

# ICRI-Broken Rails Review

Eric Magel

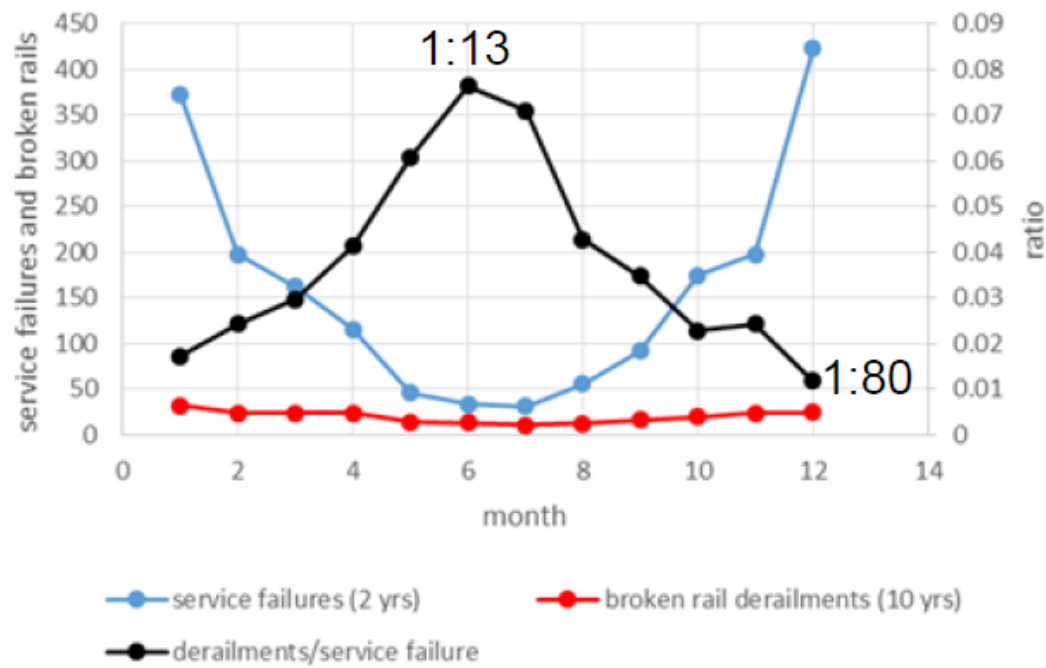
Principal Consultant – EM-WRI Consulting Inc.

Project Consultant, Global Rail – North America

# BR Derailments - Seasonality

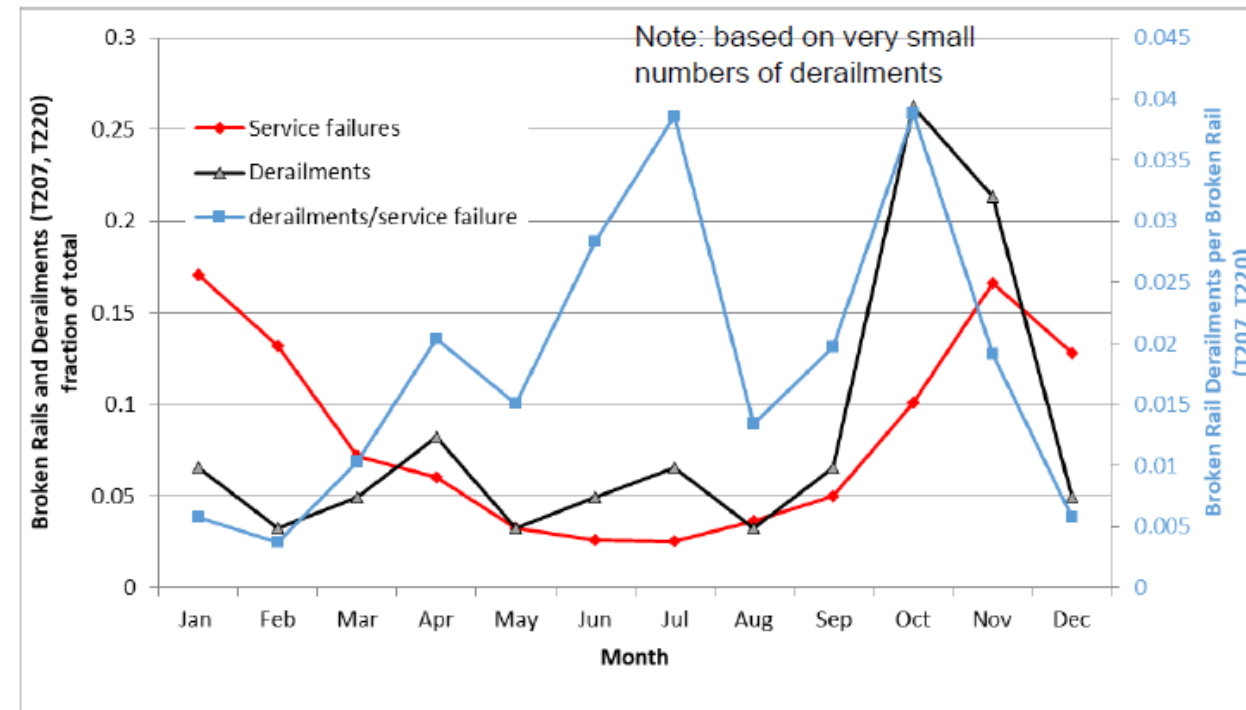
from UIUC "SEASONAL EFFECT ON THE OPTIMIZATION OF RAIL DEFECT INSPECTION FREQUENCY", ASME, 2013

