Hauraki Rift earthquake modelling

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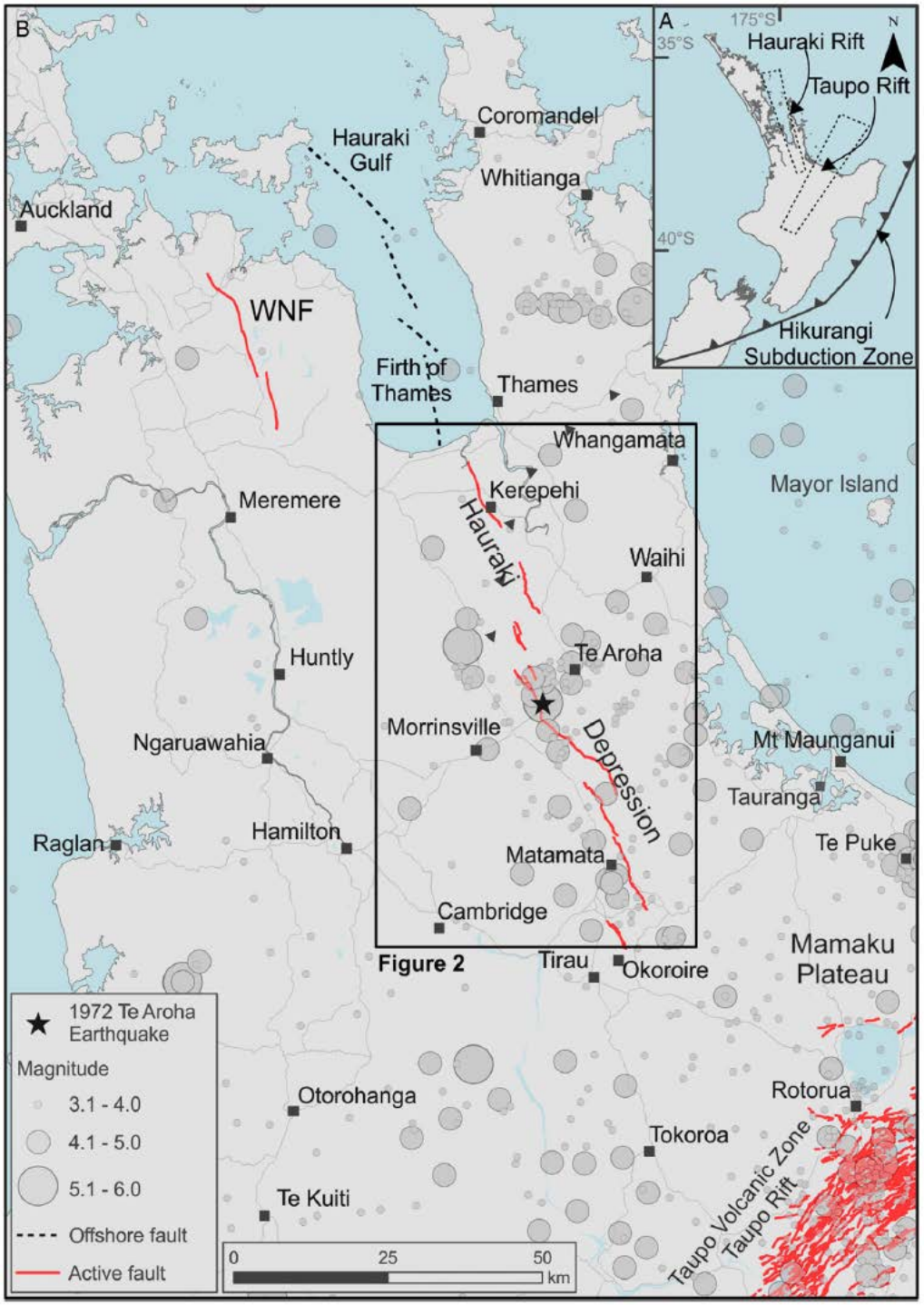
Hauraki Rift and the Kerepehi Fault

- Active normal fault, 6 segments, 80 km onshore length.
- Low slip-rate, recurrence interval <5 to >10 kyr.
- M 5.5 to 7.0 for segments, up to M 7.4 for all onshore sections together.
- Unknown extension in Hauraki Gulf

Persaud et al. (2016)



