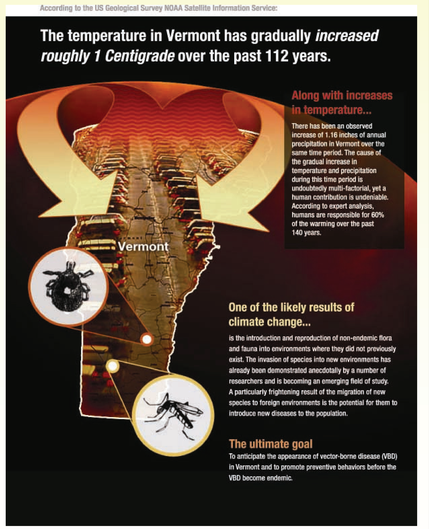




Evidence







Prevention

- Please use caution and follow all product directions when applying natural and chemical repellents.
- Be informed about symptoms and when to call the doctor.
- Effectiveness may vary with product use.

	Mosquito	Tick	Mouse
Natural	**Essential Oils** •Citronella •Lemongrass •Cedar •Lemon Eucalyptus	**Essential Oils** •Lemon Eucalyptus •Neem (Azadirachta indica) Oil	*See behavioral methods*
Chemical	**EPA-Registered Repellants** •10-30% DEET •Permethrin •Picardin	**EPA-Registered Repellants** •10-30% DEET •Permethrin	
Mechanical	•Window screens •Light-colored clothing •Long pants tucked into socks •Hats •Remove standing water	•Light-colored clothing •Long-sleeve shirts •Long pants tucked into socks •Hats •Check for ticks on clothing/skin	•Outdoor occupational workers wear functional respirators
Behavioral	•Minimize outdoor activities during peak transmission season	•Minimize outdoor activities during peak transmission season •Plan activities in low areas of vegetation •Manage humid wooded areas, leaf litter and tall grass to create "tick-safe zones"	•Keep home clean •Seal any entry holes with screen or cement •Remove brush piles •Keep foodstuffs in covered containers •Wet down droppings and clean to minimize aerosolization

Stay informed with updated information: http://www.CDC.gov ; http://www.epa.gov

Conclusions

- The temperature and amount of annual precipitation has been increasing in Vermont
- Expected warming trend to continue in the near future.
- Patterns of climate change have led to the invasion of new insect species and the diseases they carry.
- Lyme disease did not exist in Vermont 20 years ago, but is now prevalent in the state.
- Incidence of Lyme is predicted to increase as winters become milder and summers become longer.
- West Nile Virus is expected to expand its natural habitat into Vermont with warmer temperatures
- Other diseases with similar temperature-based migration patterns to Lyme are Hantavirus, Eastern Equine Encephalitis and other mosquito-borne encephalitides, Rocky Mountain Spotted Fever, and possibly even malaria.

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