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ACEDP
Lake Tai Water Pollution Treatment Project

Newsletter

Issue 1 (Jul.~ Oct. 2009)

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AUS Cluster Lead by Earth Systems Consulting

Foreword

Welcome to the first edition of the ACEDP Lake Tai Water Pollution Treatment Project Newsletter. The aim of the newsletter is to disseminate news about the Project to a wide audience of Chinese and Australian stakeholders and highlight project achievements in the past 3 month period. The newsletter will also highlight interesting developments in Australia related to the Project's 3 components, Integrated River Basin Management (IRBM), Lake Science Management and Technical Measures in Support of Governance/IRBM.

Nigel Murphy

Project Director

AUS Cluster Lead by Earth Systems Consulting

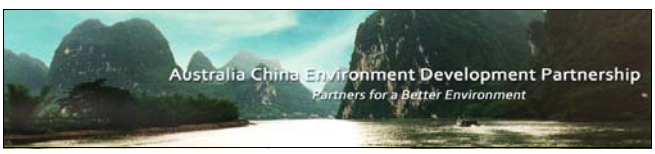
LAKE TAI INTRODUCTION

LAKE TAI (Taihu Lake), is approximately 2,400 km^2 with an average depth of only 2 meters. As the third largest lake in China, the hydrology/hydrodynamics of Lake Tai is of a complex nature with a network of interconnected rivers, canals and lakes between Lake Tai and the Yangtze River. Lake Tai is situated on the border of Jiangsu and Zhejiang Province, with the majority of it lying in Jiangsu Province and a very small slice in the southern part of the lake in Zhejiang Province. Suzhou, Wuxi, Huzhou and Shanghai are the main municipalities around the Lake Tai basin.

Lake Tai has been polluted continuously and particularly since 1990, including point source pollution, non point source pollution and flooding. China has identified Lake Tai as a priority concern, after the severe algae outbreak in the year 2007. The government took measures for the treatment of Lake Tai with special provisions in the 10th and 11th Five-Year Plans.

ACEDP LAKE TAI PROJECT

The *Australian China Environment Development Partnership (ACEDP)* is a five-year, $25m Australian Government, AusAID initiative com-



menced in July 2007 with the objective of supporting and improving policy development in China, in the area of environmental protection and natural resources management.

ACEDP aims to facilitate enduring partnerships between Australian and Chinese agencies, institutions and individuals engaged in national environmental policy development and implementation through a combination of high level policy dialogue, capacity building measures and collaboration on discreet activities that demonstrate good environmental governance.

ACEDP Lake Tai Water Pollution Treatment Project is an 15-month, $1.8m project, implemented by the AUS Cluster lead by Earth Systems Consulting, and the Chinese counterpart ICC-NDRC. The objective of the Project is to increase awareness of IRBM approaches including institutional governance, science based management, and technical measures for pollution and algal control. The ACEDP Lake Tai Project will concentrate on 3 main components; Integrated River Basin Management (IRBM), Science Based Lake Management, and Technical Measures in Support of Governance and IRBM (21 activities, workshops & study tours in total) both in China and

PROJECT OVERVIEW

THE SCOPE of activities in the project consist of the following areas:

1. IRBM and Environmental Governance:

1a. IRBM at City Level

- Scoping agreement and of internships and study tour
- Short-term internship focusing on variable wastewater permitting systems
- Study tour to Australia in Municipal Level IRBM governance
- Meeting in cities with key agencies on areas of change and steps required
- Workshop with Officials on Future Needs and Approaches

1b. IRBM at Basin Level

- Exploratory meetings on reviewing the Lake Tai Coordination Plan
- Field trip to Haihe Basin
- Scoping working meetings on IRBM Needs

2. Science-based Lake Management:

2a. Lake Tai Science Management

- Establishment of small science team for Lake Tai Science Assessment
- Preparation of conceptual model for Lake Tai
- Data collection and report preparation
- Database of studies and information
- Review of conceptual model results and identify future work needs
- Scoping and agreement of study tour
- Study tour on Science Management

2b. Non Point Source Assessment

- Establishment of small science team for Lake Tai Non Point Source Assessment
- Capacity building and training in NPS accounting methods for agricultural NPS
- Preparation and training in NPS assessment approach
- Data collection and assessment of NPS Information
- Review of NPS results and identify future work needs

