Predicting the severity of Dothistroma on *Pinus radiata* under current climate in New Zealand

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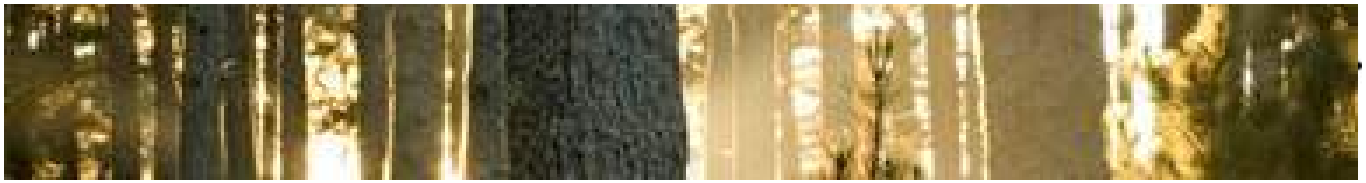
Dothistroma needle blight

- Causes defoliation of the tree and in extreme cases, death
- Wide host range, *P. radiata* highly susceptible
- Estimated annual losses high
- Approx. 100,000 ha treated each year



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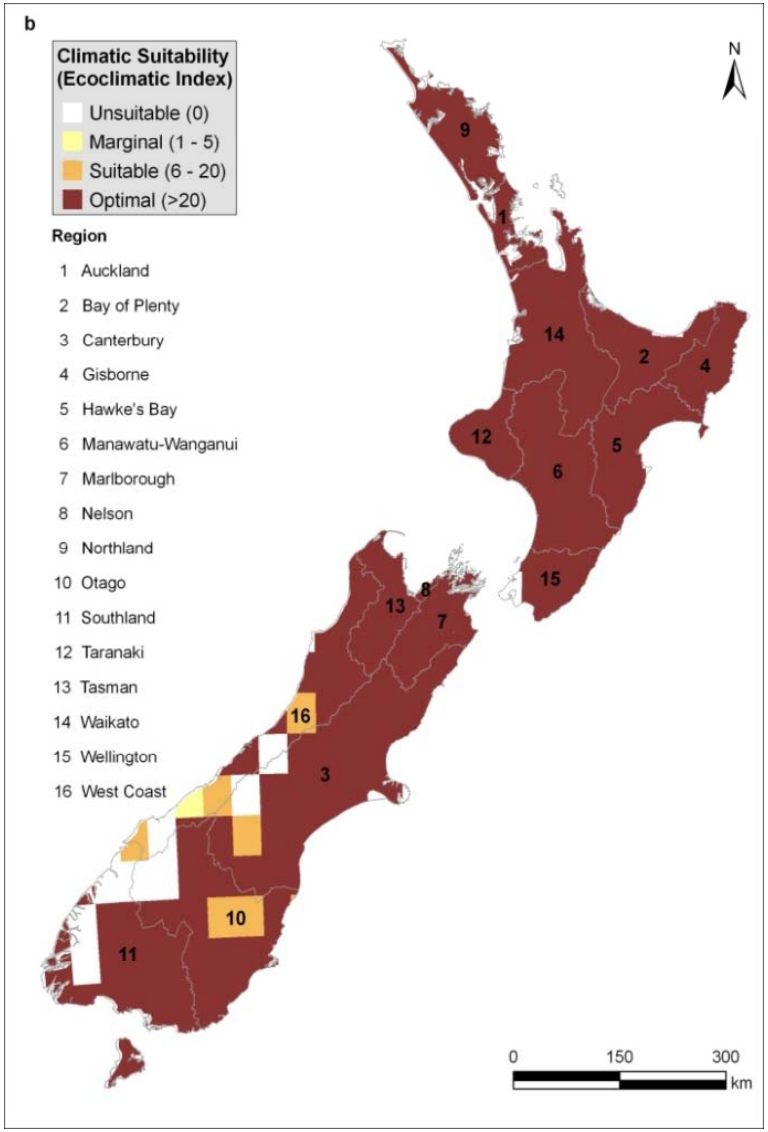
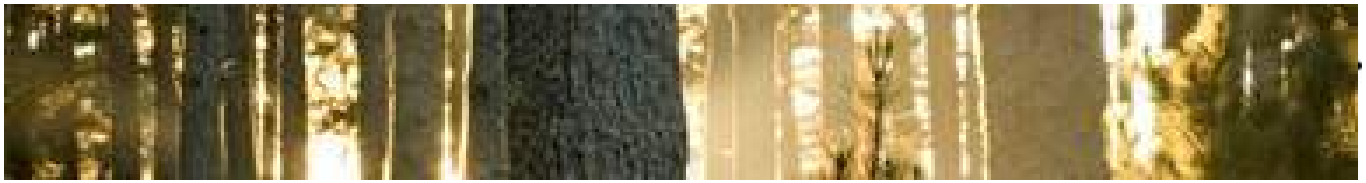
Dothistroma needle blight

