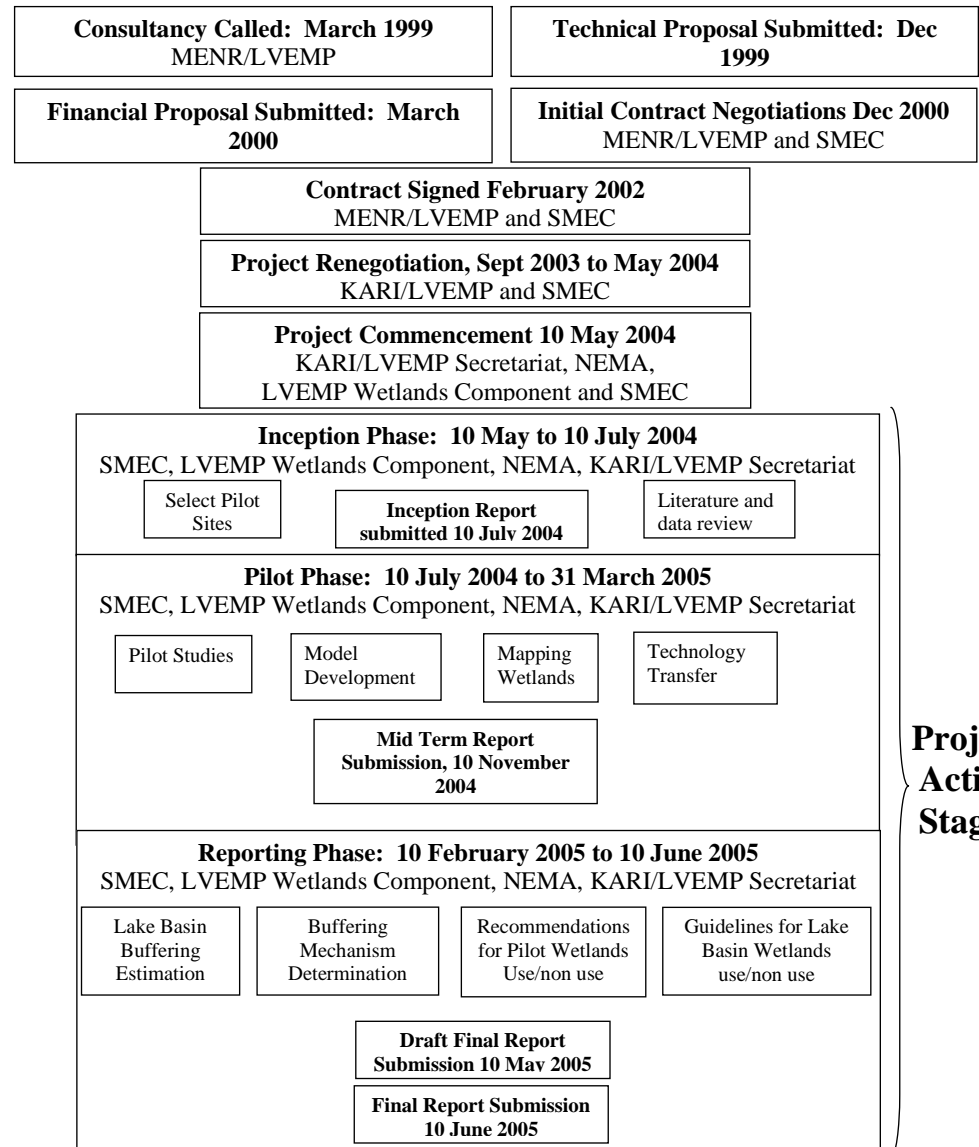


Figure 1.1: Lake Victoria Regional Setting
 (Source, NASA composite vegetation enhanced images)



Figure 1.2: Kenyan Portion of the Lake Victoria Basin
 (Source, LANDSAT Mosaic, true colour images)



Project Active Stages

Figure 2.1: Wetlands Buffering Capacity Study Stages

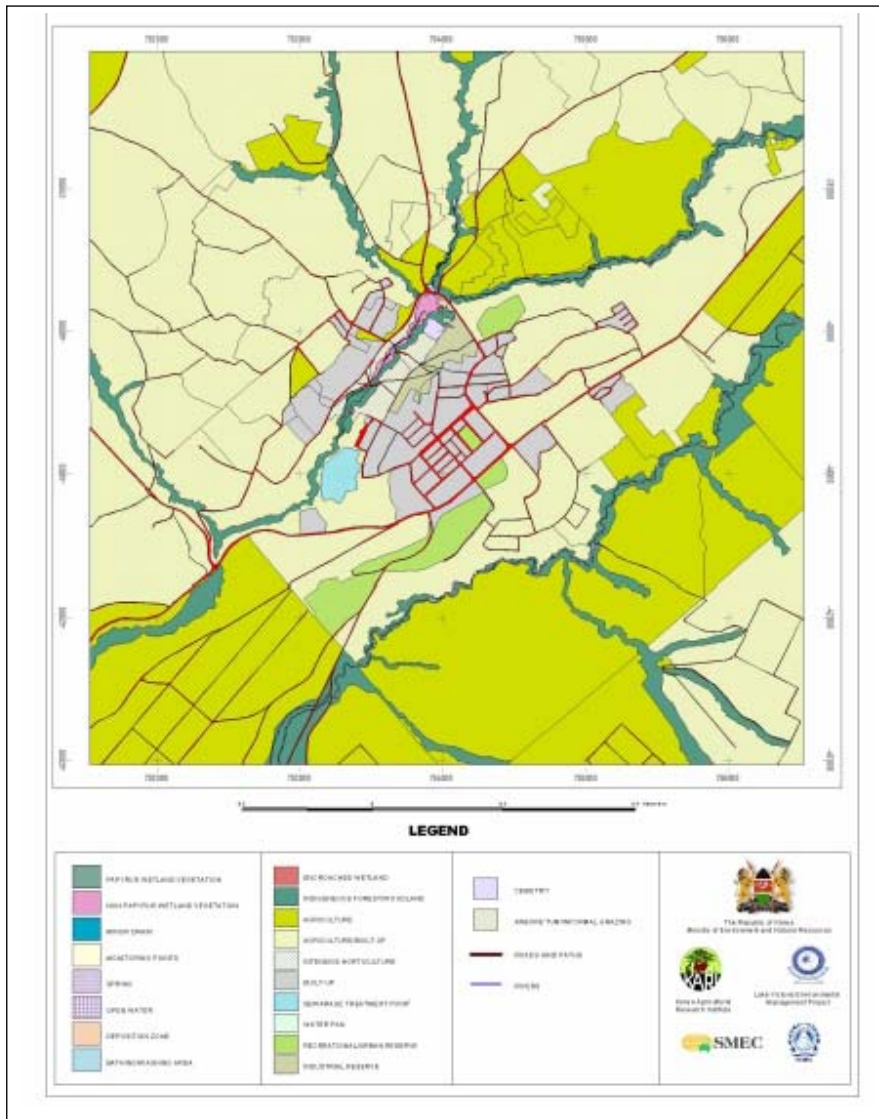


Figure 4.1: Kericho Dionosoyiet Wetland and Surrounding Land Use



Figure 4.2: Typical Land Use Activities around the Kericho Dionosoyiet Wetland are Rural (left) and urban (right)



Figure 4.3: Storm Drain Entry Point at the Kericho Dionosoyiet Wetland during wet (left) and dry periods (right). Note the extent of Gross Pollutant and Sediment Deposition



Figure 4.4: View of the Kericho Dionosoyiet Wetland Looking Upstream. The Culverts and Embankment of the Outlet Appear in the Foreground



Figure 4.5: Aerial View of Part of the Eldoret Chepkoilel Wetland. The Central band of *Cyperus papyrus* with fringing emergent vegetation are clearly visible

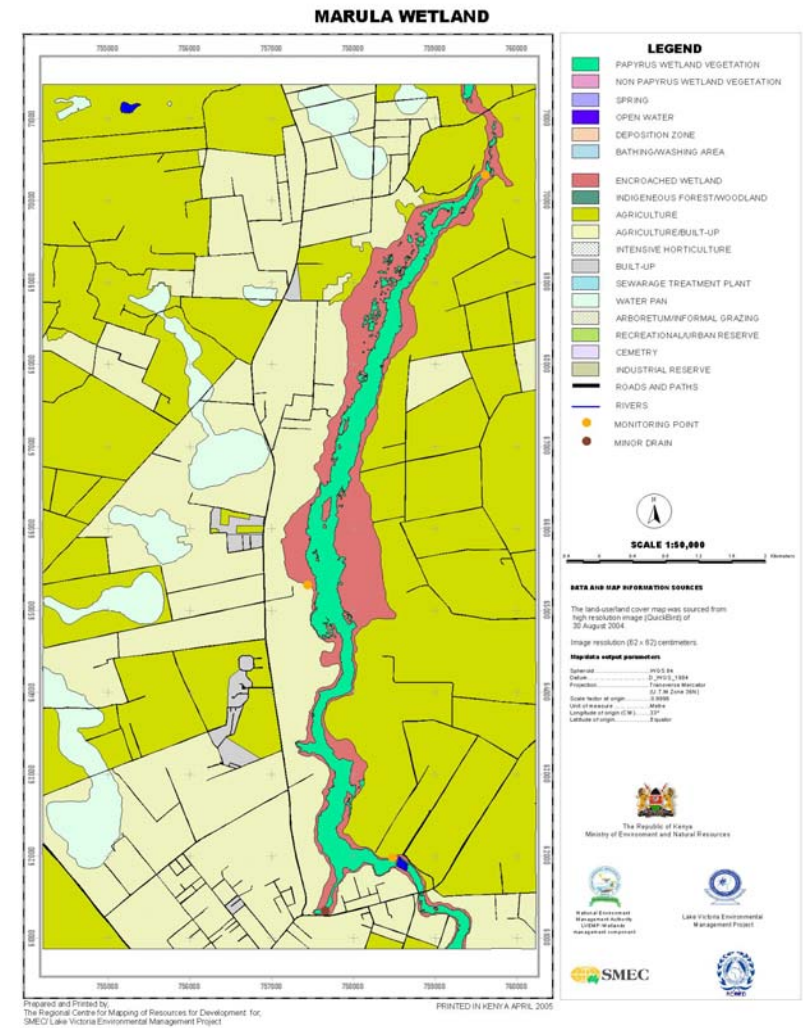


Figure 4.6: Eldoret Chepkoilel Wetland and Surrounding Land Use



Figure 4.7: Typical Appearance of the Eldoret Chepkoilel Wetland with emergent vegetation in the foreground and *Cyperus Papyrus* behind



