Working with local farmers, water quality & flows were monitored for 3 years in 6 main drainage systems in catchments dominated by cane (see map). NSW canegrowers were kept abreast of findings during the project & now have a better understanding of water quality in their catchment. Many farmers made changes to farming practices, particularly herbicide use, resulting in improved water quality.

Findings & Achievements:

**Water Quality Condition**

**Chemical & Physical**
- **pH** - Most drains monitored are in good shape, without persistent acidity. One drain had periodic acid discharges.
- **Dissolved Oxygen (DO)** - All drains mostly had DO levels between 6-8mg/L (good levels).
- **Turbidity** - All sites were below Guideline levels except in flood times.

**Nutrients**
- **Nitrogen (N)**: Inorganic N (from fertiliser and other inorganic sources) makes up around 12% of the total N measured at all sites. Some seasonal elevation of total N levels.
- **Phosphorus (P)**: The reactive form of P was less than 9% of the total P measured at all sites across 3 years.

**Guidelines** - Locally relevant guideline levels need to be developed to account for the natural soil fertility of northern NSW floodplain soils.

**Pesticides**
- **Atrazine** - Below the Guidelines 100% of the time.
- **Diuron** - Below the Guidelines 91% of the time.
- **2,4-D** - Below the Guidelines 100% of the time.
- **Glyphosate** - Never detected. **Chlorpyrifos** - Never detected.
How to improve water quality in NSW

Some straightforward recommendations for farm practices which will enhance water quality in cane catchments are listed. The soon-to-be released Code of Practice for sustainable canegrowing in Qld & NSW will describe these practices in greater detail.

Nutrients & Crop uptake
Don’t exceed recommended rates when applying fertilizers.
Soil test before applying fertilizer.
Avoid applying fertilizer immediately prior to heavy rain.
Encourage good nutrient uptake by applying fertilizer as close to the root system as possible.
Apply fertilizer at least 75 mm below the soil surface.
Encourage a healthy root system by crop rotations, increasing organic matter & reducing row compaction.
Record fertilizer inputs.
Consider leaf testing to fine-tune nitrogen rates.

Mill by-products & organic matter
Avoid spreading mill mud near farm drains.
Don’t stockpile mill mud where water leaching from the pile can enter waterways.
Use a legume break crop to build up soil nitrogen reserves & provide organic matter.
Return organic material to the soil to maintain soil organic matter.

Minimising erosion
Help to protect bare soils in summer with legume crops & retention of these residues.
Maintain grassed mown headlands.
Utilise trash retention and minimum tillage on sloping blocks prone to erosion.
Pesticide application
Only spray pesticides registered for use around waterways in & adjacent to drains.
Don’t exceed recommended rates of herbicides.
Calibrate equipment regularly.
Avoid off-target drift.
Minimise pesticide movement by not applying chemicals when heavy rain is imminent.
Seek advice on the best herbicide products for your situation.
Record pesticide inputs.

Riparian zones
Maintain healthy riparian zones along waterways as this can help to trap sediments before they reach the waterway.
Shade created by this vegetation helps to control weed growth & reduces water temperature which is important for oxygen levels in water.
Consider establishing wetland areas on lands not viable for canegrowing.

Floodgate management
Opening of floodgates will allow tidal water to enter drains which assists with controlling weeds & improving pH & dissolved oxygen levels.
Active floodgate management also helps to allow fish passage & breeding which improves the aquatic life in our waterways.

Acid sulfate soils
Manage acid sulfate soils by following all the procedures in the “Acid Hazard & Drain Management Plan” for your farm.
Always follow the procedures outlined in the Best Practice Guidelines for Acid Sulfate Soils sent with your plan.
Monitor the quality of water in farm drains.

For further information, contact your local BSES or Agricultural Officer