

Supplementary Materials: Landscape Genetic Connectivity and Evidence for Recombination in the North American Population of the White-Nose Syndrome Pathogen, *Pseudogymnoascus destructans*

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Table S1. Sample information of the *P. destructans* genomes included in this study. Raw data collected from the NCBI Short Read Archive.

Region	Country	Province/State	Sampling Location	BioProject	Run	Year	Isolation Source								
Europe	France	Aquitaine	Dordogne	PRJNA400587	SRR6011497	2009	<i>Myotis myotis</i>								
	Germany	Thuringen	Gipskarstlandschaft Questenberg	PRJNA400587	SRR6011467	2009	<i>Myotis myotis</i>								
	Hungary	Kislo	Not Available	PRJNA400587	SRR6011465	2009	<i>Myotis myotis</i>								
	Not Available	Not Available	Not Available	PRJNA391811	SRR5755629	2009	<i>Myotis myotis</i>								
	Switzerland	Aargau	Not Available	PRJNA400587	SRR6011468	2009	<i>Myotis myotis</i>								
	Ukraine	Not Available	Not Available	PRJNA400587	SRR6011496	2011	<i>Myotis myotis</i>								
	Canada	New Brunswick	Dorchester Mine	PRJNA400587	SRR6011488	2012	substrate (cave wall)								
			Harbells Cave	PRJNA472378	NB26_S1	2012	<i>Myotis lucifugus</i>								
			This Study	NB27_S3	Not Available	Not Available									
		Nova Scotia	Dorchester Mine	This Study	NB27_S2	Not Available	Not Available								
Falmouth			This Study	NS1_S5	Not Available	Not Available									
Cochrane			PRJNA400587	SRR6011483	2010	<i>Myotis lucifugus</i>									
Ontario		Kirkland Lake	PRJNA400587	SRR6011472	2010	<i>Myotis lucifugus</i>									
		Rattlesnake Point	This Study	ON14_S7	Not Available	Not Available									
Prince Edward Island		Murray River	PRJNA472378	PES_S6	2012	<i>Myotis lucifugus</i>									
North America		Not Available	Not Available	Not Available	PRJNA391811	SRR5755634	2008	<i>Myotis lucifugus</i>							
	SRR5755633					2013	<i>Ezechioptis sp.</i>								
	SRR5755632					2013	<i>Perimyotis subflavus</i>								
	SRR5755631					2013	<i>Perimyotis subflavus</i>								
	SRR5755630					2013	<i>Nelima elegans</i>								
	SRR5755628					2012	<i>Myotis lucifugus</i>								
	SRR5755627					2012	<i>Myotis lucifugus</i>								
	SRR5755624					2015	Not Available								
	SRR5755623					2015	<i>Myotis lucifugus</i>								
	SRR5755622					2013	<i>Myotis lucifugus</i>								
	USA	Connecticut	Litchfield County	PRJNA400587	SRR6011478	2008	<i>Myotis lucifugus</i>								
					SRR6011475	2009	<i>Myotis lucifugus</i>								
		Delaware	New Castle County	PRJNA400587	SRR6011494	2012	<i>Myotis septentrionalis</i>								
		Washington	Washington County	PRJNA400587	SRR6011493	2011	<i>Myotis lucifugus</i>								
		Indiana	Crawford County	PRJNA400587	SRR6011492	2011	<i>Myotis lucifugus</i>								
		Maine	Hancock County	PRJNA400587	SRR6011495	2011	<i>Myotis lucifugus</i>								
		Maryland	Allegany County	PRJNA400587	SRR6011480	2010	<i>Myotis septentrionalis</i>								
		Berkshire	Berkshire County	PRJNA400587	SRR6011477	2008	<i>Myotis septentrionalis</i>								
		Massachusetts	Hampden County	PRJNA400587	SRR6011466	2008	<i>Myotis lucifugus</i>								
		Missouri	Lincoln County	PRJNA400587	SRR6011489	2012	<i>Perimyotis subflavus</i>								
New Jersey	Warren County	PRJNA400587	SRR6011470	2009	<i>Myotis lucifugus</i>										
New York	Ulster County	PRJNA400587	SRR6011481	2009	<i>Eptesicus fuscus</i>										
New York	Williams Hotel	PRJNA276926	SRR1952982	2008	<i>Myotis lucifugus</i>										
Pennsylvania	Centre County	PRJNA400587	SRR6011469	2009	<i>Myotis lucifugus</i>										
Tennessee	Montgomery County	PRJNA400587	SRR6011491	2011	<i>Myotis lucifugus</i>										
						Fentress County	PRJNA400587	SRR6011484	2010	<i>Myotis septentrionalis</i>					
											Sullivan County	PRJNA400587	SRR6011479	2010	<i>Perimyotis subflavus</i>
	Rutland County	PRJNA400587	SRR6011482	2010	<i>Myotis lucifugus</i>										
						Bennington County	PRJNA400587	SRR6011474	2008	<i>Myotis septentrionalis</i>					
	Wise County	PRJNA400587	SRR6011490	2011	<i>Myotis lucifugus</i>										
						Giles	PRJNA400587	SRR6011476	2009	Not Available					
	West Virginia	Pendleton Countv	PRJNA400587	SRR6011471	2009						<i>Myotis septentrionalis</i>				

