
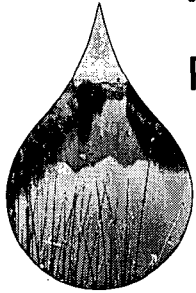


32. Research in Water Reuse

Presenter

Stephen T. Hayashi, Union Sanitary District

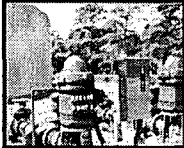
Water Environment
Research Foundation


Research in Water Reuse

Stephen T. Hayashi
Chairman, Board of Directors
Water Environment
Research Foundation

Water Reuse Research Drivers




Non-potable uses
already occurring




Attention
focused on
conserving
and reusing
existing water
sources


Potable reuse will
have to meet
regulatory standards



WERF Reuse Research Areas




Treatment for Reuse



Microbial Detection and Risk Assessment

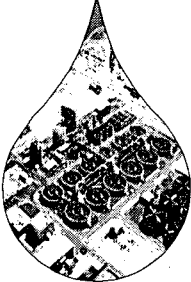
Chemical Contaminants



Communication and Public Outreach

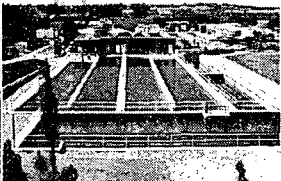
Treatment for Reuse

How can treatment processes be modified or developed to yield water for subsequent reuse?



Treatment for Reuse

Completed Projects



Membrane Bioreactors

Impact of Surface Storage

Treatment for Reuse

Ongoing Projects

Advanced Membrane Treatment



Treatment for Reuse



Developing design standards and guidance on distribution systems

Looking at how these effluents can be used to prevent saltwater intrusion

WERF Reuse Research Areas

Treatment for Reuse



Microbial Detection and Risk Assessment

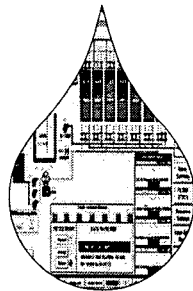
Chemical Contaminants



Communication and Public Outreach

Microbial Detection and Risk Assessment

What new tools can be developed for on-line monitoring of pathogens and indicators?

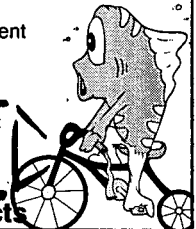


Microbial Detection and Risk Assessment

- PCR/RT-PCR
- Microarrays
- Molecular Beacon
- Microorganism removal and inactivation during water reclamation
- Evaluation of Microbial Risk Assessment Techniques

Ten completed and ongoing projects looking at new molecular detection techniques for use in water and wastewater

Ongoing Projects



Microbial Detection and Risk Assessment

Future research



Continue to focus on the development of analytical tools

WERF Reuse Research Areas

Treatment for Reuse



Microbial Detection and Risk Assessment

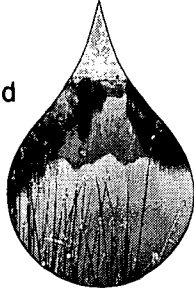
Chemical Contaminants



Communication and Public Outreach

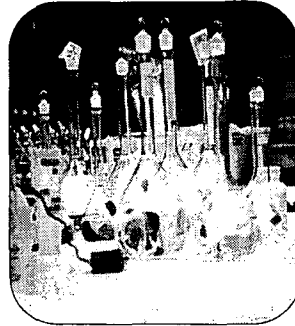
Chemical Contaminants

Are there better tools for measuring or anticipating chemical toxicity in effluent and reclaimed water?



Chemical Contaminants

Ongoing Projects



- *Two projects evaluating effects of endocrine disrupting chemicals and pharmaceuticals in reclaimed water
- *New initiative on developing on-line methods for toxicological monitoring

Chemical Contaminants

Focus on the issue of emerging contaminants such as endocrine disrupting compounds and pharmaceuticals

Future research



WERF Reuse Research Areas

Treatment for Reuse



Microbial Detection and Risk Assessment

Chemical Contaminants



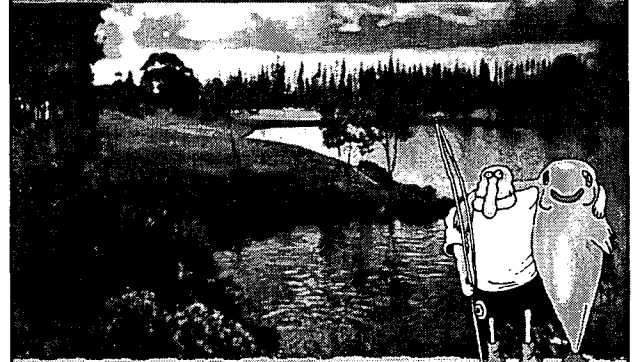
Communication and Public Outreach

Communication and Public Outreach

How do we best synthesize the vast amount of data and information on chemical and microbial constituents



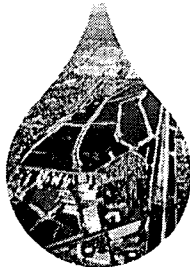
Communication and Public Outreach



Completed Projects

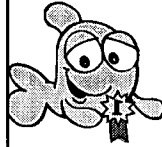
Communication and Public Outreach

What new insights and tools are needed to work effectively with the public? And how can you apply these tools in building a public outreach program?