From Table A6: Broken Rail Derailments and Service Failures

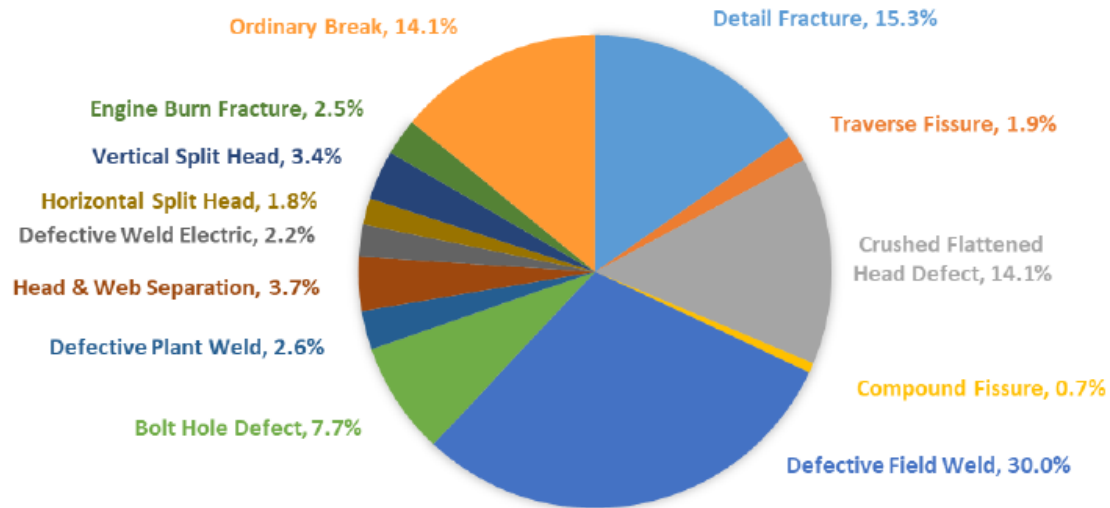


- # of broken rail derailments DOES NOT vary directly with the number of broken rails

