

Peter Hill

Senior Associate
Senior Hydrologist

Qualifications

- Master of Engineering Science (Civil), University of Adelaide 1993
- Bachelor of Engineering, (Civil) (Hons.), University of Adelaide, 1991

Affiliations

- Member, Engineers Australia, CPEng
- Member, Australian Water Association
- Member of International Water Association

Professional Activities

- Member Engineers Australia's National Committee on Water Engineering
- Committee member for revision of ANCOLD Guidelines on Assessment of the Consequences of Dam Failure
- Convenor for ANCOLD Acceptable Flood Capacity Guidelines
- Past Chairman, Victorian Water Eng. Branch, Engineers Australia

Fields of Special Competence

- Flood hydrology
- Dam safety risk assessment
- Environmental hydrology

Awards

- Project Manager of the "Spatial Query Tool for Statewide Estimates of Water Use for Key Land Use Types" winner of the 5th Annual Victorian Spatial Excellence Awards 2009 Environment and Sustainability Award
- Co-author of paper which received the Sternbeck Medal for the best paper at the joint NSW and Victorian Flood Management Conference – Albury Wodonga 16 – 20 February 2009
- Project Manager for winning project AWA SA Water Award 2002 in categories of Water, Environment and Society and also Studies, Plans and Investigations and winner SA Australian Planning Institute Award for Environment 2003
- 2001 ACEA Future Leaders Award - Silver Award of Highly Commended
- Best presentation – Water 99 Joint Congress - 25th Hydrology and Water Resources Symposium, Brisbane, July 1999
- Best presentation – Hydrology and Water Resources Symposium, Hobart, 1996
- Best Student or recent graduate surface water paper presentation Water Down Under '94 Adelaide 21-25 November 1994
- AWWA's Inaugural HJN Hodgson Award for excellence on water related studies by undergraduate students, December 1991



Relevant experience

SINCLAIR KNIGHT MERZ, Australia

October 1996 to current

Dam Safety Risk Assessment

- Application of CRC-FORGE method for deriving design rainfalls (NSW)
- Hydrology study for Myponga Dam (SA)
- Peer Review of Wyaralong Flood Hydrology Study (Qld)
- Construction flood risk assessment for William Hovell Dam (Vic.)
- Comparative analysis of dam safety regulation frameworks (Vic.)
- Detailed hydrology, dambreak modelling and consequence assessment for Scrivener Dam (Lake Burley Griffin) (ACT)
- Hume Dam hydrology assurance review (NSW)
- Peer review of Blue Rock hydrology (Vic.)
- Hydrology and construction flood risk for Toorourrong Dam (Vic)
- Hydrology and construction flood risk for Tarrago Dam (Vic)
- Detailed hydrology, dambreak modelling and consequence assessment for McKay Dam (Vic.)
- Peer review of dambreak modelling and consequence assessment for Tillegra Dam (NSW)
- Detailed hydrology study for Middle River Dam (SA).
- Seasonal construction flood risk for Blowering Dam (NSW)
- Seasonal construction flood risk for Laanecoorie Dam (Vic)
- Dambreak modelling and consequence assessment for Upper Coliban, Lauriston and Malmsbury Dams (Vic).
- Detailed hydrology study for Bundaleer, Barossa and Warren Dams (SA).
- Development of guidelines and state-wide database for statement of obligations reporting on dam safety risks (Vic.)
- Modelling flood operation of Eildon spillway gates for different surcharge conditions (Vic.)
- Extreme flood hydrology for Googong Dam (ACT)
- Detailed flood hydrology for upgrade of Hinze Dam (Qld.)
- Extreme flood hydrology for Corrin, Cotter and Bendora Dams including joint probability initial reservoir level in cascade of correlated storages (ACT)
- Extreme flood hydrology for Tallowa Dam (NSW)
- Hydraulic modelling of Keepit Reservoir to determine velocities upstream of proposed auxiliary spillways (NSW)
- Review of ANCOLD Hazard Category for 6 dams for Wannon Water (Vic.)
- Dambreak modelling and risk assessment for Sunday Creek Reservoir (Vic.)
- Peer review of Meander Dam Hydrology Study (Tas.)
- Detailed review of hydrology for Upper Coliban, Malmsbury and Lauriston Reservoirs including accounting for correlated initial drawdowns and gate failure scenarios (Vic.)
- Preliminary risk investigation for Montpellier No.2 Dam (Vic.)
- Assessment of conceptual upgrade options for Painkalac Dam (Vic.)
- Review of statement of obligations from water authorities for Department of Sustainability and Environment (Vic.)

