TASMANIAN ACID SULFATE SOILS INFORMATION (TASSI) PROJECT

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ACID SULFATE SOILS
information and awareness

Australian Government

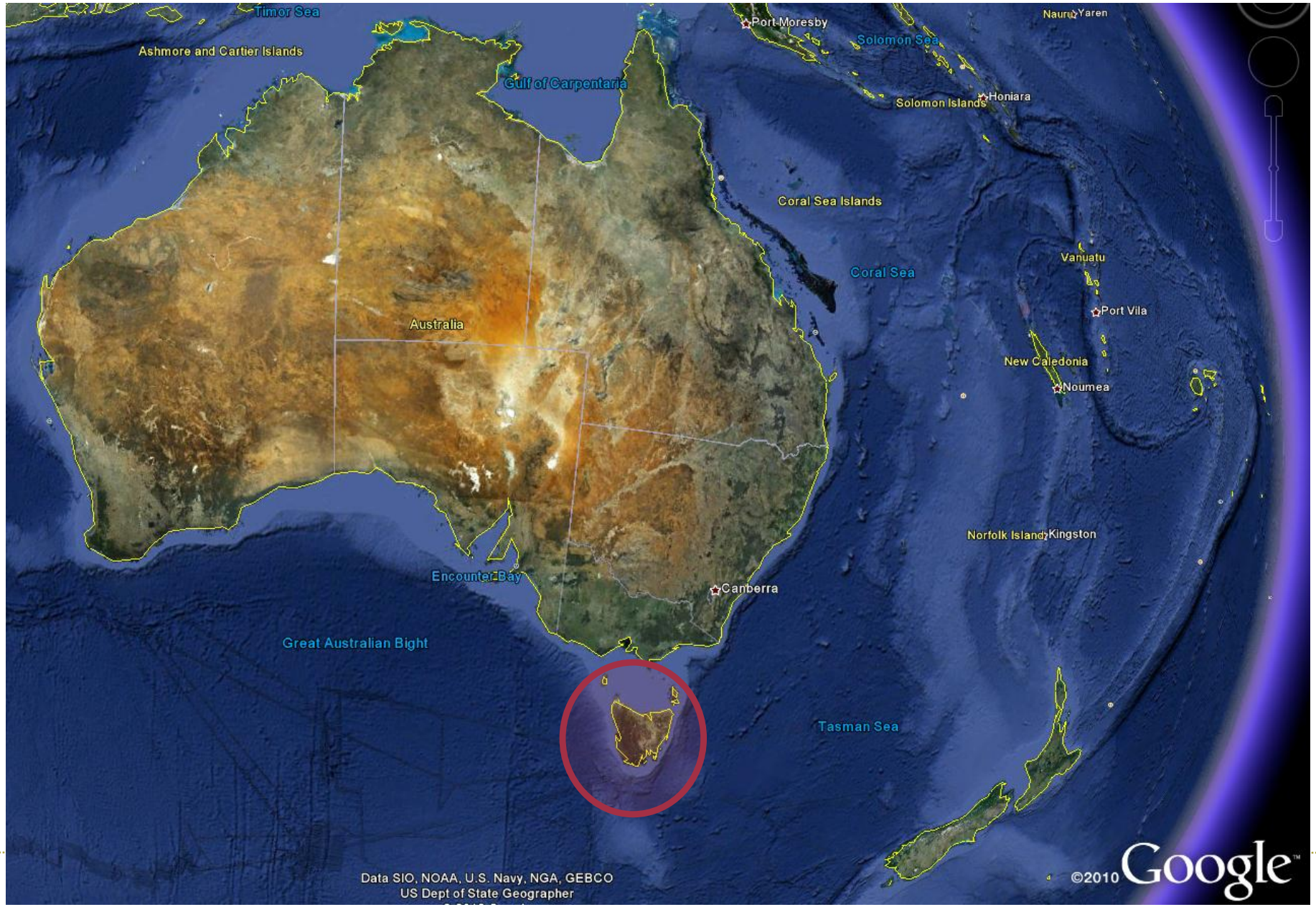
nrm SOUTH
NATURAL RESOURCE MANAGEMENT

Cradle Coast NRM

NRM North
Natural Resource Management in Northern Tasmania

Tasmania
Explore the possibilities

TASMANIA - THE OTHER SIDE OF THE WORLD



THE AIM OF THIS PRESENTATION

- To highlight the outcomes and information products of TASSI

- To demonstrate how important the TASSI project has been for :
  - Streamlining ASS Information availability and use
  - Increasing the awareness of the ASS issue
  - Improving the ability to make decisions

- Demonstration of online data delivery system (if time and technology allows)

THE PATH TO ENLIGHTENMENT TASMANIA ?

TASSI Project Began in earnest

6th IASSC – China – Reported that we had plans

NATCASS - Momentum builds

Not important enough? …yet

ASS exists formally in Tasmania

Reconnaissance Mapping Gurung 2001 (250k)

Lets look! ...Oh we do have some!

It Possible ??……

Denial "No Mangrove..s..Too cold.??!!.."

