Government of South Australia

SA Water

Aboveground Storage for Recycled Water

Wednesday, 24 February 2016

What are the options?

- Reservoir
  - Need useful geography
- Tanks
  - Limited size
  - High cost/volume ratio compared to other methods
- Lagoons
  - Covered or uncovered
  - Simple construction
  - Holds large volumes

Storage Lagoons:
Construction

Site selection and survey

- Check site geology
- Check for site contamination
- Planning approval

Excavating topsoil stockpiling

- Top soil stripping
- Site preparation

Excavating

Aldinga

Excavating

Aldinga

Excavating

Compaction

Embankment roads

Connect pipework

Aldinga

Rock Lined Lagoon

- Geotextile fabric membrane
- 300mm minimum layer of blast rock
- Monitoring wells placed around lagoon

Membrane Liner

Minnipa

Underdrain – leak detection

Liner anchor points

Minnipa

Cover

Minnipa

Cover

Minnipa

Aldinga

Storage Lagoons:

What are the advantages and drawbacks?

Advantages

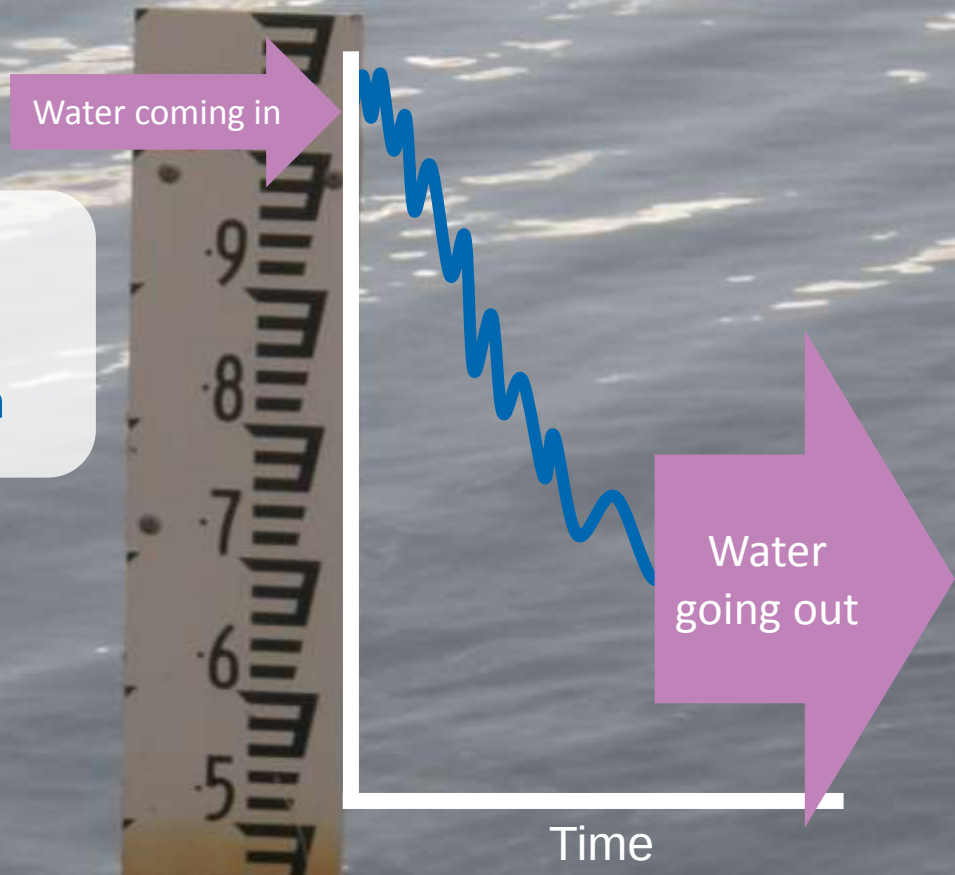
- Relatively simple construction
- Inexpensive materials

Advantages

- Extensive industry experience with dams and lagoon management

Advantages

- Network balancing storage
  - Assists in maintaining pressures and flow during irrigation season