Figure 4.8: Typical Catchment Upstream of the Eldoret Chepkoilel Wetland with a peri urban area in the foreground and agricultural activities behind

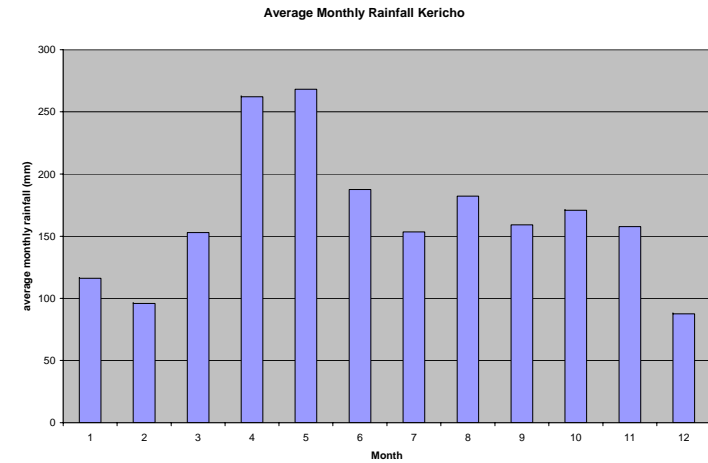


Figure 5.1 Average Monthly Rainfall at Kericho, 1994 to 2004

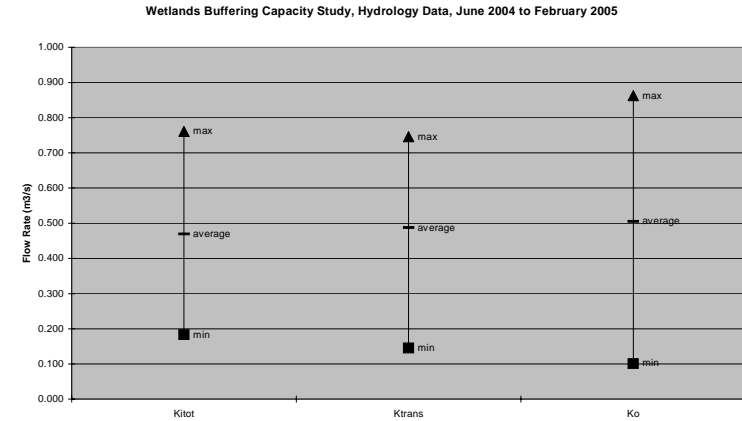


Figure 5.2: Inflow Sources, Transect and Outflow Comparison, Kericho Wetland as Measured

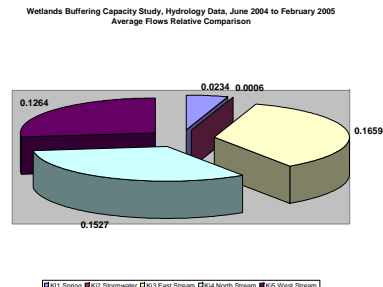
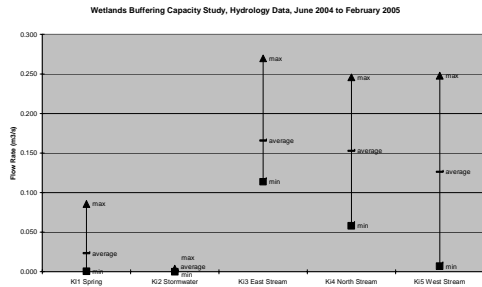


Figure 5.3: Inflow Ranges (left) and relative contributions (right) at the Kericho Wetland, June 2004 to February 2005 as Measured



Figure 5.4: Typical Channelisation of Flows in the Kericho Wetland Downstream of Inlets IK4 and IK5.

Flows consist of a high velocity central channel flow surrounded by thick vegetation where the flow is near stagnant

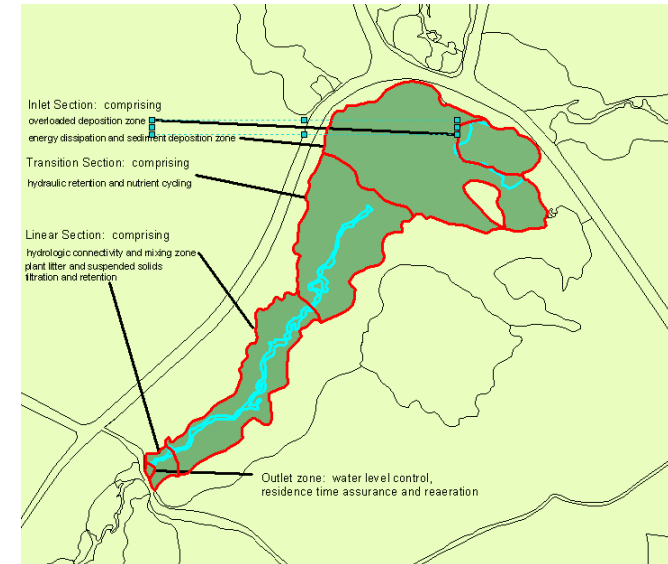


Figure 5.5: Hydrologic Delineation of Kericho Dionosoyiet Wetland

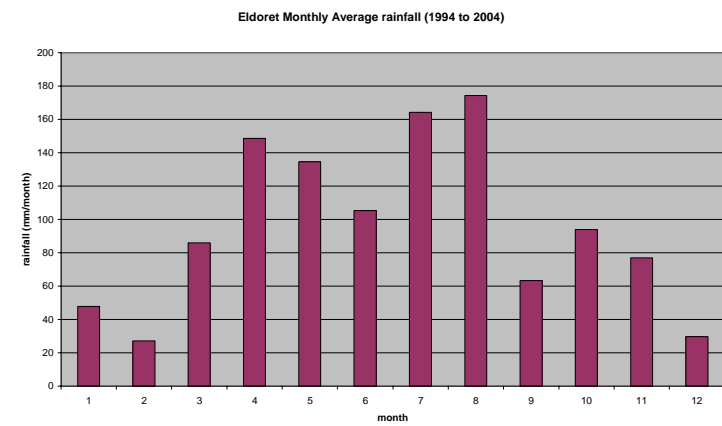


Figure 5.6: Average Monthly Rainfall at Eldoret, 1984 to 2004

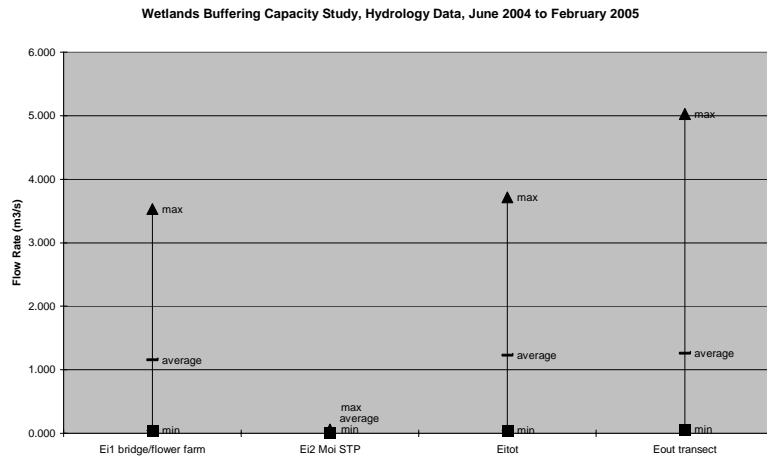


Figure 5.7: Eldoret Chepkoilel Wetland Measured Flow Rates Summary



Figure 5.8: Typical High Flow Zonation in the Eldoret Chepkoilel Wetland Marsh flow is occurring in the foreground. To the rear, the central papyrus mat can be seen, which is floating over the central permanent stream (flow is from right to left)

