

Session 2

Site Assessment and E&SC Planning

1

Centre for Environmental Training cet

Plan Preparation

- What sort of plan do I require?
- Plan may comprise:
 - Drawing(s) to show layout of works
 - Commentary as annotated sketches or report
- If disturbed area is $>250\text{m}^2$ and $<2,500\text{m}^2$ require an ESCP
- If disturbed area is $>2,500\text{m}^2$ require an SWMP

2

Centre for Environmental Training cet

Examples

- Disturbed area $<250\text{m}^2$: house extension, garage, small driveway
- Disturbed area $250\text{--}2,500\text{m}^2$: most houses, commercial developments, small subdivisions, small medium/high density housing, small civil works
- Disturbed area $>2,500\text{m}^2$: large subdivisions, large medium/high density housing, large civil works

3

Centre for Environmental Training cet

ESCP or SWMP?

- Chapter 2 of the Blue Book describes the difference between an ESCP and a SWMP
- ESCP:
 - Site plan to show Best Management Practices (BMPs)
 - Standard Drawings from Blue Book
- SWMP, in addition, requires:
 - Supporting calculations for sediment basins and structures
 - Details of erosion and sediment controls
 - Inspection and maintenance notes
 - Stabilisation requirements

4

Centre for Environmental Training cet

ESCP

Measures include:

- Clean water diversion
- Site access controls (barrier fence)
- Stabilised access
- Sediment fence
- Designated stockpile locations
- Waste disposal facilities/storage

5

Centre for Environmental Training cet


Clean water diversion



6

Centre for Environmental Training cet

Stabilised access



7

Centre for Environmental Training cet

SWMP

- Applies same principles as ESCP
- For larger projects with:
 - Greater areas of disturbance
 - Higher pollution risk



8

Centre for Environmental Training cet

SWMP

- Is the area of disturbance >2,500m²?
- Undertake constraints analysis
- Waterfront/riparian land or flood prone?
- Erosion hazard assessment
- Run RUSLE and determine Soil Loss Class
- Consider timing restrictions
- Batter limitations required?
- Sediment basin test
- Determine type of basin required
- Prepare SWMP to include erosion and sediment controls, maintenance notes, stabilisation requirements and standard drawings

9

Centre for Environmental Training cet

Assessment of Constraints

- Blue Book Reference Chapter 3

Consider:

- Waterfront (riparian land): vegetated land adjacent to waterbodies
- Flooding: <2 year ARI flood level, automatically considered Soil Loss Class 6 – high erosion hazard
- Need to focus on erosion control

10

Centre for Environmental Training cet

Riparian and flood prone land

- What are the E&SC implications for riparian and flood prone land?



11

Centre for Environmental Training cet

Groundwater

- How can groundwater affect E&SC?
- Flow into bores, wells and open excavations
- Collapse of excavations
- Site access
- Perched watertables
- Moisture fluctuations
- Seasonal and permanent watertables
- Implications for plant growth and stabilisation

12

Centre for Environmental Training cet

Salinity

- How can salinity affect E&SC?
- Implications for plant growth
- Reduction in C-factor and consequent increase in erosion hazard
- Blue Book Reference Appendix C lists constraints in various Soil Landscapes throughout NSW

13 Centre for Environmental Training cet

Acid sulfate soils

- How can acid sulfate soils affect E&SC?
- Acid Sulfate Soil Risk Map
- Common in coastal NSW
- Excavations in and near coast and estuaries
- Procedures for handling and pH stabilisation

14 Centre for Environmental Training cet

Project (E&SC) Planning

- Both short- and long-term impacts must be considered:
 - Identify site limitations (soils, topography, water and vegetation)
 - Identify on-site and off-site values
 - Identify legislative/regulatory requirements
 - Identify areas of risk (or opportunity?)
 - Define project extent allowing sufficient area to achieve environmental goals.


15 Centre for Environmental Training cet

Issues to Consider Regional Soils

- Range of soil types; weak to strong horizon differentiation, gravels to clays
- Typically poor to moderate soil fertility, low pH, high erodibility, variable thickness
- Mass movement on steeper formations
- Erodible surface soils common
- Acidity, sodicity and dispersive soil conditions common
- Often moderate to high erosion hazard, particularly subsoils

16 Centre for Environmental Training cet

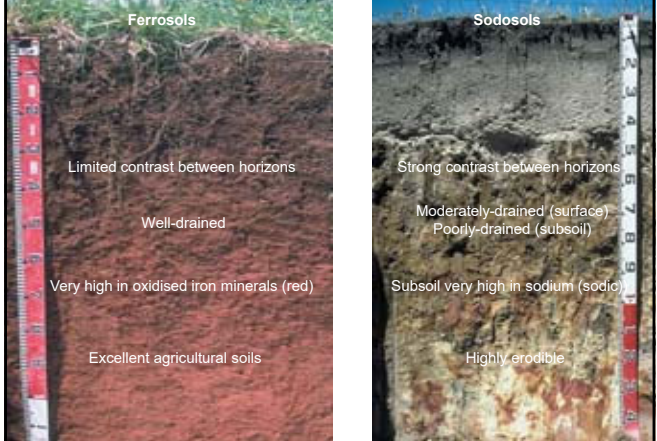
A duplex soil



High organic matter and water holding capacity; coarse textured and well structured →

