Presentation UC1638

GIS-based Forest Seed Deployment Tracking over Time and Space in British Columbia

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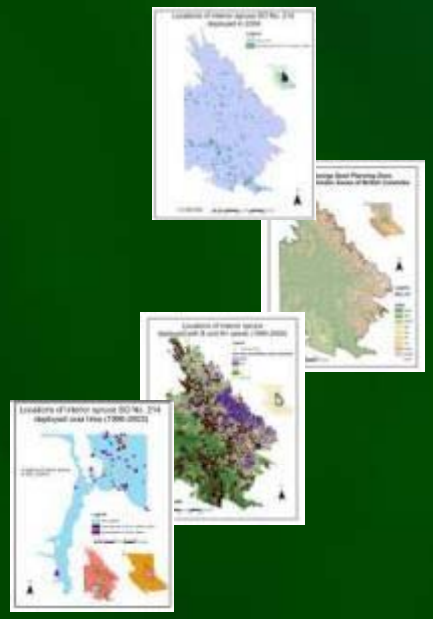


Table of contents

Introduction

- Genetic Resource Management (GRM)
  - GRM in BC
  - Tree improvement and seed deployment
  - Brief history of GRM in BC
- Brief review of GIS applications

- Objectives and overview of the thesis

Introduction

- Genetic Resource Management (GRM)
  - GRM in BC
  - Tree improvement and seed deployment
  - Brief history of GRM in BC
    - 1946 1st seed planning zone map,
    - 1987 1st map for interior spruce,
    - 1996 1st seed orchard in Prince George zone,
    - Present, web-based SeedMap.

Introduction

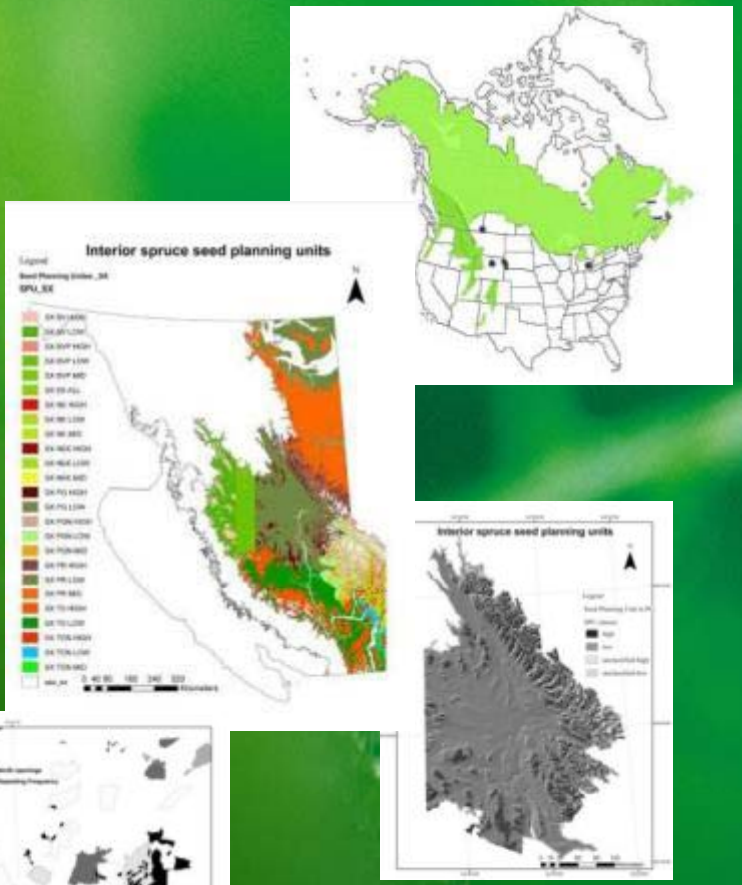
- Genetic Resource Management (GRM)
  - GRM in BC
  - Tree improvement and seed deployment
  - Brief history of GRM in BC
- Brief review of GIS applications
  - Genetic resources conservation studies
  - Other ecological studies
- Objectives and overview of the thesis

Research objectives

- Provide an overview of the historical development of GRM with GIS applications;
- Create GIS methodology for investigating spatiotemporal trends in GRM;
- Analyze interior spruce deployment trend in genetic composition, geographical distribution, frequency, extent and the possible causes of these trends.

