

Determining the Vulnerability and Resilience of Boreal Forests & Shrubs across Northwestern North America

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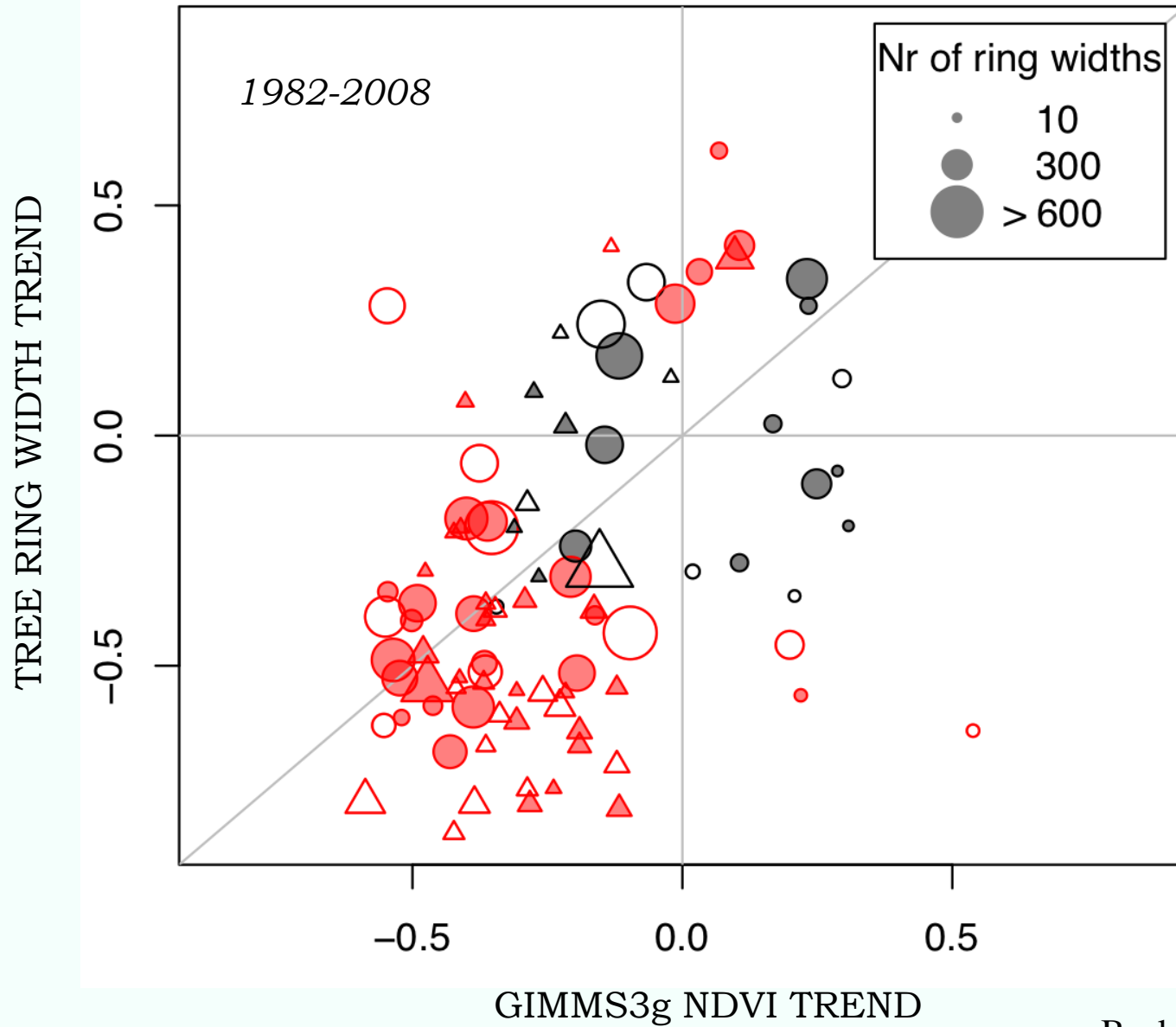
PROJECT GOALS

