

Curriculum Vitae

Alfred Jayakar Kalyanapu, PhD
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Professor
Department of Civil & Environmental Engineering
Tennessee Tech University
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Education

NIT, Warangal, India	Civil Engineering	B.Tech, 2003
The University of Utah	Civil Engineering	MS, 2007
The University of Utah	Civil and Environmental Engineering	PhD, 2011

Research Areas

- Computational Hydraulics & Hydrology
- Hydraulic/Hydrologic Modeling
- Low-cost solutions hydrologic monitoring
- Urban Water Management
- Regional Scale Flood Modeling & Simulation
- GIS Applications in Water Resources Engineering
- AI/ML applications in Water Resources Engineering

Professional Experience

Professor (2023 – present)

Department of Civil and Environmental Engineering, Tennessee Tech University
Cookeville, TN.

Interim Co-Director (2022 – present)

Center for the Management, Utilization and Protection of Water Resources, Tennessee Tech University, Cookeville, TN.

Associate Professor (2017 – present)

Department of Civil and Environmental Engineering, Tennessee Tech University
Cookeville, TN.

Assistant Professor (2011 – 2017)

Department of Civil and Environmental Engineering, Tennessee Tech University
Cookeville, TN.

Research Collaborator (2009 – 2011)

Scientific Computing and Imaging (SCI) Institute, NVIDIA Center for Excellence
University of Utah, Salt Lake City, UT

Research Activities: Graphics Processor Unit (GPU) CUDA, C++ programming, High Performance Computing, Real-time Flood Modeling and Simulation, Visualization, Hydraulic Modeling.

Graduate Research Assistant (2004 – 2011)

Department of Civil and Environmental Engineering, University of Utah, Salt Lake City, UT

Research Projects:

Flood Modeling and Uncertainty Analysis: PhD Dissertation

GPU programming using CUDA and OpenGL, Real-time Flood Modeling and Simulation using C++, MATLAB & ArcGIS.

Integrated Flood Modeling Framework: Project funded by Los Alamos National Laboratory. Masters Research – Numeric Hydrologic Modeling
Developed numeric based 1D Distributed Hydrologic model. Using VB.NET to integrate hydrologic model output into flood modeling framework. Performed floodplain mapping using this framework.

Dolores River Floodplain Mapping: Project funded by University of Utah.

100 yr Floodplain mapping. Hydraulic Modeling using HEC-RAS & GeoRAS.

Satellite precipitation based runoff modeling: Project funded by NASA.

Hydrologic Modeling using HEC-HMS, Radar Precipitation Modeling using WMS & GeoHMS.

Urban Morphological Land Cover Classification: Project funded by DTRA.

Urban Land Cover classification using SRTM, NLCD, LandSAT TM GIS & Remote Sensing data for Urban Canopy Parameter extraction for use in Meteorological models.

Graduate Research Assistant (Spring '06 to Spring '07)

Systems Engineering and Integration, Los Alamos National Laboratory, Los Alamos, NM

Research Project: National Infrastructure Simulation and Analysis Center's Water

Infrastructure Simulation Environment.

Developed 1D Hydrologic model, developed automated hydraulic cross section extraction using VB.NET programming.

Aarvee Associates, Hyderabad, India (May '03 to August '04)

Title: Graduate Trainee Engineer

Responsibilities:

- Underground drainage, water supply and stormwater drainage system design
- Conducting Feasibility Survey and Detailed Project Report
- Conducting Preliminary Engineering and Railway Traffic survey
- Water Supply Network Decision Support System design

Teaching Experience

Tennessee Tech University, Department of Civil & Environmental Engineering

- Undergraduate: Hydraulics (2012, 2013, 2014), Engineering Hydrology (2012, 2014)
- Graduate: Open Channel Hydraulics (2011, 2012, 2013, 2014), Advanced Modeling and Simulation for Flood Risk Management (2013)

University of Utah, Department of Civil and Environmental Engineering

- Undergraduate Required: Hydraulics (Spring 2009)

University/Department Experience

- **Undergraduate Research Committee**, Department of Civil & Environmental Engineering
- **Graduate Research Committee**, Department of Civil & Environmental Engineering
- **ABET Committee**, Department of Civil & Environmental Engineering
- **University Budget Committee**, Tennessee Technological University