Technical scope

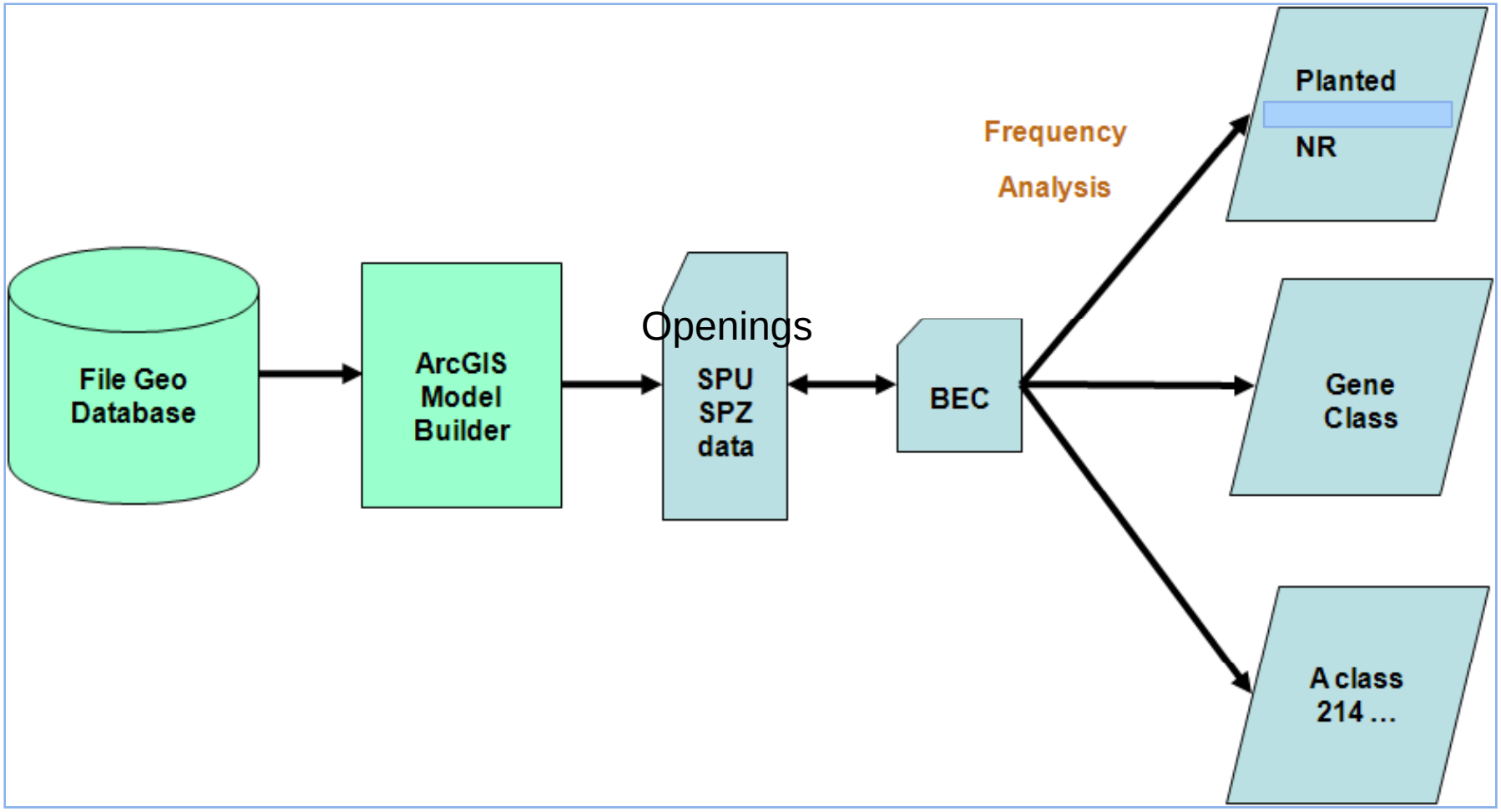
- Species studied
- Geographic scale
  - Silviculture opening level
  - Seed Planning Unit
  - Seed Planning Zone
  - BEC Zone
- Reporting period
- Genetic sources
  - Orchard seed (A class)
  - Wild seed (B class)
  - B+
  - Natural regeneration
  - Not labeled (N)