- Determine risk when establishing new plantations
- Impact under climate change





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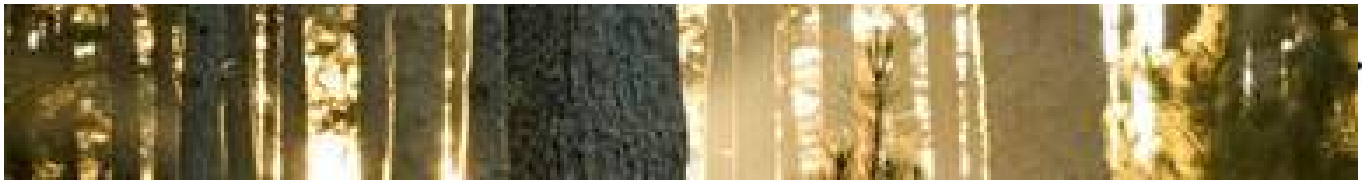
Objectives

- Develop regression model describing Dothistroma severity
- Identify key drivers of severity, their relative importance
- Develop spatial projections of severity across NZ



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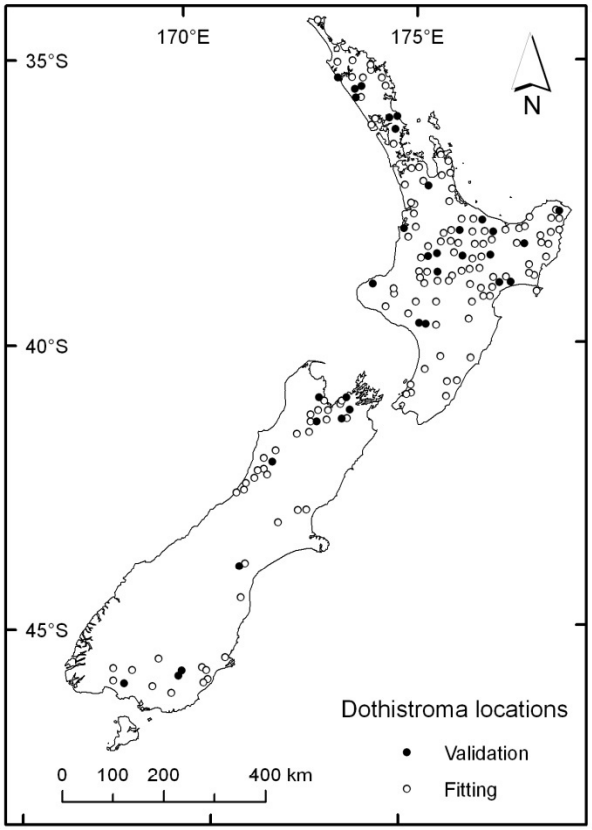
Dataset used, methods