Past Academic Activities

Graduate Teaching Assistant (Fall '07–Spring '08 & Fall '10): Civil and Environmental Engineering, University of Utah

Instructor (Spring 2009): Hydraulics (CVEEN 3410). Civil and Environmental Engineering, University of Utah

Teaching Assistant Scholar (2008-2009): Center for Teaching and Learning Excellence, University of Utah, Salt Lake City, UT

Engineering Education Research (2008-2009): Publication for American Society of Engineering Education (ASEE) for 2009 ASEE Annual Conference & Exposition, Austin, TX.

Selected Funded Projects in the past 5 years (5 year total funding: \$3,450,981)

CC Compute: A GPU Cluster for Science, Research and Education at Tennessee Tech University, National Science Foundation, Ongoing (Role: Co-PI, \$399,983)*

Development and Improvement of high-resolution Flood2D-GPU modeling for ORNL HPC Environment, ORNL/US Air Force, Ongoing (Role: PI, \$296,192)

Assessing Nutrient Retention of Wetlands Reserve Program (WRP) Easements in Kentucky and Tennessee, TNC/NRCS, Ongoing (Role: Co-PI, \$1,957,728)

Planning Watershed-wide Stormwater Management in an Underserved Community of Tennessee through University-Community Partnership, Tennessee Department of Environment and Conservation, Ongoing (Role: Co-PI, \$52,024)

Development of GIS-based Watershed Vulnerability Assessment (GAVA) Tool for HUC-12 Level Watersheds in Tennessee, NRCS, Completed (Role: PI, \$118,213)

Low-cost real-time streamflow network for Falling Water River Watershed, USGS 104B Program, TNWRRC, Completed (Role: PI, \$16,459)

Proof-of-Concept GIS-based Vegetated Swale Algorithm for TDOT Highways (GV-SwATH), ENSAFE, Completed (Role: PI, \$185,193)

Performance Evaluation of Existing Vegetated Swales for Stormwater Runoff Reduction from Tennessee Department of Transportation Highways, ENSAFE, Completed (Role: Co-PI, \$271,011)

Software Development (indicates students)*

Flood Forecaster (2022). Flood forecaster is a Machine Learning (ML) based computer model that uses timeseries inputs of water depths and rainfall data for a watershed to develop early flood warning for a selected location within the watershed. It uses the following ML architectures: long short-term memory, random forest and support vector regression techniques to forecast watershed depths as specified lead times between 3 to 6 hours. It has been developed for Window Cliffs State Natural Area, but can be applied to any watershed with adequate data. Programmer: George Darkwah*; Supervisor: Alfred Kalyanapu

TRITON-Lite (2022). TRITON-Lite is a surrogate model for the TRITON model, which is based machine learning techniques. The model uses TensorFlow and applies a “bridged” UNet algorithm to ingest all the inputs to the original TRITON model and generates the output rasters of flood depth, flood velocity maps. The objective of this Triton-Lite model is to “mimic” the TRITON simulations for any impending floods, so as to decide whether or not to perform TRITON simulations on large supercomputers. Programmer: George Darkwah*, Faria Nur*; Supervisor: Alfred Kalyanapu

Two-dimensional Runoff Inundation Toolkit for Operational Needs (TRITON) (2020). It is a two-dimensional (2D) hydrodynamic model that simulates flood wave propagation and surface inundation based on the full shallow water equations. The purpose of this document is to provide new users with key information about the model and help them navigate through various topics including how to download, install and run the code. Model code available at <https://triton.ornl.gov/>. Programmers: Md Bulbul Sharif (TTU), Mario Morales-Hernandez (ORNL); ORNL PI: Shih-Chieh Kao, TTU PI: Alfred Kalyanapu.