TASSI – Tasmanian Acid Sulfate Soils Information (Sept 2007 - Dec 2009)

Funded by - State Natural Resource Management Organisations (through Federal National Heritage Trust funding)

Undertaken by - Department of Primary Industries Parks Water & Environment (DPIPWE)

Supported by – National Committee for Coastal Acid Sulfate Soils (NatCASS)

Australian Government

NRM SOUTH NATURAL RESOURCE MANAGEMENT

Cradle Coast NRM

NRM North Natural Resource Management in Northern Tasmania

Tasmania Explore the possibilities

To Produce:

- Management guidelines- for the management of Acid Sulfate Soils (ASS)
- Predictive ASS mapping- using GIS spatial techniques and field validation to identify ASS in high conservation value areas (such as Ramsar wetlands) as well as coastal and inland regions of Tasmania with potential future development/disturbance pressures;
- A Range of information products- that target planners, developers, field operational staff, agriculture and aquaculture industries and the general public;
- An information delivery system- designed to make this information freely available and to raise stakeholder awareness of potential Acid Sulfate Soil hazards and their distribution in Tasmania.

HOW DID WE MAKE SURE WE MET OUR TARGET STAKEHOLDERS NEEDS -

We met with them and we asked them what they required……

"Information must be easy to get hold of ....any time / from anywhere"

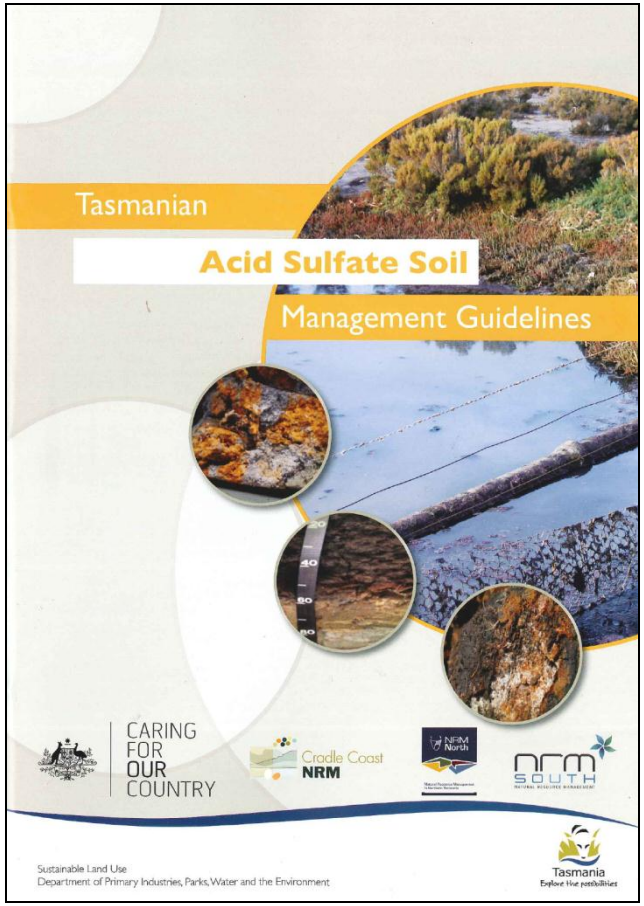
"Must be free (no cost $$$$$)

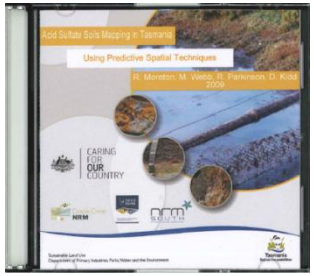
"Must be accurate"

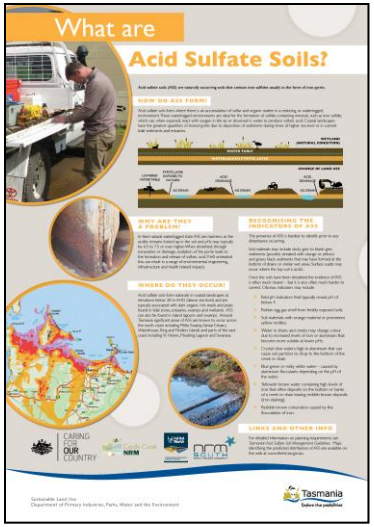
"Must be easy to use…. so any council (community) planner can use it !"