Table S2. Summary of basic information on the microsatellite loci used for genotyping, and allelic diversity (Simpson’s index, $1 - D$). Microsatellite loci originally described by Drees et al [1] based on the *P. destructans* reference genome (ATCC 20631-21).

Locus	Contig (Accession)	Number of Alleles	1-D
Pd1	KV441387	4	0.34
Pd11	KV441394	4	0.31
P19	KV441397	5	0.22
Pd3	KV441391	3	0.3
Pd6	KV441390	6	0.33
Pd7	KV441406	1	-
Pd8	KV441398	2	2
Pd13	KV441393	1	-
Pd21	KV441412	1	-
Mean		3	8

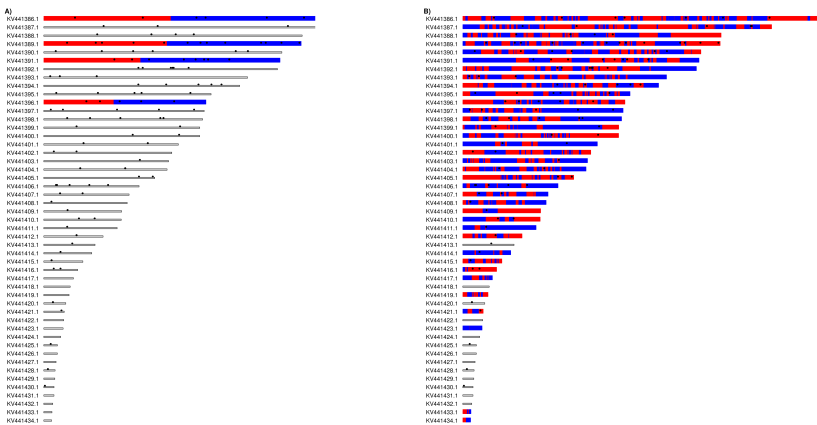


Figure S1. The estimated genomic locations of recombination breakpoints based on four-gamete test criteria Using SNPs from A) North American and B) European samples. Contigs from *Pseudogymnoascus destructans* reference genome. Gene coding regions in green. Contiguous regions alternate between red and blue at estimated FGT break points. Black points are SNP locations.