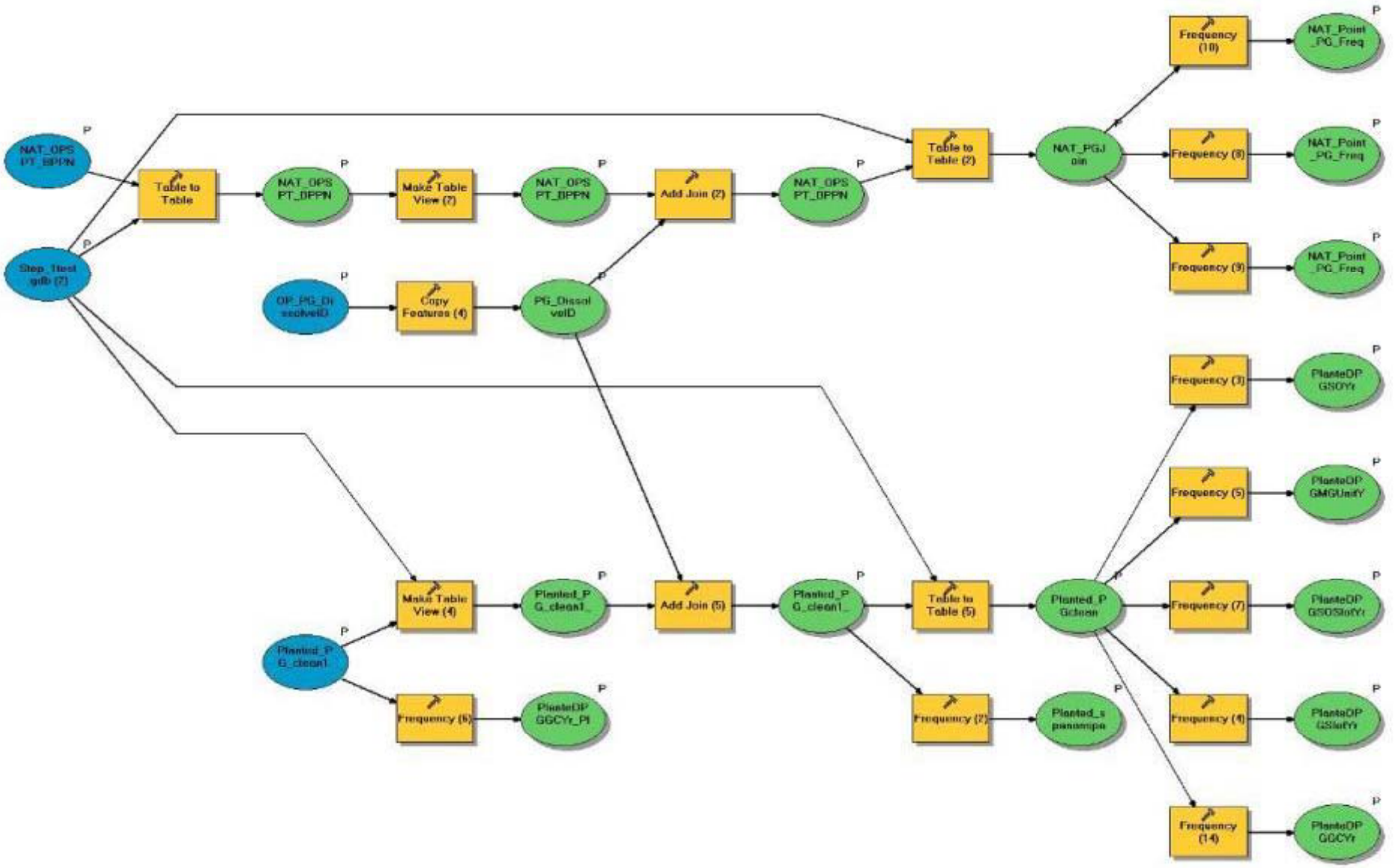


Methods and data analysis

- Data sources
  - Spatial data sources
  - Non-spatial data sources
- Data preparation
  - Error checking and data cleaning
  - Spatial data preparation
- Spatial modeling and analysis
- Model description

Methods and data analysis



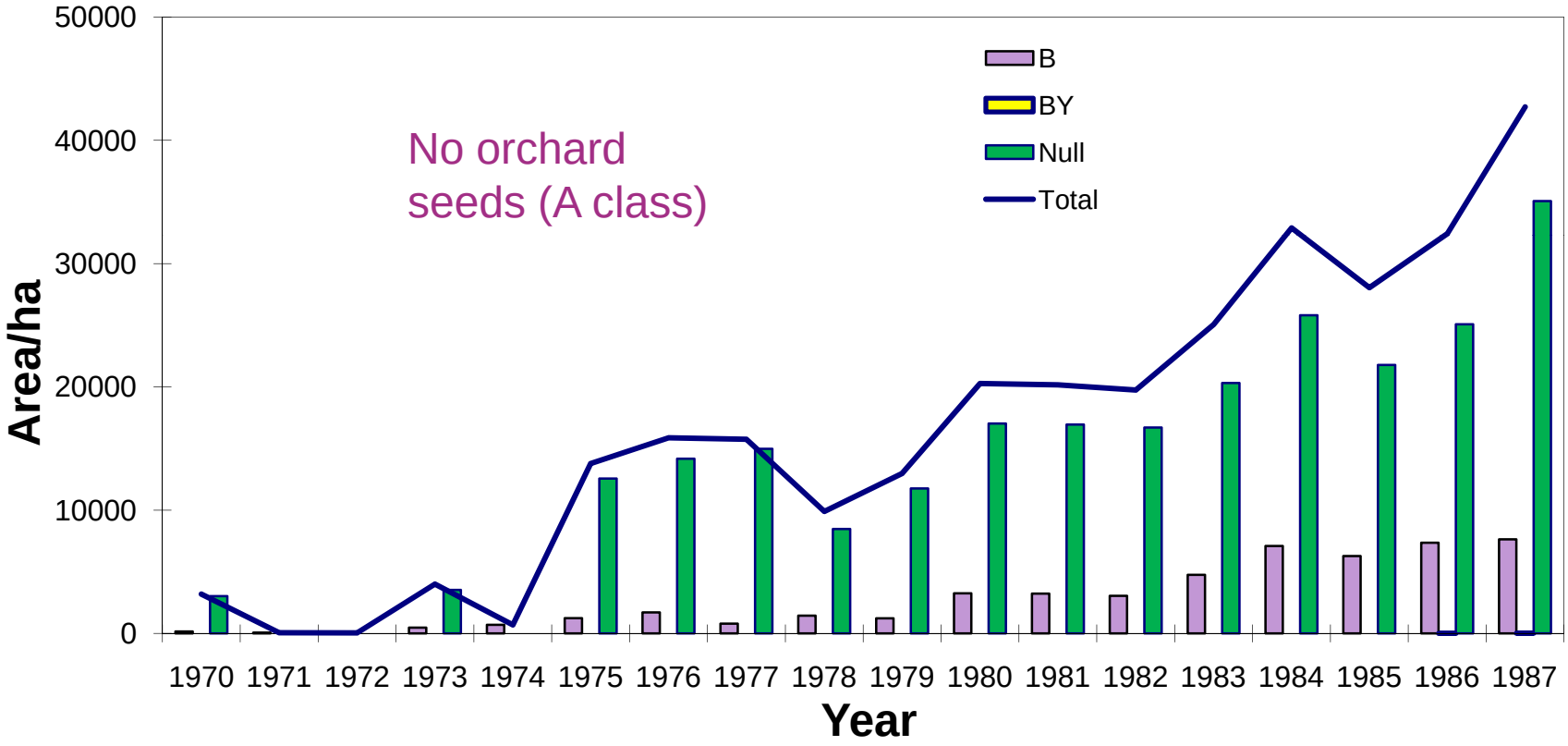


Model flow chart of Step 1-SPZ model. Blue modules represent project data, yellow ones are Tools and green ones are derived data outputs.