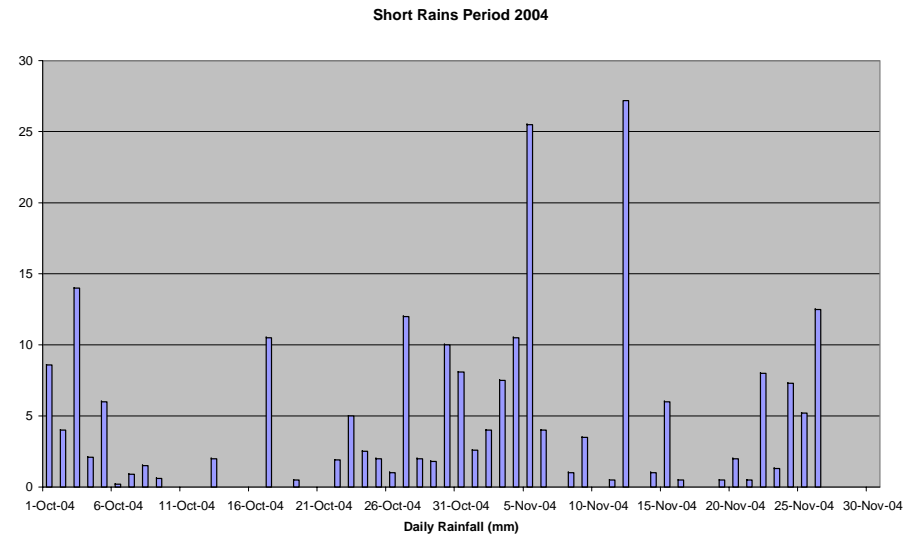


Figure 5.9: Daily Rainfall during the Short Rains Rainfall, 2004

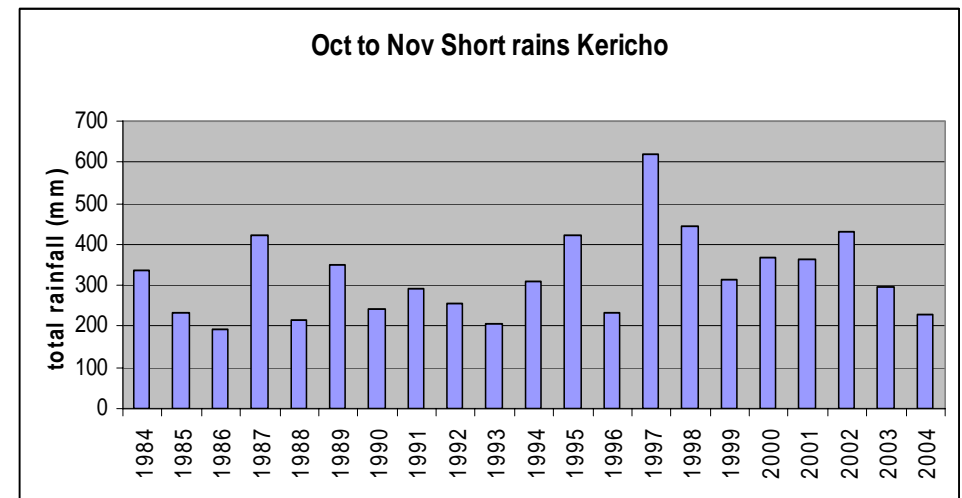


Figure 5.10: Short Rains Period (Oct to Nov) Period Rainfall, 1984 to 2004

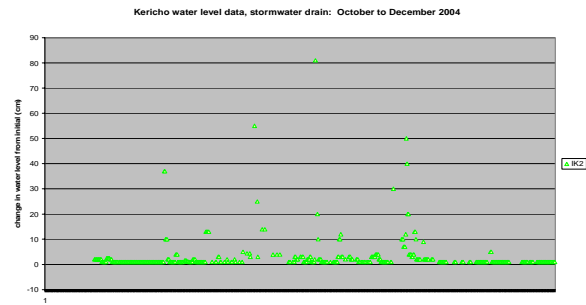


Figure 5.11: Water Levels at the stormwater drain inlet

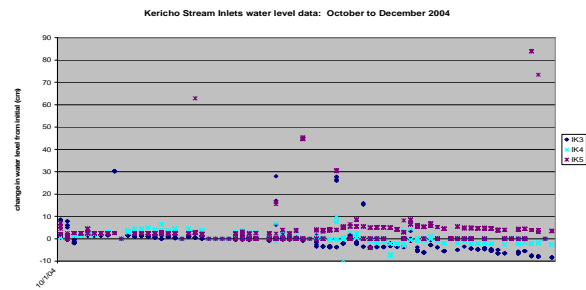


Figure 5.12: Water Levels at the three stream inlets

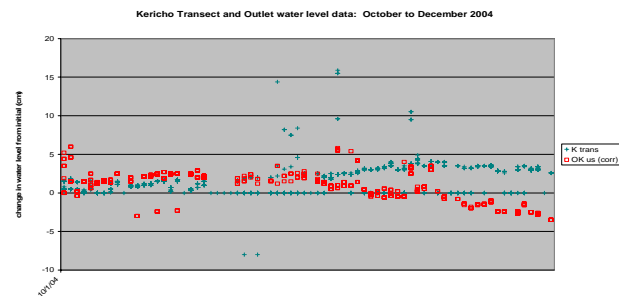


Figure 5.13: Water Levels at the Transect and Outlet

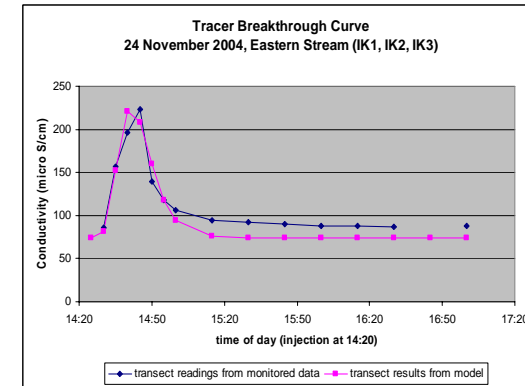


Figure 5.14: Example of a Tracer Breakthrough Curve and Modelled Gaussian Dispersion Curve used for advection and dispersion determination

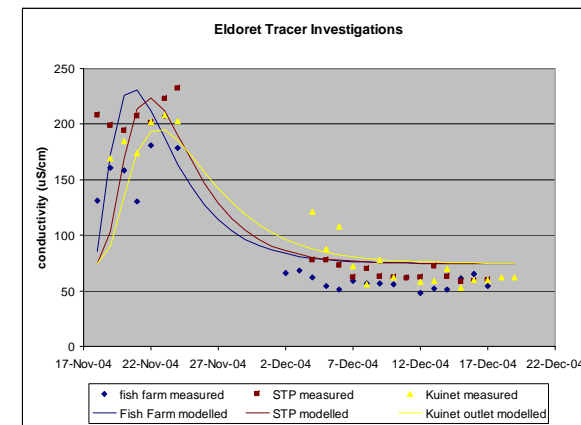


Figure 5.15: Eldoret Chepkoilel Wetland Tracer Breakthrough Curves



Figure 5.16: ISCO Autosampler Installation at the Dionosoyiet Wetland Transect



Figure 5.17: Watchdog Weather Station Installation at the Township Primary School

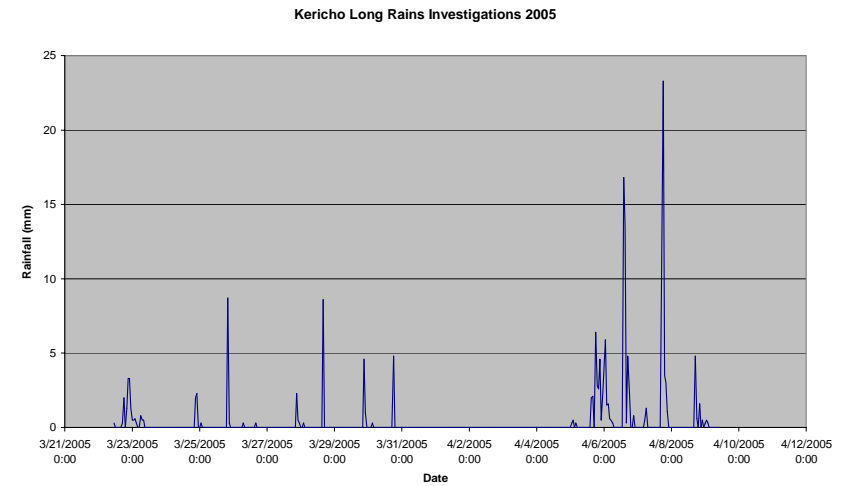


Figure 5.18: Rainfall Recorded at Kericho During the Long Rains Intensive Monitoring

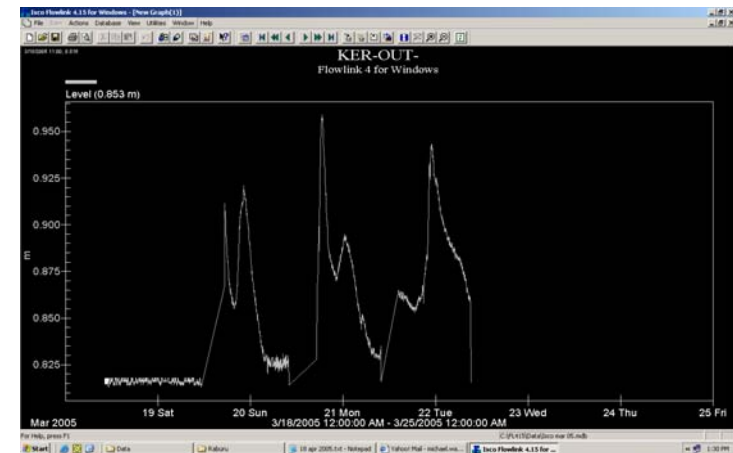


Figure 5.19: Typical Output from the ISCO Bubbler Flow Meter at the Kericho Wetland Outlet

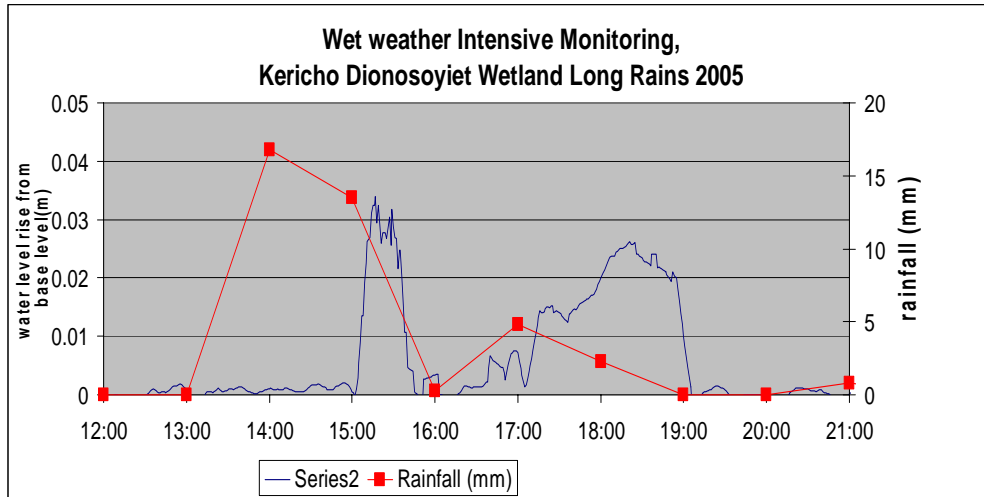


Figure 5.20: Rainfall and Water Levels Recorded at Kericho during Long Rains Intensive Monitoring