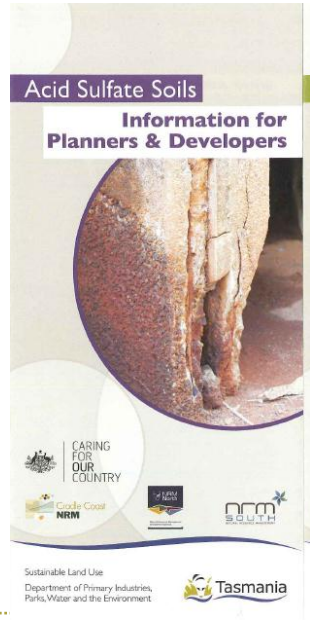
We also asked National colleagues to help guide some methodologies used

OUTPUTS OF THE TASSI PROJECT









All available at the DPIPWE WEBSITE http://www.dpiw.tas.gov.au/acidsulfatesoils

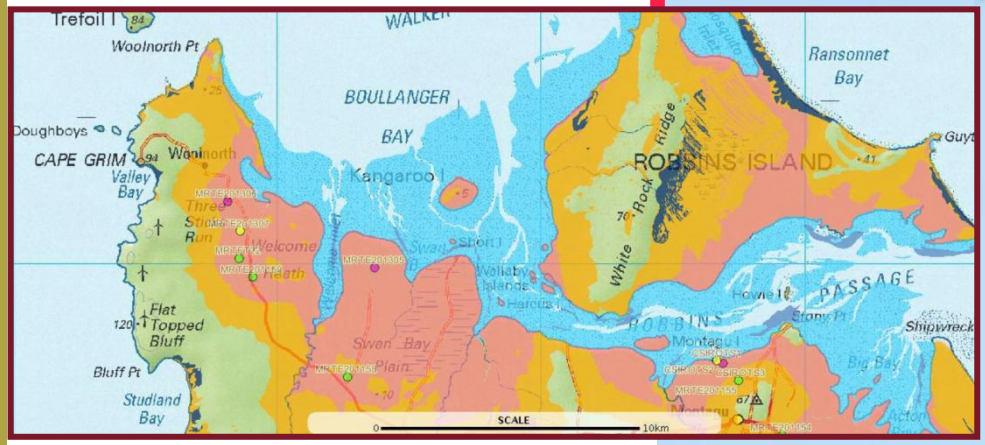
What have been the benefits from ASS mapping information