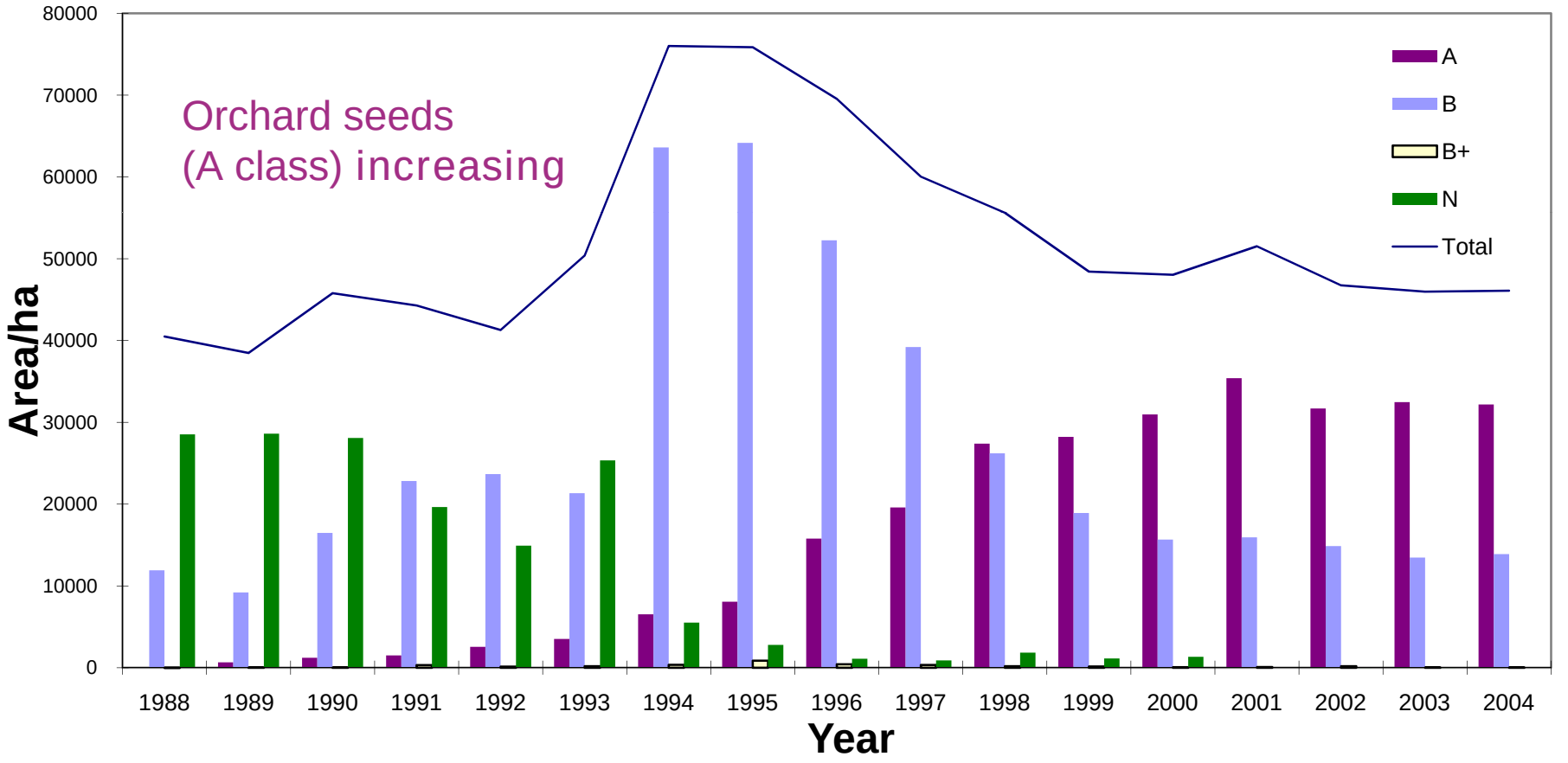
Results

- Background report
- PG Seed Planning Zone
  - BEC Zone
  - SPU
- Map representations for openings

