S3 Text: Overview of characteristics of studies in the systematic review

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| Reference | | Journal | Region | Study design | Method | Failure due to | Habitat | Failure type |
| 1. | (Achim, Nicoll, Mochan, & Gardiner, 2003) | Proceedings International Conference ‘Wind Effects on Trees’ | Leanachan Forest, Fort William, Scotland, UK | Experiment (in the field) | Biomechanical modelling and analysis | Wind | Forest | Stem |
| 2. | (Achim, Ruel, & Gardiner, 2005) | Canadian Journal of Forest Research | Montmorency forest, Laurentian Mountains, Québec, Canada | Experiment (in the field) | Analysis of variance  Regression analysis | Wind | Forest | Stem |
| 3. | (Achim, Ruel, Gardiner, Laflamme, & Meunier, 2005) | Forest Ecology and Management | Montmorency  forest, Laurentian, Québec, Canada | Experiment (in the field) | Biomechanical analysis  Residual maximum likelihood analysis | Wind | Forest | Stem |
| 4. | (Achim & Nicoll, 2009) | Urban Forestry & Urban Greening | Nickerson state park, Barnstable County, Massachusetts, USA | Experiment (in the field) | Soil mechanical analysis  Analysis of variance  Regression analysis | Anchorage strength | Forest | Root |
| 5. | (Adams, 1967) | Journal of Applied Ecology | Kassala Province, Sudan | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 6. | (Aldrich, Work, & Lewis, 1935) | Journal of Agricultural Research | Rogue River Valley of Oregon | Case study | Correlation analysis | Root spread and depth | Forest | Root |
| 7. | (Ashton, 1975) | Australian Journal of Botany | Victora, Wallaby Creek. Australia | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 8. | (Asner & Goldstein, 1997) | Biotropica | Kokee state park, Kauai, Hawaii, USA | Case study | Biomechanical analysis | Hurricane Iniki | Forest | Stem |
| 9. | (Baker, 1997) | Journal of Experimental Biology | Nottingham University campus, UK | Experiment (in the field) | Biomechanical analysis | Wind | Urban | Stem |
| 10. | (Ballantyne, 1916) | UAES Bulletins. Paper 109 | Utah State University, Utah Agricultural Experimentation Station, St. George | Experiment (in the field) | Descriptive statistics | Root spread and depth | Forest | Root |
| 11. | (Bannan, 1940) | American Journal of Botany | Lake Superior, Thunder Bay, Ontario, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 12. | (Batanouny & Abdel Wahab, 1973) | Oecologia | wadi El-Assiuti, Egypt | Case study | Descriptive statistics | Root spread and depth | Desert | Root |
| 13. | (Bergeron, Ruel, Elie, & Mitchell, 2008) | Forestry | Québec, Quebec, Canada | Experiment (in the field) | Descriptive statistics  Regression analysis | Wind | Forest | Stem |
| 14. | (Berndt & Gibbons, 1958) | Research report | Rocky Mountain Forest and Range Experiment Station Fort Collins, Colorado, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 15. | (Bishop, 1962) | Ecology | Blue Mountains of Oregon, USA | Case study | Graphical analysis | Root spread and depth | Forest | Root |
| 16. | (Biswell, 1935) | Botanical Gazette | Fayette, Missouri, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 17. | (Brüchert, Becker & Speck, 2000) | Forest Ecology and Management | Altglashütten, Black Forest, Germany | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Stem |
| 18. | (Brüchert & Gardiner, 2006) | American Journal of Botany | Kilmichael Forest, Argyll Forest District, western Scotland, UK | Case study | Descriptive statistics  Analysis of variance  Regression analysis | Wind | Forest | Stem |
| 19. | (Buckley, Slater, & Ennos, 2015) | Arboricultural Journal: The International Journal of Urban Forestry | Silverdale, Lancashire, UK | Experiment (laboratory) | Biomechanical analysis  Regression analysis | Wind  Angle of inclination | Forest | Branch |