PyGEE-SWToolbox (2022). PyGEE-SWToolbox is a freely available Google Earth Engine-enabled open-source toolbox developed with Python to be run in Jupyter Notebooks that provides an easy-to-use graphical user interface (GUI) that enables the user to obtain time series of Landsat, Sentinel-1, and Sentinel-2 satellite imagery, pre-process them, and extract surface water using water indices, such as the Normalized Difference Water Index (NDWI), Modified NDWI (MNDWI), Automated Water Extraction Index (AWEI), and Dynamic Surface Water Extent (DSWE). The toolbox can be accessed on Github (<https://github.com/collinsowusu/PyGEE-SWToolbox>). Programmer: Collins Owusu*; Supervisor: Alfred Kalyanapu.

GIS-based Watershed Vulnerability Assessment Tool (GAVA). (2021). GAVA tool is a GIS-based tool that uses analytical hierarchy process multi-criteria decision making (AHP-MCDM) approach and inputs hydrologic soil group, land use/land cover dataset, soil erodibility maps, slope rasters, drainage density and distance to streams to generate a spatially variable watershed vulnerability map for a given watershed. Decision makers, such as the Natural Resources Conservation Service, can use this tool for watershed prioritization

towards implementing conservation measures in agricultural lands in order to protect watershed health and water quality. Programmers: Minhaz Islam*, Alfred Kalyanapu, Vinay Dhanvada*.

GIS-based Vegetated Swale Algorithm for TDOT Highways (GV-SwATH). (2020). It is a GIS-based tool developed for Tennessee Department of Transportation, to estimate the extent and geometric properties of vegetated swales/drainage ditches along TDOT highway medians. Programmers: Minhaz Islam* and Alfred Kalyanapu

Watershed Quality Index Tool (2014). Python, ArcGIS & Excel. GIS-based user-friendly tool to adequately assess alternative environmental and financial costs associated with changes in land and water resources practices. Watershed Quality Index (WQI)-based planning tool illustrates, in simplistic terms, the positive and/or negative impacts of land and water resources practices on receiving water quality and quantity. Programmers: Nasrin Alamdari*, Yvette Clark, Alfred Kalyanapu

GIS-based Digital Elevation Model Correction Techniques (2013). Python, ArcGIS & Excel. Digitally enhance the channel conveyance of National Elevation Dataset. Primary Programmer: Md Nowfel Mahmud Bhuyian*

Monte Carlo Flood Risk Framework (2011). C++, CUDA & GIS. Includes three modules: Monte Carlo Sampling; Geospatial Output Analysis; Flood Risk Analysis. Generates Probability weighted flood risk maps in terms of population at risk. Primary Programmers: Alfred Kalyanapu

Flood2D-GPU (2009). C and CUDA code. GPU implementation of Flood2D-CPU. Used for real-time flood modeling. Capable to visualize flood model results in ArcGIS. OpenGL based front-end visualization tool available. Primary Programmers: Alfred Kalyanapu and Siddharth Shankar.

Flood2D-CPU. (2009). C++ code. Developed to predict flood resulting from various events including dam break, storm surge, rainfall etc. Uses readily available USGS DEM data as input and outputs flood depths and velocities. Solves 2D shallow water equations using first order accurate upwind finite difference.

Primary Programmer: Alfred Kalyanapu.

GIS-based 1D DHM. (2007). Visual Basic .NET and Fortran 90 code for ESRI ArcGIS. Distributed hydrologic model developed to predict overland flow from rainfall events over medium to larger geographical areas. Model uses readily available data downloadable from the internet as input and outputs flow hydrographs. Visual Basic .NET integrates customized Fortran DLL with Hydrologic engine that solves 1D diffusive wave equations using backward finite difference. Primary Programmer: Alfred Kalyanapu.

Flood Prediction Model. (2006). Visual Basic .NET code for ESRI ArcGIS. Developed to rapidly predict flooding from extreme rainfall events over large geographical areas. Model

uses readily available data downloadable from the internet as input and output flood depth contours. Primary Programmers: David Judi and Alfred Kalyanapu.

Channel Morphology Tool (CMT) (2006). Visual Basic .NET code for ESRI ArcGIS. Developed to rapidly extract channel cross-sections from USGS DEM data downloadable from the internet. Cross sections are compatible with both USACE HEC-RAS and EPA SWMM5. Primary Programmers: David Judi and Alfred Kalyanapu.