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- Estimation of construction flood risks for Ross River (Qld).
- Review of flood surcharge levels for Eildon Dam (Vic.)
- Application of Risk Analysis Prioritisation Tool to Central Highland Water's portfolio of dams (Vic.)
- Estimation of potential loss of life and economic consequences for Millbrook and Kangaroo Creek Dams (SA)
- Assessing issues relating to gate operation and reservoir surcharge for Goulburn-Murray Water (Vic.)
- Application of Risk Analysis Prioritisation Tool to Coliban Water's portfolio of dams (Vic.)
- Detailed review of hydrology and estimation of Probable Maximum Flood for Kangaroo Creek Dam (SA)
- Review of hydrology and dambreak modelling for Laanecoorie Dam (Vic.)
- Review of hydrology and dambreak modelling for William Hovell Dam (Vic.)
- Development of Portfolio Risk Analysis Tool for Barwon Water (Vic.)
- Hydraulic modelling and inundation mapping upstream and downstream of Cairn Curran Dam for spillway upgrade options (Vic.)
- Provision of hydrologic inputs to upgrade of Eildon Dam (Vic.)
- Specialist hydrology input to Ross River Dam Stages 2 to 5 Upgrade Study (Qld.)
- Tender evaluation panel member for Ross River Dam Stages 2 to 5 Upgrade Study (Qld.)
- Assessment of downstream impact of Dartmouth Regulation Pond for Southern Hydro (Vic.)
- Review of hydrology and estimation of Probable Maximum Flood for Little Para Dam (SA)
- Review of Barwon Water Business Risk Analysis in light of ANCOLD Risk Guidelines (Vic.)
- Review of hydrology and estimation of Probable Maximum Flood for Nillahcootie Dam (Vic.)
- Detailed review of hydrology for Cairn Curran Dam (Vic.)
- Hazard assessment and assessment of acceptable flood capacity for Dartmouth Slimes Dam (Vic.)
- Modelling cascade failure of Talbingo, Jounama and Blowering Dams (NSW)
- Detailed review of hydrology for Millbrook Dam (SA)
- Hydraulic modelling and inundation mapping to assess the downstream impacts of final upgrade options for Keepit Dam for State Water (NSW).
- Estimation of the flood risk at Cairn Curran Dam during upgrade of filters. (Vic.)
- Review of hydrology and dambreak modelling for Tullaroop Dam (Vic.)
- Detailed review of hydrology for Dartmouth Dam (Vic.)
- Review of hydrology using a Monte-Carlo flood estimation approach, event tree modelling and risk analyses for the Ross River Upgrade Project (Qld.)
- Review of hydrology of Dartmouth Slimes Dam (Vic.)
- Hydraulic modelling and inundation mapping to assess the downstream impacts of interim upgrade options for Keepit Dam for State Water (NSW).
- Review of spillway adequacy, dambreak modelling and consequence assessment for Moondara and Pine Gully Dams for Gippsland Water (Vic.)
- Review of hydrology and first order risk analysis for Millbrook Dam for SA Water (SA).
- Developed upgrade options to provide additional flood capacity for Cairn Curran Dam for Goulburn Murray Water (Vic.)
- Detailed risk investigations for 10 dams for Central Highland Water (Vic.)(refer Civil Engineers Australia, April 2001)



