Salt Intrusion is one of major constraints in water resources development in Central Plain area of Thailand for both agricultural, domestic and industrial purposes especially when the proper water management is required in dry season. The one-dimensional Finite Difference Model has been developed and studied in order to forcast the salinity amount for various tidal and discharge conditions but the numerical results compared with the field data are still infavourable.

The one-dimensional Finite Element Model is then developed with the aid of Galerkin procedure and the weak formulation of the diffusion equation. Numerical Investigations are done to test the model's convergency and accuracy compared with analytical solutions to examime their sensitivities to nondimensional parameters of the governing equation. In application, all variables in the governing equations: momentum, continuity and diffusion equations, are solved simultaneously. The model is applied to the actual computation of the Chao Phraya River and the results show better agreement to field data compared with the previous Finite Difference Model.