May show bleaching at interface →

Good structure, imperfect drainage. Fine textured and low nutrient / organic matter →



Ferrosols

Limited contrast between horizons

Well-drained

Very high in oxidised iron minerals (red)

Excellent agricultural soils

Sodosols

Strong contrast between horizons

Moderately-drained (surface)
Poorly-drained (subsoil)

Subsoil very high in sodium (sodic)

Highly erodible

Central Coast Council Practical Erosion and Sediment Control for the Workforce 1 July 2024



Soil Landscape Mapping

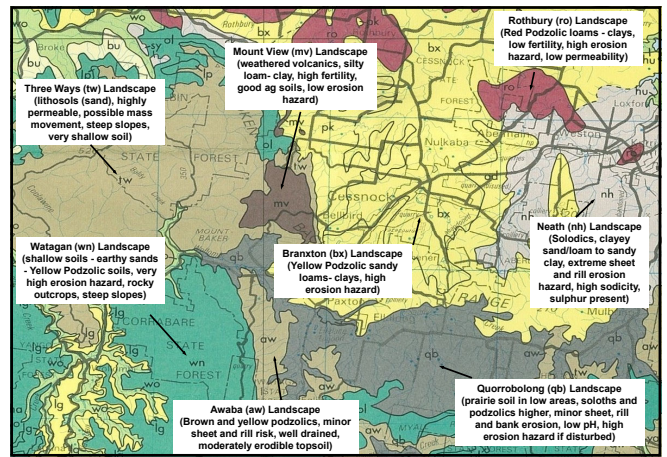
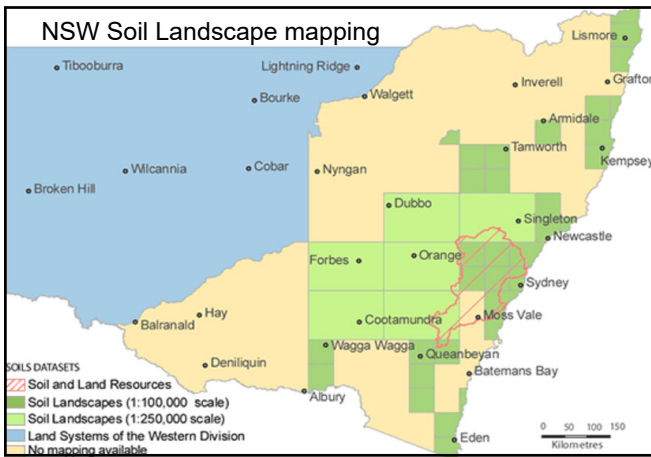
NSW Soil Landscape Maps (OEH)

- 1:100,000 – 1:250,000 scale
- Detailed information in companion books
- Available at shop.nsw.gov.au

SPADE in NSW NR atlas

- Electronic data, including borelogs
- <http://www.environment.nsw.gov.au/eSpade2Webapp>

20 Centre for Environmental Training



23 Centre for Environmental Training

Soil Essentials Report

Three reports:
Soil Essentials
Soil Profile
Soil Technical
(increasing level of detail)

Site Location: MGA Grid Reference: Easting 341704, Northing 6237030 QCSFORD 0131, 1:100,000 sheet

Profile Details: Soil Landscapes of the Coast 1:100,000 Sheet Survey, Profile 319, collected by Chris Ripley on May 28, 1990

Phytography: Slope in low hills under dry sclerophyll forest on sandstone-quartz lithology and used for volutionary pasture. Slope 4% (estimated), elevation 155 m, aspect south east, profile is readily drained, erosion hazard is high, and no salting evident.

Soil Type: Fragile Humusosol; Aeric Podzol (ASC), Podzol (OSG), Uic 32 (PFF)

Soil Description:

Layer 0
00.00 - 00.20 m
A1 horizon
sandy sand with single grained (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident, Segregations are not evident, not evident, sharp (+5 mm) boundary to...

Layer 2
00.20 - 02.70 m
A2 horizon
sand with massive structure (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident, Segregations are not evident, not evident, sharp (+5 mm) boundary to...

Layer 3
02.70 - 03.00 m
B horizon
sandy sand with massive structure (sandy), field pH is 5. Coarse fragments are not evident, and not evident, and not evident, pans are not evident, not evident, not evident, Segregations are not evident, not evident, not evident.

Laboratory Test Data:

Upper	Lower	%	USCS	PH	EC	OC	Blay	P	Bole	Each	Each	Each	Each	Each
Board	Board													
Clay	Clay													

For information on laboratory test data and units of measure, please see the SPADE Help page.

24 Centre for Environmental Training



Management Options?