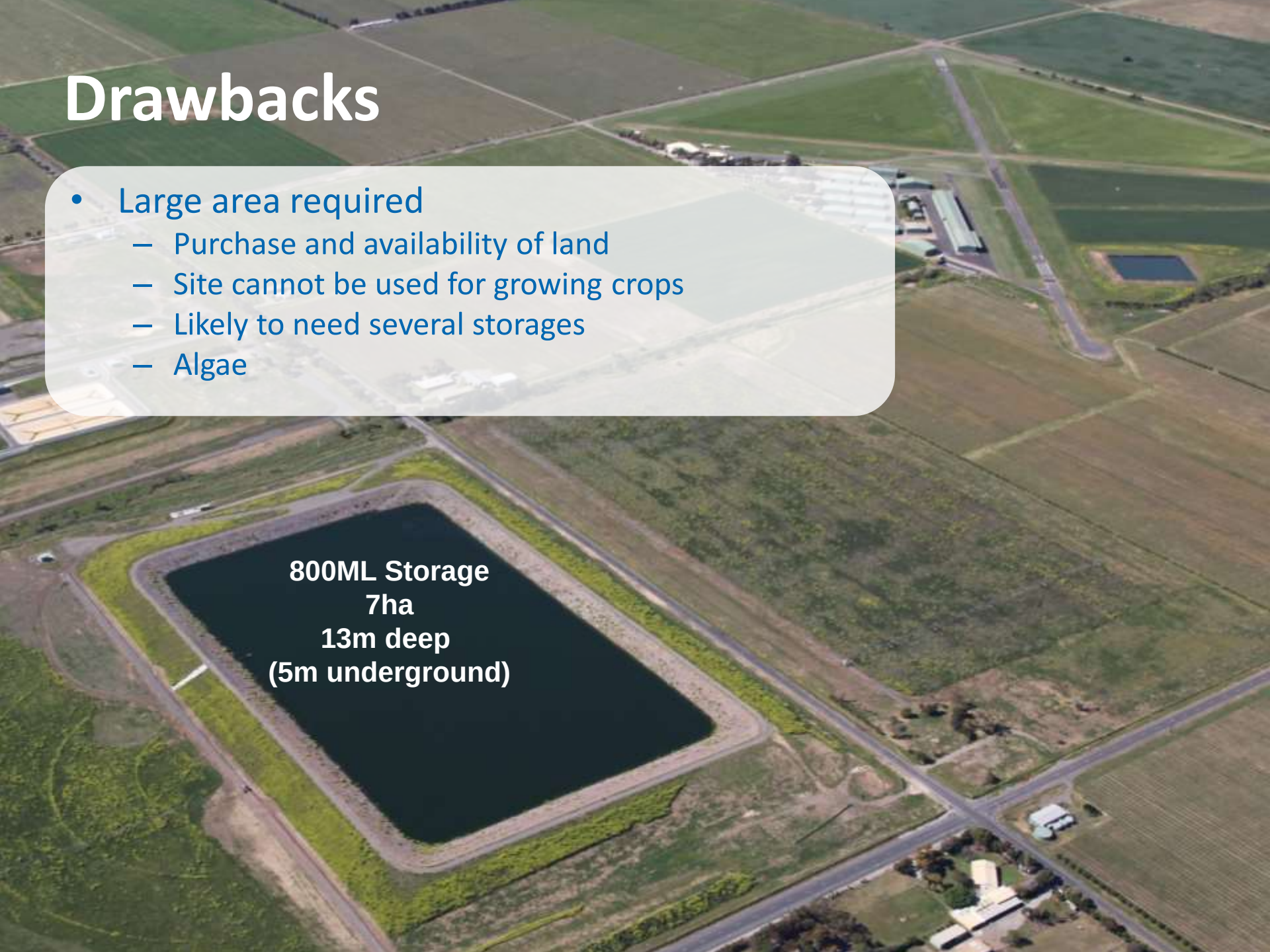


Advantages

- Leak protection
  - Clay liner or membrane keeps water in place
- Certainty of available water
  - Easily calculated and monitored