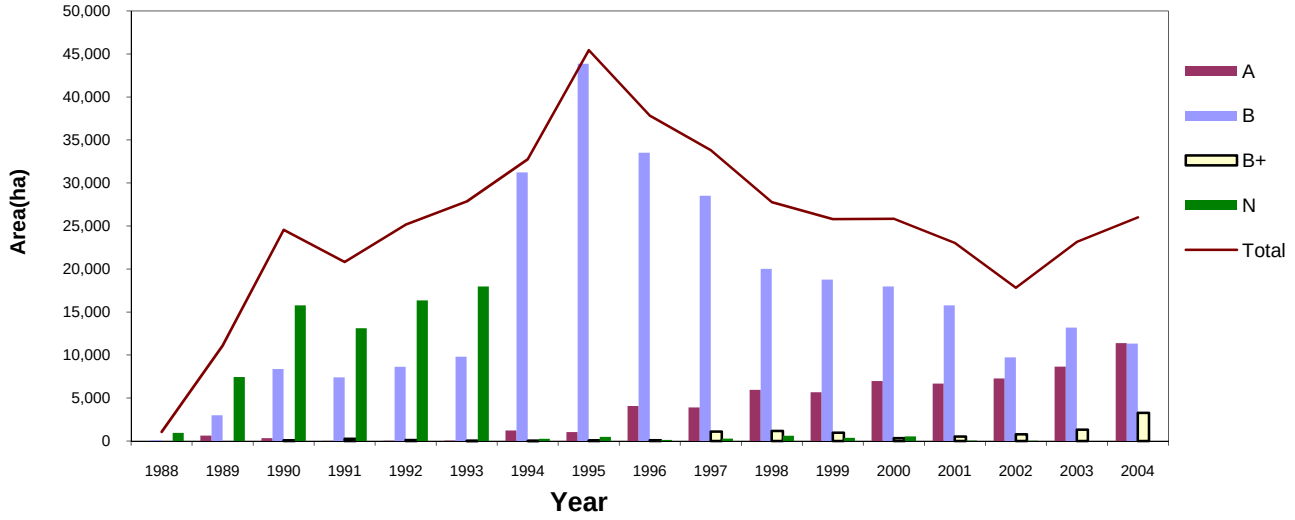
Total Area Treated (Planted) with Interior Spruce by Gene Class from 1970 to 1987, British Columbia



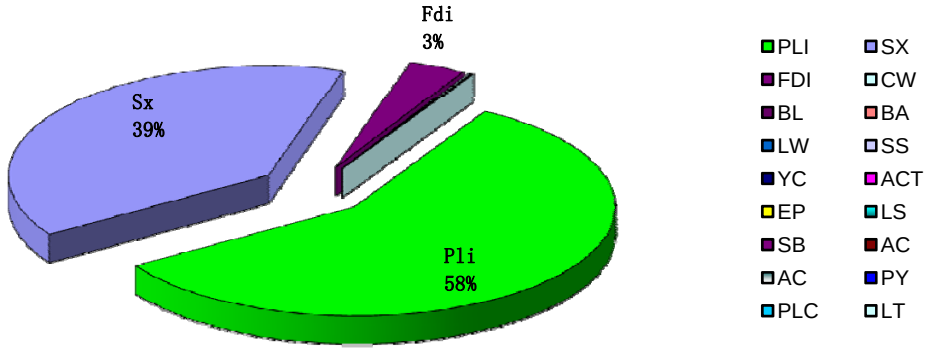
Total Area Treated (Planted) with Interior Spruce by Gene Class from 1988 to 2004, British Columbia



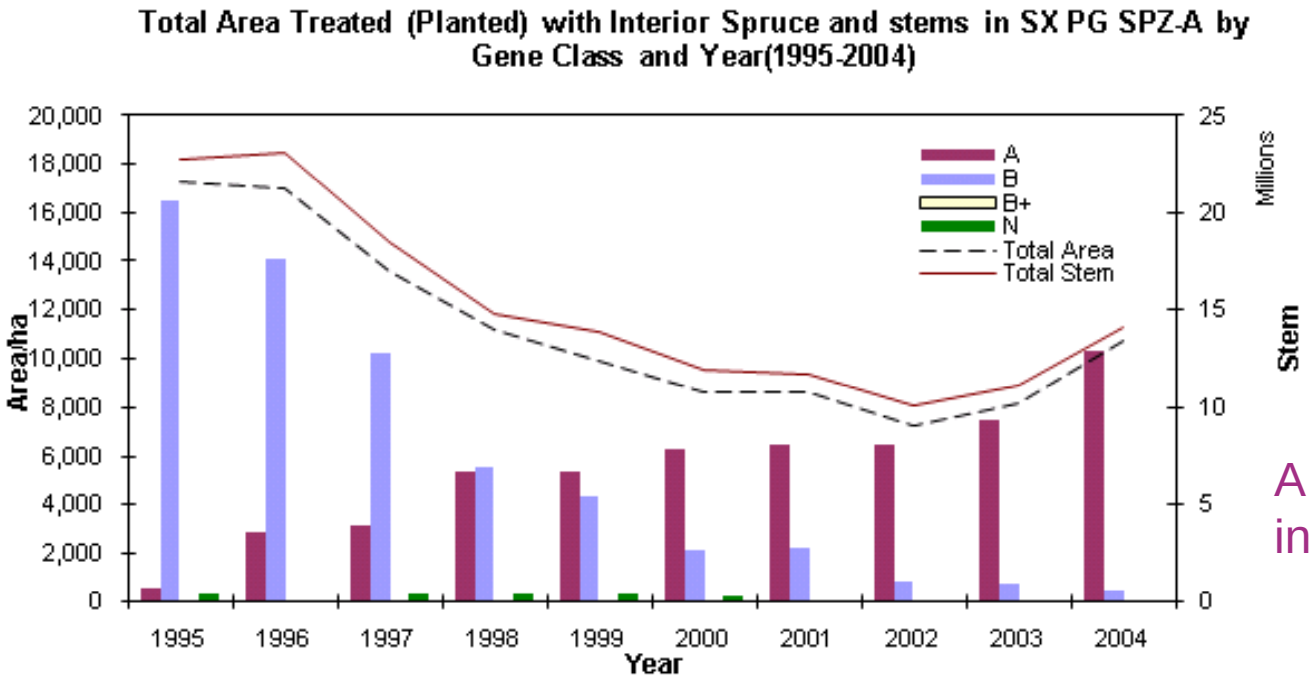
Total Area Treated (Planted) with Interior Spruce by Genetic Class and Year in SPZ_A_SX BVP, PG and PGN (1988-2004)