- Assessment of consequence of failure for Blowering, Split Rock, Keepit and Burrinjuck dams including damage to infrastructure, agriculture, potential loss of life and qualitative assessment of damage to the environment. (NSW)
- Application of the CRC-FORGE method of estimating extreme design rainfalls to South-Australia (SA)
- Review of hydrology and dambreak modelling of all 17 of SA Water Corporations large dams as part of a portfolio risk assessment (SA)
- Event tree modelling and risk analysis as part of the portfolio risk analysis for South-East Queensland Water Board (Qld.)
- Review of hydrologic risk, dambreak analyses and preparation of inundation maps for Eppalock, Eildon, Cairn Curran and Nillahcootie dams (Vic.)
- Expert input on event tree modelling for Portfolio Risk Assessment for HEC (Tas.)
- Hydrologic and hydraulic modelling of impact of fuse plug spillway for Keepit Dam on incremental flooding in the Peel River (NSW).
- Dambreak modelling for Blowering Dam including the cascade failure of Talbingo and Jounama dams (NSW)
- Dambreak modelling for Dartmouth Dam as part of the Hume-Dartmouth Risk Analysis (NSW)
- Detailed review of hydrologic risk for Brogo Dam (NSW)
- Hydrologic inputs for Dartmouth and Hume Dam risk analysis. (Vic.)
- Detailed review of hydrologic risk for Rocky Valley Dam incorporating joint probability of inflows and initial reservoir levels and the impact of snowmelt (Vic.)
- Dambreak modelling of Rocky Valley Dam (Vic.)
- Portfolio evaluation of hydrologic risk for Goulburn-Murray Water (Vic.)
- Preliminary review of hydrologic risk and dambreak modelling of the dams in the Kiewa Hydro scheme (Vic.)
- Review of spillway adequacy for the Snowy Scheme (NSW)
- Review of hydrology, dambreak modelling and assessment of potential loss of life for Sunday Creek Dam. (Vic.)

Hydrology

- Peer review of Melbourne Water's Flood Risk Assessment Framework (Vic)
- Australian Rainfall and Runoff Update Project 7 - Baseflow for Catchment Simulation
- Development of flood forecasting tool for the Gippsland Lakes (Vic)
- Identification of Hydrologic Impact Zones based upon assessment of current hydrologic stress and impact of land use change (Vic.)
- Baseline assessment of intercepting activities across Australia for NWC
- Comparison of evapotranspiration estimates from CAT and Soilflux models for Corrangamite and Gippsland regions (Vic)
- Hydrologic impact of 2006/07 bushfires on streamflow yield (Vic.)
- State-wide assessment of the impact of land use change on streamflow yields involving modelling the evapotranspiration of key vegetations types across Victoria. (Vic.)
- Seasonal forecasting of Victorian streamflow using regionally based climate indices (Vic.)
- Water Resource Assessment for the Murray Darling Basin modelling impact of future climate and landuse on streamflow yield – collaborative project with CSIRO and winner of CSIRO's 2009 Chairman's Award.

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- Collation of water resource information for assessing bushfire risk (Vic.)
- Literature review of the impact of logging on in-stream water quality for the Melbourne Water Supply Catchments (Vic.)
- Hydrologic impact of 2003 Alpine bushfires as part of DSE's Bushfire Recovery Project – in conjunction with University of Melbourne and CSIRO (Vic.)
- Modelling impact of low flow bypasses on farm dams for the Onkaparinga River Catchment (SA).
- Land use Planning and Environmental Water Provisions for the Onkaparinga River Catchment (SA).
- Impact of landuse change on water quality and quantity in south-western Victoria and south-eastern South Australia (Vic & SA)
- Determination of the impact of forest management on streamflow yield and water quality for the Otway Ranges (Vic)
- Determination of Environmental Water Requirements for the Onkaparinga Catchment - winner AWA SA Water Award 2002 in categories of Water, Environment and Society and also Studies, Plans and Investigations and winner SA Australian Planning Institute Award for Environment 2003, Highly commended Engineers Australia's SA Division 2003 Engineering Excellence Awards (SA).
- Salt and Water Balance Study of the Avon-Richardson Catchment (Vic)
- Preparation of the flood component of the Catchment Plan for the Northern Adelaide and Barossa Catchment Water Management Board (SA)
- Development of a method to assess low flow homogeneity in the Hawkesbury Nepean Catchment (NSW)
- Development of a method to estimate yield for ungauged catchments in Victoria in order to determine the impact of farm dams (Vic)
- Assessment of the impact of forest management on water quality and quantity in 3 regional forest agreement regions (NSW)
- Floodplain management study of the Avon-Richardson Catchment (Vic)
- Analysis of low flow hydrology of the Hawkesbury Nepean River System as part of a study of environmental flows (NSW)
- Environmental Assessment of the Wannon River (Vic)

