Fisheries Management and Red Tide Forecast
漁業管理與紅潮預報

The fisheries management system provides an integrated information platform in matters related to mariculture in Hong Kong. The system can provide: (i) hydro-meteorological data, tide levels and currents, water quality trends, and allowable fish stocking density for each fish culture zone; (ii) the most up to date information on red tide occurrence and risk assessment for coming week. Fish farmers and decision makers can be regularly informed about recent water quality trends and likely future conditions in the fish culture zones, thus enabling effective utilization of our marine resources. The system can also help to optimize the planning and deployment of field monitoring of water quality.

"漁業管理系統"致力於提高香港海魚養殖業的管理水平，通過結合數理模型與潮汐、氣象和水質等實際數據，預測各養殖區內的環境承載力（最優產魚量）和藻華（紅潮）爆發風險，為海魚養殖業提供科學管理基礎數據及決策依據。

## Online Red Tide Early Warning System
實時紅潮預警系統

Accounting for algal dynamics and vertical turbulence, a real-time red tide forecast system is developed to provide a quick assessment of the likelihood of algal bloom occurrence. The prediction is translated into a red tide risk map to provide regular alerts and updates. Once a red tide is observed, hydrodynamic tracking of blooms can be performed to predict the red tide movement and likely impacted regions in the coming week.

實時紅潮預警系統基於藻類生態動力學原理和垂向紊動機理，可快速評估紅潮爆發的風險；結合實際監測數據，本系統能提供即時紅潮預警及情況更新。利用水動力模型，每當紅潮發生時，本系統能快速預測有關紅潮的未來動向。
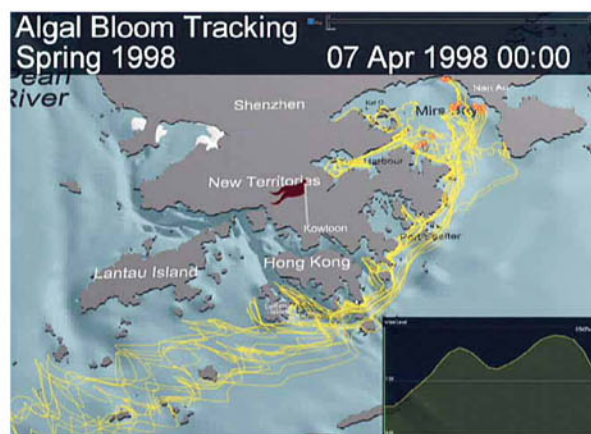
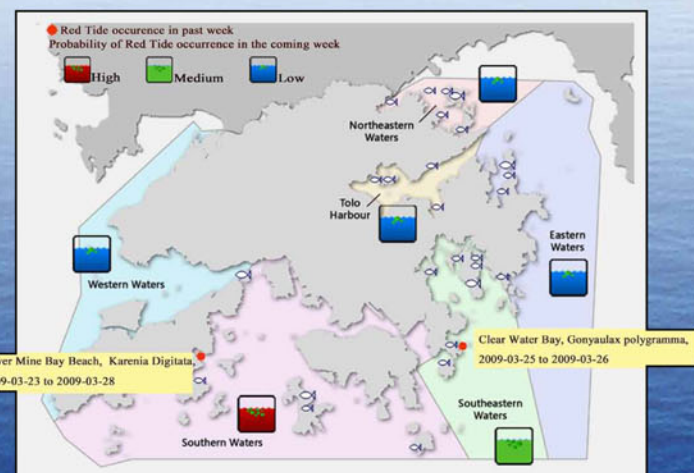Hydrodynamic tracking of the massive 1998 red tide
1998年香港大規模紅潮的移動路線
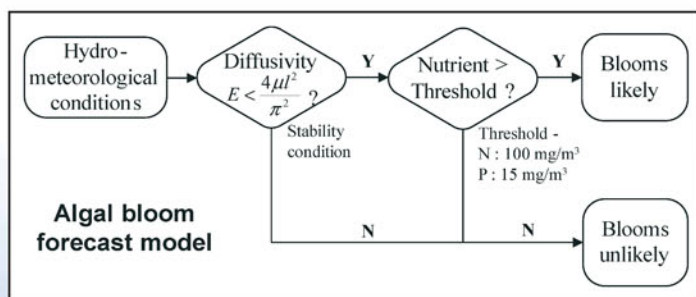
Carrying Capacity for Fish Culture Zones
魚場環境承載力

The carrying capacity of a fish culture zone – the maximum allowable fish stocking density for sustainable fish farming – is mainly governed by the tidal flushing rate of the site, the organic loading of the fish farm, and the background water quality. The tidal flushing rate can be determined from numerical tracer experiments using a 3D hydrodynamic model. The carrying capacity can then be determined using a quasi-steady diagenetic water quality model to assess the acceptable loading that will meet the requirements of key water quality indices (e.g., dissolved oxygen).

本系統透過三維水動力模型計算養殖區的潮流交換沖洩率，結合準穩態水質模型進行養殖區內水質狀況的分析，並參照關鍵指標（如溶解氧）計算海魚養殖區在可持續發展的情況下的最大海魚養殖量。

Algal bloom forecast model

Red tide risk map
魚場紅潮風險圖