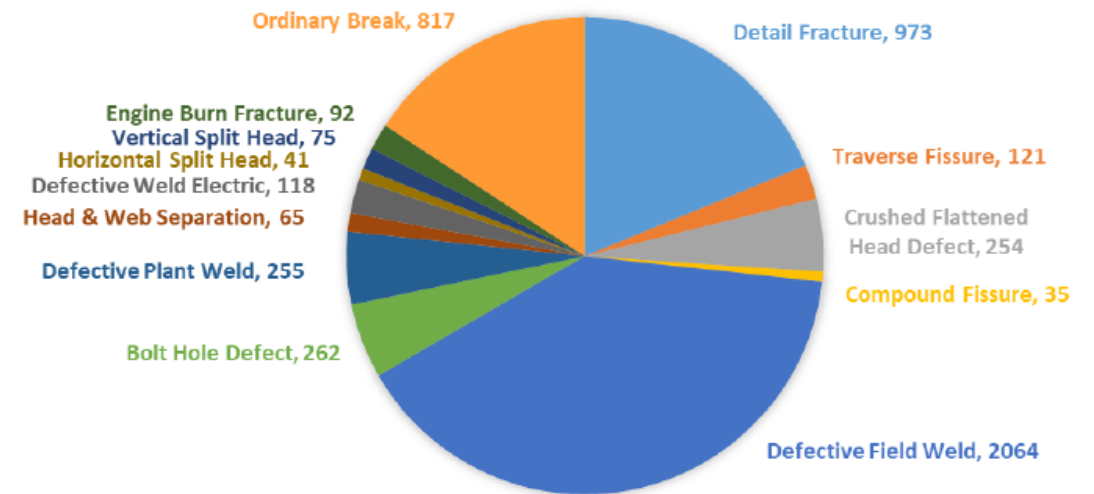
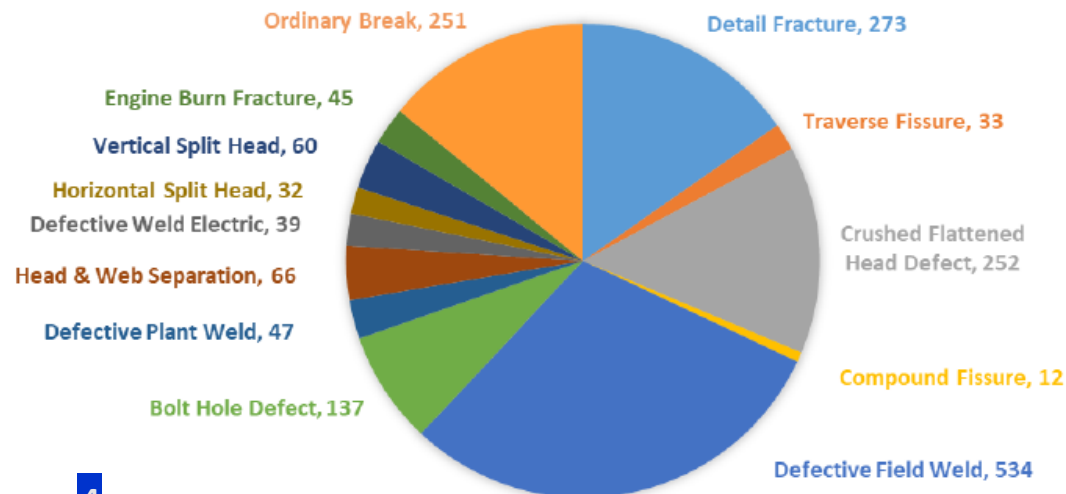
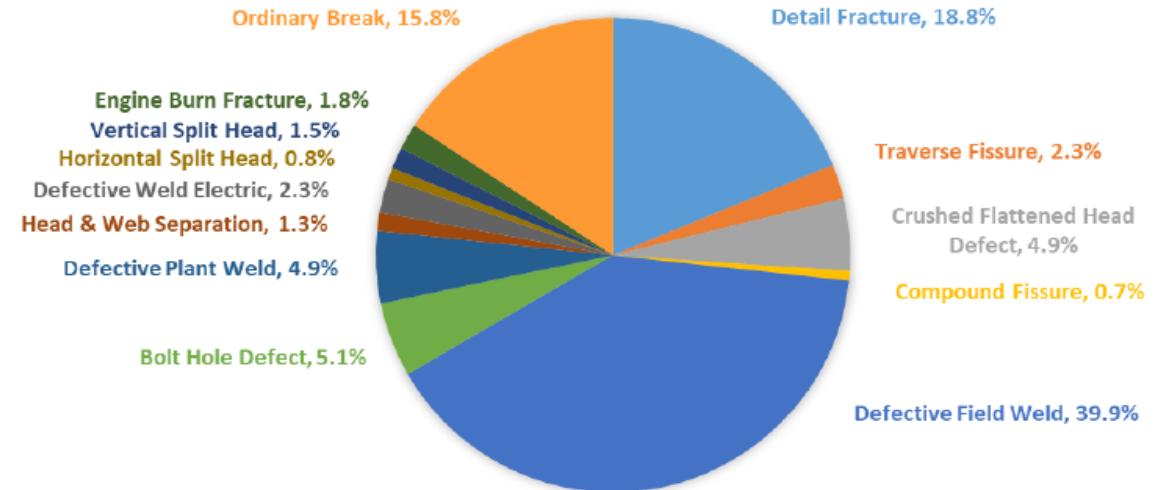
2004-2015