Cooperative Research Centre for Catchment Hydrology, Monash University

April 1993 to October 1996

Research Assistant and then Project Leader

- managed research project on loss modelling for flood estimation
- published 4 papers and 7 research reports
- reported to reference and review panels
- supervised a team of several research staff including joint supervision of a M.Eng.Sc. (research) student
- presented a number of seminars and organised 2 workshops on yield modelling
- undertook research on loss modelling and real-time flood forecasting



Sample Papers

- Hill, P.I.**, Murphy, R.E., Daamen, C., Williams, K., Moran, R., Berg, S. (2009) Statewide estimates of water use for key land use types. *32nd Engineers Australia Hydrology and Water Resources Symposium*
- Mannik, R.D, **Hill, P.I.**, Murphy, R.E., Herron, A., Moran, R (2009) Estimating the change in streamflow resulting from the 2003 and 2006/07 bushfires in south eastern Australia. *32nd Engineers Australia Hydrology and Water Resources Symposium*
- Murphy, R.E., **Hill, P.I.**, Grace, D., Bell, A.B., Day, G. Moran, R. (2009) Implications of climate change on changes in evapotranspiration resulting from afforestation in North Eastern Victoria *32nd Engineers Australia Hydrology and Water Resources Symposium*
- A.E. Smith. A.E., Hossain, A., **Hill, P.I.** (2009) Flood Risk to People – Towards a framework for incorporating life safety risk in Australian floodplain management. *Joint NSW and Victorian Flood Management Conference – Albury Wodonga 16 – 20 February 2009*
- Westra, S., Varley, I., Jordan, P.W., **Hill, P.I.**, Ladson, A.R. (2009) Recent Developments in Climate Science: Implications for Flood Guidelines, *Joint NSW and Victorian Flood Management Conference – Albury Wodonga 16 – 20 February 2009*
- Hill, P.I.**, Jordan, P.W., Nathan, R.J., Payne, E. (2008) Estimating Construction Flood Risk. *2008 ANCOLD Conference on Dams*. Gold Coast November 2008
- Hill, P.I.**, Mordue, A. Nathan, R.J., Daamen, C.C., William, K., Murphy, R.E. (2008) Modelling the Hydrologic Response of Bushfires at the Catchment Scale. *Australian Journal of Water Resources Vol 12. No. 3 and Water Down Under 2008 (incorporating 31st Engineers Australia Hydrology and Water Resources Symposium)*. pp1472-1480.
- Jordan, P.W., Wiesenfeld, C.R., **Hill, P.I.**, Morden, R.A., Chiew F.H.S. (2008) An assessment of the future impact of farm dams on runoff in the Murray Darling Basin, Australia. *Water Down Under 2008 (incorporating 31st Engineers Australia Hydrology and Water Resources Symposium)*. pp1618-1629.
- Sih, K., **Hill, P.I.**, Nathan, R.J., (2008) Evaluation of simple approaches to incorporating variability in design temporal patterns. *Water Down Under 2008 (incorporating 31st Engineers Australia Hydrology and Water Resources Symposium)*. pp1049 -1059.
- Hill, P.I.**, McDonald, L Payne, E. (2007) Incremental consequences of dam failure and the ANCOLD hazard classification system. *2007 NZSOLD/ANCOLD Conference on Dams*. Christchurch November 2007
- Mittiga, L. Nathan, R.J., **Hill, P.I.**, Weinmann, P.E. (2007) Treatment of Correlated Cascade Drawdown and Uncertainty in the Flood Hydrology for Dams. *Australian Journal of Water Resources Vol 11 No. 2*. pp169-176
- Hill, P.I.**, Nathan, R.J., Jordan, P.W. (2006) Development and Application of a Risk Analysis and Prioritisation Tool (RAPT) for Dam Safety Management. *2006 ANCOLD Conference on Dams*. Sydney November 2006
- Jordan, P.W., **Hill, P.I.** (2006) Use of radar rainfall data to improve calibration of rainfall runoff routing model parameters. *Australian Journal of Water Resources Vol 10 No. 2*. pp139-149
- Jordan, P.W., Murphy, R., **Hill, P.I.**, Nathan, R.J., (2006) Seasonal Response of Catchment Runoff to Forest Age. *30th Engineers Australia Hydrology and Water Resources Symposium*. Launceston December 2006
- Hill, P.I.**, Sih, K., Nathan, R.J., Jordan, P.W. (2006) The Extremes of Tropical Hydrology. *ANCOLD Bulletin Issue No. 133 August 2006 and 2005 ANCOLD Conference on Dams 21-22 November 2005 Fremantle*.
- Jordan, P.W., **Hill, P.I.** (2005) Use of radar rainfall data to improve calibration of rainfall runoff routing model parameters. *29th Hydrology and Water Resources Symposium 21-23 February 2005, Canberra*.
- Gatti, S., **Hill, P.I.**, Griffith, H., Smith, S. (2004) Where's the water going to come from? Environmental flows for the Onkaparinga River and estuary. *2004 River Symposium Brisbane, 2004*.