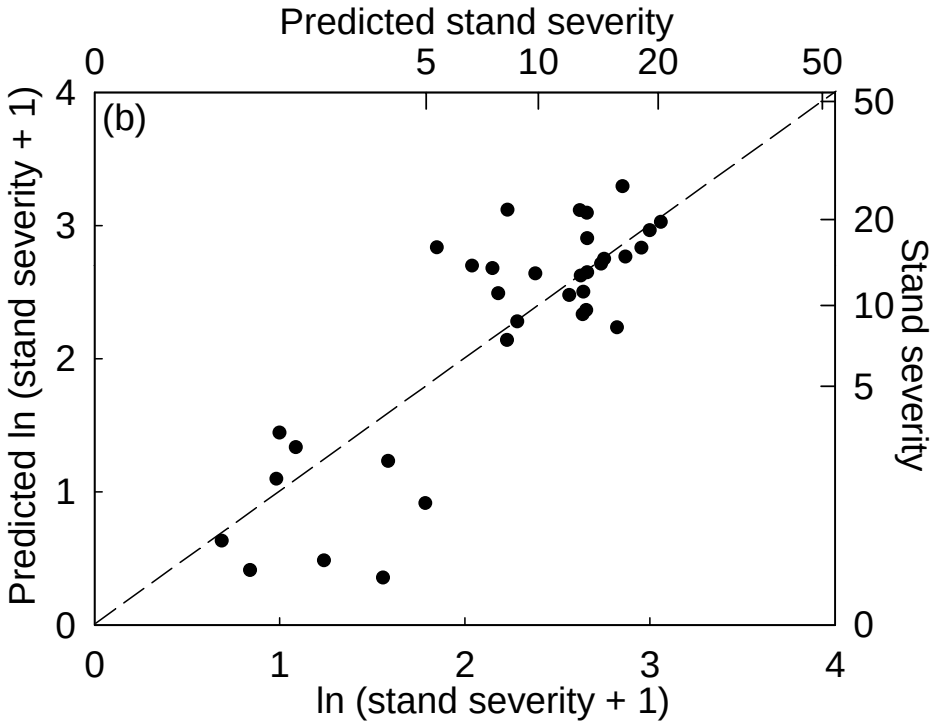


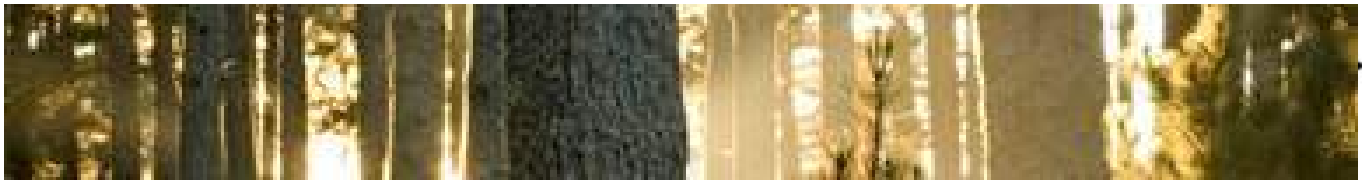
- Severity defined as percent stand affected x severity of disease on affected trees (scale 1 – 100)
- Extensive dataset, split into fitting and validation
- Regression model developed using fitting dataset, from GIS surfaces
- Model tested against the validation dataset

Model fit and validation

- Model variables
  - Stand age
  - November rainfall
  - Mean air temp. (Nov-April)
  - Mean relative humidity (Oct - April)

- Model accounted for 68% of the variance for validation dataset.





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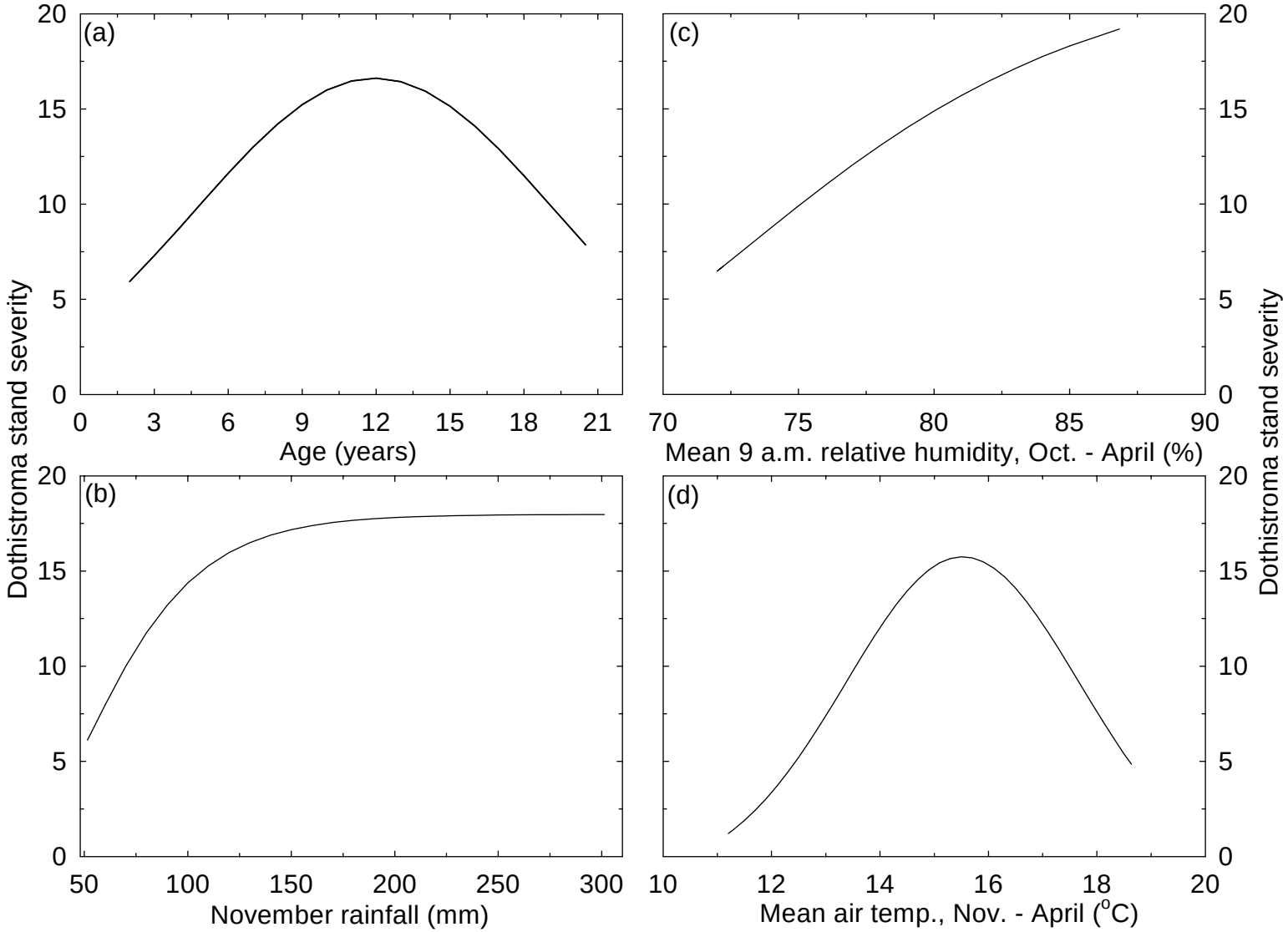
Partial response functions