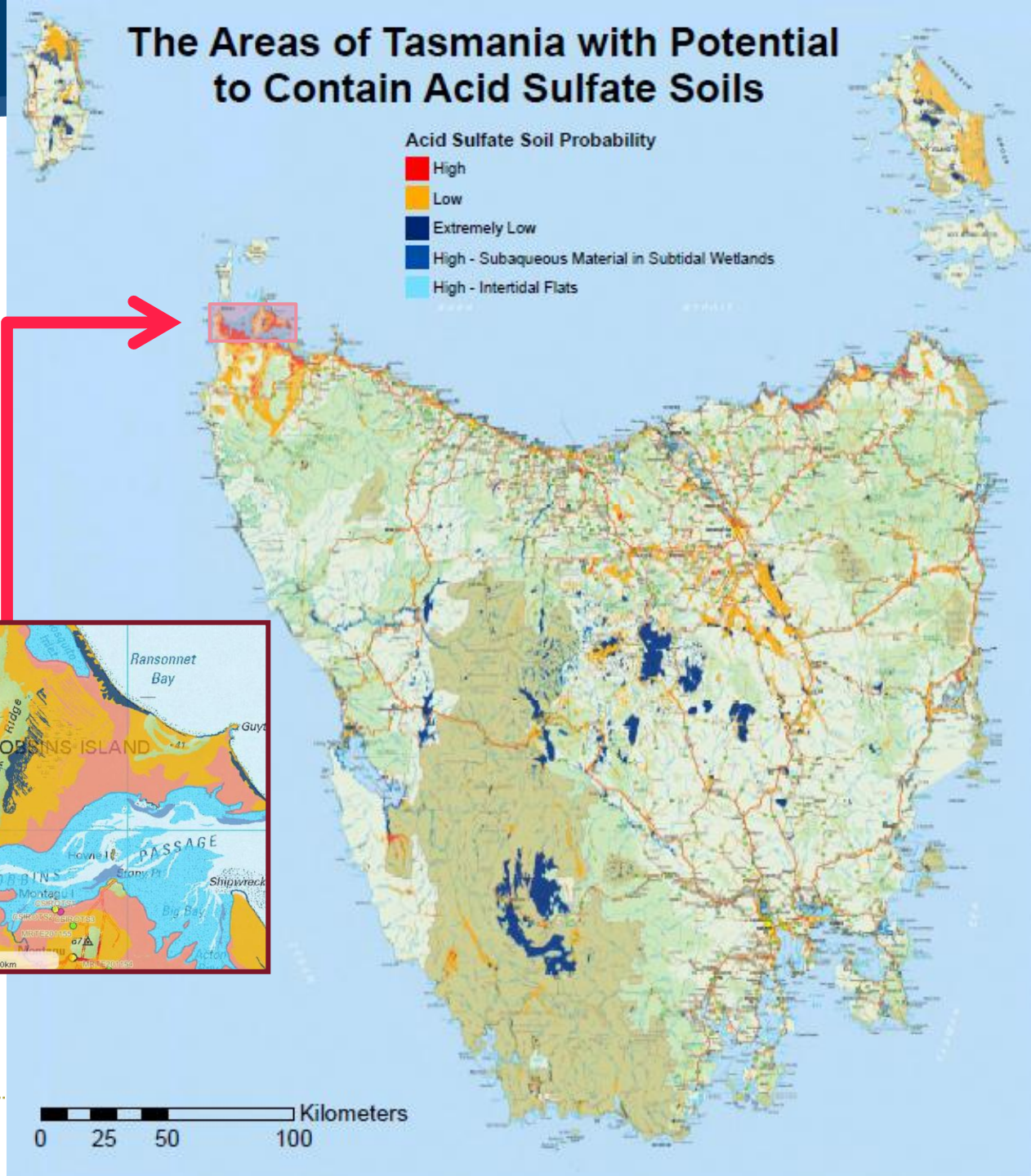
STATE MAPPING -

Ability to show Stakeholders the extent of Land with Potential to contain ASS

3 Landscapes:

- Coastal
- Inland
- Subaqueous Marine





SITE FACTSHEETS

- Site data is a powerful tool
- It helps to justify and trigger decision making

Factsheet Page 1 includes:

Site information
- Location information
- Landscape photo

Soil Classification
- National ASS classification
- Geological information

Soil Profile description
- Profile morphology
- Soil core photo
- Vegetation information
- Site notes

Site ID: T11.3

ASRIS Code: Ae(a1)

Site Information

Desc. By:	R. Moreton	**Landuse:**	Cattle
Date Desc.:	08/07/09	**Rainfall (mm):**	660
Map Ref.:	GPS	**Permeability:**	Slowly Permeable
Northing:	5416335 AMG zone: 55	**Drainage:**	Poorly drained
Easting:	509313	**Land Capability:**	Class 6
Locality:	Tamar River floodplain, Riverside.		

ASRIS Code Desc: Ae(a1) High probability of occurrence (>70% chance of occurrence in mapping unit). Floodplains <2m AHD, ASS generally within upper 1m. Grasslands, reedlands and wetland forests. (e.g Melaleuca, Casuarina). Includes backplains. Actual acid sulfate soil (AASS) = sulfuric material (Isbell 1996 p.122).
All necessary analytical and morphological data are available.

Soil Classification

Australian Soil Classification: 2 VE AE GS EV E Q Q W
Sulphuric Epipedal Black Vertosol Non-gravelly Fine Fine Deep
ASC Confidence:
Analytical data are incomplete but reasonable confidence.

Land Form

Slope Category:	Level	**Slope:**	0 %
Morph. Type:	Flat	**Aspect:**	No Data
Elem. Type:	Estuary	**Rel/Slope:**	No Data
Pattern Type:	Flood plain		
Erosion:			
Surf. Soil Condition):	Firm		
Surf. Coarse Fragments:			
Inundation Frequency:	More than one occurrence per year		

Geology

Geol. Ref.: Qhiv
Scale: 1:25,000 Geology
Description: Estuarine deposits of clayey silt, silt, sand and subordinate gravel, supra-estuarine swamp and laterally derived alluvial, deposits, unmapped man-made deposits including silt dredgings; in environments inferred to lie above frequent tidal influence.

Profile Morphology

A11	0 - 0.04 m	Black (10YR2/1-Moist); Loam; Strong grade of structure, 2-5 mm, Subangular blocky; Field pH 6.11 (pH meter); EC 1.12 Ds/m
A12	0.04 - 0.18 m	Black (10YR2/1-Moist); Silty light clay; Strong grade of structure, 5-10 mm, Subangular blocky; Field pH 5.72 (pH meter); EC 1.2 Ds/m
A31	0.18 - 0.46 m	(GLEY12.5/-Moist); Mottles, 0-2%, 0-5mm, Distinct, 7.5YR4/6; Light clay; Strong grade of structure, 20-50 mm, Lenticular; Field pH 4.93 (pH meter); EC 1.57 Ds/m
A32	0.46 - 0.61 m	Black (10YR2/1-Moist); Mottles, 2-10%, 5-15mm, Distinct, 7.5YR4/6; Light medium clay; Strong grade of structure, 20-50 mm, Lenticular; Field pH 4.57 (pH meter); EC 1.33 Ds/m
B2	0.61 - 0.83 m	Dark greyish brown (2.5Y4/2-Moist); Mottles, 2-10%, 15-30mm, Prominent, 7.5YR4/6; Silty light clay; Massive grade of structure; Field pH 3.93 (pH meter); EC 1.62 Ds/m
C1	0.83 - 1.08 m	Very dark grey (10YR3/1-Moist); Silty light clay; Massive grade of structure; Field pH 3.88 (pH meter); EC 1.7 Ds/m
C2	1.08 - 1.7 m	Very dark grey (5Y3/1-Moist); Silty light clay; Massive grade of structure; Field pH 4.22 (pH meter); Field pH 4.22 (pH meter); EC 2.18 Ds/m; EC 2.96 Ds/m

Vegetation: *Lolium sp., Trifolium sp., Phragmites australis.*

Site Notes 800m NE of Eaglewood farm.

