Acid Sulfate Soils Priority Investigations

for the Lower Hunter River Estuary

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Presentation Outline

- Project Location and Aims
- ASS Assessment Methods
- Results and Recommendations
- Questions

Location – Hunter Estuary

Catchment: >2 million Ha
River length: 467 km
Ramsar Wetlands
Saltmarsh & Birds

Project Aims

- Identify ASS high risk areas
- Assess impacts on Lower Hunter Ramsar wetlands
- Field & lab. testing for ASS
- Provide management options for mitigating ASS
- Communicate outcomes

Project Methods

1. Undertake soil coring and describe profiles
Project Methods

2. Peroxide Field Test

3. Laboratory testing of soil samples
   - Electrical Conductivity (EC) (Method 3A1 Rayment & Higginson, 1992)
   - Soil pH (CaCl₂) (Method 4B1 Rayment & Higginson, 1992)
   - Chromium Reducible Sulfur (S₉%)(Method 22b ASSMAC, Ahern et al, 2004)
   - Total Actual Acidity (TAA) (Method 21F ASSMAC, Ahern et al, 2004)
   - Soluble Chloride
   - Soluble Sulfate
   - Exchangeable Aluminium

4. Water Quality Testing
   - Ground and surface water pH
   - Electrical conductivity
   - Chloride : Sulfate Ratio

ASS Risk Rating, determined by:
   - AASS and PASS depth
   - pH & Total Actual Acidity
   - Sulfate in groundwater
   - Exchangeable Aluminium
   - Current Management

5. LiDAR data
   Technology: Light Detection and Ranging (LiDAR)
Results and Recommendations

Site by site:
• Fullerton Cove
• Tomago Wetland
• Hexham, Kooragang and Shortland

Fullerton Cove

• AASS (Jarosite) at 35cm depth
• PASS at 50cm of surface
• Groundwater pH 3.5
• TAA up to 180 moles H+/tonne
• Exchangeable Aluminium up to 26%

Fullerton Cove - Recommendations

• Drainage of surface water NOT groundwater
• Floodgate management – tidal flushing/neutralisation
• Associated levee works
• Liming spoil piles

Tomago Wetland

• PASS below -1m AHD
• Surface sulfide accumulation
• Groundwater pH 3.5 to 4
• High TAA along northern perimeter
**Tomago - Recommendations**

- No additional drains, especially in the north
- Manage surface sulfides
- Open floodgates (saltmarsh restoration)

**Hexham, Shortland, Kooragang**

- Lower priority sites (including Ramsar Wetlands)
- Maintain groundwater above ASS
- Manage surface sulfide accumulation
- Manage floodgates - tidal flushing & neutralisation

**Recommendations**

- Prevention is better than cure
- Use a range of soil and water tests to identify ASS
- Use existing infrastructure to beneficially manage ground water and tidal exchange
- Improve land manager awareness & education

**Communication**

- Raise community awareness of ASS issues
- Wet Pasture Management Workshops
- Keep soils wetter for improved pasture production

**Outputs**

- Final report
- National ASS Atlas
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