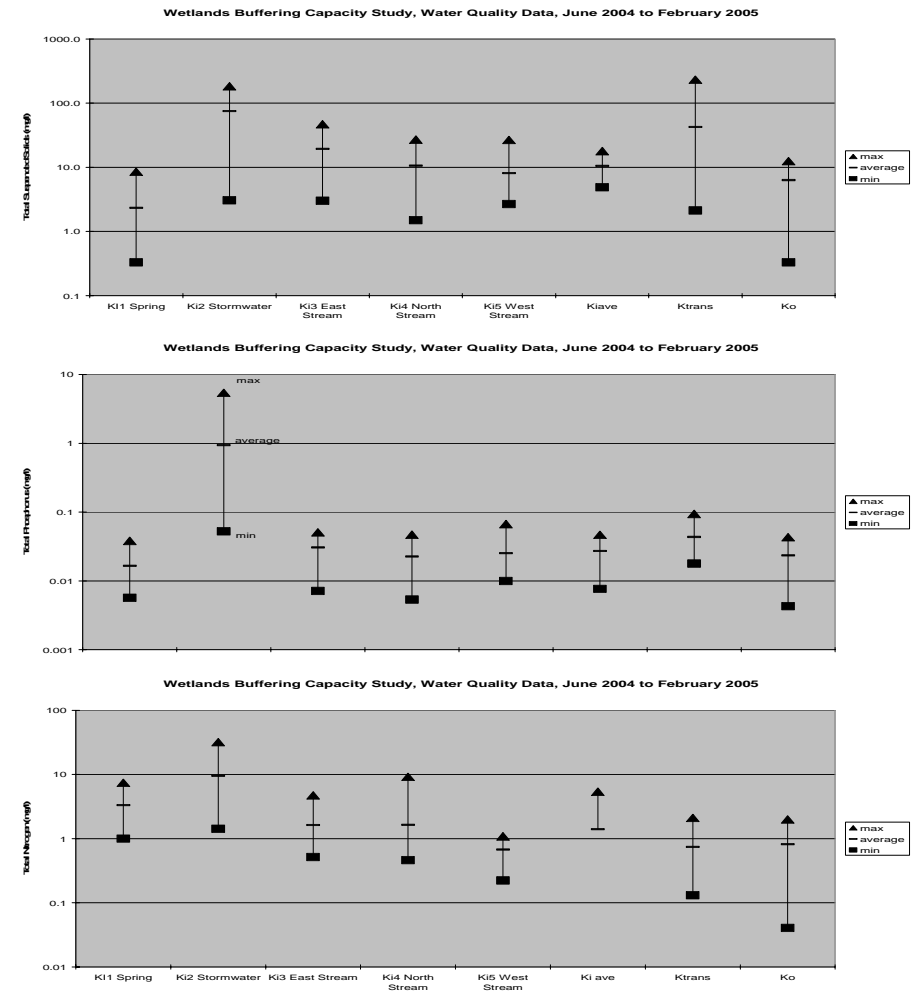


Figure 6.1: Water Quality Monitoring Summary Results for the Dionsoyiet Wetland, Kericho
TSS (top), TP (middle) and TN (bottom)
Note: extreme variability in readings means the scale is logarithmic

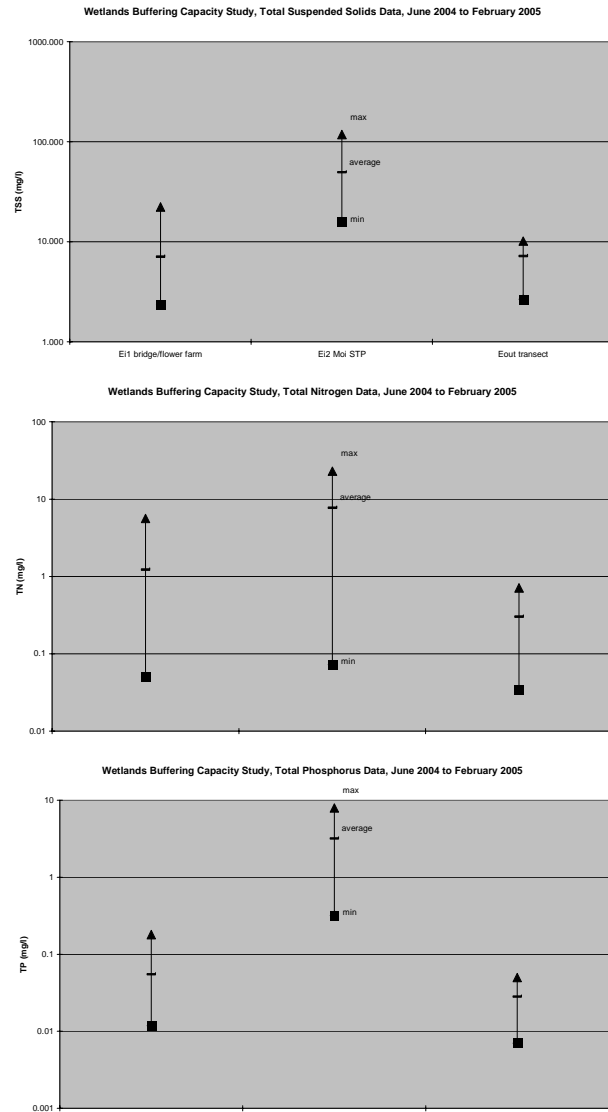
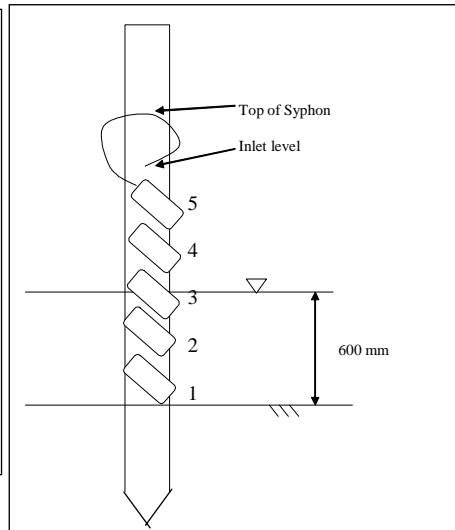


Figure 6.2: Water Quality Monitoring Summary Results, Eldoret Chepkoilel



Bottle number	Level, inlet (above, [-below] mean water level)	Level, Top of Syphon (above mean water level)
1	-160	30
2	-130	80
3	30	180
4	80	280
5	180	380

Figure 6.3: Rising Stage Sampler
(a) prior to deployment (Left) (b) Specifications (right)

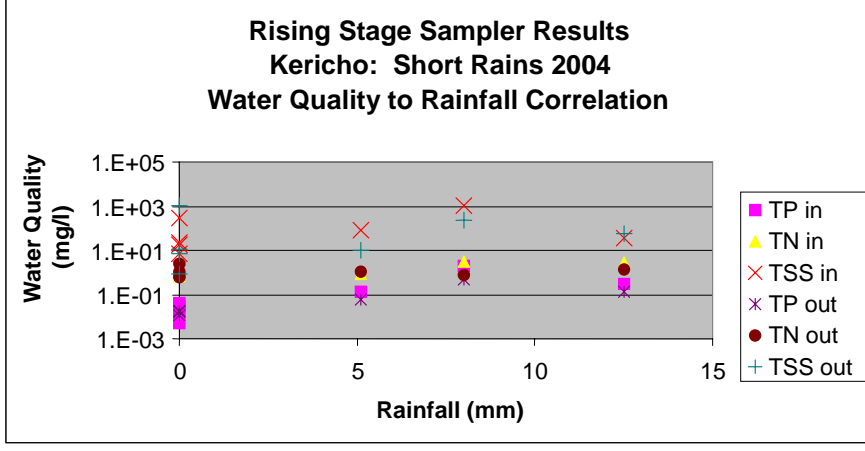


Figure 6.4: Rising Stage Sampler Results, Kericho Dionosoyiet Wetland

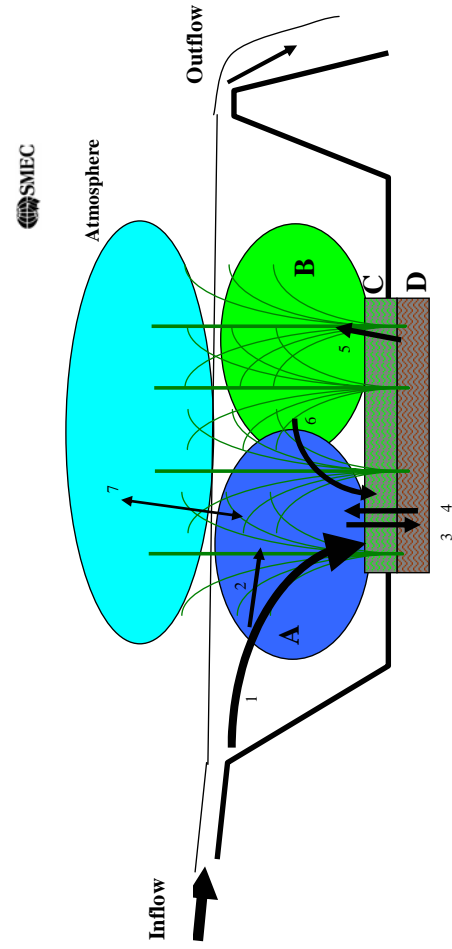


Figure 7.1: Simplified Conceptual Partitioning of Nutrients and Buffering Functions in a Tropical Wetland
 With bottom rooted vegetation

Legend:

Partitioning Zones:

- A. Water Column
- B. Plant Tissue
- C. Organic Sediment Zone
- D. Plant Root Zone

Buffering Functions

- 1. Settling of Sediments and Nutrients
- 2. Interception by Plant Matter (stems only)
- 3. Nutrient Adsorption and Precipitation within sediments
- 4. Nutrient Desorption and Release Processes
- 5. Plant Uptake Processes
- 6. Plant senescence, death and decay processes
- 7. Atmospheric Exchange (Nitrogen only)

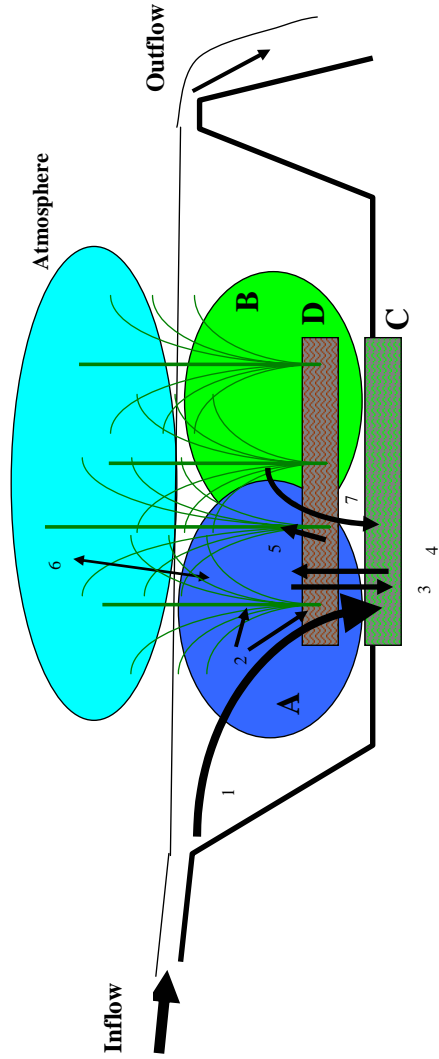


Figure 7.2: Simplified Conceptual Partitioning of Nutrients and Buffering Functions in a Tropical Wetland with Floating root vegetation (eg *Cyperus papyrus*)