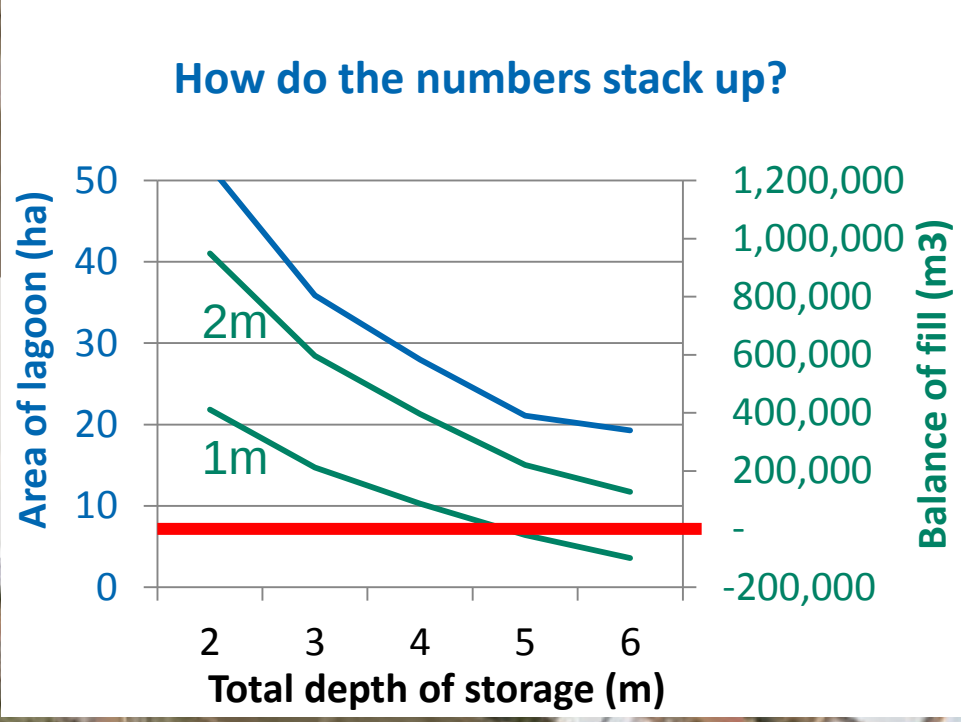
Drawbacks

- Large area required
  - Purchase and availability of land
  - Site cannot be used for growing crops
  - Likely to need several storages
  - Algae



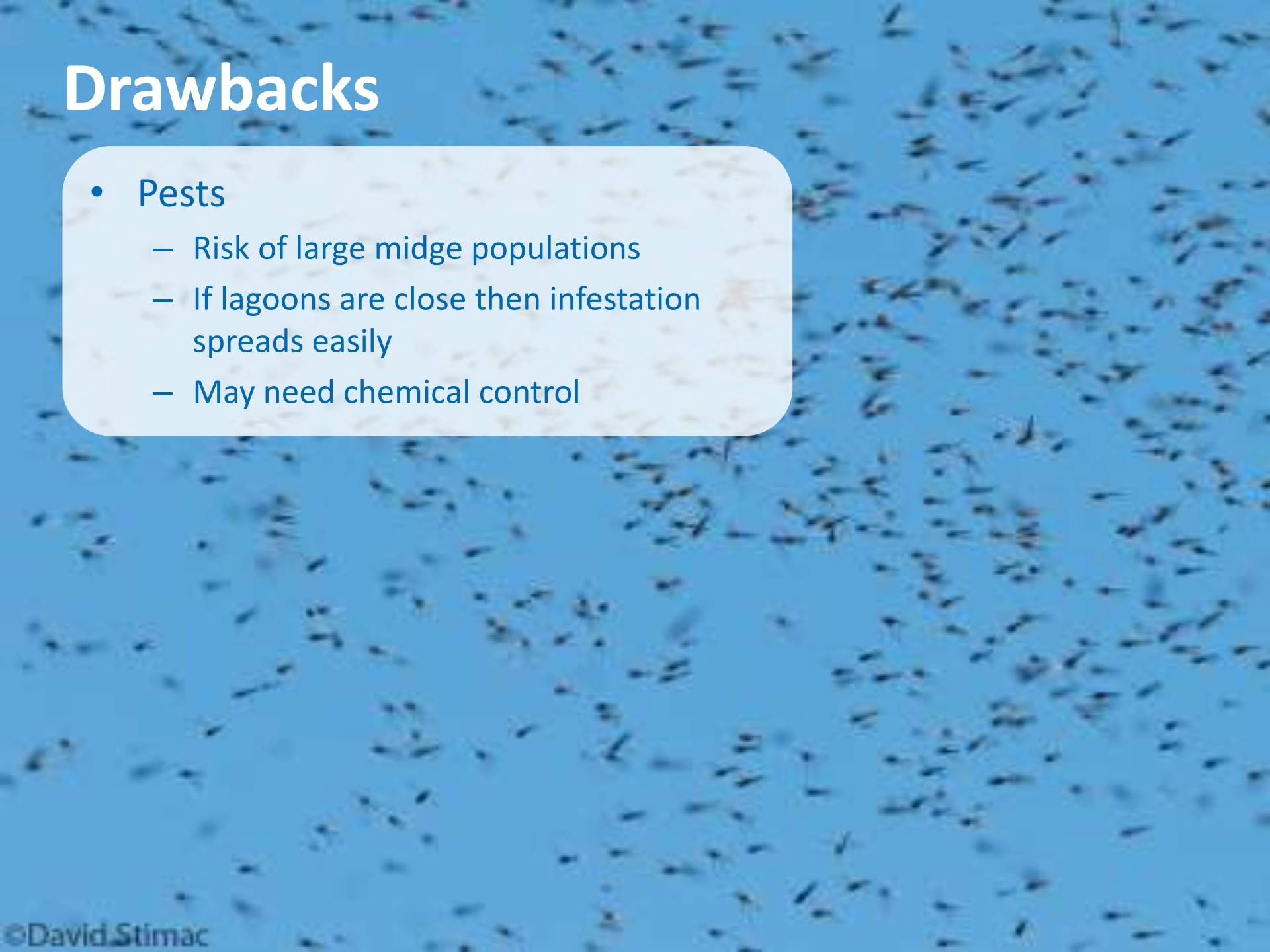
Drawbacks

- Depth limited by shallow groundwater levels
- Disposal or import of fill



Drawbacks

- Pests
  - Risk of large midge populations
  - If lagoons are close then infestation spreads easily
  - May need chemical control