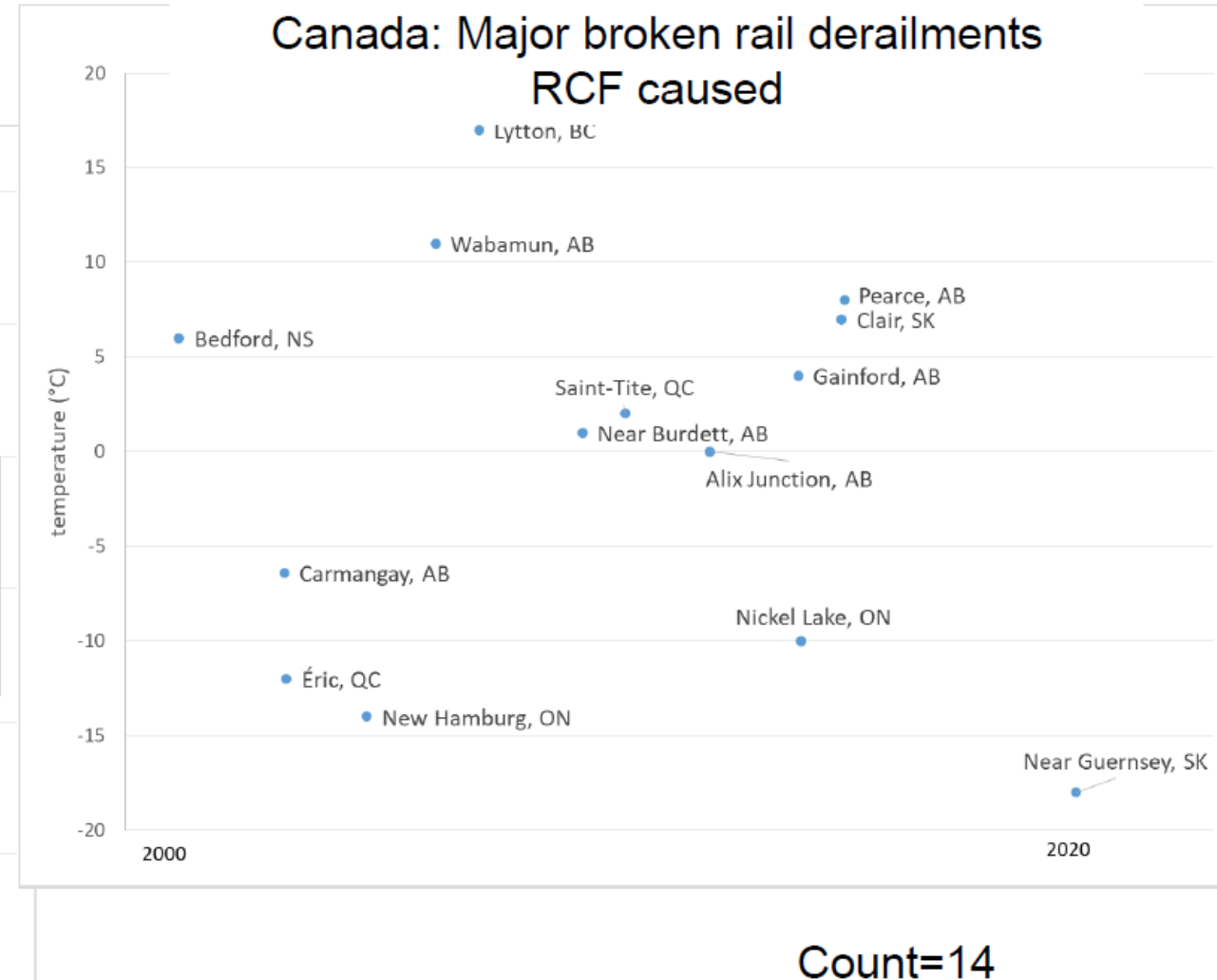