- Legend:**
- A. Water Column
 - B. Plant Tissue
 - C. Organic Sediment Zone
 - D. Plant Root Zone
- Buffering Functions**
1. Settling of Sediments and Nutrients
 2. Interception by Plant Matter (stems and floating root mat)
 3. Nutrient Adsorption and Precipitation within sediments
 4. Nutrient Desorption and Release Processes
 5. Plant Uptake Processes
 6. Atmospheric Exchange (Nitrogen only)
 7. Plant senescence, death and decay processes

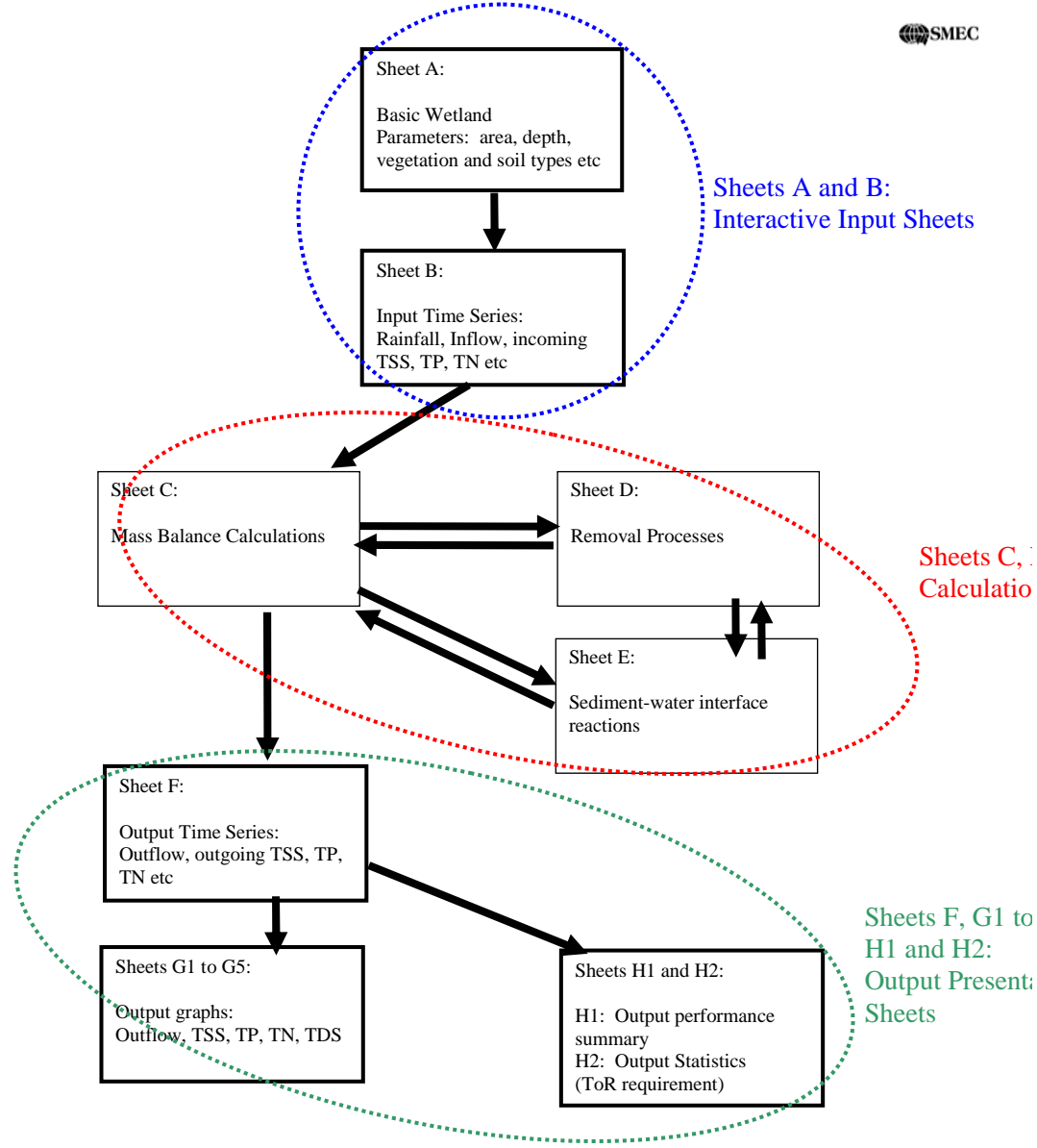


Figure 8.1: Modelling Framework for LAVINKS-WEB

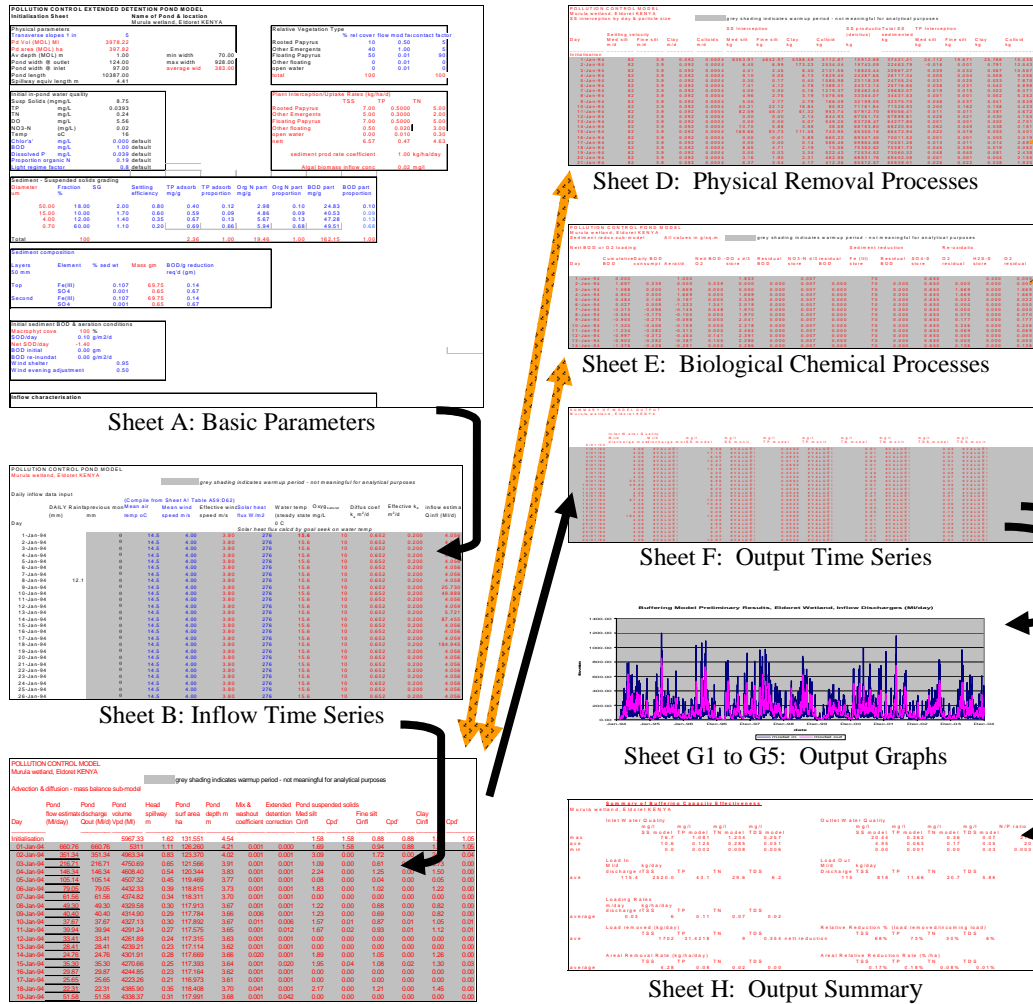


Figure 8.2a to h: Typical Spreadsheet Screens for the LAVINKS-WEB Model and Calculation Interactions Between Sheets

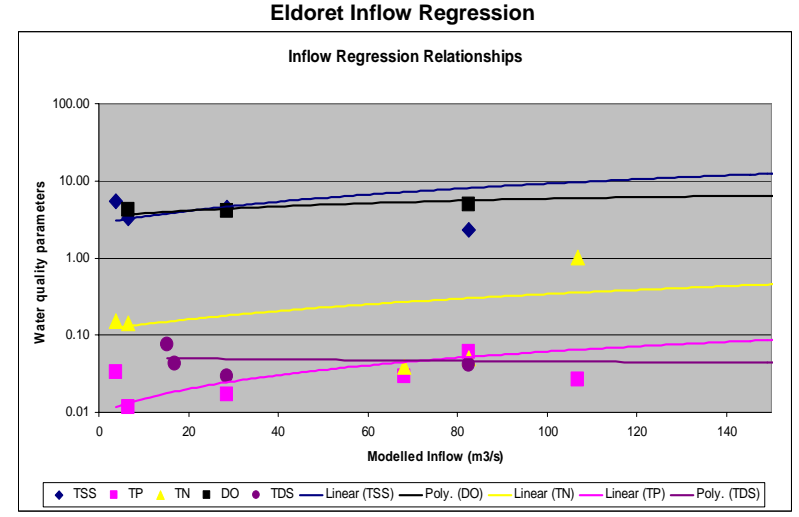
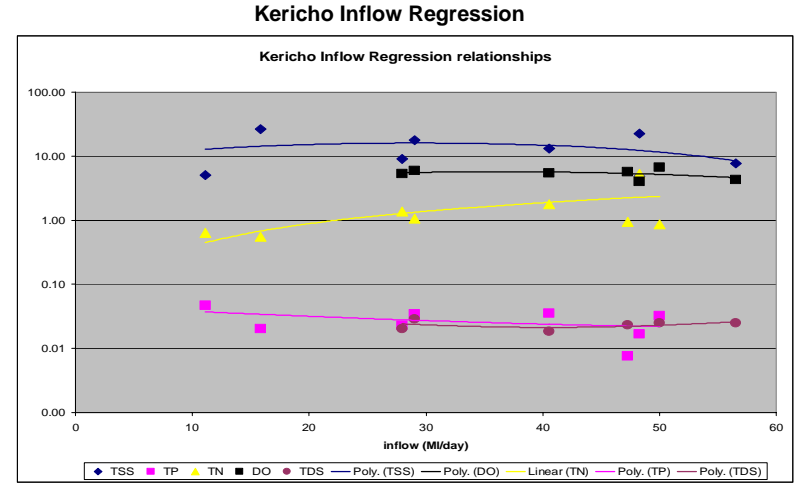
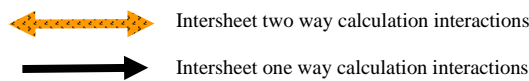
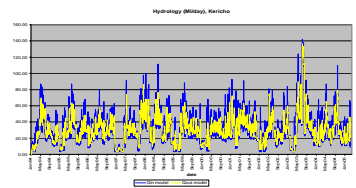
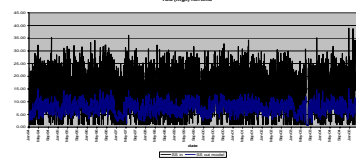