| 20. | (Cable, 1977) | Journal of range management | Santa Rita Experimental Range, Tucson, Arizona | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 21. | (Cannon, Barrett, & Peterson, 2015) | Forest Ecology and Management | Hillsboro, Georgia, USA | Experiment (in the field) | Biomechanical analysis  Regression analysis | Wind | Forest | Stem |
| 22. | (Castro-García, Blanco-Roldán, Gil-Ribes, & Agüera-Vega, 2008) | Trees | Cordoba, Spain | Quasi-experimental study | Biomechanical analysis  Analysis of variance | Wind | Orchard | Stem |
| 23. | (Chiba, 2000) | Forest Ecology and Management | Hita City, Ooita Prefecture, Japan | Experiment (in the field) | Biomechanical analysis  Regression analysis | Wind | Forest | Stem |
| 24. | (Ciftci, Arwade, Kane, & Brena, 2014) | Probabilistic Engineering Mechanics | Belchertown, Amherst, Massachusets, USA | Quasi-experimental study | Biomechanical analysis  Monte Carlo simulation | Wind | Solitary | Stem |
| 25. | (Coile, 1937) | Journal of Forestry | Duke forest, north carolina, USA | Case study | Analysis of variance | Anchorage strength | Forest | Root |
| 26. | (Coutts, 1986) | Forestry | Kershope forest, UK | Experiment (in the field) | Biomechanical analysis | Anchorage strength | Forest | Root |
| 27. | (Coutts, 1986) | Forestry | Roslin, Midlothian, UK | Experiment (in the field) | Soil mechanical analysis  Descriptive statistics | Anchorage strength | Forest | Root |
| 28. | (Crook & Ennos, 1996) | Journal of Experimental Botany | Granada Arboretum, Jodrell Bank, Manchester, UK | Experiment (in the field) | Soil mechanical analysis  Regression analysis | Anchorage strength | Forest | Root |
| 29. | (Cucchi et al., 2004) | Trees | France | Experiment (in the field) | Biomechanical analysis  Regression analysis and GLM | Rooting depth  Wind | Forest | Stem |
| 30. | (Dahle & Grabosky, 2010) | Urban Forestry & Urban Greening | Rutgers Gardens, New Brunswick, New Jersey, USA | Experiment (in the field) | Biomechanical analysis  Descriptive statistics  Analysis of variance | Wind | Urban | Branch |
| 31. | (Dahle et al., 2006) | Arboriculture & Urban Forestry | Tippecanoe County, Indiana, USA | Experiment (in the field) | Biomechanical analysis  Regression analysis | Decay | Forest | Branch |
| 32. | (Danjon, Fourcaud, & Bert, 2005) | New Phytologist | Landes de Gascogne Forest, Bordeaux, France | Case study | Biomechanical analysis  Principal component analysis | Wind  Anchorage strength | Forest | Root |
| 33. | (Davis, 1977) | Hydrology and water resources in Arizona and the Southwest | Nevada, Arizona, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 34. | (Day, 1944) | The American Midland Naturalist | Sault Ste. Marie, Michigan, USA | Case study | Correlation analysis | Root spread and depth | Forest | Root |
| 35. | (Dorren & Berger, 2006) | Tree physiology | Forêt Communale de Vaujany, France | Experiment (in the field) | Biomechanical analysis | Rockfall | Forest | Stem |
| 36. | (Eames & Cox, 1945) | American Journal of Botany | Norwich, New York, USA | Case study | Descriptive statistics | Graft union | Urban | Stem |
| 37. | (Edberg & Berry, 1999) | Journal of Arboriculture | San Luis Obispo County, California, USA | Case series | χ²-analysis | Decay  Structural defects | Urban | Root |
| 38. | (Eisner, Gilman, & Grabosky, 2002) | Journal of Arboriculture | Gainesville, Florida, USA | Experiment (in the field) | Biomechanical analysis  General Linear Models | Wind | Forest | Branch |
| 39. | (Elie & Ruel, 2005) | Canadian Journal of Forestry | Québec, Quebec, Canada | Experiment (in the field) | Biomechanical modelling (ForestGales)  Regression analysis | Wind  Anchorage strenght | Forest | Stem  Root |