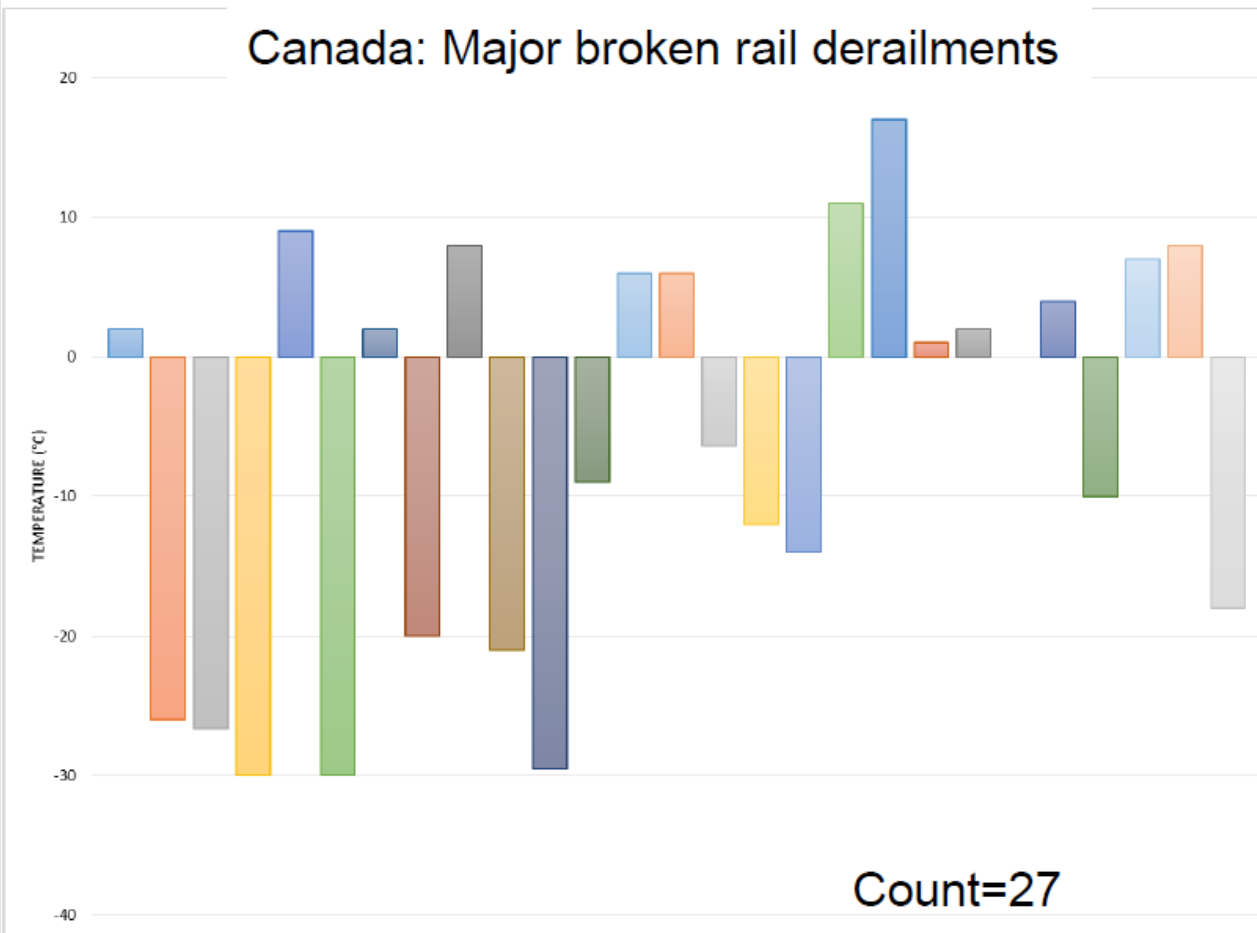