Water Distribution Model Builder (WDMB), Version 1.1. (2005). Visual Basic for Applications code for ArcGIS. Graphical User Interface developed to convert GIS shapefiles of water distribution network into EPANET network for water distribution modeling. Programmers: Pooja Mutha and Alfred Kalyanapu.

Miscellaneous software. a) C++ based random number generator. b) MATLAB based code to input ASCII raster files and create graphics and videos.

Professional License/Registration and Memberships

- Passed Fundamentals of Engineering (FE) Exam
- Member
 - American Society of Civil Engineers (ASCE)
 - American Water Resources Association (AWRA)
 - American Geophysical Union (AGU)
 - American Society of Engineering Education (ASEE)
 - ASCE Environmental Water Resources Institute (EWRI)
 - American Association for Advancement of Science (AAAS)
 - Sigma Xi Research Honor Society
 - Chi Epsilon Honor Society
- Leadership Positions
 - Executive Committee Member – EWRI Computational Hydraulics Technical Committee (2013 – present)
 - Secretary – EWRI Emerging and Innovative Technologies Committee (2022 – present)
 - President – TN AWRA, Executive Committee (2018)
 - Member – TN AWRA, Executive Committee (2011 - present)
 - President-Elect, ASCE Computational Hydraulics Committee (2019-2021)
 - Member, TN H2O Surface Water Subcommittee (2018 – 2020)
 - Secretary – TN AWRA, Executive Committee (2011-2012)
 - 2011, TBR Research Academy Fellow, 2011-2012
 - Member- AWRA Utah Section Executive Committee (2009-2011)
 - President– AWRA, University of Utah Student Chapter (2008-09)
 - President– WEAU, University of Utah Student Chapter (2008-09)
 - Committee Member – Student Advisory Committee, Department of Civil & Environmental Engineering, University of Utah (2008-2009)
 - Student Officer – Chi Epsilon, University of Utah Chapter (2008-2009)
 - Founding Member, University of Utah AWRA Student Chapter 2008
 - Founding Member, University of Utah WEAU Student Chapter 2008

Synergistic Activities

- **Co-Editor** of the Special Issue of MDPI Remote Sensing Journal on the theme “Anticipation of Flash Floods and Rainfall-induced Hydro-geomorphic Hazards”, 2022 - present
- **Associate Editor** of the Special Issue of the Earth Interactions Online Journal published by the American Geophysical Union, American Meteorological Society and American Association of Geographers on the theme “Human Impact on Climate Extremes for Water Resources Infrastructure Design, Operations and Risk Management” published in 2013.
- **Contributing author** of a book chapter titled “Climate vulnerabilities and adaptation of urban water infrastructure systems” to Volume 5: Vulnerability of Water Resources to Climate series in Climate Vulnerability.
- Co-Author of the chapter titled “Water Cycle”, part of “Guidance Manual for Rainwater Harvesting as a Stormwater Best Management Practice”, a Report of the State of the Practice and Recommended Guidance by the EWRI Rainwater Harvesting Technical Committee (in preparation).
- **Research Fellow** of the Tennessee Board of Regents (TBR) Research Academy (2011-2012).
- Journal Reviewer:
 - ASCE Journal of Hydrologic Engineering
 - Journal of Flood Risk Management
 - Journal of Hydrology
 - Environmental Modelling & Software
 - Water Resources Management
 - Climatic Change
 - Volume 5: Vulnerability of Water Resources to Climate series in Climate Vulnerability.
 - Remote Sensing
 - Sustainability
- Panel Reviewer for EPA, NSF and DOE
- Active Volunteer for Outreach Activities including [Engineering A Future](#) at TTU and Governor’s School for Emerging Technologies.

Media Coverage

- 2023, Stonecom Radio Station, interview with Betsy Scarisbrick on Low-cost real-time flood sensors.
- 2023, Stonecom Radio Station, interview with Betsy Scarisbrick on “TRITON” flood simulator.
- 2022, Scripps National article titled “States building independent weather monitoring networks to be better prepared for major storms”, [TMJ4](#), [WKTR](#), [Denver7](#), [ABCActionNews](#), [WTLocal](#), [WCPO](#).