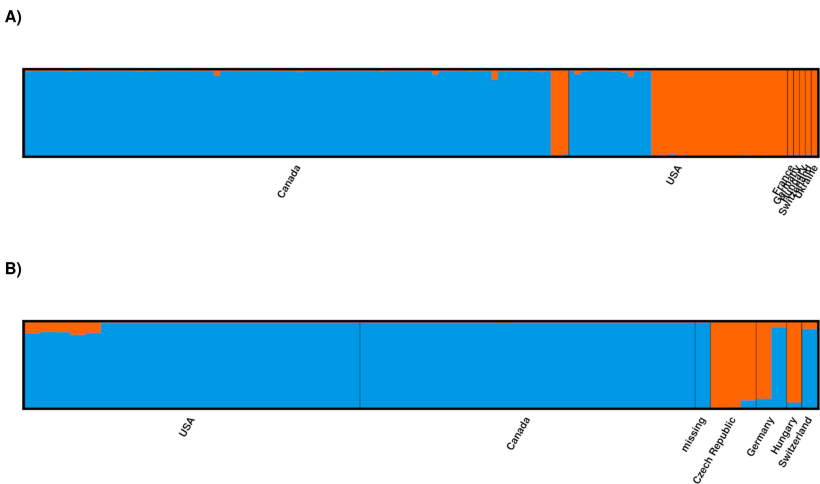


Figure S2. Visualization of STRUCTURE results in a "distruct" plot, showing the combined membership probability for the optimal number of populations, $k = 2$. The individual membership of each isolates genotyped with A) microsatellite loci (134 North American isolates and 7 European isolates) and B) SNPs (44 North American isolates and 8 European isolates).

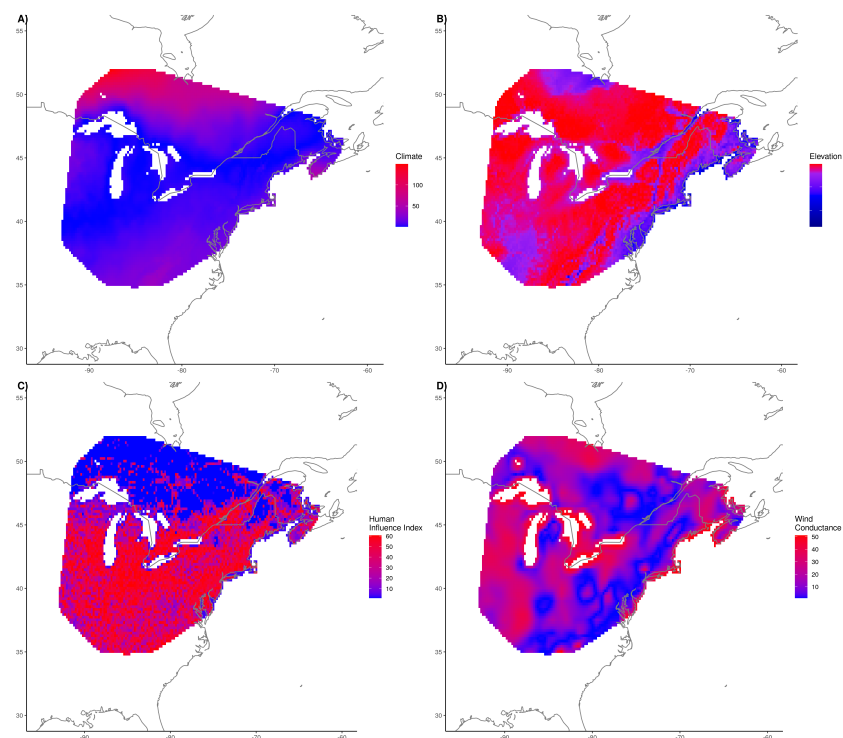


Figure S3. Optimized landscape surfaces for A) climate, B) elevation, C) human influence index, and D) wind conductance.

Supplementary References

1. Drees, K.P.; Lorch, J.M.; Puechmaille, S.J.; Parise, K.L.; Wibbelt, G.; Hoyt, J.R.; Sun, K.; Jargalsaikhan, A.; Dalannast, M.; Palmer, J.M.; Lindner, D.L.; Marm Kilpatrick, A.; Pearson, T.; Keim, P.S.; Blehert, D.S.; Foster, J.T. Phylogenetics of a Fungal Invasion: Origins and Widespread Dispersal of White-Nose Syndrome. *MBio* **2017**, *8*, e01941–17.