### SUMMER SERVICE FAILURES (JUN-AUG, 2014 AND 2015)



### WINTER SERVICE FAILURES (DEC-FEB, 2014-15 AND 2015-2016)

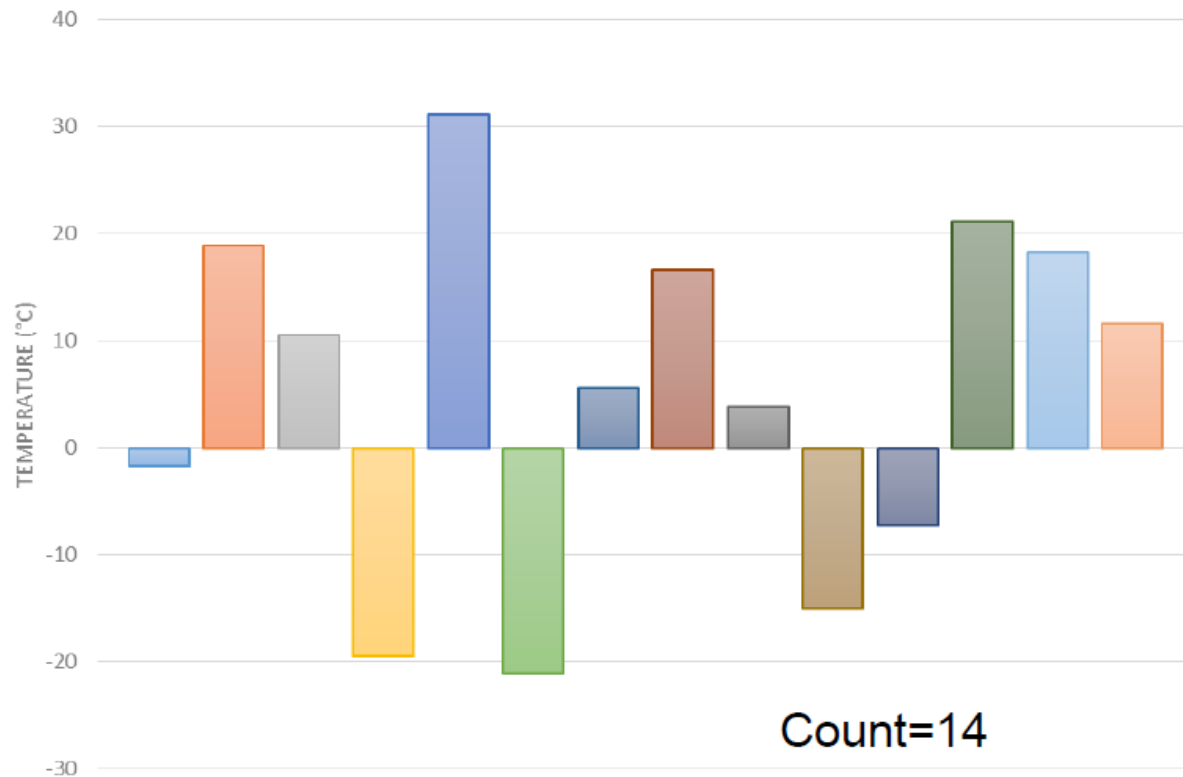




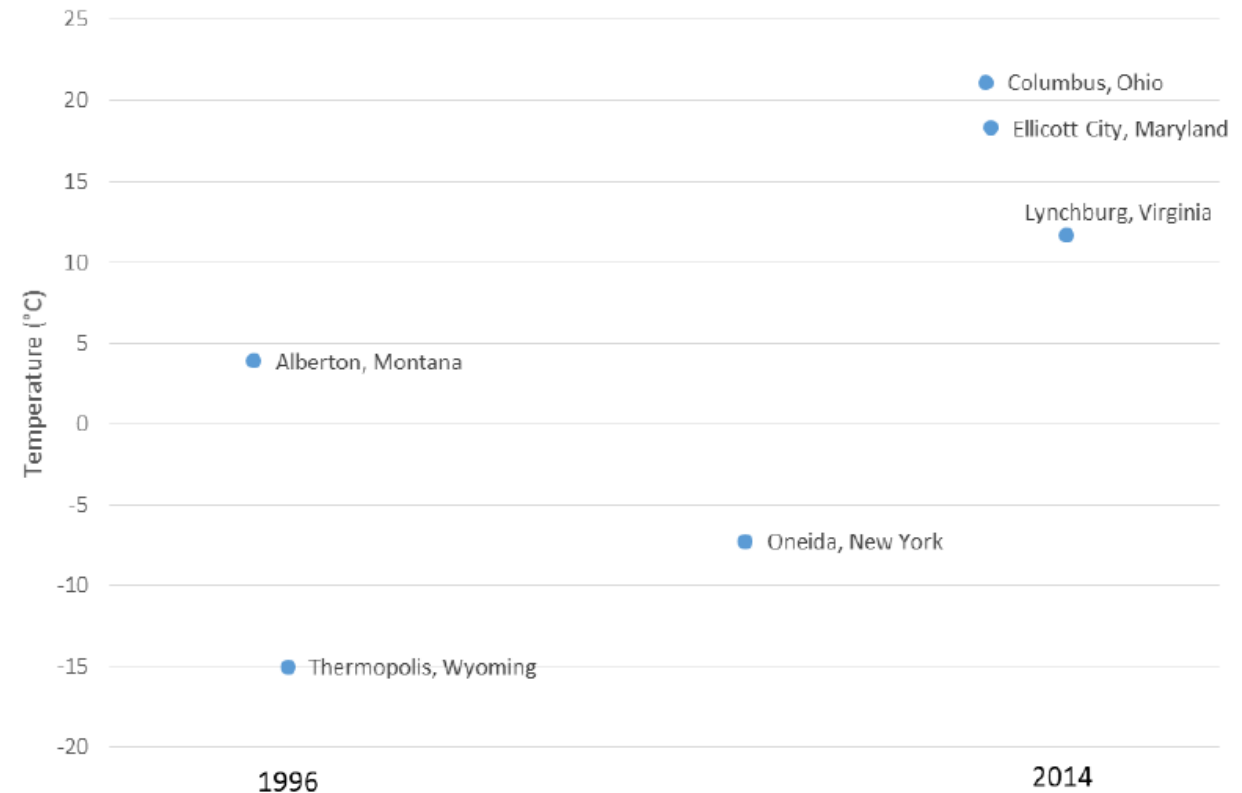
# USA – NTSB investigated broken rail derailments