| 40. | (Falinski, 1978) | Vegetatio | Bialowieza National Park, Poland | Case study | n.a. | Wind | Forest | Stem |
| 41. | (Faulkner & Malcolm, 1972) | Forestry | Pickering Vale, Scotland, UK | Experiment (in the field) | Regression analysis | Anchorage strength | Forest | Root |
| 42. | (Flesch & Wilson, 1999) | Agricultural and Forest Meteorology | Hotchkiss River, Manning Alberta Canada | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Stem |
| 43. | (Foster, 1988) | Journal of Ecology | Harvard Forest, Petersham, Massachusetts, USA | Case study | Regression analysis | Hurricane | Forest | Stem |
| 44. | (Francis, 2000) | Journal of Arboriculture | San Juan, Puerto Rico, USA | Case study | Descriptive statistics  Regression analysis | Hurricane Hugo | Urban | Stem |
| 45. | (Fraser, 1962) | Forestry | Northumberland, UK | Experiment (in the field) | Biomechanical analysis  Regression analysis | Wind  Fungi | Forest | Stem |
| 46. | (Fredericksen, Hedden, & Williams, 1993) | Canadian Journal of Forest Research | Hobcaw Forest, Waccamaw Peninsula, Georgetown County, South Carolina, USA | Case study | Regression analysis | Wind | Forest | Stem |
| 47. | (Gardiner, Stacey, Belcher, & Wood, 1997) | Forestry | Kershope Forest, Cumbria, UK | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Stem |
| 48. | (Gerhold & Johnson, 2003) | Journal of arboriculture | Pennsylvania, USA | Case study | Descriptive statistics  Regression analysis | Root spread and depth | Forest | Root |
| 49. | (Gifford, 1966) | The American Midland Naturalist | Farmington, Utah, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 50. | (Gilman, 1989) | Journal of Environmental Horticulture | East Brunswick, New York, USA | Case study | Regression analysis | Root spread and depth | Forest | Root |
| 51. | (Gilman, 2003) | Journal of Arboriculture | Agricultural Experiment Station, Florida, USA | Experiment (in the field) | Regression analysis | Branch trunk ratio | Urban | Branch |
| 52. | (Gilman, Masters, & Grabosky, 2008) | Arboriculture & Urban Forestry | University of Florida,  Alachua County, Florida, USA | Experiment (in the field) | Analysis of Variance | Pruning | Orchard | Branch |
| 53. | (Gilmore, 2001) | Forest ecology and management | University of Minnesota, Grand Rapids, Minnesota, USA | Case study | Regression analysis | Morphological characteristics | Solitary | Stem |
| 54. | (Glover, 1951) | East African Agricultural and Forestry Journal | Somalia | Case study | Descriptive statistics | Root spread and depth | Desert | Root |
| 55. | (Gurau, Cionca, Mansfield-Williams, Sawyer, & Zeleniuc, 2008) | Wood & Fiber Science | Forest Products  Research Center, High Wycombe, UK | Experiment (laboratory) | Biomechanical analysis | Wind | Forest | Branch  Stem |
| 56. | (Haidari, Jalilvand, Aghajani, & Nasiri, 2013) | International Journal of Advanced Biological and Biomedical Research | Babol, Mazandaran, Iran | Case-control | Analysis of variance  Descriptive statistics | Decay  Structural defects | Urban | Stem |
| 57. | (Hale, Gardiner, Wellpott, Nicoll, & Achim, 2012) | European Journal of Forest Resesarch | Clocaenog, Kyloe, Harwood, Kershope, Wales, UK | Experiment (in the field) | Biomechanical analysis  Correlation analysis | Wind | Forest | Stem |
| 58. | (Harcombe & Marks, 1983) | Oecologia | The Wier Forest, Lumberton, Hardin County, Texas, USA | Case study | Regression analysis | Wind | Forest | Stem |
| 59. | (Hassinen, Lemettinen, Peltola, Kellomäki, & Gardiner, 1998) | Agricultural and Forest Meteorology | Mekrijävi, Joensuu, Finnland | Experiment (in the field) | Descriptive statistics  Spectral analysis | Wind | Forest | Stem |
| 60. | (Hauer, Wang, & Dawson, 1993) | Journal of Arboriculture | Urbana, Illinois, USA | Case study | Descriptive statistics  Biomechanical analysis | Ice storm | Urban | Stem |