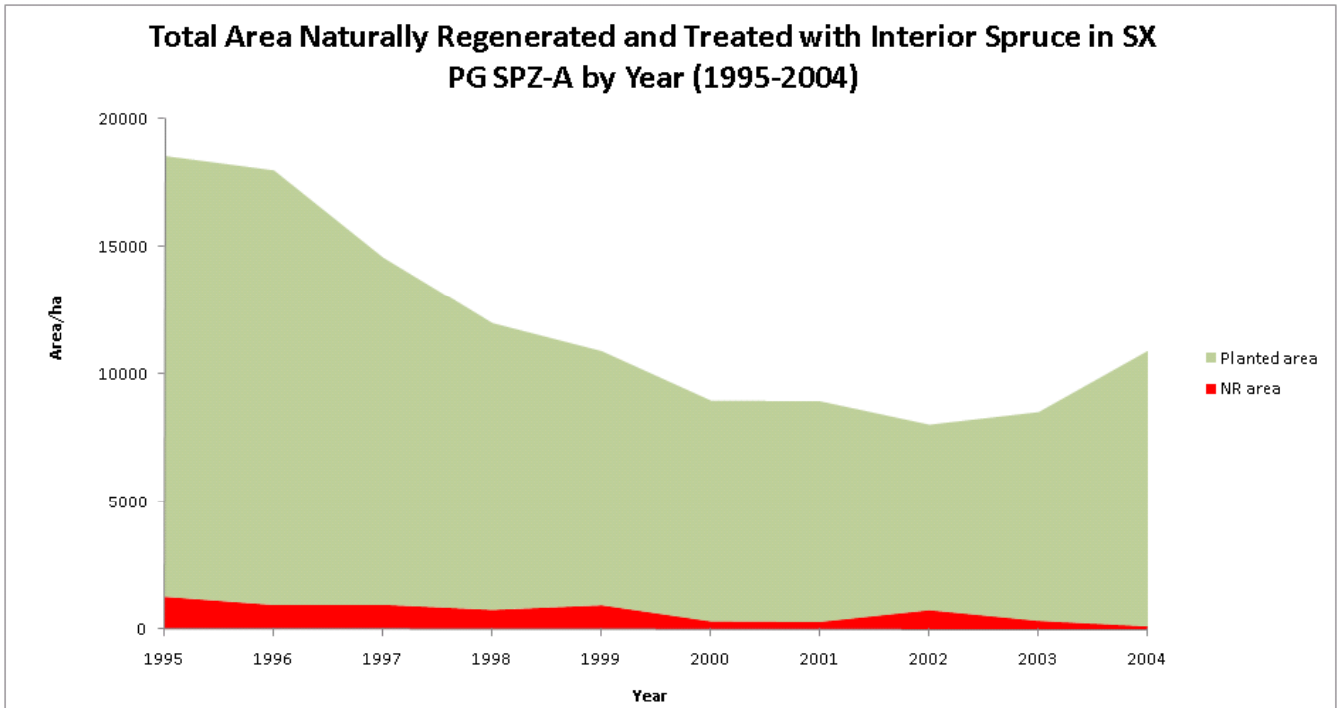
Comparison of Total Area Treated with All Species Reported in PG from1995 to 2004