PAGE 2 – SITE FACTSHEET

Factsheet Page 2 includes:

- Chip tray photo (viewable to high resolution)
  Showing sample :
  depth/colour/characteristics

- Field pH
- pH FOX
- pH Post Incubation
- pH change (+ive or –ive)
- CRS% (Chromium Reducible Sulphur)
- Reduced inorganic sulphur (moles H/tonne)
- Liming rate (kg/m3)
- Shading- indicates trigger values exceeded

- Explanation/Discussion of Results

Site ID:11.3

Chip tray photograph

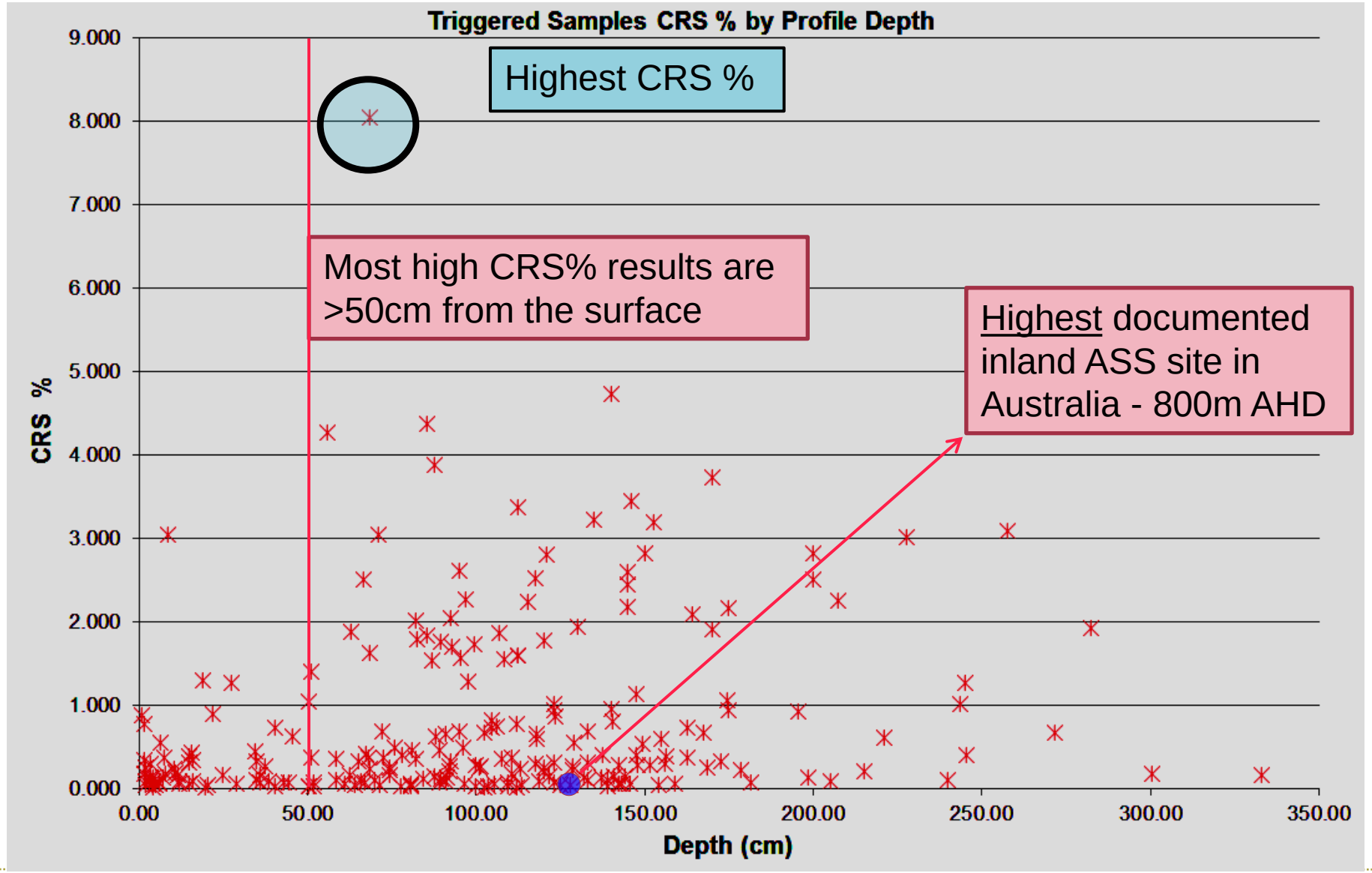
pH ageing test data / ***Laboratory data***

Sample code	Initial pH 1:5 (field)	pH FOX (lab)	Aged sample pH 1:5	pH Change after ageing 1:5	% Chromium reducible Sulfur	Reduced inorganic Sulfur (moles H^+/tonne)	Lime Calculation Kg/m^3 *(Neutralising Requirement
T11.3.1	6.11	2.23	4.45	-1.66	0.041	26	8
T11.3.2	5.72	2.29	4.45	-1.27	0.019	12	10
T11.3.3	4.93	2.7	4.55	-0.38	0.011	7	9
T11.3.4	4.57	2.89	4.33	-0.24	0.009	6	9
T11.3.5	3.93	2.4	3.8	-0.13	0.011	7	16
T11.3.6	3.88	1.92	3.45	-0.43	0.026	16	17
T11.3.7	4.22	1.74	2.55	-1.67	1.783	1112	100
T11.3.8	4.22	1.78	2.38	-1.84	2.462	1536	125
T11.3.9	5.85	1.81	2.92	-2.93	2.105	1313	100