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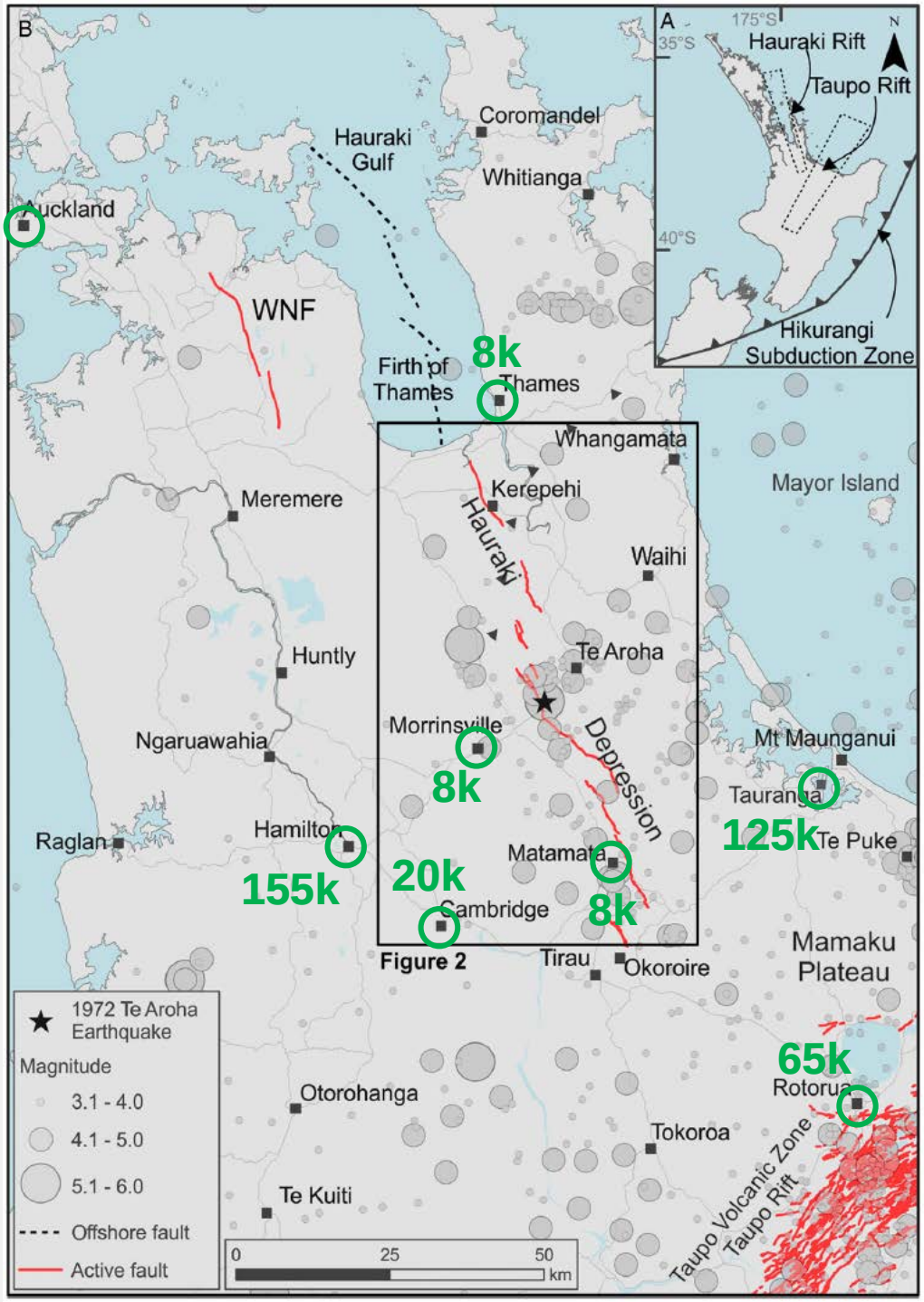
Hazard to cities and region

minor provincial town

- 40% of NZ population and 40% of NZ GDP within 50 km of fault.
- Thought to be low hazard.
- Cascading hazard – landslides and tsunami.

