• If liquefaction is involved (depending on input motion), the model should have a proper mechanism to describe dilatancy. It seems that the most reliable models for liquefaction analysis are those critical state based.

• For a critical state model to predict the onset of liquefaction, the critical state line (not easy to obtain) and the in situ state are most important parameters.

• I would certainly use my analysis results as a means of understanding mechanisms.
FE procedure (SUMDES2D, Ming 2001)
Unified sand model (based on Li & Dafalias 2000)

Measured (Seed et al. 1973)
Calculated Displacement
Direction of Displacement

Calculated Displacement
Direction of Displacement
(a) Shear Stress Distribution Along the Base of the Embankment (Upper San Fernando Dam)

- Shear Stress Distribution
- Horizontal Coordinate (m)
- Shear Stress (kPa)
- With Seepage Force
- Without Seepage Force

(b) Shear Stress Distribution Along the Base of the Embankment (Lower San Fernando Dam)

- Shear Stress Distribution
- Horizontal Coordinate (m)
- Shear Stress (kPa)
- With Seepage Force
- Without Seepage Force

Residual Strength Envelope
Base of Embankment
- 160 kPa
(a) Original Dam

(b) Without Seepage Effect

(c) Without the Downstream Berm

(d) With a Deficient D/S Foundation

(e) With an Added Upperstream Berm
Model Parameters

1. Number of model parameters: ~14

2. The parameters were used for all soils

3. CSL was calibrated based on Castro’s data

4. All other parameters were their default values (calibrated for Toyoura sand)