618.100 NASIS Calculation for Estimating Effective Cation-Exchange Capacity

**Inputs.**—See documentation for appendix 618-2 NASIS calculation for estimating cation-exchange capacity.

**Calculation.**

```plaintext
#---------Calculates ECEC when pH(water) < 5.5---------------------------------------------
DEFINE ececr
IF ISNULL(ph1) THEN 1/0
ELSE IF ph1 == "no" AND ocr > 8 AND taxminalogy1 == "andisols"
THEN EXP(0.938*ln_ocr - 0.029*pheac12r - 0.054)
ELSE IF ph1 == "no" AND ocr > 8
THEN EXP(0.699*ln_ocr + 0.556*pheac12r - 1.497)
ELSE IF ph1 == "no" AND ocr <= 8 AND desgnmaster1 == "E"
THEN EXP((0.371*ln_ocr) + (0.728*ln_clayr) + (0.392*ln_siltr) + (0.728*ln_phwatr) - 2.145)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "parasquic"
THEN EXP((0.109*ln_ocr + 0.904*ln_clayr - 0.927*ln_phwatr - 0.083)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "smectitic OR taxminalogy1 == "montmorillonitic"
THEN EXP((0.965*ln_clayr + 0.939*ln_phwatr - 1.974)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "isotic"
THEN EXP((0.124*ln_ocr + 0.535*ln_w15barr + 0.405*ln_siltr - 0.455)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "superactive"
THEN EXP((0.035*ln_ocr + 0.913*ln_clayr - 0.341)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "active"
THEN EXP((1.15*ln_clayr - 0.115*ln_ocr - 1.725)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "semiactive"
THEN EXP((1.049*ln_clayr - 0.058*ln_ocr - 1.864)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "subactive"
THEN EXP((0.757*ln_clayr - 1.01*ln_phwatr + 0.214*ln_siltr + 0.465)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "alitsols"
THEN EXP((0.019*ln_ocr + 0.834*ln_clayr + 0.325*ln_phwatr + 0.288*ln_siltr - 1.937)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "entisols"
THEN EXP((0.387*ln_ocr + 0.818*ln_clayr - 0.343)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "inceptisols"
THEN EXP((0.283*ln_ocr + 0.541*ln_clayr + 1.913*ln_phwatr + 1.369)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "mollisols"
THEN EXP((0.122*ln_ocr + 0.721*ln_clayr + 0.6*ln_phwatr + 0.635)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "oxisols"
THEN EXP((0.21*ln_ocr + 0.685*ln_clayr - 2.881*ln_phwatr + 0.355*ln_siltr + 1.169)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "spodosols"
THEN EXP((0.309*ln_ocr + 0.526*ln_clayr + 0.525*ln_siltr - 0.535)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "ultisols"
THEN EXP((0.555*ln_clayr + 0.481*ln_siltr - 1.204*ln_phwatr + 0.016)
ELSE IF ph1 == "no" AND ocr <= 8 AND taxminalogy1 == "histosols"
THEN 0.443*clayr + 2.377*ocr - 2.906
ELSE 1/0.
```

(430-VI-NSSH, Amend. 19, November 2010)