Persaud et al. (2016)



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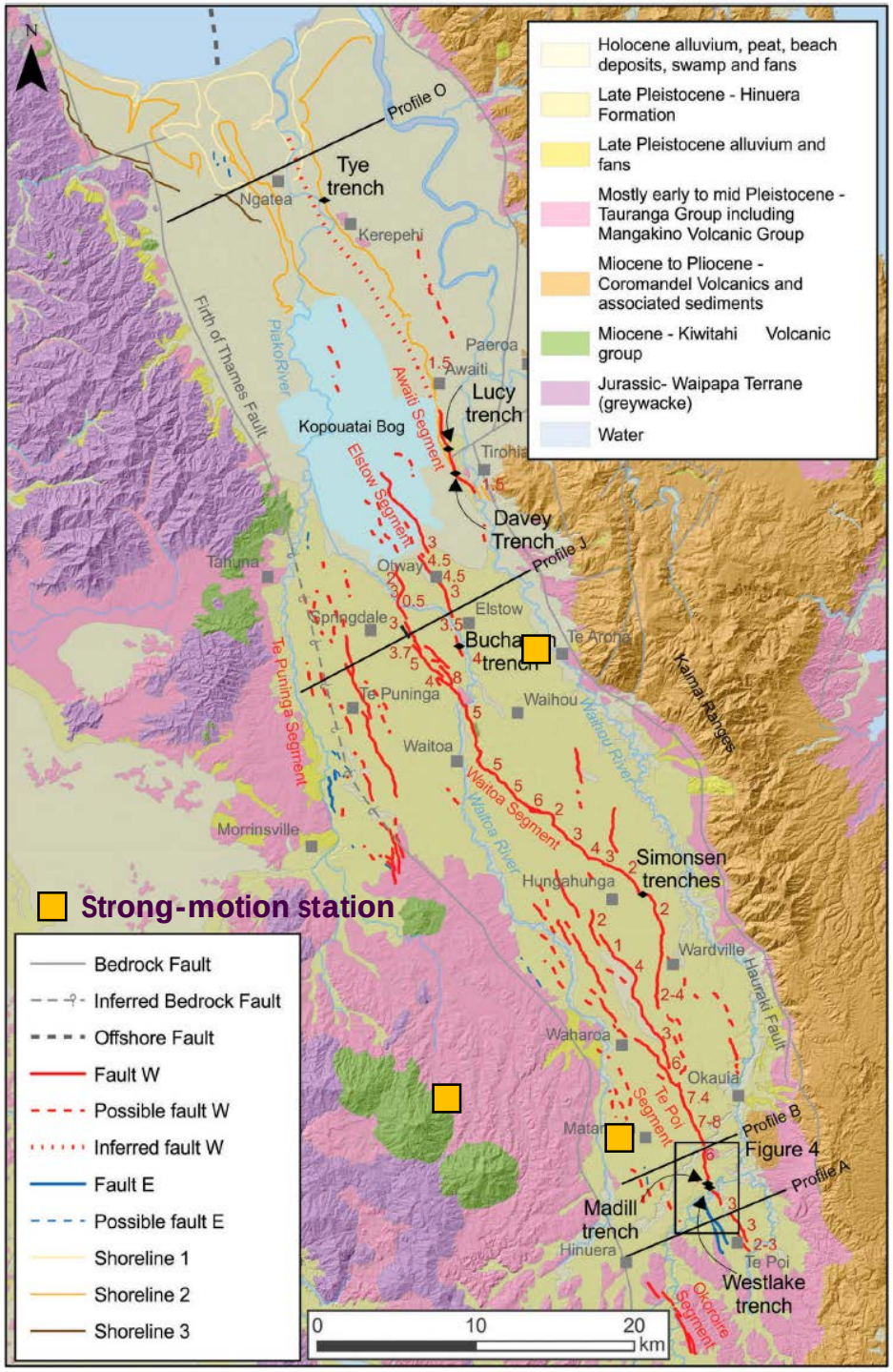
Tie in with other Auckland work

- Hauraki Rift infilled with sediments up to 2.5-3.0 km thick.
- Characterize velocity-depth-to-basement across rift (Wotherspoon) for first-cut basin model.
- Local site response measurements in Auckland and Tauranga (Wotherspoon).
- Inform 2019 MBIE bid for Hauraki Rift characterisation



Persaud et al. (2016)