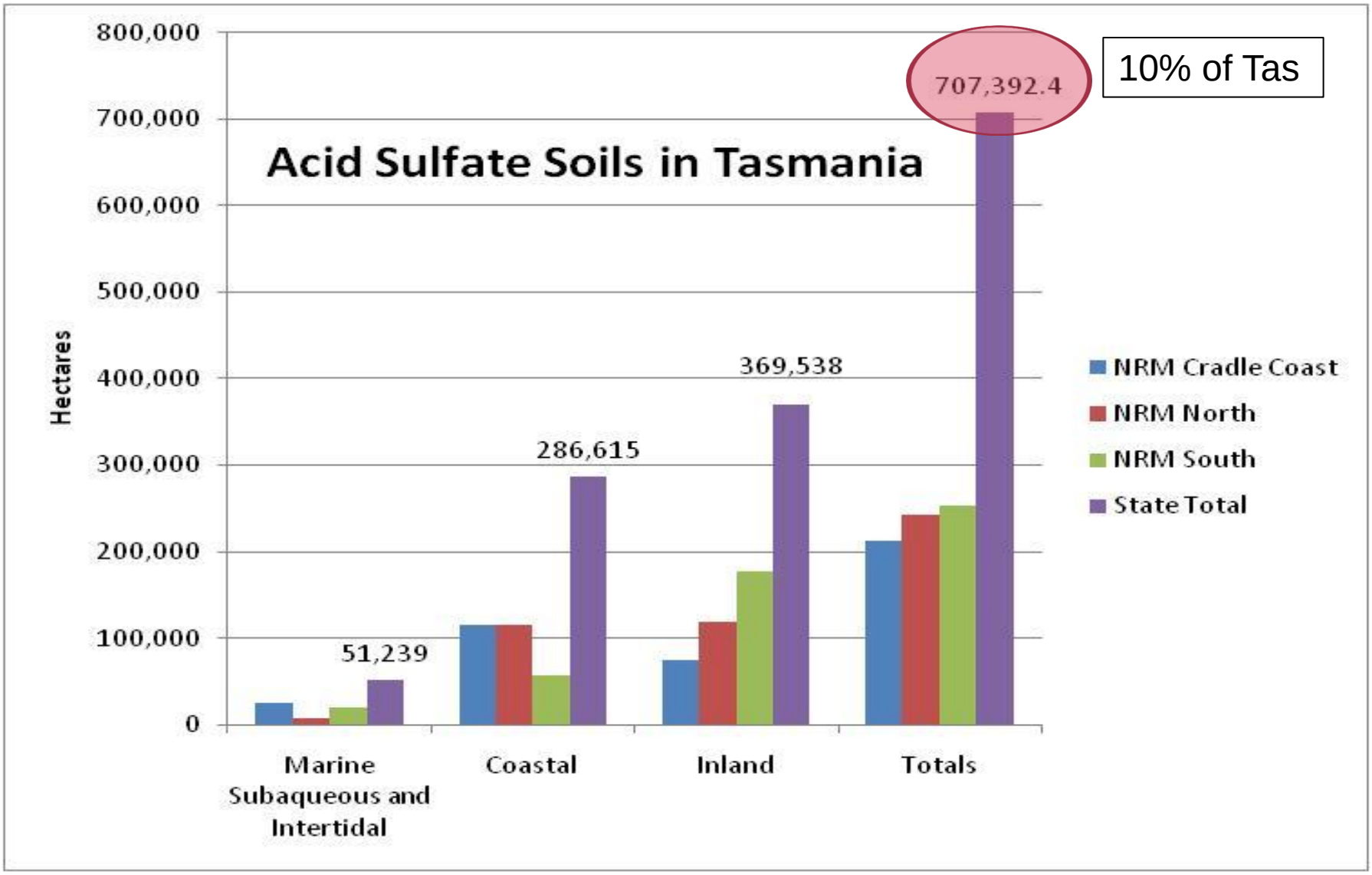
Discussion of results

- The laboratory tests conducted on samples from this site identify the presence of **Actual Acid Sulfate Soil (AASS)** horizons within this soil profile to the depth sampled. These samples indicate that acidification has already taken place at the site.
- Horizons shaded blue indicate the depths at which samples have exceeded the Laboratory trigger values for Acid Sulfate Soil Classification.
- For this site the **Risk Category** for disturbance of and impact from ASS= **Moderate** as PASS material is within 1.5m of surface.
- **Ageing Test** results show a **Very High Risk** of oxidation to form ASS under natural conditions. Cells shaded yellow indicate samples that have oxidised in a simulated natural ageing process to a pH of 4 or less.
  (ageing tests were undertaken for a minimum of 12 weeks)
- **Lime Calculation (kg/m^3) -** indicates the required kg of lime/m^3 that will neutralise acidity. Layers shaded blue, indicate those soil horizons which have been classified as ASS and therefore have potential to generate acidity from sulfide oxidation, Horizons with no blue shading are not classified as ASS but may in some circumstances have some neutralising requirement (eg soils are naturally acidic or sulfide content is low). Negative figures for Lime Calculation indicate soil horizons with its own ANC (acid neutralising capacity). * Note - Lime Calculation includes a 1.5 safety factor and to achieve a neutralising effect will require lime to be appropriately applied and mixed within that soil layer (refer to Tasmanian Acid Sulfate Soil Guidelines, 2009 available free from Department of Primary Industries Parks Water and Environment or online at: **www.dpipwe.tas.gov.au/acidsulfatesoils**.