- 2022, WPLN News article titled “A Tennessee professor is building tech that detects floods, with rural communities like Waverly in mind”, available online at: <https://tinyurl.com/mryepwer>
- 2022, NewsChannel5 Nashville TV interview titled “Tennessee professor designs low-cost water gauges to help mitigate floods”, available online at: <https://youtu.be/kXv9q6oP8bw>
- 2022, NewsChannel5 Nashville article titled “Tennessee professor designs water gauge that could help warn communities like Waverly about floods”, available online at: <https://tinyurl.com/ycytebw7>
- 2022, Upper Cumberland Business Journal article titled “Tech faculty, students create faster flood simulator”, available online at: <https://tinyurl.com/5n7e9r63>
- 2021, Upper Cumberland Business Journal article titled “Water research project helping rural community” available online at: <https://tinyurl.com/4dak9vut>
- 2019, Herald-Citizen article titled “TDEC mulls Cummins Falls monitoring system”, available online at: <https://tinyurl.com/5f4h332t>
- 2019, Opinion piece in Tennessean titled “Flash flood warning system not the only safety solution at Cummins Falls State Park”, available online at: <https://tinyurl.com/69cpewn4>
- 2017, Herald-Citizen article titled “Improving safety at Cummins Falls”, available online at: <https://tinyurl.com/yf3e62eh>

Major Honors and Achievements

- 2023, Leighton E. Sissom Innovation and Creativity Award, College of Engineering, TTU
- 2021, Wings Up 100 Research Achievement Award, TTU
- 2020, Wings Up 100 Research Achievement Award, TTU
- 2020, co-author of Sharif et al., 2020 - Platform for Advanced Scientific Computing 2020 (PASC20) **Conference Best Paper Award**
- 2019, Wings Up 100 Research Achievement Award, TTU
- 2016 Kinslow Research Award, College of Engineering, TTU
- 2015 NITW Outstanding Young Alumni Professional Achievement Award
- 2015 Outstanding Reviewer, Environmental Modelling & Software Journal
- 2014, Sigma Xi Faculty Research Award
- 2013, Primary Author, **Commended Paper** for the Outstanding Paper Award, *Journal of Flood Risk Management*
- 2010, Founding member of AWRA Student Chapter, 2010 National Outstanding Student Chapter of AWRA
- 2009, Offered unique opportunity to teach undergraduate senior level Hydraulics course by Department of Civil and Environmental Engineering
- 2009, Best Paper, Graduate Division, J. Paul Riley American Water Resources Association (AWRA) Utah Section Annual Student Conference and Paper Competition
- 2008, Outstanding Teaching Assistant, University of Utah, College of Engineering

- 2008, Co-Author, Best Paper, Graduate Division, J. Paul Riley American Water Resources Association (AWRA) Utah Section Annual Student Conference and Paper Competition
- 2007 & 2008, Scholarship Recipient, Department of Civil & Environmental Engineering, University of Utah

Programming & Modeling Skills

- Modeling: HEC-HMS, HEC-RAS, HEC-FIA, WMS, GeoRAS, GeoHMS, AnnAGNPS, HSPF, EPA SWMM, EPANET, TRITON
- Packages: ESRI ArcGIS, ArcGIS Pro, Matlab, ENVI
- Programming: C, C++, GPGPU (OpenGL, CUDA), VB.NET, Python, R.
- Platforms & Environments: Linux, Windows, Visual Studio, Eclipse