- 1. UPDATE TREE-RING FIELD COLLECTIONS OF TREE/SHRUB WOOD AT NORTHERN ALASKAN TREELINE FOR RECENT DECADES.**
- 2. GENERATE TREE-RING CHRONOLOGIES OF RING WIDTH AND DENSITY.**
- 3. COMPARE TREE-RING AND SATELLITE INDICES TO ASSESS RECENT EXTREMES & TRENDS IN BOREAL FOREST GROWTH RATES (IN NW NORTH AMERICA)**

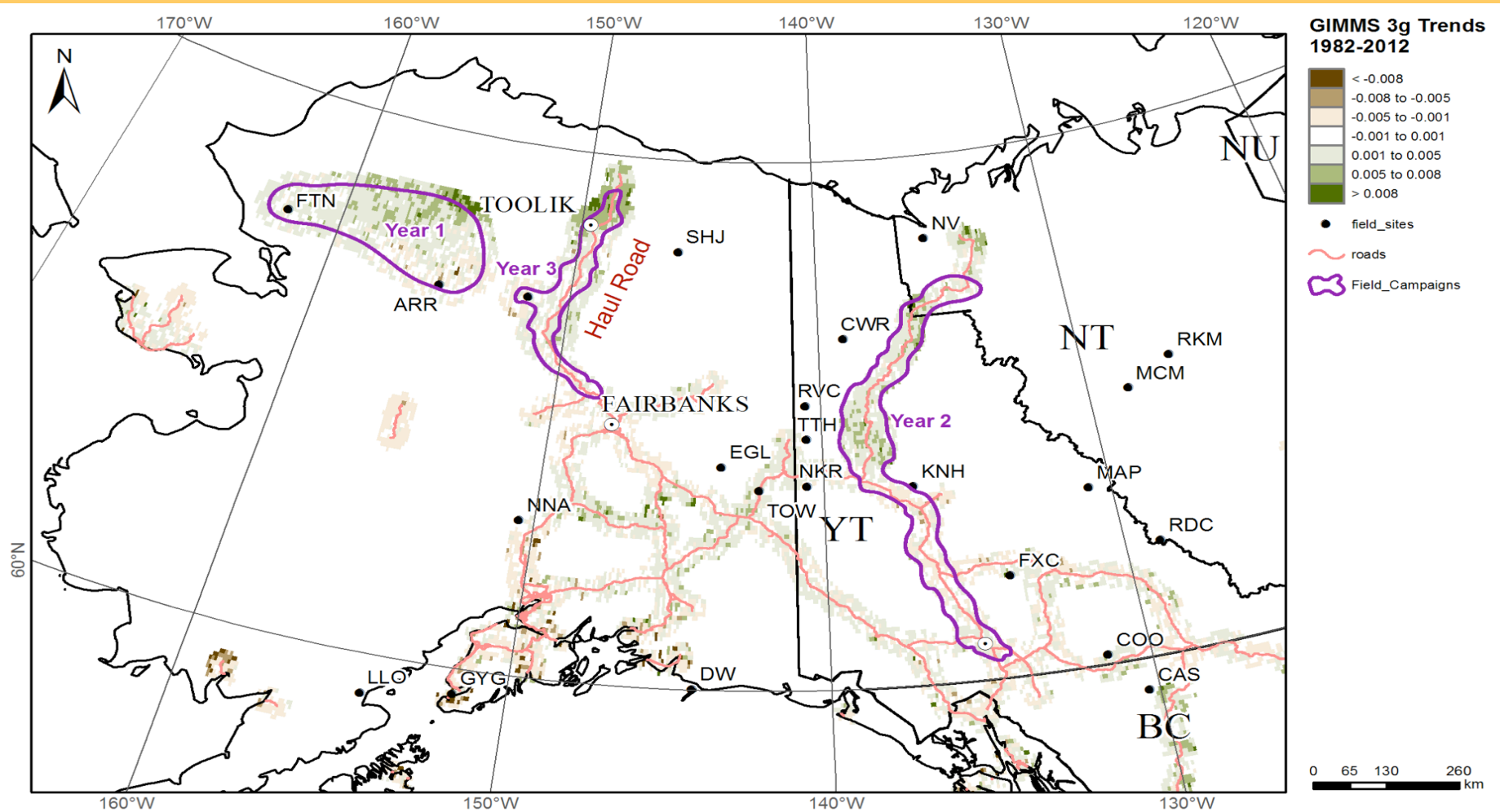


The overarching theory being tested in this project is that the current controls over vegetation growth are not operating as they have been in the past.