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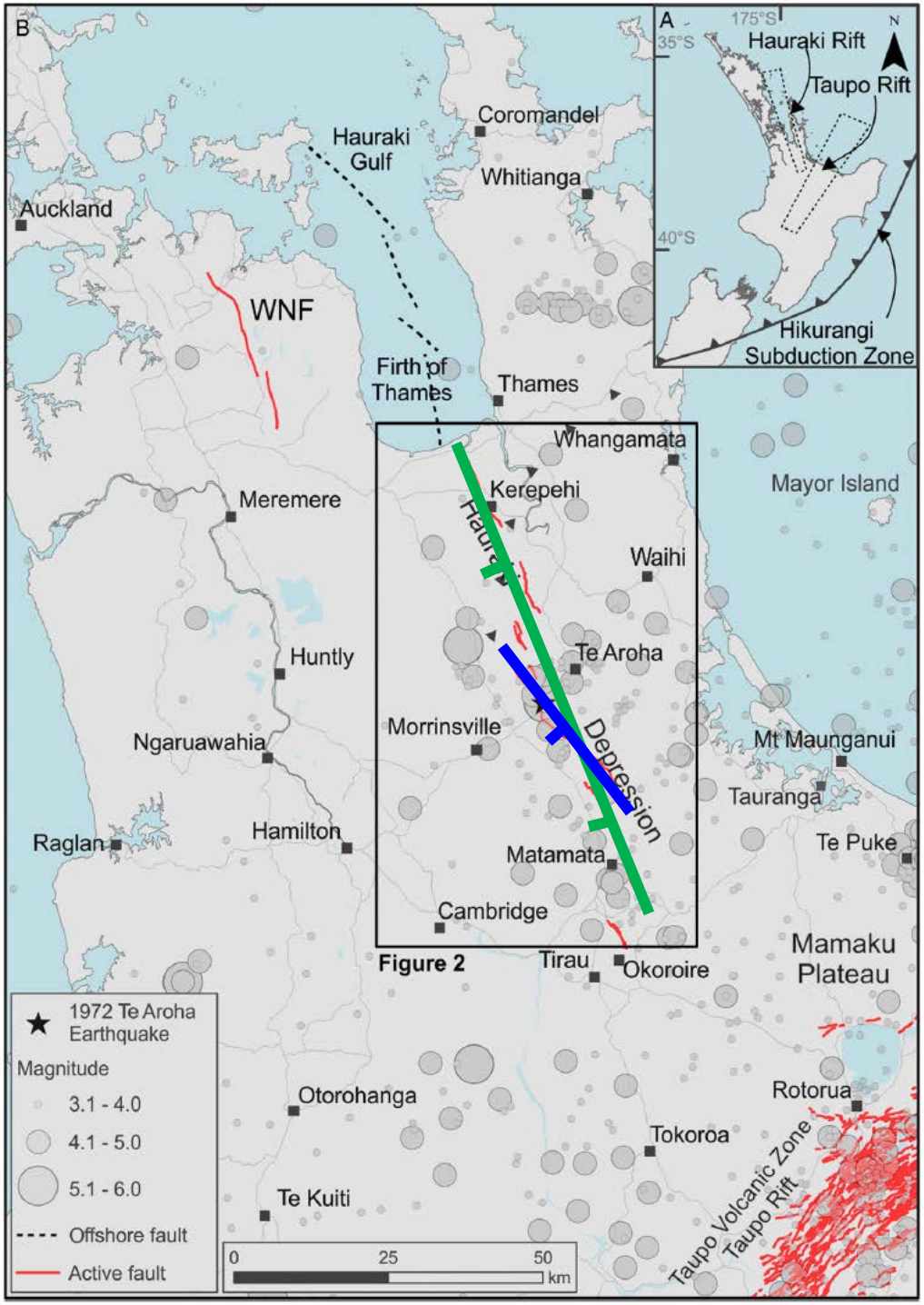
Simulation Scenarios

Consider the Persaud et al. (2016) scenarios, which used Villamor et al. (2001) regression for rifts.

- ~45 km long rupture of Waitoa segment, M 7.0
  1. north-to-south
  2. south-to-north
- ~80 km long rupture of all onshore segments, M 7.3
  3. north-to-south
  4. south-to-north
- Other segments as time permits.

Persaud et al. (2016)



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Simulation details

- Using simulation and pre/post-processing tools installed on Kupe (thanks Sung and Jonney).
- NZ velocity model (Eberhart Phillips et al., 2010) as base, supplemented with Hauraki Rift "basin model" once available.
- Local site effects from NZ Vs30 model, supplemented with on-site measurements in Auckland and Tauranga when available.
- Evaluate ground motions at sites in Auckland (CBD, airport), Tauranga, Hamilton, Matamata, Rotorua, Thames.