- Where identified, suitable revegetation topsoils must be separated and preserved for later use
- Minimise exposure of sodic subsoils
- If excavation necessary, segregate sodic soils from other materials and treat/store appropriately to manage dispersion
- Treat sodic soils with gypsum

25

Centre for Environmental Training cet

Potential Limitations Regional Climate

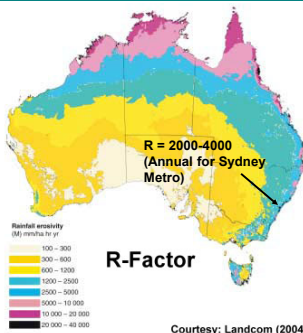
Variability across NSW (E-W & N-S):

- Predictable rainfall patterns over the long term record (changing?)
- El Nino Southern Oscillation (e.g. La Nina 2010)
- Wet summers or wet winters
- High variability in evaporation rates (spatially and temporally) from open water and soil surfaces
- Soil cover and permeability commonly limiting to soakage = runoff

26

Centre for Environmental Training cet

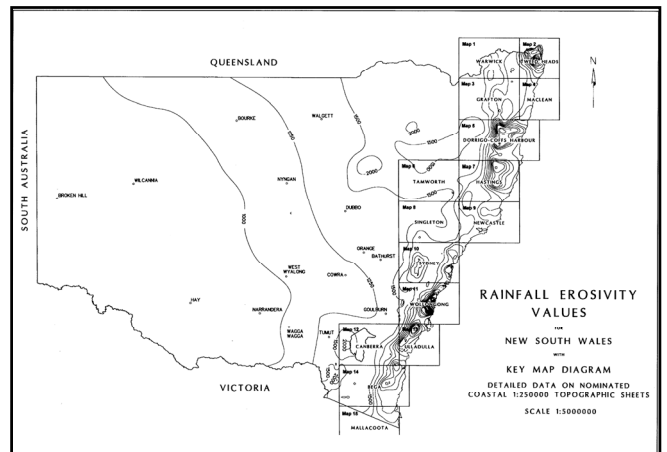
Rainfall Erosivity (R-factor)



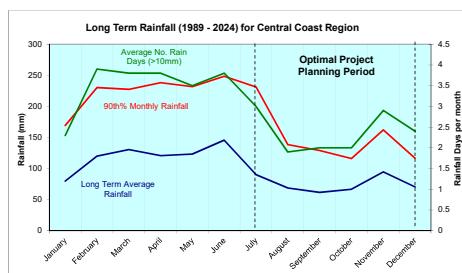
- A measure of the ability of rainfall to cause erosion
- Related to the energy and intensity of rainfall
- Varies throughout Australia and throughout the year
- Range in NSW 250-10,000

27

Centre for Environmental Training cet



Potential Limitations Local Climate



29

Source: BOM Norah Head


Centre for Environmental Training cet

Potential Limitations Site Hydrology


- Urban stormwater systems
- Flood dynamics variable (spatially and temporally)
- Runoff close to 100% on impervious surfaces (urban); low time of concentration
- Drainage on and around your construction site – where will the water go?

30

Centre for Environmental Training cet



Warragamba Dam,
 March 2012



Newcastle, June 2007

31

Other Potential Conflicts

- **Physical Assets**
 - access tracks, local roads, rail corridors, utilities, bridges etc.
- **Natural Assets**
 - Surface waters, catchment areas, groundwater, wetlands, cultural heritage areas, sensitive species and habitats

32

Centre for Environmental Training cet



Potential Conflicts

Water and Sewer Assets

- Water storages / reservoirs
- Water treatment plants
- Wastewater treatment plants
- Sewer mains
- Pump stations
- stormwater pipe, culverts and detention / treatment facilities

35

Centre for Environmental Training cet






Other Potential Conflicts

Infrastructure Assets

- Main and local roads
- Paths and cycle ways
- Kerb and gutter
- Bridges and culverts

38

Centre for Environmental Training 





Endangered List NSW

Species

- 611 terrestrial plants, 124 birds, 44 reptiles, 28 amphibians, 25 marsupials, 21 bats, 16 invertebrates, 13 rodents, 11 fungi/algae/ lichens, 7 marine mammals, 4 aquatic plants

Populations (localised areas)

- 20 plants, 17 animals

Ecological Communities

- 102

45 Centre for Environmental Training cet

Endangered List NSW

Level of Threat:

- Vulnerable “likely to become endangered unless the circumstances and factors threatening its survival or evolutionary development cease to operate”
- Endangered “likely to become extinct or is in immediate danger of extinction”
- Critically Endangered (even more likely/sooner)

46 Centre for Environmental Training cet





Management Options?

- Program critical works during times of 'low probability' for extreme rainfall conditions
- Store problematic materials (dispersive/sodic soils) well away from potential areas of inundation
- Maintain maximum surface cover (natural or installed) of exposed areas
- Minimise the use of temporary stream crossings (greenfield sites)

50

Centre for Environmental Training