BUILDS UPON & EXTENDS PREVIOUS WORK IN THE REGION

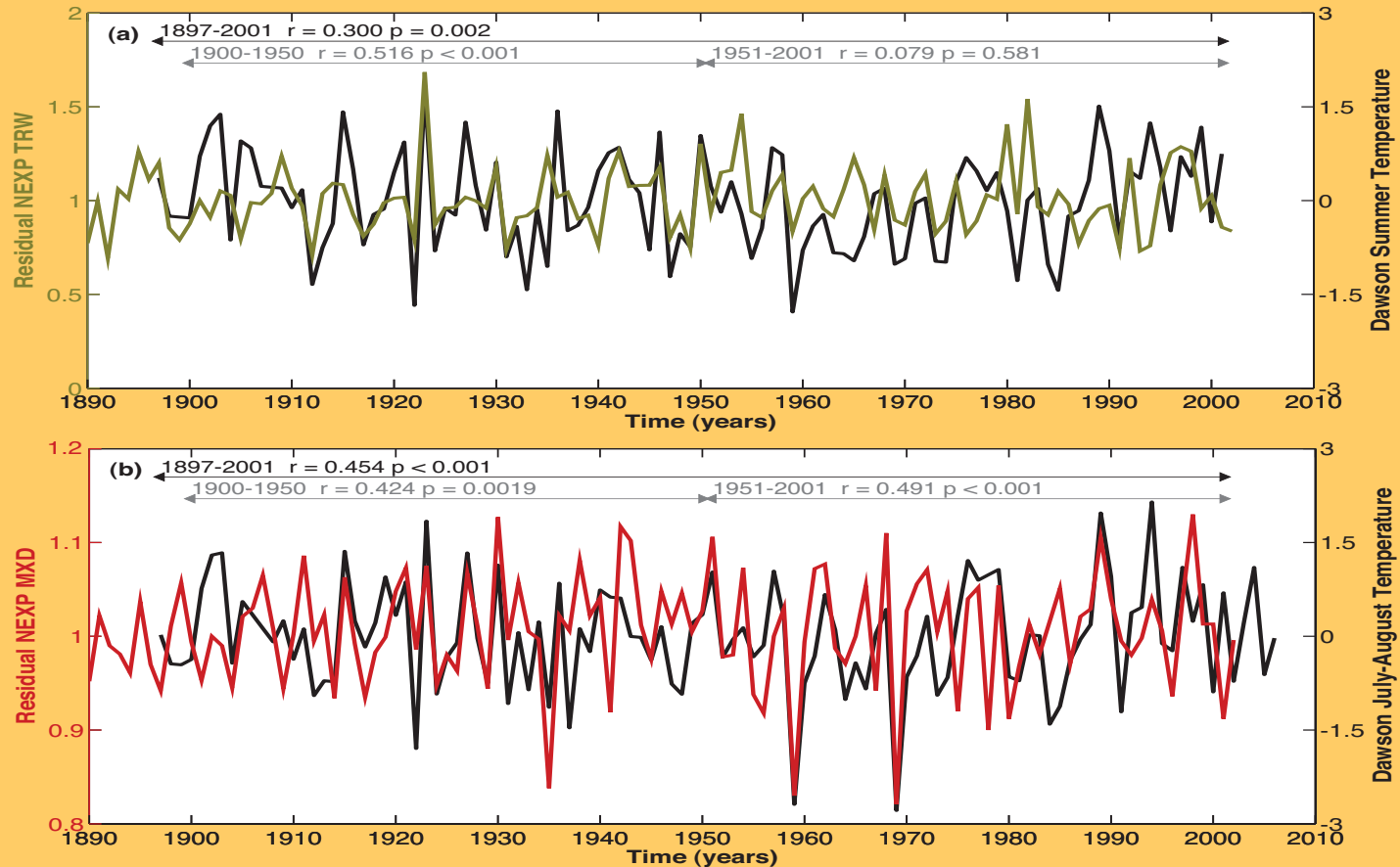


TREE-RING SAMPLES SITES NORTHWESTERN NORTH AMERICA



We will target sites that have not been updated in the past decade or more

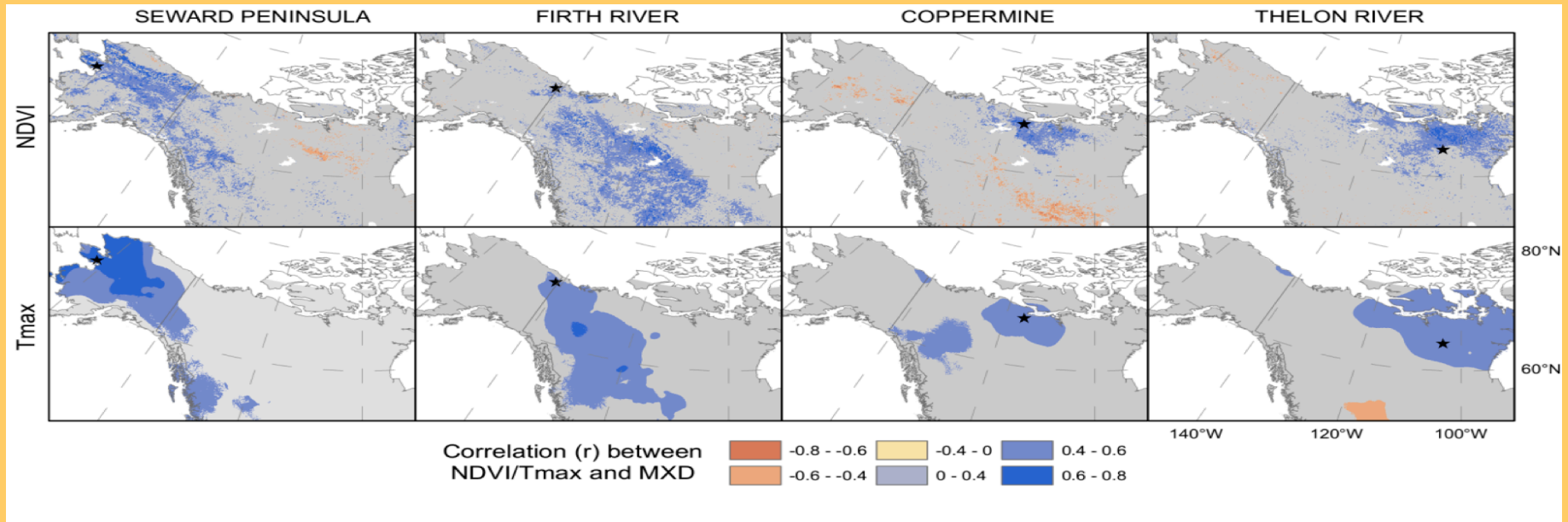
Changing climate sensitivity at Firth River, Alaska.



Top: Ringwidth and air temperatures (Dawson, Yukon) show recent loss of correlation.

Bottom: More consistent correlation of ring Late Wood Density (MXD) and air temperature (Andreu-Hayles et al. 2011).

Correlations of tree-ring density & NDVI (1982-2004) at 4 sites (stars) within the ABoVE domain