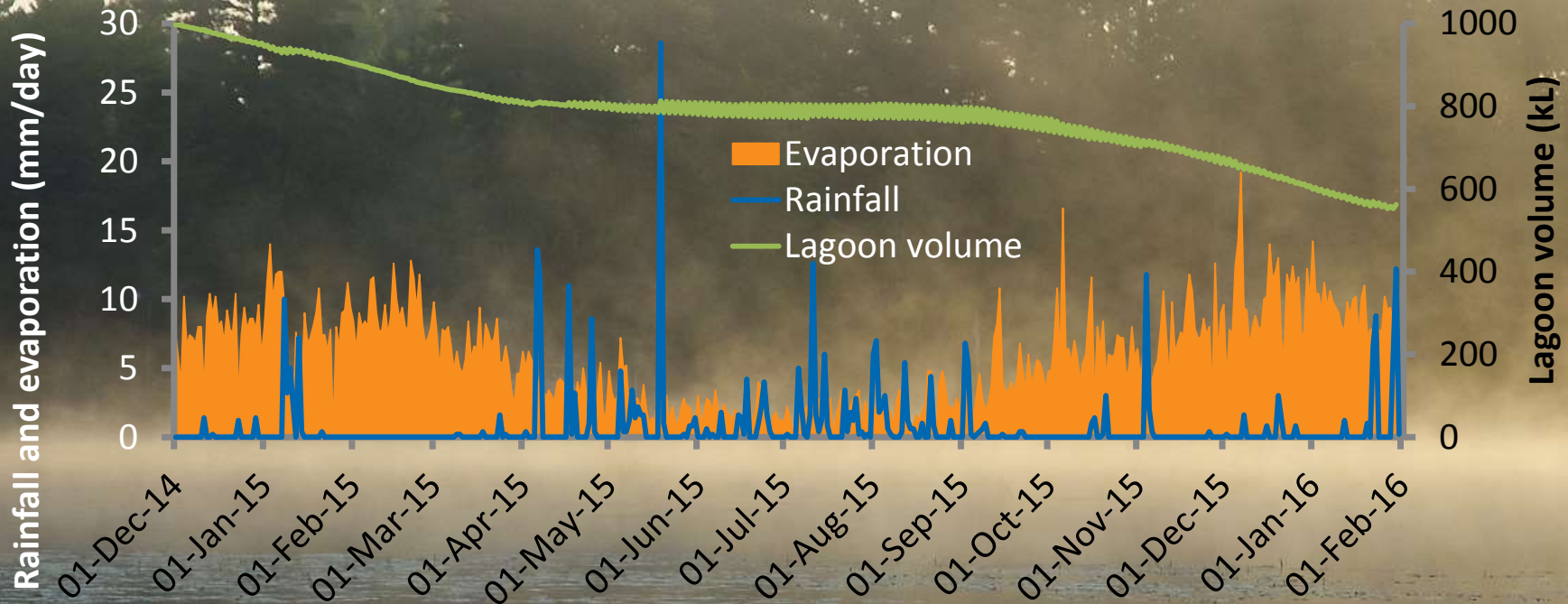


Drawbacks

- Weeds and reeds

Drawbacks

- Water quantity and quality issues
  - Reduction in volumes available and **increasing salinity** due to evaporation
  - Salinity may restrict irrigation of some crops or require desalination



(Image credit: wplynn, link)

Drawbacks

- Water quality issues
  - Contamination from birds
  - May require post storage treatment

Drawbacks

- Water quality issues
  - Algal growth during irrigation season, shown to impact pH balance
  - Likely to require post storage treatment
  - Storage may need to be covered, adds to cost and maintenance

Drawbacks

- Controlled access and safety
  - Large fences to control access
  - Structures for safe operation and maintenance

Summary – Aboveground Storage

Advantages	Drawbacks
Relatively simple construction	Large area required
Inexpensive materials	Shallow groundwater limits depth
Extensive industry experience with dams and lagoon management	Fill needs to be removed or imported
Leak protection – easy to identify problems	Pests – midges and vegetation
Network balancing storage	Evaporation reduces volumes available and increases salinity
Certainty of available water	Algae affects quality of water and may impact pH
	Pathogens introduced by birds
	Covering is costly and may limit the size of lagoon

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Thank you.

Questions?