| 61. | (Hedden, Fredericksen, & Williams, 1995) | Canadian Journal of Forest Research | Hobcaw Forest, Waccamaw Penninsula, Georgetown County, South Carolina, USA | Experiment (in the field) | Regression analysis  Biomechanical analysis | Wind | Forest | Stem |
| 62. | (Heräjärvi, 2004) | Wood Science Technology | Finnland | Experiment (laboratory) | Biomechanical analysis | Wind | Forest | Stem |
| 63. | (Heyward, 1933) | Ecology | Choctawhatchee National Forest, Pensacola, Florida | Case study | Graphical analysis | Root spread and depth | Forest | Root |
| 64. | (Jahani, 2019) | International Journal of Environmental Science and Technology | Tehran, Iran | Case study | Artificial Neural Network  Sensitivity analysis | Urban conditions | Urban | Stem |
| 65. | (James, Hallam, & Spencer, 2013a) | Agricultural and Forest Meteorology | Australia | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Root |
| 66. | (James, Hallam, & Spencer, 2013b) | Biosystems Engineering | Victoria, Australia | Experiment (in the field) | Biomechanical analysis | Wind | Urban | Root |
| 67. | (James, Haritos, & Ades, 2006) | American Journal of Botany | Australia | Experiment (in the field) | Biomechanical modelling and analysis | Wind | Urban | Stem |

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| 68. | (Jim, 2005) | Journal of Environmental Management | Hong Kong | Case study | Descriptive statistics  Principal component analysis | Civil engineering Structural defects  Decay  Rooting space | Urban | Stem |
| 69. | (Jim & Liu, 1997) | Landscape and Urban Planning | Guangzhou, China | Case study | Descriptive statistics | Storm | Urban | Stem |
| 70. | (Jonsson et al., 2007) | Trees | Davos, Switzerland | Experiment (in the field) | Biomechanical modelling | Wind | Forest | Stem |
| 71. | (Jonsson et al., 2006) | Plant and Soil | Davos, Switzerland | Case study | Biomechanical modelling | Morphological characteristics | Forest | Stem |
| 72. | (Kamimura, Gardiner, & Koga, 2017) | Forestry | Ashoro Research Forest, Kyushu University Hokkaido Island, Japan | Experiment (in the field) | Biomechanical analysis  Logistic regression analysis | Wind | Forest | Stem |
| 73. | (Kamimura, Kitagawa, Saito, & Mizunaga, 2012) | European Journal of Forest Research | Kamiatago forests, Shizuoka University, Shizuoka, Japan | Experiment (in the field) | Biomechanical analysis  Analysis of Covariance | Wind | Forest | Stem |
| 74. | (Kamo, Konoshima, & Yoshimoto, 2016) | Formath | Toyama Prefecture,  Japan | Experiment (in the field) | Cox regression modelling | Wind | Forest | Stem |
| 75. | (Kane, 2007) | Arboriculture & Urban Forestry | Virginia Tech campus, Blacksburg, Virginia, USA | Experiment (in the field) | Biomechanical analysis  Regression analysis | Attachment failure | Urban | Branch |
| 76. | (Kane, 2008) | Urban Forestry & Urban Greening | Nickerson state park, Barnstable County, Massachusetts, USA | Case study | Analysis of variance  Logistic regression | Storm | Forest | Stem |
| 77. | (Kane, 2014) | Trees | Pelham, Massachusetts, USA | Experiment (in the field) | Descriptive statistics  Regression analysis | Wind | Forest | Stem |
| 78. | (Kane & Clouston, 2008) | Arboriculture & Urban Forestry | Belchertown, Massachusetts, USA | Experiment (in the field) | Regression analysis  Biomechanical analysis | Wind | Urban | Stem |
| 79. | (Kane, Farrell, Zedaker, Lofersky, & Smith, 2008) | Arboriculture & Urban Forestry | Watkins Nursery  in Midlothian, Virginia, USA | Experiment (laboratory) | Regression analysis  Analysis of variance | Included bark | Urban | Branch |
| 80. | (Kane & Finn, 2014) | SpringerPlus | University of  Massachusetts in Amherst, USA | Case study | Generalized linear mixed effects model  Analysis of variance | Snowstorm | Urban | Branch |
