Climate change influences on the potential geographic distribution of the disease vector tick *Ixodes ricinus*

Abdelghafar A. Alkishe¹, ², A. Townsend Peterson¹, and Abdallah M. Samy³

¹Biodiversity Institute, University of Kansas, Lawrence, KS 66045, USA. ²Zoology Department, Faculty of Science, University of Tripoli, Tripoli, Libya. ³Entomology Department, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt.

**Background**

- *Ixodes ricinus* is a species of hard tick that transmits several important diseases in Europe and North Africa, including Lyme borreliosis and tick-borne encephalitis.
- Climate change is affecting the geographic distributions and abundances of arthropod vectors, which in turn influence the geographic distribution and epidemiology of associated vector-borne diseases.
- To date, few studies have investigated effects of climate change on the spatial distribution of *I. ricinus* at continental extents.
- We assessed the potential distribution of *I. ricinus* under current and future climate conditions to understand how climate change may influence the geographic distribution of this important tick vector and associated tick-borne pathogens in coming decades.

**MATERIALS & METHODS**

**Results**

- Our models anticipated potential range expansions more broadly in northern Europe, with milder winter conditions as temperature increases.
- In Sweden, for example, the climate has changed to be significantly warmer in the last 3 decades: the 8 warmest Novembers on record were between 2000 and 2009.
- Given that various tick-borne diseases cause serious health problems, predicting future suitable areas for *I. ricinus* can help to guide plans to manage and mitigate effects of these health threats.

**Discussion**

**Acknowledgment**