CURRICULUM VITAE

DR STEVE JOYNES

Years of experience 33

Dr Steven Joynes owned Hydraulic Modelling Services Ltd for 12 years before selling the business in 2005 and became their consultant until 2008. He is again an independent contractor using the brand name Golovin. The focus of this business is not only hydraulic modelling projects but also training other engineers and surveyors in hydraulic modelling tools and also the methodology required.

Steven has used the Danish Hydraulic Institute software since 1990, especially MIKE11 and then MIKE-FLOOD. However in 2008, after using HEC-RAS occasionally since 2000 moved predominantly to HEC-RAS because of the prohibit maintenance costs. He still uses DHI products when specifically required but HEC-RAS, and HEC-HMS predominates.

Dr Joynes has been summoned as an expert witness to the Environment Court and High Court to assist in the commissioners and judges decisions of a flooding nature. One case created case law on the liability of local councils on flood protection.

Steven started training local engineers in the use of HEC-RAS in 2011. About 60 people have attended this course and over 200 have participated in his other modelling courses.

Dr Joynes has been effectively an independent consultant for 22 years. He has worked for a wide range of clients including local (21) and regional (3) government, many private developers and major consultancies. These have included Waikato Regional Council, Northland Regional Council, Napier District Council, Whangarei District Council, Rodney District Council and Hamilton City Council. Steven was the inaugural Chairman of the Special Interest Group for Modelling in Water New Zealand in 1999

Contact

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KEY EXPERIENCE

- Floodplain and River Modelling
- Feasibility studies for major development work for stormwater disposal,
- Coastal modelling for harbours, port development and hydro-electric schemes.
- State-of-the-art analysis systems using HEC-RAS, HEC-HMS, MIKE11, MOUSE, RMA2, ILSAX, HEC2 and MIKE21.
- Preparation of Modelling Policy Statements

- Peer Reviews
- Training and teaching, HEC-HMS, HEC-RAS, Graduate courses
- Preparation of Stormwater Management Plans,
- Preparation of wastewater management

SPECIALISATION:

- Expert in Hydraulic Modelling
- Stormwater management planning
- Hydraulic analysis
- Hydrology
- Sewer reticulation system analysis
- One-dimensional hydrodynamic modelling of rivers and urban area
- Two-dimensional hydrodynamic modelling of coastal, estuarine and harbour areas
- Client liaison
- Project management
- Public consultation
- Hearings evidence.

EDUCATION AND PROFESSIONAL STATUS

- Bachelor of Science (honours) in Civil Engineering, University of Salford, UK, 1984
- PhD Civil Engineering, University of Salford, UK, 1988
- Diploma in Management Studies, Waikato University, 1997
- Board Member New Zealand Water and Wastes Association, 1994 to 1998

PROFESSIONAL CONTRIBUTION AND ENGAGEMENT

- Written numerous articles for *Water New Zealand* journal
- Attends South Pacific Sewer and Water Modelling Conferences in Australia
- Attends Stormwater Conferences hosted by *Water New Zealand*
- Original co-author of Guidelines for Water Distribution Modelling published by *Water New Zealand*
- Original co-author of Guidelines for Wastewater Modelling published by *Water New Zealand*

WORK EXPERIENCE

Major river and catchment studies

Lower Waikato-Waipa River Control Review, Environment Waikato, 1999-2010 (11 years)

Adopted and enhanced a model of the Lower Waikato Catchment. The river network exceeded 200km and has numerous storage lakes. A full hydrological and hydraulic analysis

was undertaken. The model was calibrated against 5 major flows at 7 gauging stations. It lead to numerous specific studies on swamp control gates, stopbank height checking, dam flow optimization and urban infrastructure design. **KEY WORDS:** *hydrology, flood modelling, consent, MIKE11*

Cross Country Drain, Napier City Council, 1994 – 2012 (18 years)
Performed the hydraulic modelling of the entire open drainage system for the city. The catchment is 3,000ha and includes 40km of open drains, 6 pumps stations, 3 floodgates and over 20 storage pockets. The model was calibrated against historical flood levels. The model was used to design a new diversion drain to the south of the city. The model was optimised by manipulating the pumping mechanisms and storage areas. **KEY WORDS**: *stormwater, resource consent, pump stations, floodplains*

Hikurangi Swamp, Private Client, 2003 – present (14 years)
Hydrological and hydraulic analysis of a major flood protection scheme. A land-owner disputed the local councils proposed solution and I helped him prove them wrong and we won the court case that followed. The catchment is 560km^2 and consists of 5 major tributaries and a storage swamp. Total length of river modelled was 35km. The storage swamp consists of 7 pockets designed to overflow at 5-year return periods. The model was fuly calibrated with 7 major flood events. The preparation of a Modelling Policy Statement for about 25 diverse catchments. **KEY WORDS:** *flood modelling, consent, modelling policy statement*