3. Technical Measures in Support of Governance/IRBM

3a. Source Identification and Pollution Audit for Nutrient Management

- Working meetings on Source Identification and Audit
- Source identification and Pollution load estimates and audit
- Working meetings on Load Estimation and Audit

3b. Improved Wastewater Treatment and Recycling Technologies

- Meetings to identify priority concerns on WWTP and recycling technologies
- Study tour on Wastewater Treatment and Recycling Technologies

3c. Integrated Management of Algal Blooms

- Workshop to define clear understanding of algal monitoring needs; recommend monitoring strategies and trial models for predicting blooms; and identify future technical support needs, including technical equipment and software
- Workshop on toxicity monitoring and assessment techniques
- Workshop on Algal Bloom Emergency Management Plans

- Evaluate existing trials of Algal Control Technologies
- Review of Control and Disposal Technologies
- Trial of Technologies, as Justified

3d. Market Mechanism Policies for Pollution Control

- Study tour to Australia on market mechanisms

PROJECT MILESTONE (JULY~OCTOBER)

- Earth Systems, representing the AUS Cluster awarded the tender for implementation of the project and signed the contract with ACEDP in Australia.
- Earth Systems set up the project office in Beijing, which is close to office of the Chinese counterpart ICC.
- Series of successful mobilisation phase meetings with Lake Tai project team, project partners, ICC NDRC, AusAID and ACEDP in Australia and China.
- Launched successful Inception Workshop in Suzhou municipality (60 participants) and meetings in Huzhou municipality (27 participants) respectively between August 25 and 28.
- Meetings held with Austrade China office to discuss the potential for further linkages between the Australian business community and Chinese government stakeholders as a result of the project.
- On September 15, Project Director Mr. Nigel Murphy made a presentation to a gathering of Australian businesses through the AUS Cluster initiative.
- Earth Systems and AUS Cluster organised a World Bank Beijing Office Delegation to conduct a two day visit to Melbourne on Catchment Management in October.
- From the 26 to 30 October 2009, two workshops (Wastewater Treatment & Recycling Review and Integrated Management of Algal Blooms Workshop) were simultaneously held in the two trial cities Huzhou and Suzhou. More than 30 participants from different authorities and stakeholders attended the workshops.
- Project Director Mr. Nigel Murphy, delivered a speech on *"ACEDP Lake Tai Water Pollution Treatment Project"* at the 13th World Lake Conference in Wuhan on November 2.

INCEPTION WORKSHOP

THE project launched its 4-day Inception Workshop in late August 2009, in Suzhou Municipality, Jiangsu Province and Huzhou Municipality, Zhejiang Province, respectively.

More than 60 participants from stakeholder-agencies participated in the Inception Workshop in Suzhou. Mr. Jianguo Wei (Former Vice Minister of MOFCOM) and Mr. Tom Connor (Australian Consulate General Shanghai) formally launched the project. Mr. Wei was also commissioned as the "General Consultant" of the project. There were also opening speeches from Mr. Xiaochong Zhang (Director of ICC NDRC), Ms. Yin Tan (Vice Mayor of Suzhou), Mr. Mingming Liu (Representative of MOFCOM), Mr. Gunther Mau (Manager of ACEDP) and Mr. Nigel Murphy (Project Director of the AUS Cluster). Representatives from MWR, Lake Tai Basin Authority, MEP and SFA were also present.

During the Inception Workshop, the AUS Cluster team members Mr. James Machin, Mr. Clive Lyle, Dr. Michael Waters, and Dr. Justin Brookes provided presentations on Australian strengths and experiences in terms of lake and eutrophication management, algae control technologies and the proposed workplan of this project. The pilot cities' (Suzhou and Huzhou) agencies briefed delegates on the broader context of Lake Tai, their priorities and urgent needs for support on algae bloom forecast and monitoring, waste water treatment and recycling, non point source management and market mechanism of pollution control, etc, most of which will be covered by project activities.

The joint Australian Chinese project team also paid a two-day site visit to Huzhou Municipality which is located upstream of Lake Tai within Zhejiang Province, and it was subsequently agreed that Huzhou would participate in the project in order to further strengthen

Friendly talk between Mr. Jianguo Wei and Mr. Tom Connor

Speech from ACEDP Program Manager Mr. Gunther Mau

integrated basin management and trans-jurisdictional coordination and cooperation. Concrete project activities will be refined during the inception phase.