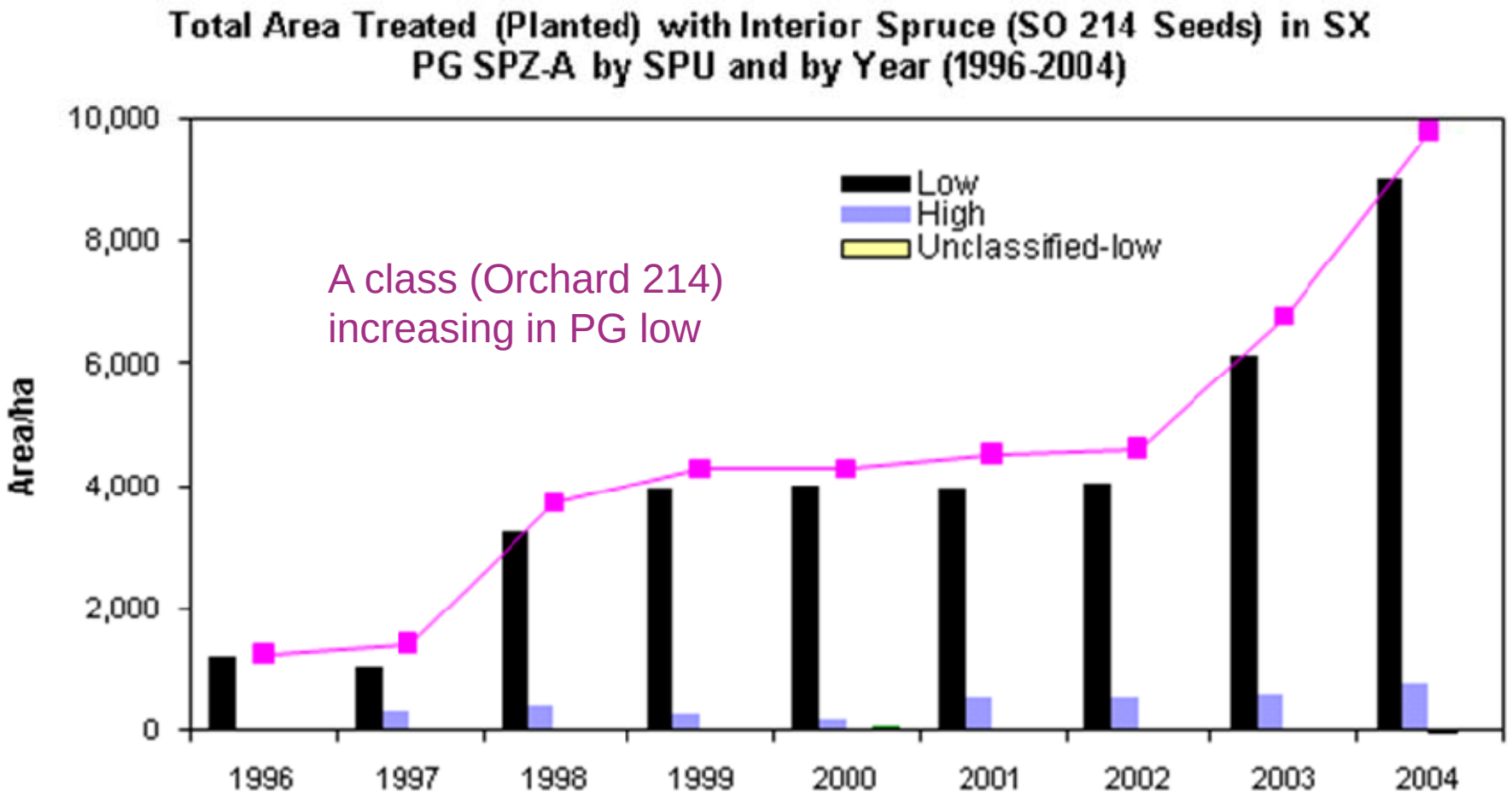


More A class use in Sx



A class increasing

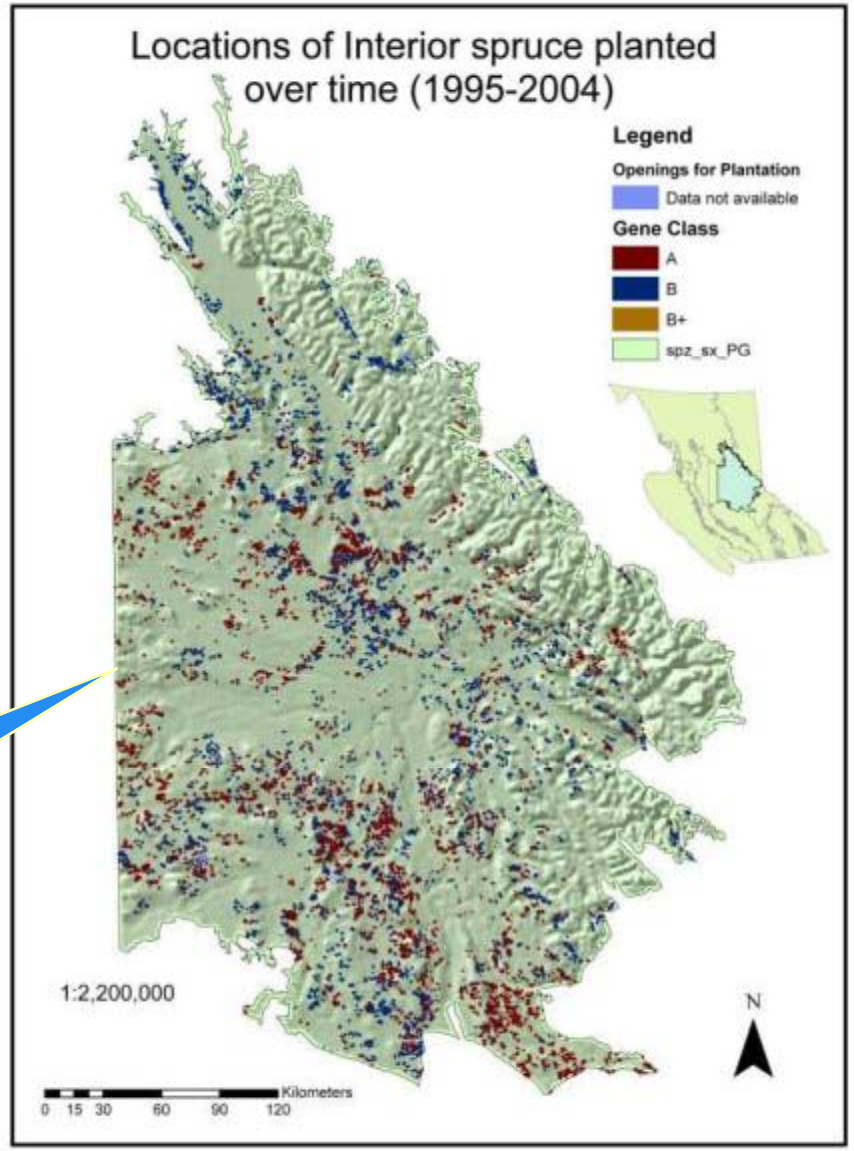


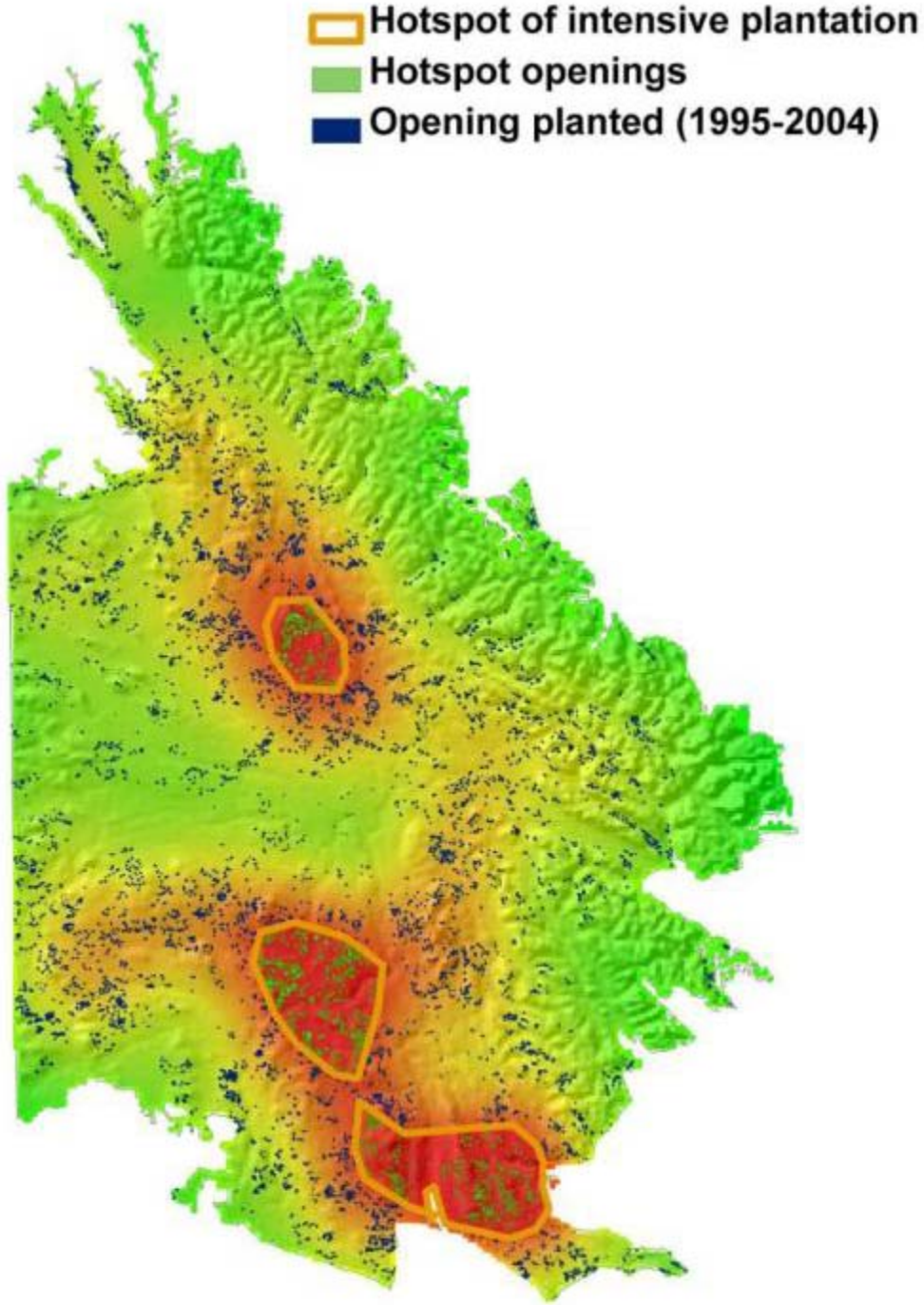

Total Area Treated (Planted) with Interior Spruce (SO 214 Seeds) in SX PG SPZ-A by SPU and by Year (1996-2004)
Area/ha
10,000
8,000
6,000
4,000
2,000
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
Low
High
Unclassified-low
A class (Orchard 214) increasing in PG low

Mapping seed deployment

- Total area treated (planted) with interior spruce in SX PG SPZ-A by year from 1995 to 2004

Representing 39% of all species plantation area in PG SPZ.




Hotspot of intensive plantation
Hotspot openings
Opening planted (1995-2004)

Conclusion

- The genetic resources improved,
  - A class increasing,
  - Exceeding the 75% goal in PG SPZ.
- Effective GRM monitoring and assessment.
- The tracking method is applicable for different species and multiple zones.
- Potential impacts of clustering,
  - Environmental conditions.
  - More genetics attributes.
- Long-term data management.

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