| 81. | (Kane & James, 2011) | Canadian Journal of Forest Research | Charlotte, North Carolina, USA | Experiment (in the field) | Analysis of variance | Wind | Solitary | Stem |
| 82. | (Kane, Modarres-Sadeghi, James, & Reiland, 2014) | Trees | Belchertown, Massachusetts USA | Experiment (in the field) | Analysis of variance  Regression analysis | Wind | Urban | Stem |
| 83. | (Kane & Smiley, 2006) | Canadian Journal of Forest Research | Charlotte, North Carolina, USA | Experiment (in the field) | Analysis of variance  Biomechanical analysis | Wind | Orchard | Stem |
| 84. | (King, 1986) | Ecology | Wisconsin, USA | Experiment (in the field) | Regression analysis | Wind | Forest | Stem |
| 85. | (Kontogianni, Tsitsoni, & Goudelis, 2011) | Ecological Engineering | Thessaloniki, Greece | Experiment (in the field) | Regression analysis | Wind | Urban | Stem |
| 86. | (Leaf, Leonard, & Berglund, 1971) | Ecology | Charles Lathrop Pack Forest, Upper Hudson River Valey, Adirondack Mountains, New York state, USA | Case study | Descriptive statistics | Root spread and depth | Solitary | Root |
| 87. | (Lilly & Sydnor, 1995) | Journal of Arboriculture | Ohio State University, Ohio, USA | Experiment (in the field) | Biomechanical analysis  Least significant difference | Snow and ice loads | Urban | Branch |
| 88. | (Lopes, Oliveira, Fragoso, Andrade, & Pedro, 2009) | Internatonal Scientific Conference "Bioclimatology and Natural Hazards" | Lisbon, Portugal | Case study | Descriptive statistics | Storm | Urban | Stem |
| 89. | (Luley, Nowak, & Greenfield, 2009) | Arboriculture & Urban Forestry | Albany, Buffalo, Rochester, Syracuse, New York, USA | Case study | χ²-analysis | Decay | Urban | Stem |
| 90. | (Luley, Plenınger, & Sisinni, 2001) | Tree Structure and Mechanics Conference Proceedings: How Trees Stand Up and Fall Down. USA: International Society of Arboriculture | Rochester, New York, USA | Case study | Regression analysis | Wind Pruning | Urban | Branch |
| 91. | (Luley, Sisinni, & Pleninger, 2002) | Journal of Arboriculture | Rochester, New York, USA | Case control study | Least Square Difference | Pruning | Urban | Branch |
| 92. | (Lundström, Jonas, Stöckli, & Ammann, 2007) | Tree Physiology | Zürich, Switzerland | Experiment (in the field) | Biomechanical analysis  Regression analysis | Anchorage strength | Forest | Root |
| 93. | (Lundström, Jonsson, & Kalberer, 2007) | Plant Soil | Switzerland | Experiment (in the field) | Descriptive statistics | Wind | Forest | Stem |
| 94. | (Mattheck, Bethge, & Tesari, 2006) | Trees | Germany | Case study | Biomechanical analysis | Decay | Forest | Stem |
| 95. | (Mattheck, Bethge, & West, 1994) | Trees | Tasmania, Australia  South-West Australia | Case study | Biomechanical analysis | Decay | Forest | Stem |
| 96. | (McQuilkin, 1936) | Journal of agricultural research | Allegheny Forest Experiment Station, New Jersey, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 97. | (Miesbauer, Gilman, & Giurcanu, 2014) | Arboriculture & Urban Forestry | Florida, USA | Experiment (in the field) | Analysis of variance  Regression analysis | Wind | Urban | Stem |
| 98. | (Miesbauer, Gilman, Masters, & Nitesh, 2014) | Urban Forestry & Urban Greening | Environmental Horticulture Landscape Experimental laboratory, University of Florida, Gainesville, Florida, USA | Experiment (laboratory) | Biomechanical analysis  Analysis of variance | Ice, snow, wind | Urban | Branch |
| 99. | (Milne, 1986) | Proceedings Workshop Danish Forest Experiment Station and EC | Moffat forest, Scotland, UK | Experiment (in the field) | Descriptive statistics  Biomechanical analysis | Wind | Forest | Stem |
| 100. | (Milne, 1991) | Tree Physiology | Moffat forest, Scotland, UK | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Branch |