- Hill, P.I.**, Bowles, D., Jordan, P., Nathan, R.J. (2004) Estimating Overall Risk of Dam Failure: Practical Considerations in Combining Failure Probabilities. *ANCOLD Bulletin* No. 127 pp 63-72
- Hill, P.I.**, Griffith, H., Shirley, M., Fleming, N.S., Abernethy, B., Gatti, S. (2003) Developing Options for Providing Water for the Environment in the Onkaparinga River Catchment. *28th International Hydrology and Water Resources Symposium*, 10 - 14 November 2003, Wollongong, NSW. Pp2.73-2.80
- Mannix, A.E., Nathan, R.J., **Hill, P.I.** (2003) Application of Quantitative Risk Analysis to Floodplain Management *28th International Hydrology and Water Resources Symposium*, 10 - 14 November 2003, Wollongong, NSW. pp3.195-3.202
- Daamen, C.C., Clifton, C., **Hill, P.I.**, Ryan, H., Nathan, R.J. (2003) Modelling the impact of landuse change on regional hydrology. *28th International Hydrology and Water Resources Symposium*, 10 - 14 November 2003, Wollongong, NSW. pp2.169 - 2.176
- Nathan, R.J., Weinmann, P.E., **Hill, P.I.** (2003) Use of a Monte-Carlo Simulation to estimate the Expected Probability of Large to Extreme Floods *28th International Hydrology and Water Resources Symposium*, 10 - 14 November 2003, Wollongong, NSW. pp1.105 - 1.112
- Nathan, R.J., Weinmann, P.E., **Hill, P.I.** (2002) Use of a Monte Carlo Framework to Characterise Hydrologic Risk. *ANCOLD 2002 Conference on Dams*. 19-25 October 2002 Glenelg, Adelaide South Australia. pp 53-62.
- Shirley, M., **Hill, P.I.**, Hannon, S., Abernethy, B., Griffith, H., Gatti, S. (2002) Water for the Environment? Providing Environmental Flows in the Onkaparinga River. *ANCOLD 2002 Conference on Dams*. 19-25 October 2002 Glenelg, Adelaide South Australia. pp 39 - 50.
- Hill, P.I.**, Bowles, D., Nathan, R.J., Herweynen, R. (2001) On the Art of Event Tree Modelling for Portfolio Risk Analyses. *NZSOLD/ANCOLD Conference on Dams*. Auckland, NZ November 2001.
- Nathan, R.J., **Hill, P.I.**, Griffith, H. (2001) Risk Implications of the PMF and PMP Design Flood. *NZSOLD/ANCOLD Conference on Dams*. Auckland, NZ November 2001.
- Daamen, C.C., **Hill, P.I.**, Munday, S.C., Nathan, R.J., Cornish, P.M. (2001) Assessment of the Impact of Forest Logging on Water Quantity in the Otway Ranges, *MODSIM November 2001*.
- Hill, P.I.**, Cook, D., Nathan, R.J., Crowe, P., Green, J., Mayo, N., (2001) Development of a Comprehensive Approach to Consequence Assessment. *ANCOLD Bulletin* Issue No. 117 April 2001 pp33 - 46.
- Hill, P.I.**, Rahman, A., Nathan, R.J., Lee, B.C., Weinmann, P.E. (2000) Estimating design rainfalls for South Australia using the CRC-FORGE method. *3rd International Hydrology and Water Resources Symposium*, Perth, 2000.
- Nathan, R.J., **Hill, P.I.**, Nandakumar, N., Croke, J., Hairsine, P., Vertessy, R., Cornish, P. (2000), Assessment of the Impact of Forest Logging on Water Quantity and Quality. *Xth World Water Congress*, Melbourne, 12-17th March 2000.
- Crowe, P.A., Nathan, R.J., **Hill, P.I.** (2000) Development of Prediction Equations for Estimating Catchment Yield from Farm Dams. *Xth World Water Congress*, Melbourne, 12-17th March 2000.
- Hill, P.I.**, Nathan, R.J., Weinmann, P.E., and Green, J.A.H. (2000): Improved estimates of hydrologic risks for dams - impacts of the new flood guidelines. *ANCOLD Bulletin* 114: 49-58.
- Hill, P.I.**, Nathan, R.J., Weinmann, P.E., Green, J., Karunaratne, T. (1999) Impact of the revised flood guidelines on the assessment of hydrologic risk for selected catchments. *Water 99 Joint Congress - 25th Hydrology and Water Resources Symposium, Brisbane, July 1999*, Vol. 1 pp 277-283.
- Nathan, R.J., Crowe, P., **Hill, P.I.**, Green, J., (1999) A quick method for estimating Probable Maximum Precipitation in the Tropical and South-east Regions of Australia. *Water 99 Joint Congress - 25th Hydrology and Water Resources Symposium, Brisbane, July 1999*, Vol. 2 pp 703-708.
- Green, J., **Hill, P.I.**, (1998) Developments in Extreme Flood Estimation Techniques - Hume Dam a Case Study. *ANCOLD - NZSOLD 1998 Conference on Dams, Sydney September 1998*.
- Hill, P.I.**, Mein, R.G., Siriwardena, L., (1997) *How Much Rainfall becomes Runoff? - Loss Modelling for Flood Estimation*. CRC for Catchment Hydrology Industry Report. Report 98/5 - June 1998.