Kerikeri River Peer Review – Northland Regional Council, 2015
At the commissioners hearing there was doubt to the accuracy of the flood levels envisaged by a major river diversion. I was asked to peer review the modelling from 1st principles. A number of recommendation were made to improve the outcome. The catchment is over 100km2 and the river system in excess of 40km. **KEY WORDS:** *flood modelling, consent, peer review*

Risk Reduction Project, Northland Regional Council, 2009
The preparation of a Modelling Policy Statement for about 25 diverse catchments. I was asked to prepare the full modelling methodology to enable the client to tender the work accurately and comprehensively. This work included hydrology assessment of 70 years of rainfall data, the discretization of the 2D floodplain components and the survey specification. **KEY WORDS:** *flood modelling, 2D floodplains, modelling policy statement*

Recent - Project Management, Peer Review, Resource Consent Focus

Lake End-use Plan – confidential, 2013
Hydraulic analysis of stream and old mine crater to create a pond, bund design and overflow dimensions

Flooding Dispute – confidential, ongoing, 2013
Legal case defending a client who has been sued for caused neighbor flooding

2D Model Review – Samoa Water Board, 2011
Reviewed the modeling of a major flood mitigation project in Apia with numerous overland flowpaths **KEY WORDS:***, 2D modelling, urban flood modelling, peer review*

Structure Plan Development, Franklin District Council, 2011
The preparation of a Modelling Policy Statement for a major land-use change in Pukekohe. **KEY WORDS:***, modelling policy statement, urban flood modelling*

Waiuku Integrated Catchment Management Plan, Franklin District Council, 2010
The modelling of the urban and semi-urban area of Waiuku. Modelled all drains and pipes. Developed remediation options. **KEY WORDS:***, Urban flood modelling, land-use change effects, Mike-Urban.*

Numerous Stormwater Discharge Consents, Waikato Region, 2009-2010
Undertaken 4 minor stormwater consent studies for local surveyors and engineers. **KEY WORDS:** *catchment modelling, peer review, consent*

Kerikeri Stormwater Management Plan, Far North District Council, 2009-2010
Peer Review of a major stream and river network in a 630km2 catchment. Observed fatal flaws in the modelling that would compromise Council future planning. **KEY WORDS:** *flood modelling, peer review, catchment analysis, MIKE11, Mike-Urban*

Rotorua Wastewater System, Rotorua District Council, 2010
Peer review of Rotorua's sewer system modelling contract undertaken by a major consultancy. **KEY WORDS***: wastewater modelling, peer review, Infoworks CS*

Risk Reduction Project, Northland Regional Council, 2009
The preparation of a Modelling Policy Statement for about 25 diverse catchments. **KEY WORDS:** *flood modelling, consent, modelling policy statement*

Hingaia Stream Integrated Catchment Management Plan, Papakura District Council, 2009
The preparation of a Modelling Policy Statement for rural/urban catchment. **KEY WORDS:** *flood modelling, consent, modelling policy statement*

Peacockes Road Wastewater Study, Hamilton City Council, 2009
The preparation of a Modelling Policy Statement for an urban catchment going through major new developments. **KEY WORDS:** *wastewater modelling, design, modelling policy statement*

LWWCS Review, Environment Waikato, 1999-2010
Undertaking modelling review of the scheme. **KEY WORDS:** *hydrology, flood modelling, consent, MIKE11*

Long Term (within past 15 years) - General Hydraulic Modelling – usually leading to a resource consent application

Anns Creek Stormwater Consent, Auckland, Private Developer, 2008-2012
Preparation of stormwater model to examine impact of land development. Presents evidence at Council hearing. **KEY WORDS:** *stormwater modelling, consent hearing, Mike-Urban*

Cross Country Drain, Napier City Council, ongoing since 1994

Stanmore Bay Stormwater Modelling, - Rodney District Council, 2003-2007
Preparation of stormwater models using MOUSE and producing upgrade options. **KEY WORDS:** *hydrology, flood modelling, consent, MOUSE*

Orewa CBD Stormwater Modelling, - Rodney District Council, 2003-2008

Preparation of stormwater models using MOUSE and producing upgrade options. **KEY WORDS**: *hydrology, flood modelling, consent, MOUSE*

Patumahoe Stormwater Management Plan, Franklin District Council, 2004

Preparation of stormwater management plan for large rural town. Includes modelling, water quality, surveying, upgrading works. **KEY WORDS:** *hydrology, flood modelling, consent, MOUSE.*

Contract Work, Waipa District Council, 2003
Stood in for Steven Cornelius to assist and organise stormwater and modeling work as required for 2 days per week. Contract lasted about 5 months.