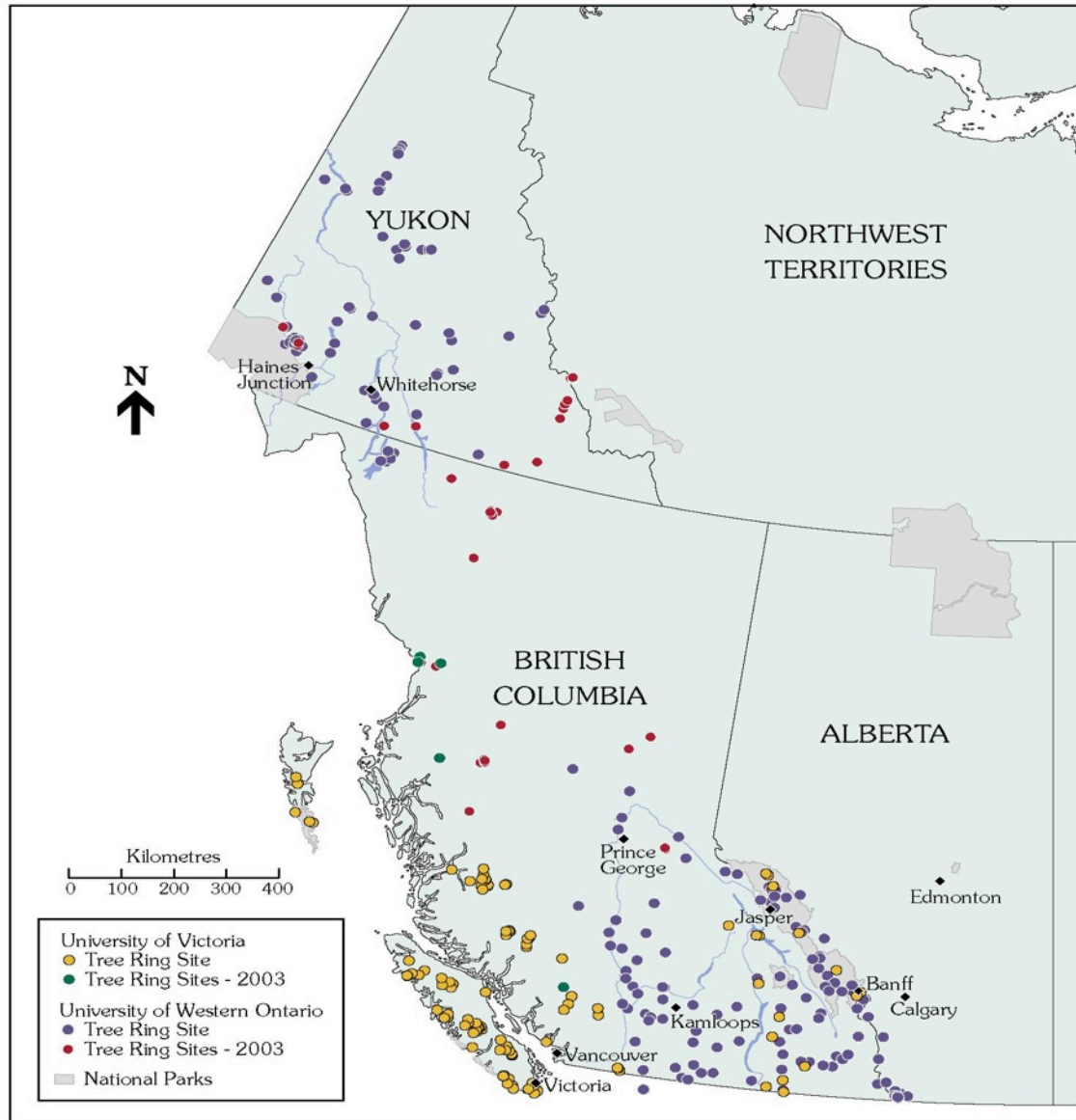


Top: GIMMS3g NDVI

Bottom: May-June growing season temperatures

Beck et al. 2013 GPC

ADDITIONAL TREE-RING DATA FROM LUCKMAN COLLECTION



UWO - UVic Data Holdings as of August, 2003.

Contains material with at least eight, 800-1100 year chronologies from three species (*Engelmann spruce*, *Whitebark pine* and *Alpine larch*) from sites in the Yukon, southern British Columbia, and Alberta.

There are also extensive core collections - some never measured - that will be used to develop regional temperature records for the past 3-400 years using MXD and BI, which will be compared to satellite data.

SUMMARY

Recently funded NSF Arctic project affiliated with NASA ABOVE.

This project will update and improve coverage for a tree-ring network (ring width, maximum latewood density, blue light intensity).

This network will be compared to NDVI and other indices (climate) to assess and cross-validate recent growth trends and extremes in the far North and increase understanding of recent patterns (greening, browning) across NW North America.

