Fiche analytique – Mémoire de Master MUSE

A rendre au secrétariat lors de l'inscription à la soutenance du mémoire

* champs obligatoires

AUTEUR*	NOM : LOGEAIS	PRENOM : MATHIEU	
TITRE MEMOIRE*	To diverge or not to diverge ? A tree-ring -investigation in -southern Yamal, Siberia		
NUMERO MEMOIRE			395
DATE SOUTENANCE	18 août 2020	Salle: CV003	Heure: 10 :00
THEMATIQUE* (AFFILIATION)	Impacts climatiques		
VOLEE MUSE*	2017		
TITRE ACADEMIQUE* (par ex.: licencié en biologie)			
DIRECTION* / EVALUATION	Directeur de mémoire* Prof. Markus Stoffel	Co-directeur de mémoire* Dr. Sébastien Guillet	Nom(s) du ou des juré(s)* - - -
STAGE (éventuel)	Organisme d'accueil	Maître de stage	
Projet de l'ISE (éventuel) auquel le mémoire est rattaché			
Bourse (éventuelle) reçue par l'étudiant			
COLLATION*	Nb de pages* 49	Nb de figures* 20	Nb de tableaux* 2
TERRAIN D'ETUDE OU D'APPLICATION			
MOTS-CLES* (entre 5 et 10)	Dendroclimatology, tree-ring analysis, divergence, climate change, Siberia, Structural equations models		
RESUME* (max 1500 car)			
SUMMARY* (en anglais)	At high northern latitude, tree growth is heavily limited by summer temperature variations and thus, through dendroclimatology analysis, these trees are often used to reconstruct past climate conditions, especially trees growing in Yamal, western Siberia. Such a reconstruction relies on the uniformitarian principle postulating that tree-climate growth relationships have operated unchanged throughout time. Yet, in the past two decades, scholars have noticed a loss of sensitivity towards summer temperature in trees growing at high latitude, thereby questioning the reliability of past climate reconstruction. Little is known about this phenomenon named "divergence". Until now, only a few studies have considered other climate variables than temperature and have assessed their influence on tree growth in Arctic. Here, we combined three centennial tree-ring chronologies from 63 Larix sibirica, sampled in different sites in southern Yamal, to assess growth relationships between trees and temperature, precipitation, anthropogenic activity, permafrost thaw, hydrology and ozone over the 1901-2018 period. We built three site-related chronologies and we used (1) static correlation and response functions to assess significant tree-climate growth relationships; (2) moving correlation functions to evaluate the relationships stability over time; and (3) structural equations models to unravel the influence		

	of temperature, precipitation and hydrology on tree-ring width index for two distinct periods (1901-1980 and 1981-2018). We show that tree growth is rather driven by regional climate conditions than micro conditions, such as soil composition or surrounding vegetation. We also observe that, although the correlation with summer temperature variations is strong, it has significantly decreased over time. Simultaneously, trees became more limited by April temperature and positively influenced by summer precipitation. Insights from permafrost thaw, humidity and tropospheric ozone concentration are more difficult to interpret. Yet, high levels of humidity in summer are detrimental to tree growth and may be linked to the thaw of permafrost. Overall, tree growth in southern Yamal seems to diverge and these findings illustrate the importance of understanding tree-climate growth relationships at high latitude and not only with summer temperature.
REMARQUES	