- Hill, P.I.**, Mein, R.G., Weinmann, P.E., (1997) Development and Testing of New Design Losses for South-Eastern Australia. *24th Hydrology and Water Resources Symposium Auckland 1997*.
- Boughton, W.C. **Hill, P.I.**, (1997) *A Design Flood Estimation Procedure using Data Generation and a Daily Water Balance Model*. CRC for Catchment Hydrology. Report 97/8.
- Siriwardena, L., **Hill, P.I.**, Mein, R.G., (1997) *Investigation of a Variable Proportional Loss Model for use in Flood Estimation*. CRC for Catchment Hydrology. Report 97/3.
- Hill, P.I.**, Mein, R.G., Weinmann, P.E., (1997) Towards Reducing the Uncertainty in Design Flood Estimation. *Water - Journal Australian Water and Wastewater Association*. March/April 1997.
- Hill, P.I.**, Maheepala, U., Mein, R.G., Weinmann, E., (1996) *Empirical Analysis of Data to Derive Losses for Design Flood Estimation in South-Eastern Australia*. CRC for Catchment Hydrology. Report 96/5 October.
- Hill, P.I.**, Mein, R.G., Weinmann, E., (1996) *Testing of Improved Inputs for Design Flood Estimation in South-Eastern Australia*. CRC for Catchment Hydrology. Report 96/6. October.
- Hill, P.I.**, Mein, R.G., (1996) Incompatibilities between Storm Temporal Patterns and Losses for Design Flood Estimation, *Hydrology and Water Resources Symposium, Hobart*, I.E.Aust. Nat. Conf. Pub. No. 96/05 pp 445-451.
- Hill, P.I.**, Daniell, T.M., (1994) Extreme Flood Estimation - Guesses at Big Floods? *Water Down Under '94 Adelaide, Australia, 21-25 November 1994*. I.E.Aust. Nat. Conf. Pub. No. 94/15 pp 193-198.
- Hill, P.I.**, Fleming, N.S., Daniell, T.M., (1993) How Bad is your RORB Modelling? Sensitivity Fitting - An Innovation! *Proceedings of the International Conference on Environmental Management, Geo-Water and Engineering Aspects*, Wollongong NSW, 8-11 February 1993. A.A.Balkema, Rotterdam. pp 431-440.