Waiuku Stormwater Management Plan, Franklin District Council, 2000

Preparation of stormwater management plan for large rural town. Includes modelling, water quality, surveying, upgrading works. **KEY WORDS:** *hydrology, flood modelling, consent, MOUSE.*

Marsden Power Station Stormwater Consent, ECNZ, 1999

Completion of necessary investigation to prepare AEE and consent application for stormwater and circulating waters to ocean environment. **KEY WORDS**: *stormwater, discharge consent*

Kyle Orwell Stormwater Management Plan, North Shore City Council, 1999

Preparation of a stormwater management plan to implement possible Low Impact strategies to reduce capital works and environmental impacts. **KEY WORDS**: *stormwater, ILSAX,*

Kiripaka Rd Culvert, Whangarei District Council, 1999

Flood modelling analysis to examine flow restrictions at a culvert and assess impacts of development. **KEY WORDS**: *stormwater, MIKE11,*

Darwin Harbour – East Arm Development, NT Govt, 1998
Updated a 2-D model of the harbour to examine the impact of locating a jetty on current flows. This required calibration work and used **RMA2**. **KEY WORDS**: *sediment transport, 2-D harbour modelling,*

Sydney 2000 Olympic Village, SOCOG, 1998
Part of the team to design the infrastructure for 3000 lot Olympic Village. The works include the design of the stormwater system, **MOUSE** modelling of the sewer system. Design had to

be done to cope with 10,500 people during Olympic mode and the long term requirements of 6,000 people post-Olympics. **KEY WORDS**: *stormwater, wastewater*

Pukekohe CBD Stormwater Study, Franklin District Council, 1997-98
Surveyed and analysed the stormwater system within the towns CBD. Also project managed CCTV work. Produced a **MOUSE** model of the system to identify areas of upgrading for asset management plans. **KEY WORDS**: *stormwater, CCTV, survey,*

Harrison's Cut Stormwater Management, Tauranga District Council, 1998
Developed a **MIKE11** hydraulic model to examine flooding problems for a discharge point. Work included measuring stormwater quality to assess newly urbanised subdivisions. Resource Consent report produced to lodge with Environment Bay of Plenty. **KEY WORDS**: *stormwater, survey, resource consent, consultation, floodplains, water quality*

Bay View Catchment, Napier City Council, 1998
Developed a hydraulic model using **MIKE11** to optimise the pump station and open drainage system for future housing. The catchment is 1,100ha, 10km of open drains, 2 pumps stations and about 5 storage pockets. 3 storm durations for 3 return periods were modelled to establish the critical storm conditions for various parts of the catchment. **KEY WORDS**: *stormwater, pump stations, floodplains*

Porirua Stream, Wellington City Council, 1997
Re-examined the hydrology for a trouble-some stream. Developed a 3 phase rainfall model to account for differential cloudburst for a major storm. Used a **MIKE11** model to then calibrate the storms against known floodplain levels. Used model as predictive tool for future stopbank works. Catchment is 2,000ha, the stream length is 10km. **KEY WORDS**: *stormwater, floodplains, river engineering*

Papamoa Main Drain, Various clients, 1997-98
Produced a comprehensive hydraulic model for a 13.5km drain with a catchment of 1,340ha. The **MIKE11** model had over 40 subcatchments, 4 control gates, culverts, an outfall and a weir outlet. The 3, 6, 12, 24 and 48 hours storms were modelled for the 10 and 50 year return periods. **KEY WORDS**: *stormwater, survey, quality pond sizing, resource consent, consultation, floodplains, water quality*

Pouarua-Moukoro Drain, Hauraki District Council, 1997
Modelled the effects of pumping regimes for various flood scenarios on flat open drains. Included 3 pumps and 4 stopbank gate structures. A MIKE11 model was used. **KEY WORDS**: *stormwater, pump stations, floodplains, river engineering*

Rewarewa Catchment and Margan Ave Ponds, Waitakere City Council, 1997
Produced a catchment management report on a 350ha area in New Lynn. Report used to determine the long-term approach to stormwater management for undersized culverts, a major storage pond and on-going changes in land-use. The analysis was undertaken using a MIKE11 model. **KEY WORDS**: *stormwater, survey, quality pond sizing, floodplains, water quality*