Peer-reviewed Journal and Conference Publications (indicates student authors)*

1. Sava, E., Cervone, G., and **Kalyanapu, A.** (2023). Multiscale Observation Product (MOP) for Temporal Flood Inundation Mapping of the 2015 Dallas Texas Flood. Remote Sensing, 15(6), 1615. <https://doi.org/10.3390/rs15061615>
2. **Kalyanapu, A., Owusu***, C., Wright, T., and Datta T. (2023). "Low-Cost Real-Time Water Level Monitoring Network for Falling Water River Watershed: A Case Study." Geosciences. 2023; 13(3):65. <https://doi.org/10.3390/geosciences13030065>
3. **Owusu***, C., **Snigdha***, N. J., **Martin***, M., and **Kalyanapu, A. J.** (2022). "PyGEE-SWToolbox: A Python Jupyter Notebook Toolbox for Interactive Surface Water Mapping and Analysis Using Google Earth Engine", Sustainability 2022, 14, 2557. <https://doi.org/10.3390/su14052557>
4. **Dullo***, T. T., Zamani, K., and Kalyanapu, A. J. (2022). "Reliability Assessment of Computational River Models", Journal of Irrigation and Drainage Engineering, 148(6), DOI: [https://doi.org/10.1061/\(ASCE\)IR.1943-4774.0001681](https://doi.org/10.1061/(ASCE)IR.1943-4774.0001681)
5. **Dullo***, T. T., **Darkwah***, G. K., Gangrade, S., Morales-Hernández, M., **Sharif***, M. B., **Kalyanapu, A. J.**, Kao, S.-C., Ghafoor, S., and Ashfaq, M.: Assessing climate-change-induced flood risk in the Conasauga River watershed: an application of ensemble hydrodynamic inundation modeling, Nat. Hazards Earth Syst. Sci., 21, 1739–1757, <https://doi.org/10.5194/nhess-21-1739-2021>, 2021.
6. Morales-Hernández, M., Sharif, M. B., **Kalyanapu, A.**, Ghafoor, S. K., **Dullo***, T. T., Gangrade, Z., Kao, S. –C., Norman, M. R., and Evans, K. J. (2021). "TRITON: A Multi-GPU Open Source 2D Hydrodynamic Flood Model", Environmental Modelling & Software, 141, <https://doi.org/10.1016/j.envsoft.2021.105034>.
7. **Dullo***, T. T., Gangrade, S., Morales-Hernández, M., Sharif, M. B., Kao, S. -C., **Kalyanapu, A. J.**, Ghafoor, S., and Evans, K. J. (2021). "Simulation of Hurricane Harvey Flood Event through Coupled Hydrologic-Hydraulic Models: Challenges and Next Steps", Journal of Flood Risk Management, 14(3), <https://doi.org/10.1111/jfr3.12716>.
8. **Sharif***, M. B., Ghafoor, S. K., Hines, T. M., Morales-Hernández, Evans, K. J., Kao, S. – C., **Kalyanapu, A.**, Dullo, T. T., and Gangrade, S. (2020). "Performance Evaluation of a Two-Dimensional Flood Model on Heterogeneous High-Performance Computing Architectures", In Proceedings of the Platform for Advanced Scientific Computing