| 101. | (Moore, 2000) | Forest Ecology and Management | New Zealand, 6 locations | Experiment (in the field) | Biomechanical analysis  Regression analysis | Wind | Forest | Stem |
| 102. | (Moore & Maguire, 2004) | Trees | Not available | Literature review | Regression analysis | Wind | Forest | Stem |
| 103. | (Moore & Maguire, 2005) | Trees | Corvallis, Oregon, USA | Experiment (in the field) | Regression analysis  Biomechanical analysis | Wind | Forest | Stem |
| 104. | (Moore & Maguire, 2008) | Tree Physiology | Corvallis, Oregon, USA | Case study | Descriptive statistics | Wind | Forest | Stem |
| 105. | (Mueller & Cline, 1959) | Soil Science | Ithaca, New York, USA | Case study | Regression analysis | Wind  Anchorage strength | Forest | Root |
| 106. | (Nicoll, Berthier, et al., 2016) | Trees | Leanachan Forest, Scotland, UK | Case study | Variance analysis | Root architecture | Forest | Root |
| 107. | (Nicoll, Gardiner, Rayner, & Peace, 2006) | Canadian Journal of Forest Research | UK | Experiment (in the field) | Regression analysis | Anchorage strength | Forest | Root |
| 108. | (Nicoll & Ray, 1996) | Tree Physiology | Crookburn, Kershope Forest, Cumbria, UK | Experiment (in the field) | Analysis of variance | Wind  Anchorage strength | Forest | Root |
| 109. | (Nilsen, Sharifi, Rundel, Jarrell, & Virginia, 1983) | Ecology | Sonoran Desert, California, USA | Case study | Descriptive statistics  Regression analysis | Drought | Desert | Root |
| 110. | (Nowak, Kuroda, & Crane, 2004) | Urban Forestry & Urban Greening | Baltimore, Maryland, USA | Cohort study | Descriptive statistics | Tree size, tree health, tree species, adjacent land use | Urban | Stem |
| 111. | (O'Brien, Hubbell, Spiro, Condit, & Foster, 1995) | Ecology | Barro Colorado Island, Panama | Case study | Biomechanical modelling | Morphological characteristics | Urban | Stem |
| 112. | (Oliver & Mayhead, 1974) | Forestry | Thetford forest park, Brandon, UK | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Stem |
| 113. | (Onoda, Richards, & Westoby, 2010) | New Phytologist | Ku-ring-gai Chase National Park, Sydney, Australia | Experiment (laboratory) | Linear mixed models  Analysis of variance | Wind | Forest | Stem |
| 114. | (Ostertag, Silver, & Lugo, 2005) | Biotropica | Luquillo  Experimental Forest, Puerto Rico | Case study | Maximum likelihood ratio tests | Morphological characteristics | Forest | Branch |
| 115. | (Papesch, Moore, & Hawke, 1997) | New Zealand Journal of Forestry Science | Eyrewall Forest, Canterbury, UK | Experiment (in the field) | Analysis of covariance  Regression analysis | Wind | Forest | Stem |
| 116. | (Peltola & Kellomäki, 1993) | Silva fennica | Joensuu, Finland | Case study | Biomechanical modelling and analysis | Wind | Forest | Stem |
| 117. | (Peltola, Kellomäki, Hassinen, & Granander, 2000) | Forest Ecology and Management | Finland | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Stem |
| 118. | (Peltola, Kellomäki, Väisänen, & Ikonen, 1999) | Canadian Journal of Forest Research | Joensuu, Finland | Case study | Biomechanical modelling and analysis | Wind | Forest | Stem |
| 119. | (Pereira & Hosegood, 1962) | Journal of Soil Science | Kinale, Kenya | Case study | Regression analysis | Root spread and depth | Forest | Root |
| 120. | (Peterson & Claassen, 2013) | Forestry | Stanislaus, Sutter and San Joaquin counties, California, USA | Experiment (in the field) | Analysis of covariance, Ordinary Least Squares | Wind | Urban | Stem |
| 121. | (Pfisterer, 2003) | Proceedings Second International Symposium on Plant Health in Urban Horticulture | Germany | Experiment (laboratory) | Biomechanical analysis | Wind | Orchard | Stem |