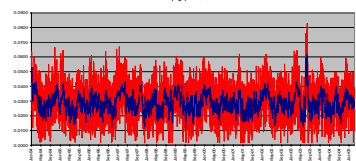
Figure 8.3: Inflow Water Quality to Inflow Regression Relationships for the Kericho Dionosoyiet (above) and Eldoret Chepkoilel (below) Wetlands. Points indicate measured data, lines indicate model average relationships



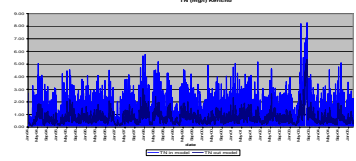
(a) Kericho flow rates



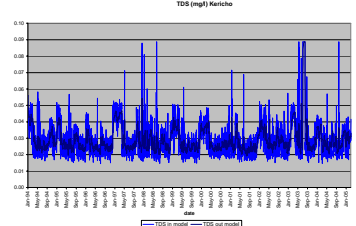
(b) Kericho Suspended Solids



(c) Kericho Total phosphorus

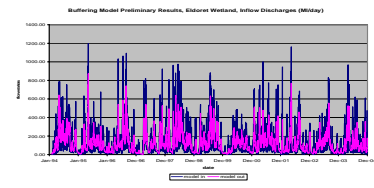


(d) Kericho Total nitrogen

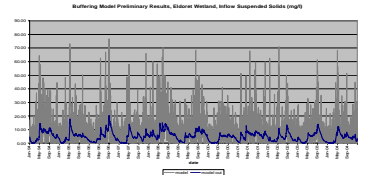


(e) Total Dissolved Solids

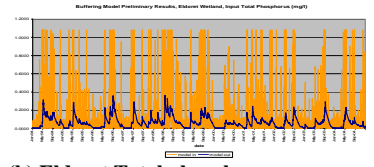
Figure 8.4: Incoming and Outgoing Flow Rates for the Kericho Dionosoyiet (left) and Eldoret Chepkoilel (right) Wetlands



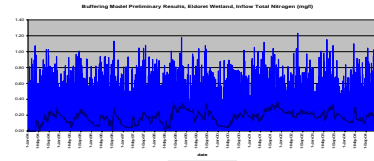
(f) Eldoret flow rates



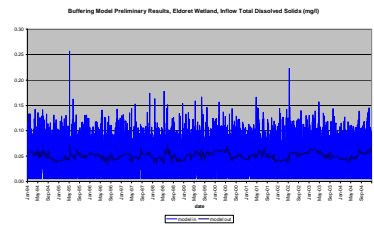
(g) Eldoret Suspended Solids



(h) Eldoret Total phosphorus



(i) Eldoret Total nitrogen



(j) Total Dissolved Solids

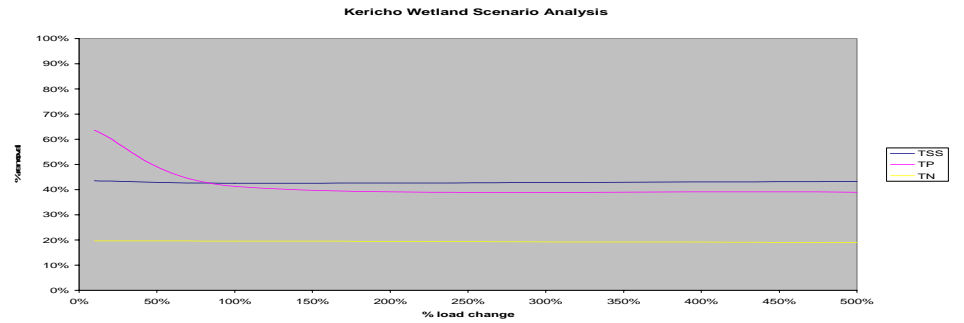
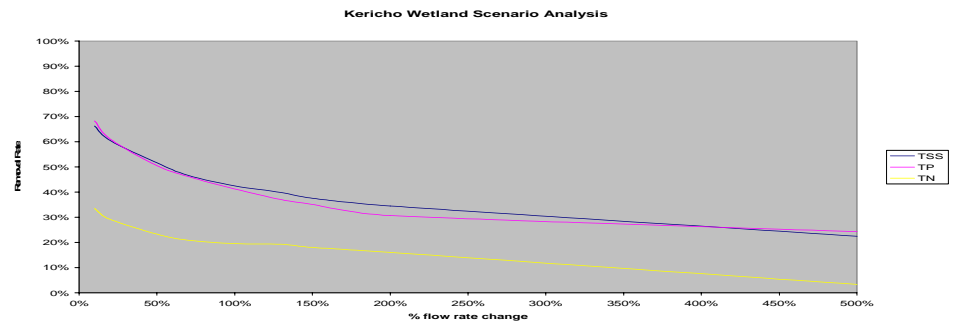
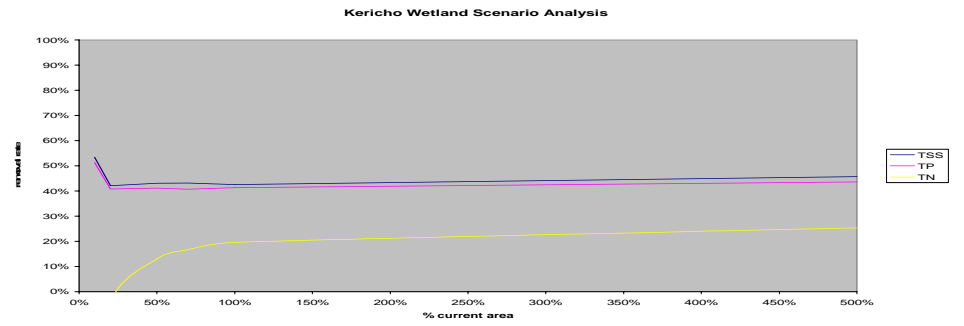


Figure 8.5: Scenario Modelling for the Kericho Dionosoyiet Wetland:

Top: impact of changing wetland area
 Centre: impact of changing inflow rate
 Bottom: impact of changing input load

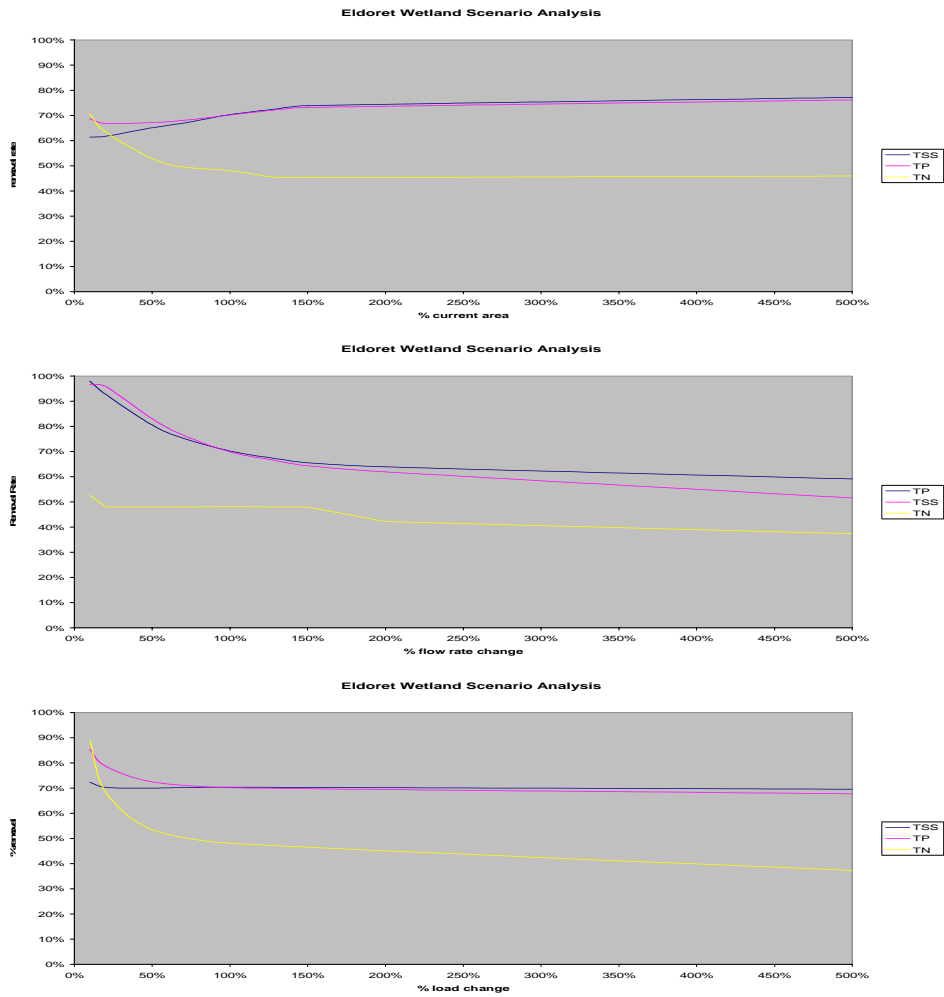


Figure 8.6: Scenario Modelling at the Eldoret Chepkoilel Wetland
 Top: impact of changing wetland area
 Centre: impact of changing inflow rate
 Bottom: impact of changing input load