The Inception Workshop also attracted the attention of CCTV and Suzhou Television which released the news of Lake Tai Project Inception respectively at the CCTV-1 at the 7:00pm News on 27 August 2009 and on the Suzhou TV News. Xinhua Daily also reported the Lake Tai Inception on 7 Sep. 2009.

INTEGRATED MANAGEMENT OF ALGAL BLOOMS WORKSHOP

On October 28~30 2009, the Lake Tai Project Integrated Algal Blooms Workshop was successfully held in Suzhou Municipality. More than 30 participants from Suzhou and Huzhou Development & Reform Commission (DRC), Construction Bureau, Agriculture Bureau, Environmental Protection Bureau (EPB), Water Resource Bureau, state-owned water companies and research institutes attended the workshops; representatives from Wuxi government agencies were also present.

This workshop aimed to introduce improved, cutting edge approaches used in Australia for the integrated management of algal blooms in order to identify needs for future support, and acquire further understanding of the work currently being carried out by the different experts involved in the Lake Tai Project.

Dr. Justin Brookes and Dr. Mike Burch delivered several speeches on the topics of algal monitoring, algal control techniques, water treatment techniques for algal blooms, algal ecology, and action plans for algal management. Chinese lake nutrient expert Prof. Qin Boqiang from Nanjing Institute of Geology and Limnology, China Academy of Science, Ms. Chen Hua, Deputy Director of Suzhou DRC and Mr. Liu Wenbao, Deputy Director of Suzhou EPB made presentations on Lake Tai algal blooms and monitoring issues.

Extensive discussion on algal monitoring and control took place between the local participants and Australian experts during the workshop. Anonymous evaluations by participants were generally very positive, with high ratings for the relevance and usefulness of the workshop. There was a strong consensus that their

Several agreements and activity plans had been confirmed and proposed for follow-up activities including further work in the areas of algal monitoring and emergency planning, modelling of algal blooms and applied research into techniques for control of algal blooms. A report is to be prepared on the workshop as part of the outcomes.

WASTEWATER TREATMENT & RECYCLING REVIEW

The Wastewater Treatment & Recycling Review (WWTR) team was led by Australian wastewater treatment expert Dr. John Messenger. The activities and events of the review included visits to the local wastewater treatment plants (WWTPs), as well as meetings with local

government officials and experts to develop an understanding of the status and background in wastewater treatment in these two trial cities. Policies, technologies and management measures relating to wastewater treatment and water recycling and gaps and issues being faced in the two cities were also discussed. A report is to be prepared on this review to assess the WWTR conditions and identify the gaps and further needs.

The aims of WWTR Review were to assess the priority concerns and opportunities regarding waste water treatment and recycling technologies, particularly the removal of nitrogen (N) and phosphorous (P), and relate with Australian based approaches and technologies in order to identify future directions of technological support.

The WWTR Review also extended to Nanjing and meetings were held with the Jiangsu Provincial Water Resources Department, Jiangsu Provincial Environmental Protection Department and Nanjing Institute of Environmental Science. The purpose of these meetings was to develop an understanding of WWTR from the provincial levels including the role of provincial level agencies and perception of their

gaps in knowledge and understanding in the WWTR field. These meetings also provided a general introduction to the ACEDP Lake Tai Water Treatment Project, introducing the AUS Cluster and its expertise, and explored further areas for potential cooperation.

WORLD BANK MELBOURNE VISIT

Earth Systems and AUS Cluster hosted a delegation from the World Bank China office from October 22-23.

The World Bank are currently designing a loan project in Wuxi city "the Jiangsu, Wuxi Tai Lake Environment Project" which is similar in scope to the Lake Tai Project. The purpose of the visit was to further familiarise the World Bank with the ACEDP Lake Tai Project, provide an introduction to Australian experience in Integrated Catchment Management, management of Non Point Source Pollution and techniques for management of algal blooms and to explore the area of potential collaboration between the ACEDP Lake Tai and World Bank initiatives. Earth Systems organised the WB Melbourne visit, and coordinated the AUS Cluster in facilitating meetings with Melbourne Water, the Department of Sustainability and Environment (DSE)'s Catchment Management Council of Victoria, Melbourne University's Australia China Centre on Water Resources Research and the Department of Innovation, Industry and Regional Development (DIIRD).