None since late 2015

USA - Major Broken Rail derailments (1996-2020) NTSB

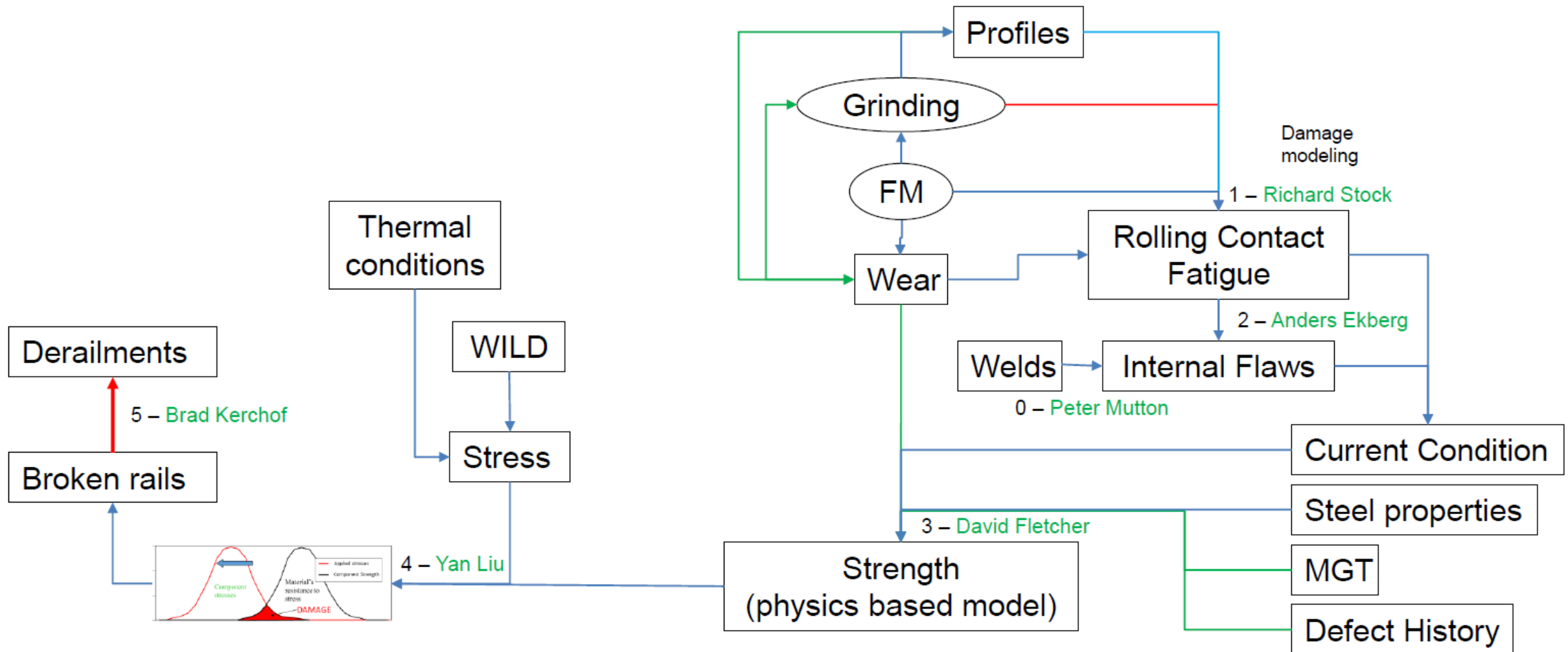


USA - Major RCF related derailments (1996-2020) NTSB

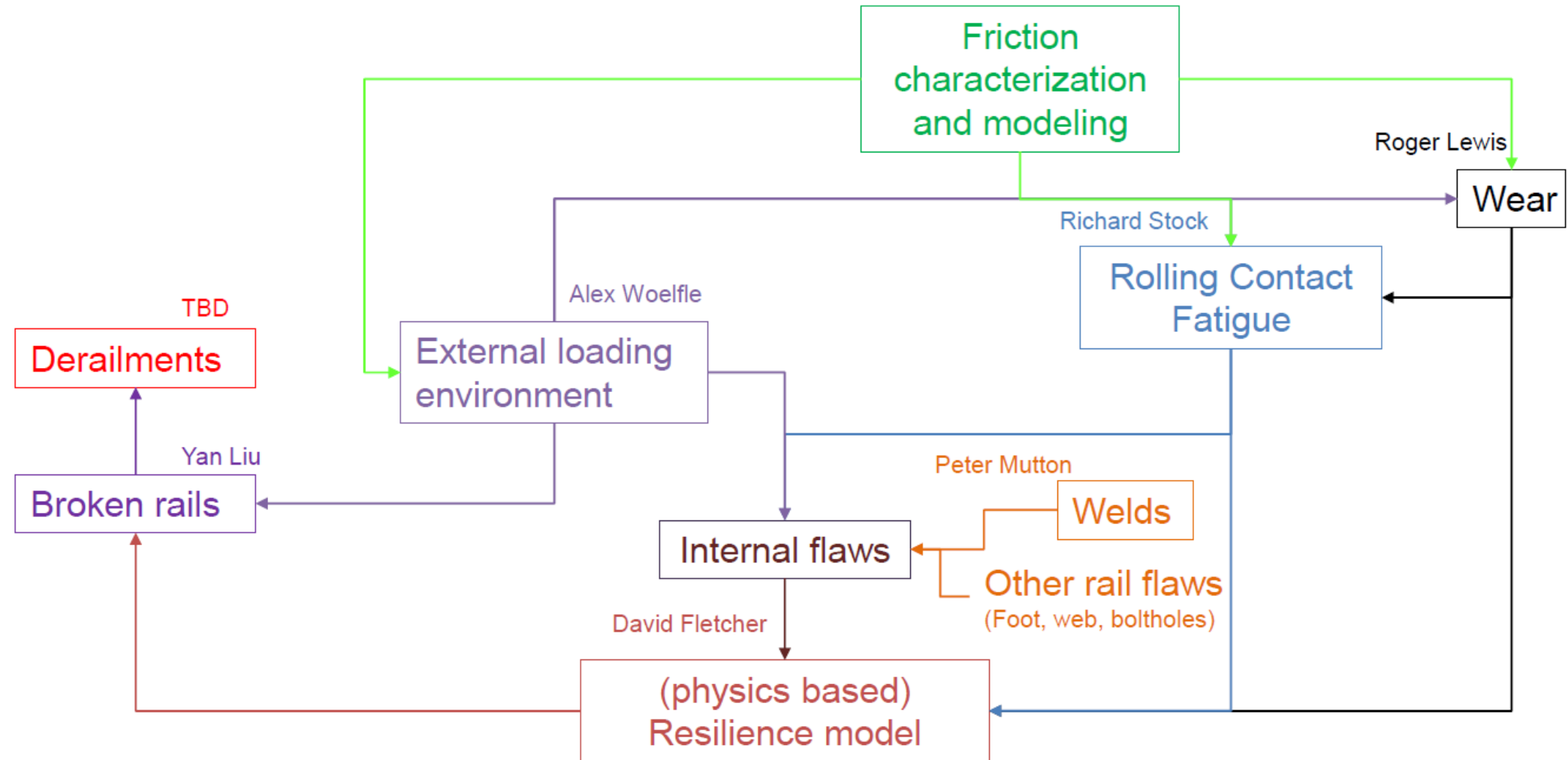


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# Stress-Strength Approach to Modeling Broken Rails



# Modeling Broken Rails



# Where are we now?

- Characterizing Friction: library, modelling and measurement working groups
- Strength modelling – 27JAN22
- Impacts and modeling of wear – 07FEB22
- Stress modeling – 17FEB22
- Welds – 02MAR22
- External loading environment - 24MAR22
- RCF modelling –14APR22



# Where to go from here?

- Collect all the data needs and research gaps from the working groups
- Identify potential collaborative projects
- Challenge teams to coalesce around these
- Identify potential funding programs