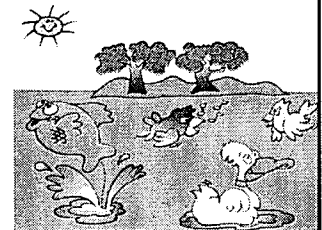


Communication and Public Outreach

Completed Projects



Understanding Public Perception and Participation



Communication and Public Outreach

Future research

Developing and applying the tools needed to implement successful public outreach programs for water reclamation projects



Additional Research is being conducted by the American Water Works Association Research Foundation.

AwwaRF Water Reuse Research

Completed Projects

- Endocrine Disruptors and Pharmaceuticals in Drinking Water
- Soil Treatability Pilot Studies
- Salinity Removal Technologies



AwwaRF Water Reuse Research

Ongoing Projects

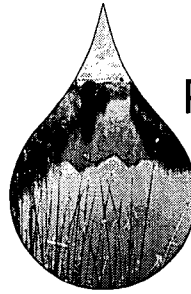
- Assessment of Source and Drinking Waters for EDCs
- Soil-Aquifer Treatment
- Recharge of Deep Aquifers
- Water Quality Requirements for Various Applications of Reclaimed Water
- Characterizing Microbial Water Quality
- Evaluation of Treatment Processes for EDCs and Pharmaceuticals Salinity Contributions in Reclaimed Water Distribution System
- Large-Scale Desalination



AwwaRF Water Reuse Research

Future research

- ◆ The Value of Water
- ◆ Enhancing Communications on Drinking Water Issues
- ◆ Sustainable Water Supply Planning



Research in Water Reuse

執筆者一覧

執筆者	担当部分
【日本側：下水道分野】	
曾小川久貴 (国土交通省都市・地域整備局下水道部長)	Welcome speech (別添5)
藤木 修 (国土交通省都市・地域整備局下水道部流域管理官)	発表論文 2
松原 誠 (国土交通省都市・地域整備局下水道部下水道企画課長補佐)	監修
宮原 茂 (国土交通省国土技術政策総合研究所下水道研究部長)	監修
高橋正宏 (国土交通省国土技術政策総合研究所下水道研究部下水道研究官)	発表論文 10
森田弘昭 (国土交通省国土技術政策総合研究所下水道研究部下水道研究室長)	本編 1～8, 発表論文 7
山下洋正 (国土交通省国土技術政策総合研究所下水道研究部下水処理研究室主任研究官)	発表論文 15
田嶋 淳 (国土交通省国土技術政策総合研究所下水道研究部下水処理研究室主任研究官)	本編 5.2
斎野秀幸 (国土交通省国土技術政策総合研究所下水道研究部下水処理研究室研究官)	本編 5.6, 5.8
山縣弘樹 (国土交通省国土技術政策総合研究所下水道研究部下水道研究室研究官)	本編 5.4, 5.5
鈴木 穰 (独立行政法人土木研究所材料地盤研究グループ上席研究員〔リサイクル〕)	発表論文 30
田中宏明 (独立行政法人土木研究所水循環研究グループ上席研究員〔水質〕)	発表論文 18
佐藤元志 (独立行政法人土木研究所水循環研究グループ招聘研究員〔水質〕)	監修
南山瑞彦 (独立行政法人土木研究所材料地盤研究グループ主任研究員〔リサイクル〕)	本編 5.14
佐々木稔 (独立行政法人土木研究所水循環研究グループ主任研究員〔水質〕)	本編 5.11, 5.12
岡安祐司 (独立行政法人土木研究所水循環研究グループ研究員〔水質〕)	本編 5.9
渡部春樹 (日本下水道事業団技術開発部長)	発表論文 23
竹島 正 (東京都下水道局業務部排水指導課長)	発表論文 26
吉岡 亨 (札幌市下水道局建設部計画課技術開発担当課長)	発表論文 31
【日本側：水道分野】	
谷津龍太郎 (厚生労働省健康局水道課長)	発表論文 1
岸辺和美 (厚生労働省健康局水道課水道水質管理官)	発表論文 4
眞柄泰基 (北海道大学大学院工学研究科教授)	発表論文 6
国包章一 (国立保健医療科学院水道工学部長)	発表論文 9, 17
安藤正典 (国立医薬品食品衛生研究所環境衛生化学部長)	発表論文 12
遠藤卓郎 (国立感染症研究所寄生動物部長)	発表論文 14
林 秀樹 ((財)水道技術研究センター浄水技術部長)	発表論文 22
山崎章三 ((財)日本水道協会特別会員)	発表論文 28
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【米国側】	
Mrs. Sally C. Gutierrez (USEPA 国立リスク管理研究所)	発表論文 3
Dr. James A. Goodrich (USEPA 国立リスク管理研究所)	発表論文 27
Ms. Kathleen Schenck (USEPA 国立リスク管理研究所)	発表論文 19
Dr. Stephen W. Clark (USEPA)	発表論文 21
Dr. Jennifer McLain (USEPA)	発表論文 5
Mr. James F. Manwaring (米国水道協会研究財団)	発表論文 11
Mr. Peter Cook (米国民営水道事業者協会)	発表論文 29
Mr. Jung Choi (フィラデルフィア市水道局)	発表論文 16
Mr. Edmund G. Archuleta (エルパソ市水道公社)	発表論文 13
Mr. Stephen T. Hayashi (ユニオン地区衛生公社)	発表論文 32
Prof. John Thomas Novak (バージニアポリテクニク州立大学)	発表論文 24
Mr. Tyler Richards (ジョージア州ギネット郡公共事業局)	発表論文 8

(役職は2002年10月時点のもの)