13TH WORLD LAKE CONFERENCE

Over 1,000 global participants attended the *13th World Lake Conference* in Wuhan between 1 and 5 November 2009. The conference concentrated on the theme of "Rehabilitate the Lake Ecosystem.

On November 2nd, Mr. Nigel Murphy, Director of Earth Systems, delivered a speech on *"ACEDP Lake Tai Water Pollution Treatment Project"* to the conference. The speech included the introduction of ACEDP, milestones of the ACEDP Lake Tai Project, Australian experiences and practices in Integrated Basin Management Water Treatment and remediation and control of algal blooms. Mr. Nigel Murphy was honoured to receive a brief interview from Wuhan TV Station, where he emphasised the importance of applying comprehensive strategies and techniques in lake treatment in China.

Australian Highlights

INTEGRATED RIVER BASIN MANAGEMENT

Catchment Management Authorities and Victoria's State's Catchment Management Framework

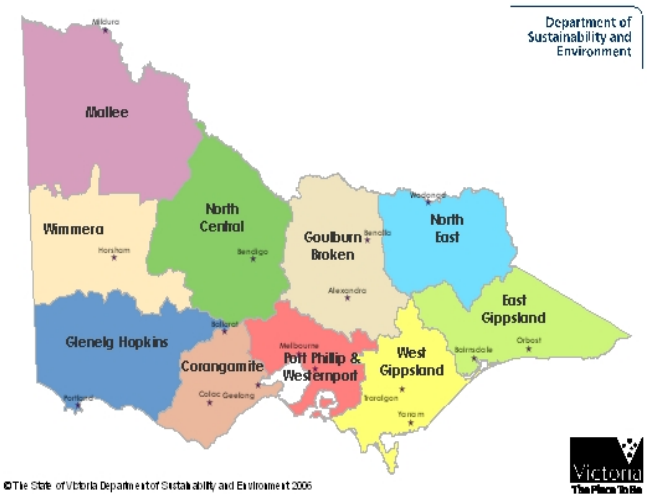
Established by the Victorian Government, the State's Catchment Management Framework is based on a model of community participation. The *Catchment and Land Protection Act 1994* provides the basis for the Catchment Management Framework.

The Framework is made up of:

- The Victorian Catchment Management Council (VCMC) in its advisory role at a State level, which reports to the Government every 5 years on the condition and management of the State's land and water resources;
- Catchment Management Authorities, providing strategic direction in their respective regions; and
- Many other agencies and groups which also play significant roles in managing the catchments including the Department of Sustainability and Environment, Department of Primary Industries, Parks Victoria, local government and water authorities.

Of particular relevance to the Lake Tai Water Pollution Treatment Project is the role of the CMAs in Catchment management. In total, 10 CMAs have been established across Victoria (See figure below), encompassing vastly different landscapes and communities including urban, temperate rainforest, sculpted coast, open plains, alpine peaks, dryland farming, fruit growing and irrigation country environments.

CMAs act as a key conduit between community and government, especially important in Victoria where more than two-thirds of the



of CMAs is their relationship with the regional communities and ability to engage with key agencies, individuals, groups and business, including the indigenous community. It is this direct community engagement role of CMAs that provides one of the key strengths of the Catchment Management Framework of Victoria.

In essence, the role of the CMA's is to achieve integrated and sustainable catchment management. Each CMA is required to develop and co-ordinate the implementation of the Regional Catchment Strategy (RCS). The RCS provides a vision for the future landscape of the region and identifies priorities, objectives and targets for managing natural assets. Other responsibilities of CMAs include water management, floodplain management, region drainage and more recently, acting as custodians of the Environmental Water Reserve.

The CMAs receive funding through the Victorian Investment Framework (VIF) which is a process which co-ordinates a number of investment programs within the Department of Sustainability and Environment (DSE) and seeks outcomes in natural resources management across Victoria's ten catchment management regions.

Sources:

http://www.dse.vic.gov.au/DSE/nrenlwm.nsf/childdocs/-E9B6826F3AB828F64A2567D7000B1BA6-48703209FEA4392CCA25755100122E15?open

Victorian Catchment Management Council (2007). *Catchment Condition Report 2007.* Victoria, pp4, 6, 10.

Victoria's Catchment Management Authorities (2007). *Celebrating 10 years – Linking Communities and Catchment.* Information courtesy of Victorian Catchment Management Council (2007) Catchment Condition Report.