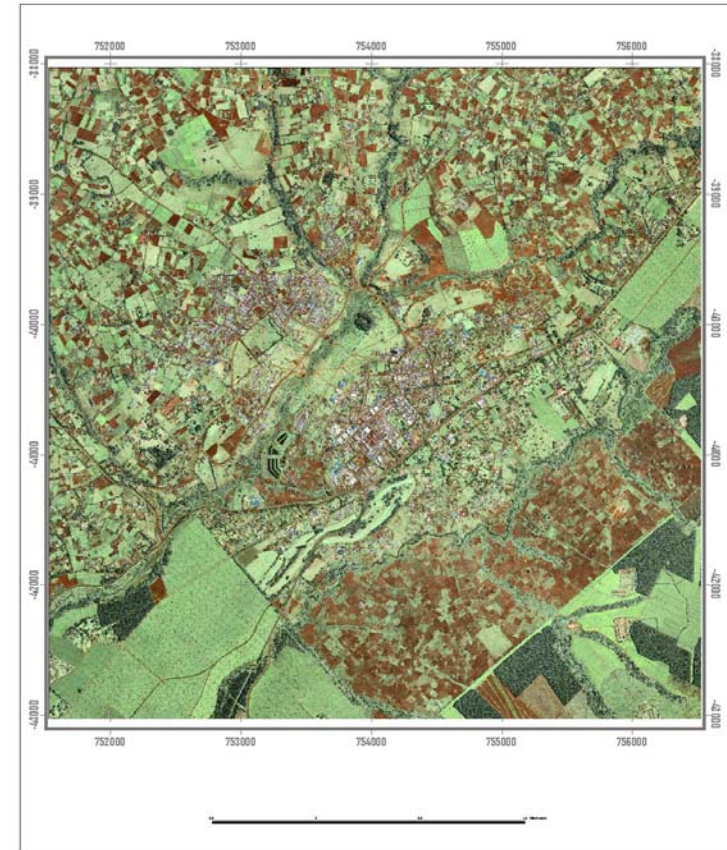


Figure 10.1. QuickBird image of the Kericho Dionosoyiet Wetland

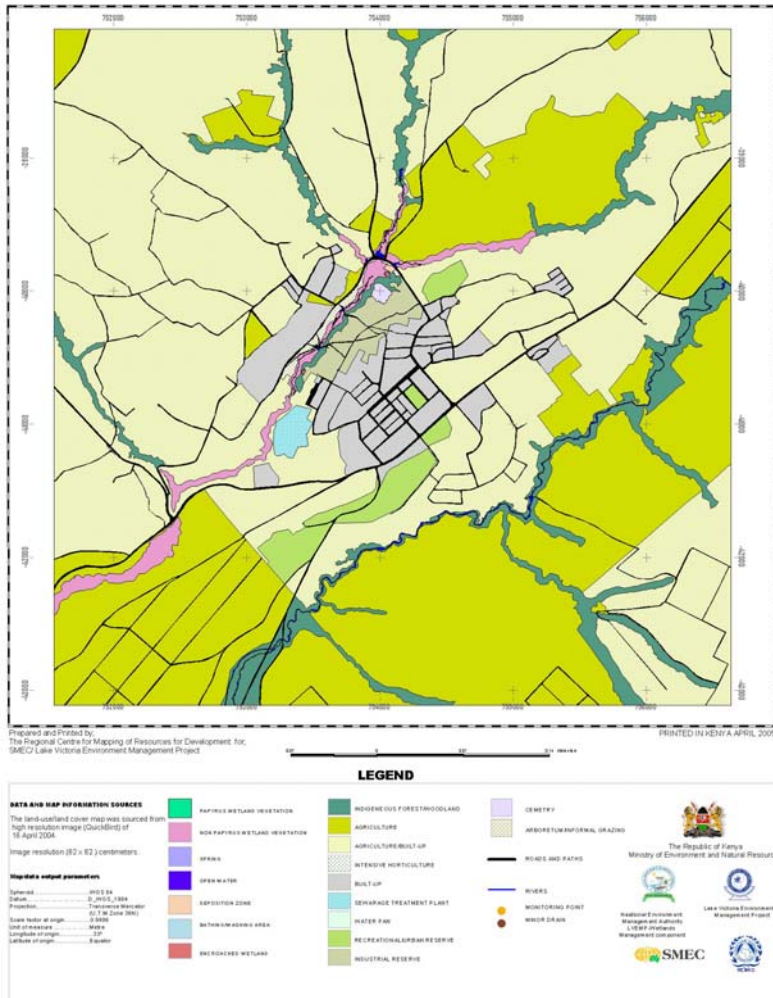


Figure 10.2: Land use/land cover maps of the Kericho Wetland

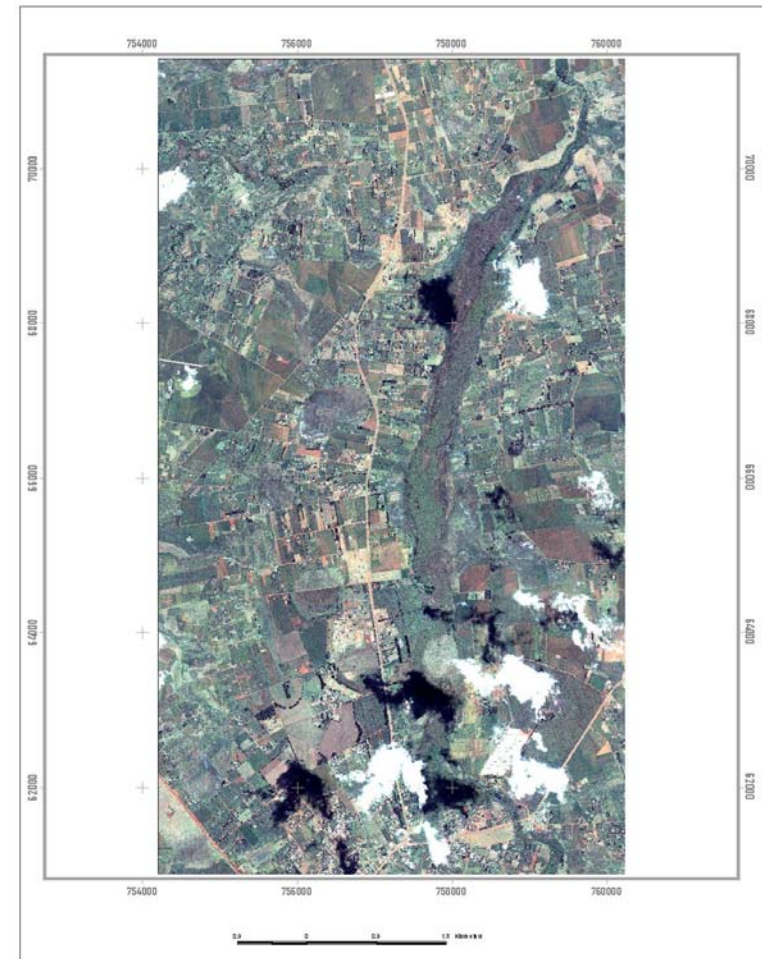


Figure 10.3. QuickBird image of Eldoret site

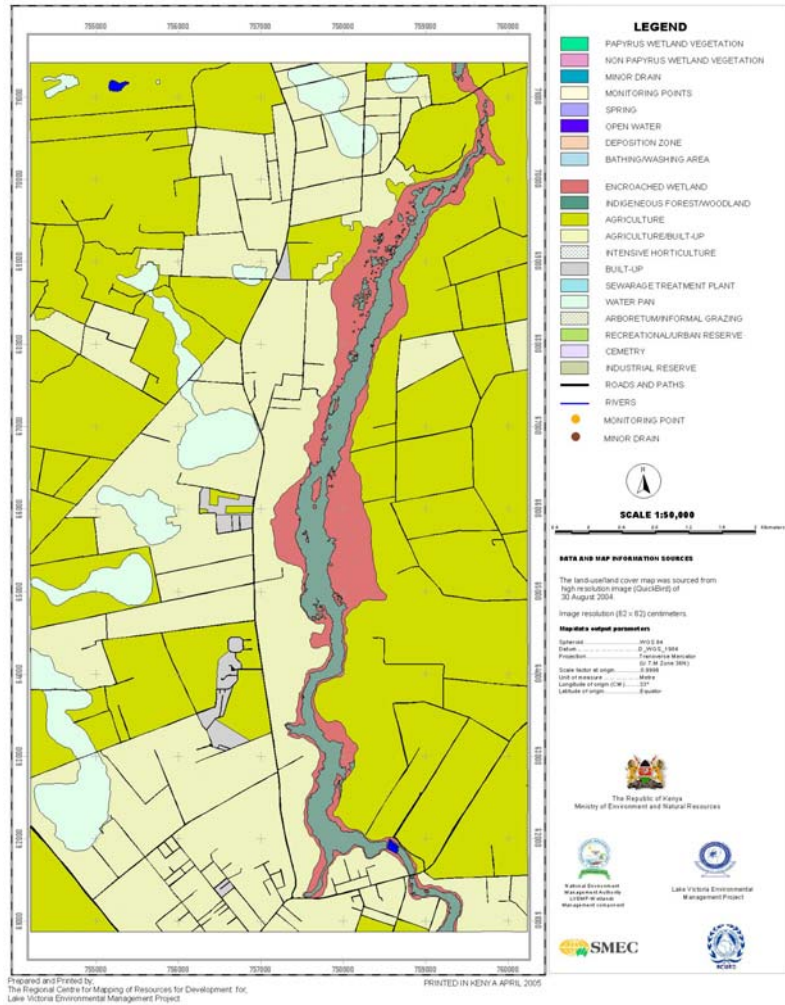


Figure 10.4: Land use/land cover maps of the Eldoret Wetland

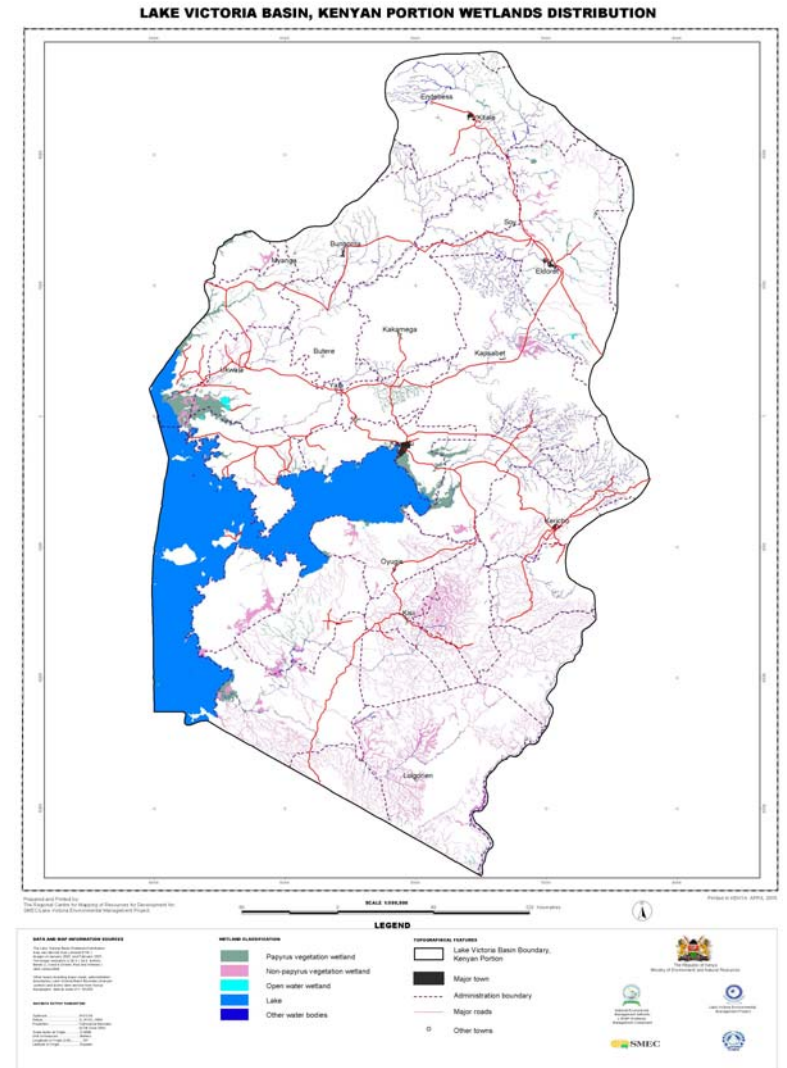


Figure 10.5: Basin-wide wetland map based on Onscreen digitisation

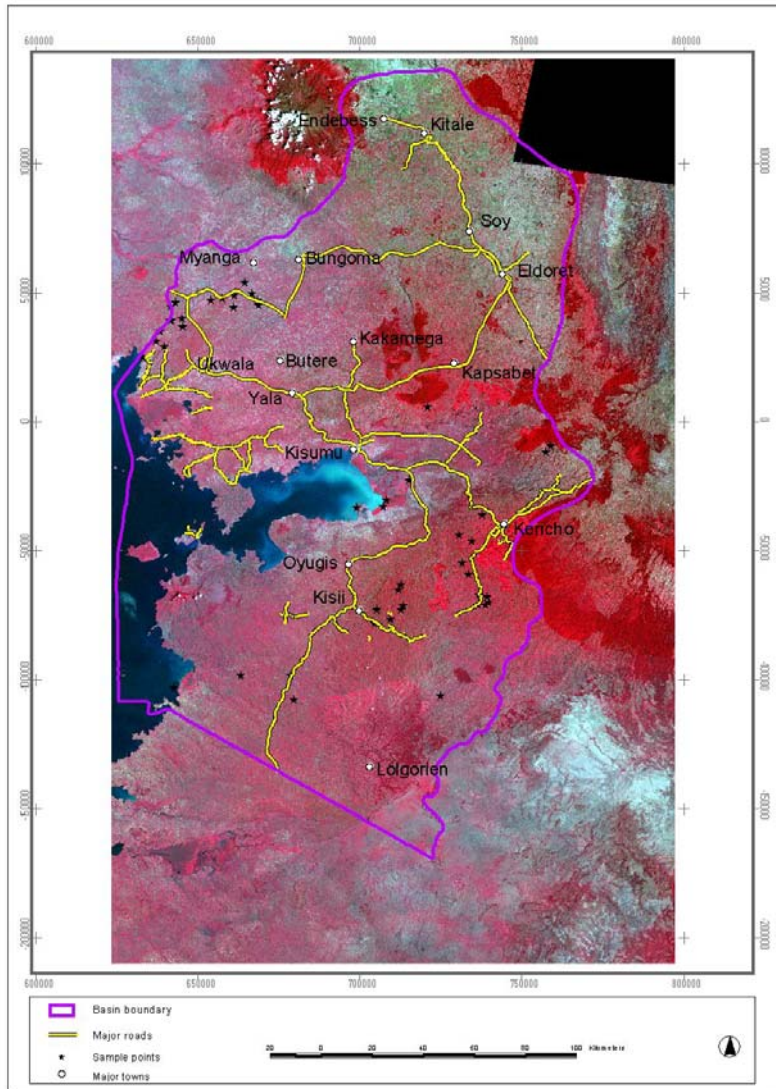


Figure 10.6: Rapid assessment points in Arcview shape file format

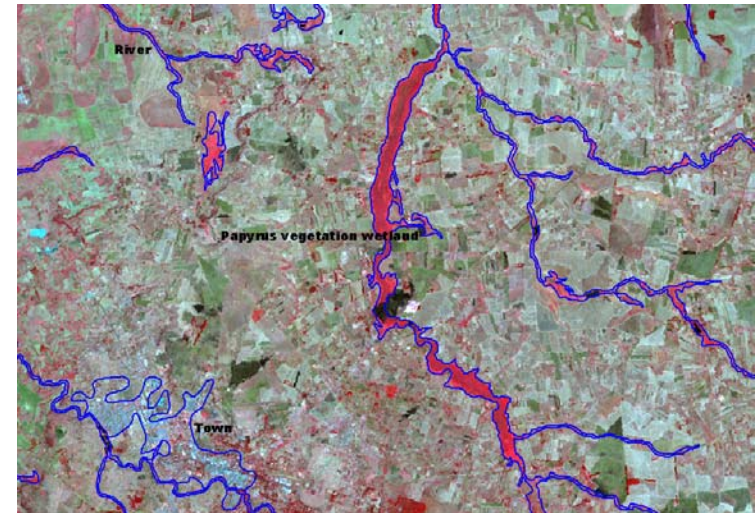
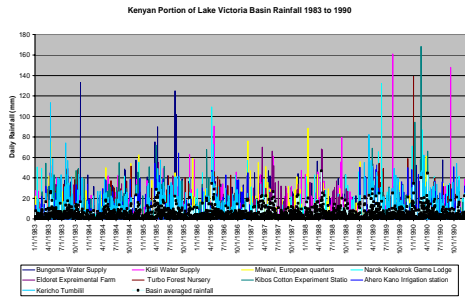


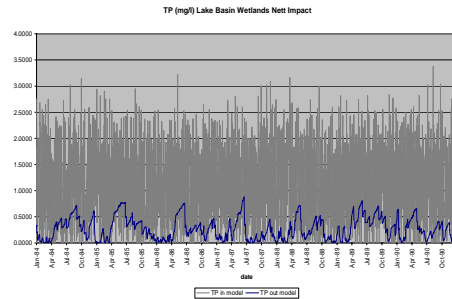
Figure 10.7. Landsat ETM interpretation of Chepkoilel wetland



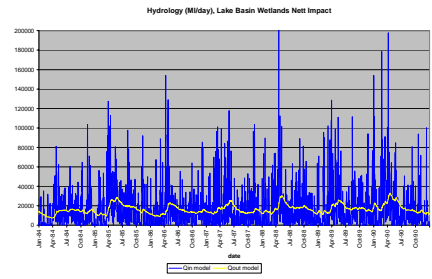
Figure 10.8. Sample of scanned topographic map at Yala swamp



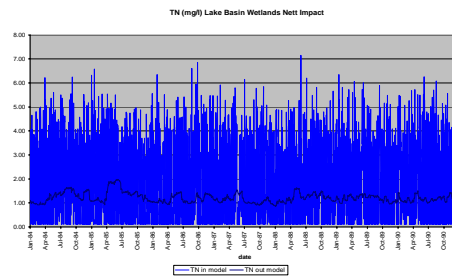
a) Rainfall Inputs 1984 to 1990



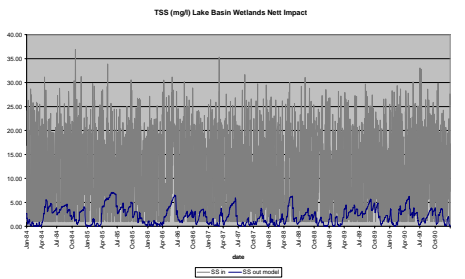