TASSI PROJECT – FIELD SAMPLING - RESULTS – POINTS OF INTEREST

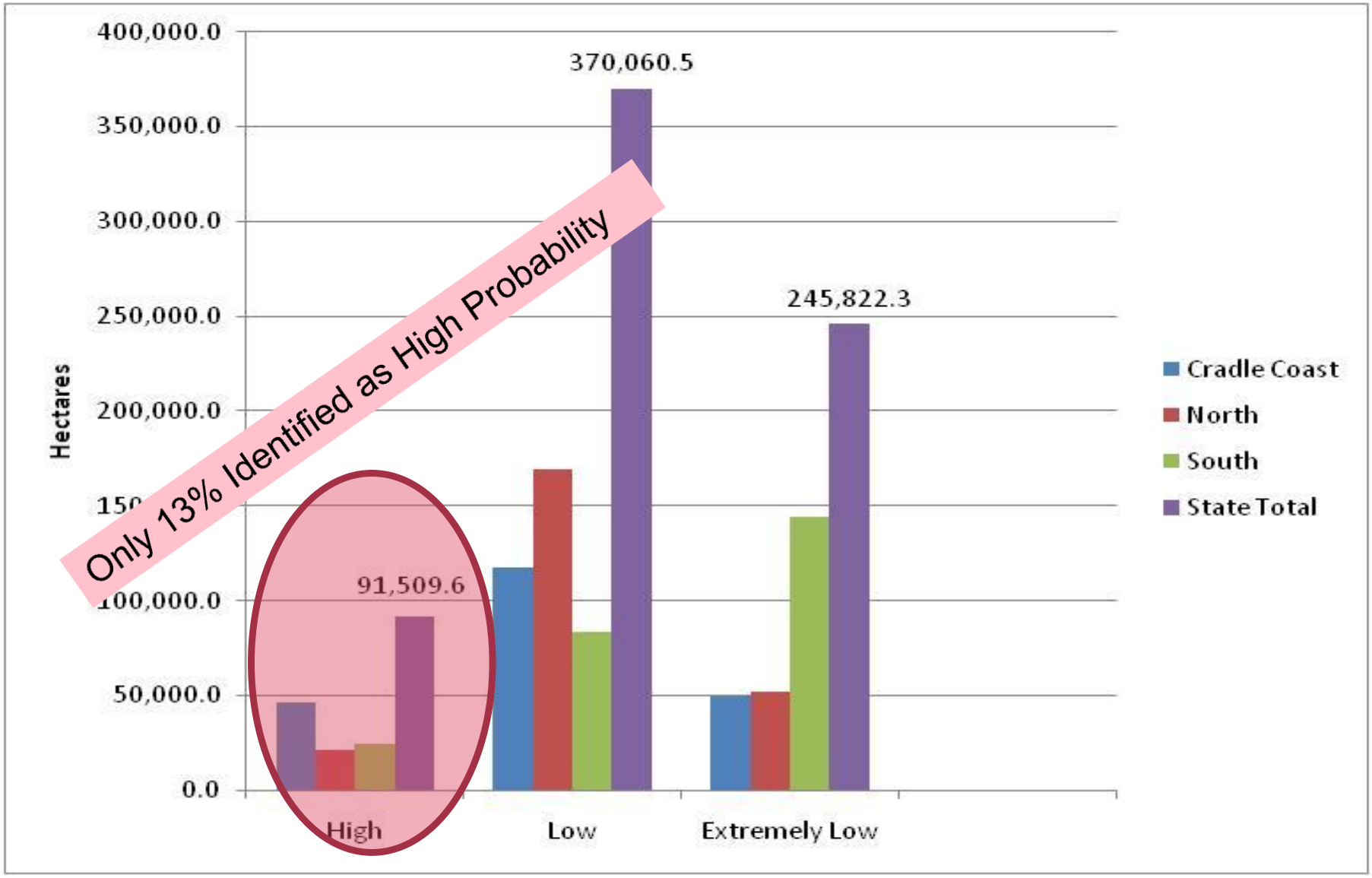


A RESULT OF MAPPING - "THE ABILITY TO SHOW REPORT CARD STATISTICS"