| 122. | (Pourhashemi, Esmaeilpour, & Heidari, 2012) | Iranian Journal of Forestry | Iran, Teheran | Experiment (laboratory) | Descriptive statistics | Drought | Urban | Stem |
| 123. | (Putz, Coley, Lu, Montalvo, & Aiello, 1983) | Canadian Journal of Forest Research | Barro Colorado Island, Republic of Panama | Case study | Discriminant analysis | Buttressing | Forest | Stem |
| 124. | (Putz & Sharitz, 1991) | Canadian Journal of Forest Research | Congaree Swamp, South Carolina, USA | Case study | Likelihood ratio tests  χ²-analysis | Hurricane | Forest | Stem |
| 125. | (Ray & Nicoll, 1998) | Forestry | Crookburn, Kershope Forest, Cumbria, UK | Experiment (in the field) | Regression analysis  Biomechanical analysis | Soil saturation  Root spread and depth | Forest | Root |
| 126. | (Reilly, 1991) | Biotropica | Virgin Islands National Park, St. John, U.S | Case study | Chi square tests | Morphological characteristics | Forest | Stem |
| 127. | (Ribeiro et al., 2016) | Forest Ecology and Management | 90 km north of Manaus, the capital of Amazonas State, Brazil | Experiment (in the field) | Analysis of Covariance | Wind | Forest | Stem |
| 128. | (Rigg & Harrar, 1931) | American Journal of Botany | Evans Creek, Seattle, Washington, USA | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 129. | (Rodriguez, De Langre, & Moulia, 2008) | American Journal of Botany | New Zealand | Case study | Finite element modelling and analysis  Orthogonal regression analysis | Wind | Solitary | Stem |
| 130. | (Roodbaraky, Baker, Dawson, & Wright, 1994) | Journal of Wind Engineering and Industrial Aerodynamics | Blidworth, Nottinghamshire, UK | Case study | Biomechanical analysis | Wind | Urban | Stem |
| 131. | (Sánchez-Medina, Ayuga-Téllez, Contato-Carol, Grande-Ortiz, & González-García, 2017) | Arboriculture & Urban Forestry | Santiago del Estero, Argentina | Case study | Descriptive statistics  (Canonical) Correlation analysis | Morphological characteristics | Urban | Stem |
| 132. | (Saunderson, England, & Baker, 1999) | Journal of Theoretical Biology | Not available | Case study | Biomechanical modelling | Wind | Forest | Stem |
| 133. | (Sellier & Fourcaud, 2009) | American Journal of Botany | New Zealand | Case study | Finite element modelling and analysis | Wind | Solitary | Stem |
| 134. | (Sellier, Fourcaud, & Lac, 2006) | Tree Physiology | Canada | Case study | Finite element modelling and analysis | Wind | Forest | Stem |
| 135. | (Sharma, Bílek, Vacek, & Vacek, 2017) | Trees | Czech Republic | Case study | Biomechanical modelling  Regression analysis | Wind | Forest | Stem |
| 136. | (Silins, Lieffers, & Bach, 2000) | Trees | Whitecourt, Alberta, Canada | Experiment (in the field) | Biomechanical analysis | Wind | Forest | Stem |
| 137. | (Shin et al., 2016) | Proceedings at the 7th ICCM2016 | Kyungpook National University, Korea | Experiment (in the field) | Biomechanical analysis | Wind | Orchard | Stem |
| 138. | (Slater & Ennos, 2013) | Trees | Prestwich Country Park, Manchester, UK | Experiment (laboratory) | Biomechanical analysis  Analysis of variance | Ice, snow, wind | Orchard | Branch |
| 139. | (Slater & Ennos, 2015) | Arboriculture & Urban Forestry | Prestwich Country Park, Manchester, UK | Experiment (laboratory) | Biomechanical analysis  Analysis of variance | Included bark | Orchard | Branch |
| 140. | (Smiley, 2003) | Journal of Arboriculture | Bartlett Tree Research Laboratories, Charlotte, North Carolina, USA | Experiment (in the field) | Regression analysis | Included bark | Urban | Branch |
| 141. | (Smiley & Fraedrich, 1992) | Journal of Arboriculture | Charlotte, North Carolina, USA | Case study | Graphical analysis | Decay | Urban | Stem |
| 142. | (Smith, 1964) | The Forestry Chronicle | UBC Forest Haney, Paul Lake, Kamloops, Canada | Case study | Descriptive statistics  Regression analysis | Typhoon | Forest | Root |