d) TP 1984 to 1990



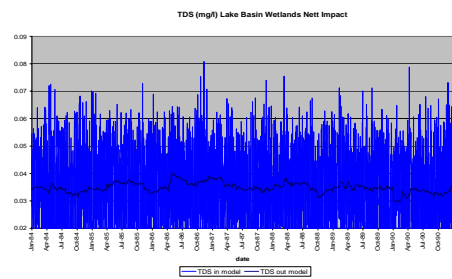
b) Hydrology 1984 to 1990



e) TN 1984 to 1990



c) TSS 1984 to 1990



f) TDS 1984 to 1990

Figure 11.1: Basin Wide Wetlands Model Inputs and Expected Nett Impacts in Buffering of Nutrient Inputs to Lake Victoria, 1984 to 1990



The Republic of Kenya
Ministry of Environment and Natural Resources



NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY
LVEMP-WETLANDS MANAGEMENT COMPONENT



Lake Victoria Environment Management Project

Chepkoilel Wetland Draft Management Plan



Prepared by
SMEC International Pty Ltd
ACN 065 475 149

Project Number: 58303



For
The Republic of Kenya
Ministry of Environment and Natural Resources



NATIONAL ENVIRONMENT MANAGEMENT
AUTHORITY
LVEMP-WETLANDS MANAGEMENT
COMPONENT



Lake Victoria Environment Management Project

Management Plan Framework For Kenyan Wetlands of the Lake Victoria Basin



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LVEMP-WETLANDS MANAGEMENT COMPONENT



Lake Victoria Environment Management Project