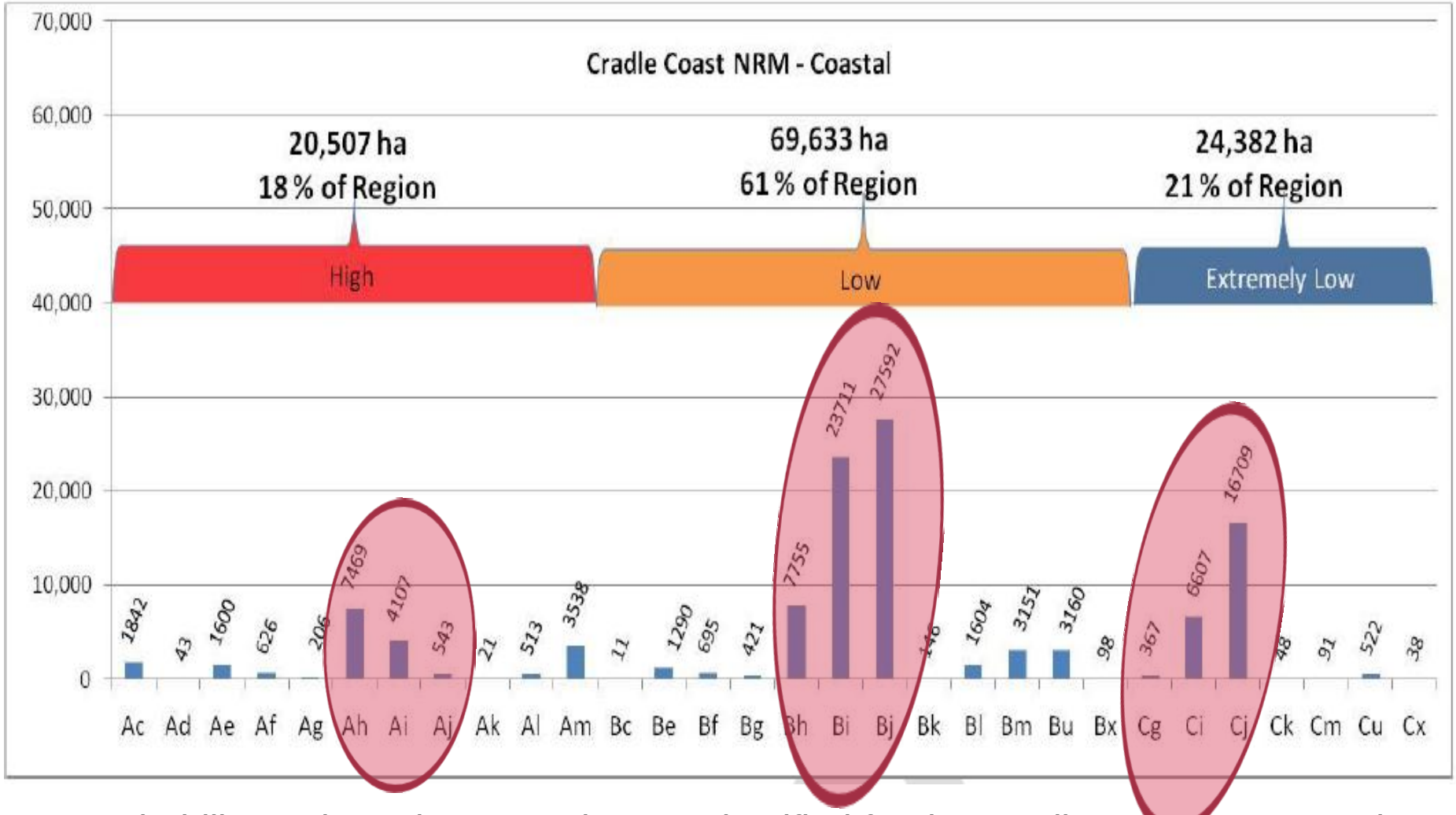
Extent of ASS identified by mapping for each ASS Category for the State of Tasmania and the NRM regions

ABILITY TO SHOW THE SCALE OF THE ISSUE :



Total area identified by mapping for each Probability Class for the State of Tasmania and the NRM regions

ABILITY TO CONDUCT ANALYSIS OF ASS CLASSIFICATION IN EACH NRM REGION



Probability and Landscapes Classes Identified for the Cradle Coast NRM Region

For this NRM Sandplains and dunes are the most common ASS landscapes

TASSI information products :

- Raise the awareness of ASS and its potential risks (**Brochures & Statistics**)
- Identify where ASS occurs or is likely to occur (**Mapping**)
- Avoids and Minimises ASS Disturbance (**Guidelines & Maps**)

The TASSI Project Ticks all these boxes

WHERE HAS THIS PATH TAKEN TASMANIA ?

INFORMATION DELIVERY SYSTEM – VIA THE WORLD WIDE WEB

Information Products - accessed via the DPIPWE Website
www.dpipwe.tas.gov.au/acidsulfatesoils

AND

ASS Probability Mapping - directly from theList
(linked to the DPIPWE website)
www.theLIST.tas.gov.au

Thankyou

Salt Lake - Midlands Tasmania - February 2007 (drought)