| 143. | (Smith, Watts, & James, 1987) | Canadian Journal of Forest Research | Kapuskasing, Ontario, Canada | Experiment (in the field) | Biomechanical analysis  Regression analysis | Wind | Forest | Stem |
| 144. | (Soethe, Lehmann, & Engels, 2006) | Plant and Soil | Estación Cienífica San Francisco, Podocarpus National Park, Ecuador | Case study | Biomechanical analysis  Student’s t-test | Root spread and depth | Forest | Root |
| 145. | (Somerville, 1979) | New Zealand Journal of Forest Science | Eyrewell State Forest, New Zealand | Experiment (in the field) | Analysis of variance  Student’s t-test | Wind,  Root spread and depth | Forest | Root |
| 146. | (Spatz & Bruechert, 2000) | Forest Ecology and Management | Altglashütten, Black Forest, Germany | Case study | Biomechanical analysis | Wind | Forest | Stem |
| 147. | (Spatz, Brüchert, & Pfisterer, 2007) | American Journal of Botany | Freiburg, Germany | Experiment (in the field) | Biomechanical analysis  Regression analysis | Wind | Forest | Branch |
| 148. | (Spatz & Theckes, 2013) | American Journal of Botany | Freiburg, Germany | Experiment (laboratory) | Biomechanical analysis | Wind | Forest | Branch |
| 149. | (Štofko & Kodrík, 2008) | Journal of Forest Science | Hnilé Blatá Mountains, Czech Republic | Case control study | Correlation analysis | Wind | Forest | Root |
| 150. | (Stokes, 1999) | Plant and Soil | Forêt de l’Hermitage, Gironde, France | Experiment (in the field) | Regression analysis | Wind | Forest | Root |
| 151. | (Stokes et al., 2005) | Plant and Soil | Forêt Domaniale de Vaujany, Vall´ee de l’Eau d’Olle, Is`ere, France | Experiment (in the field) | Analysis of variance  Biomechanical analysis | Wind | Forest | Root |
| 152. | (Stone & Kalisz, 1991) | Forest Ecology and Management | Florida Agricultural Experiment Station, USA | Literature review | Descriptive statistics | Root spread and depth | Forest | Root |
| 153. | (Strong & Roi, 1983) | Canadian Journal of Forest Research | Alberta, Canada | Case study | Descriptive statistics | Root spread and depth | Forest | Root |
| 154. | (Sugden, 1962) | The Forestry Chronicle | Petawawa Forest Experiment Station, Ontario, Canada | Experiment (in the field) | Graphical analysis pruning | Wind | Forest | Stem |
| 155. | (Sundarapandian, Mageswaran, Gandhi, & Dar, 2014) | Current World Environment | Pondicherry University Campus, Puducherry, India | Case study | Analysis of variance | Cyclone | Urban | Stem |
| 156. | (Swiecki, Bernhardt, Drake, & Costello, 2006) | Phytosphere research | Marin County, California, USA | Case study | Logistic regression  χ²-analysis | Decay | Forest | Stem |
| 157. | (Terho, 2009) | Urban Forestry & Urban Greening | Helsinki, Finland | Case study | n.a. | Decay | Urban | Stem |
| 158. | (Turner, Slater, & Ennos, 2012) | Arboricultural Journal: The International Journal of Urban Forestry | Queen’s Square, Bristol city, UK | Experiment (laboratory) | Biomechanical analysis  Analysis of variance | Wind  Flexibility branch | Urban | Branch |
| 159. | (Vesselkin, Galako, Vlasenko, Shavnin, & Vorobeichik, 2015) | Contemporary problems of Ecology | Yekaterinburg, Russia | Case study | Analysis of (co)variance  Regression analysis | Morphological characteristics | Urban | Stem |
| 160. | (Vojáčková, Tippner, Horáček, Praus, Sebera, Brabec, 2019) | Arboriculture & Urban Forestry | Brno-Cerna Pole, Czech Republic | Experiment (in the field) | Finite element method  Sensitivity analysis | Wind, snow, ice | Urban | Branch |
| 161. | (Watson, Phillips & Marden, 1999) | Plant and Soil | Christchurch, New Zealand | Experiment (laboratory) | Biomechanical analysis | Root spread | Forest | Root |

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