SCIENCE BASED SUPPORT OF LAKE MANAGEMENT AND IRBM

The Cooperative Research Centre Model

The Minister for Innovation, Industry, Science and Research, Senator Hon Kim Carr, announced funding of $243 million for world class collaborative research and innovation under the Australian Government's Cooperative Research Centres (CRC) Program on 7th August 2009.

The CRC Program provides funding to build critical mass in research ventures between end-users and researchers which tackle clearly-articulated, major challenges that are innovative, of high impact and capable of being effectively deployed by the end-users.

eWater is an example of a CRC which resulted from a merger between two former CRCs – the CRC for Catchment Hydrology and CRC for Freshwater Ecology and a number of other water-focused organisations. The CRCCH and the CRCFE focused on hydrological modelling for catchments and on improving the ecological condition of Australia's inland waters.

Among the valuable outcomes of the CRCCH was the Catchment Modelling Toolkit which eWater now manages and supports.

Meanwhile CRCFE was instrumental in building recognition of the importance of river ecosystems being in healthy condition for the future of Australian water supplies and aquatic biodiversity.

eWater has multi-disciplinary teams that encompass a blend of strategic and applied sciences. The researchers at eWater have built and still maintain a range of hydrologic and ecologic predictive models and decision support systems used by water managers. eWater researchers play key scientific roles in developing environmental flows, river restoration, water sensitive urban design in Melbourne and Brisbane, and ecological and monitoring and assessment programs.

In addition to the research, eWater has developed a range of tools which comprise decision software, guidelines, forecasting models and databases. They are designed to help solve real-world water management problems. There are four main categories which define the purpose of the tools.

- Tools for ecological management, including monitoring and assessment or restoration of freshwater and floodplains;
- Tools for forecasting and managing catchment water yield and quality in variable and changing climates and land uses;
- Tools for integrated management of urban water including water security
- Tools for managing and operating rural river systems.

Sources:http://www.waterquality.crc.org.au/index.html

http://www.ewatercrc.com.au/about/history0508-.html

TECHNICAL MEASURES IN SUPPORT OF IRBM AND LAKE MANAGEMENT

Algal Bloom management
In Gippsland Lakes

GIPPSLAND tourism industry relies heavily on a healthy Lake system and the agricultural industries are heavily dependent on the waters of the rivers running into the Lakes. The prosperity of both depends on water of a high quality. At the Gippsland Lakes in Victoria algal blooms have been recorded, typically in the summer& autumn period, over several different years since the mid 1960s. The blooms have potential to cause significant financial loss to the region, especially through lost tourism. Fish deaths and limits to recreational and commercial use of the Lakes are key concerns.

Over the past 10 years, continued research and on-going projects have been undertaken to bring together the stakeholders responsible for maintaining the Gippsland Lakes in order to prevent further deterioration of the water quality and spread of algal blooms.

An environmental audit of the Lakes was commissioned which suggested that high nutrient inputs from rivers flowing into the Lakes coupled with an altered saline balance was largely responsible for the algal bloom outbreaks. Further to this, a number of different organisations and government departments continued research into the problem of algal blooms in the Gippsland Lake and to find possible solu-

tions. The outcomes include:

- The National Blue-Green Algal Project Working Group which guides research into toxins and potable, recreational and irrigation water; the Murray Darling Basin Commission is researching bloom development factors and ways of minimising algal growth in freshwater.
- The Gippsland Lake Environmental Study used hydrodynamic and bio-geochemical models to simulate the response of the Lakes to a range of scenarios and as an aid to understanding system behaviour. A key result was that the improved health of the Gippsland Lakes would be best achieved through continued improvement in catchment management and nutrient reduction activities across public and private land.
- The Department of Sustainability and Environment and Primary Industries and EPA Victoria are leading major programs for management of nutrients from towns and catchments to improve water quality within the rivers and lakes.
- The Marine and Freshwater Resources Institute (MAFRI), Queenscliff is studying water and chemistry related to blue-green algal growth in Lakes.
- Universities have major programs of investigation into the ecology of Lakes and are developing means to monitor for any signs of excessive algal growth.

Sources:

http://www.gcb.vic.gov.au/gippslandlakes/L6Algal.pdf

http://www.csiro.au/files/mediarelease/mr2000/Lakes.htm

http://www.gippslandlakestaskforce.vic.gov.au/media/meeiareleaselakes_study_MR_final.pdf

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