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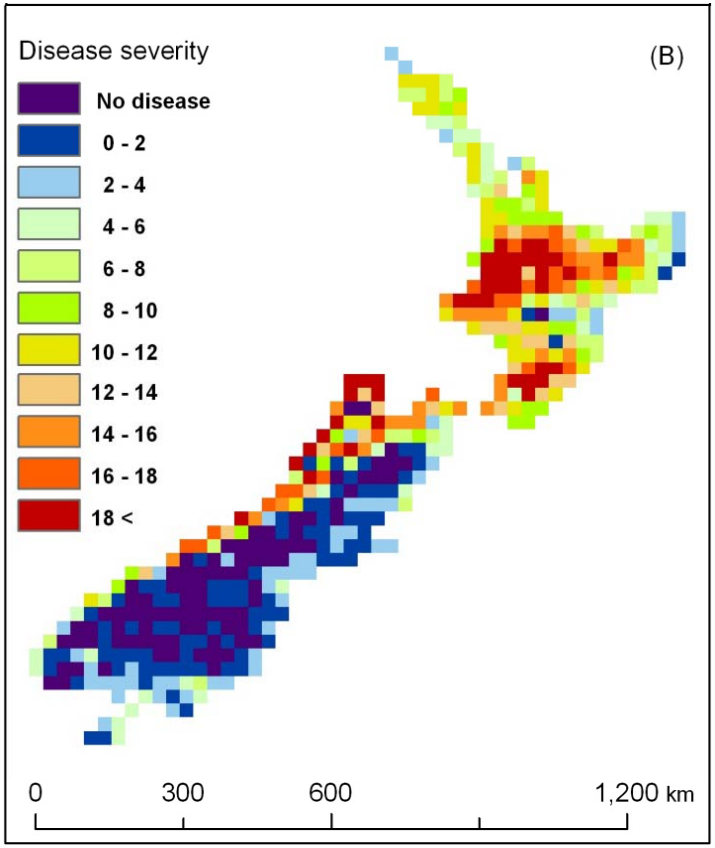
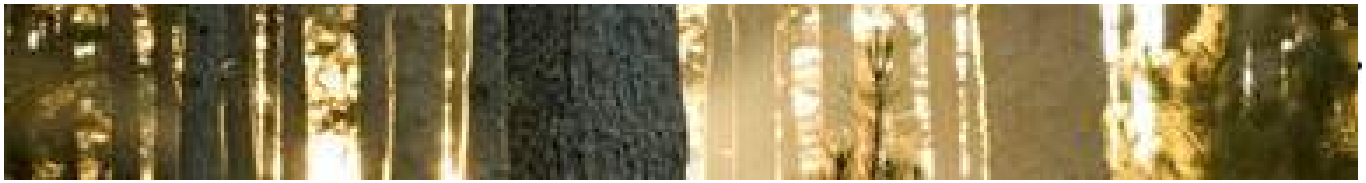
Spatial predictions of disease

- Spatial predictions of disease align well with our current knowledge
- Warm wet areas most affected
- Disease lowest in cool dry areas
- Model allows disease prediction for a given age





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- Staff who collected data

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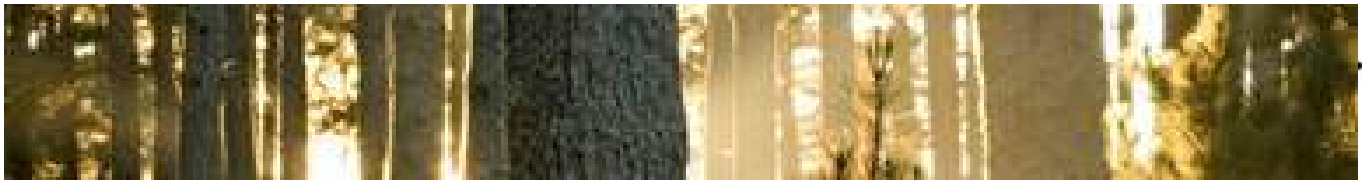

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