- Conference (PASC '20). Association for Computing Machinery, New York, NY, USA, Article 8, 1–9. DOI: <https://doi.org/10.1145/3394277.3401852>.
9. **Bhuyian***, Md. N. M. and Kalyanapu, A. (2020). “Predicting Channel Conveyance and Characterizing Planform Using River Bathymetry via Satellite Image Compilation (RiBaSIC) Algorithm for DEM-Based Hydrodynamic Modeling” *Remote Sensing*, 12(7), DOI: 10.3390/rs12172799
 10. Morales-Hernández, M., Sharif, M. B., Gangrade, S., **Dullo***, T. T., Kao, S. –C., Kalyanapu, A., Ghafoor, S. K., Evans, K. J., Madadi-Kandjani, E., and Hodges, B. R. (2020). “High performance computing in water resources hydrodynamics”, *Journal of Hydroinformatics*, 22(5), 1217-1235, DOI: <https://doi.org/10.2166/hydro.2020.163>.
 11. **Brackins***, J. T. and Kalyanapu, A. J. (2019). “Evaluation of parametric precipitation models in reproducing tropical cyclone rainfall patterns” *Journal of Hydrology*, DOI:10.1016/j.jhydrol.2019.124255.
 12. Gangrade, S., Kao, S. -C., **Dullo***, T. T., Kalyanapu, A. J., and Preston, B. L. (2019). “Ensemble-Based Flood Vulnerability Assessment for Probable Maximum Flood in a Changing Environment” *Journal of Hydrology*, Volume 576 (September 2019), Pages 342-355, DOI:10.1016/j.jhydrol.2019.06.027.
 13. **Bhuyian***, Md. N. M. and Kalyanapu, A. (2019). “Predicting channel conveyance in the Obion River Watershed using SAMBLE Method” *Journal of Hydrologic Engineering*, DOI: 10.1061/(ASCE)HE.1943-5584.0001875.
 14. **Ahmadisharaf***, E., and Kalyanapu, A. J. (2019). "A coupled probabilistic hydrologic and hydraulic modelling framework to investigate the uncertainty of flood loss estimates", *Journal of Flood Risk Management*, 12(S2), DOI:10.1111/jfr3.12536.
 15. Marshall, R., Ghafoor, S. K., **Kalyanapu**, A. J., Rogers, M., and **Dullo***, T. T. (2018). Performance Evaluation and Enhancements of a Flood Simulator Application for Heterogeneous HPC Environments, *International Journal of Networking and Computing*, 8(2), 387-407, DOI: 10.15803/ijnc.8.2_387.
 16. **Ahmadisharaf***, E., **Kalyanapu**, A. J., and Bates, P. D. (2018). “A probabilistic framework for floodplain mapping using hydrologic modeling and unsteady hydraulic modeling”, *Hydrological Sciences Journal*, DOI: 10.1080/02626667.2018.1525615.
 17. **Ahmadisharaf***, E., **Kalyanapu**, A. J., Lillywhite, J. R., and Tonn, G. L. (2018). “A probabilistic framework to evaluate the uncertainty of design hydrograph: case study of Swannanoa River Watershed”, *Hydrological Sciences Journal*, DOI: 10.1080/02626667.2018.1525616.
 18. **Bhuyian***, Md. N. M., **Kalyanapu**, A. J., and Hossain, F. (2017). “Evaluating Conveyance-Based DEM Correction Technique on NED and SRTM DEMs for Flood Impact Assessment of the 2010 Cumberland River Flood” *Geosciences*, 7, 132; doi:10.3390/geosciences7040132.
 19. Marshall, R., Ghafoor, S. K., **Kalyanapu**, A. J., Rogers, M., and **Dullo***, T. T. (2017). “Performance Improvement of a Two-dimensional Flood Simulation Application in Hybrid Computing Environments”, *Proceedings of the Fifth International Symposium on Computing and Networking (CANDAR 17)*, November 19-22, 2017, Aomori, Japan.
 20. **Dullo***, T. T., **Kalyanapu**, A. J., and Teegavarapu, R. S. V. (2017). "Evaluation of Changing Characteristics of Temporal Rainfall Distribution within 24-hour Duration Storms and their influences on Peak Discharges: A Case Study of Asheville, North Carolina" *Journal of Hydrologic Engineering*, 22(11):05017022.

21. **Bhuyian***, Md. N. M., and **Kalyanapu**, A. J. (2017). "Accounting Digital Elevation Uncertainties for Flood Consequence Assessment" *Journal of Flood Risk Management*, DOI: 10.1111/jfr3.12293
22. **Ahmadisharaf***, E. A., **Kalyanapu**, A. J., and Chung, Eun-Sung. (2017). "Sustainability-Based Flood Hazard Mapping of the Swannanoa River Watershed", *Sustainability*, 9, 1735, doi:10.3390/su9101735.
23. **Ahmadisharaf***, E., and **Kalyanapu**, A. J., Thames, B. A., and Lillywhite, J. (2016). "Application of a probabilistic framework for comparison of dam breach prediction methods", *Environmental Modelling and Software*, doi: 10.1016/j.envsoft.2016.09.022.
24. **Ahmadisharaf***, E., **Kalyanapu**, A. J., and Chung, E. –S. (2015). "Spatial probabilistic multi-criteria decision making for assessment of flood management alternatives", *Journal of Hydrology*, Vol. 533, 365-378, doi: [10.1016/j.jhydrol.2015.12.031](https://doi.org/10.1016/j.jhydrol.2015.12.031)
25. **Ahmadisharaf***, E., **Kalyanapu**, A. J., and Chung, E. –S. (2015). "Evaluating the effects of flood duration and velocity on selection of flood management alternatives using multi-criteria decision making" *Water Resources Management*, 29(8), pp 2543-2561.
26. **Bhuyian***, Md. N. M., and **Kalyanapu**, A. J. (2014). "An Approach for DEM Correction by Improving Channel Conveyance" *Journal of Hydrologic Engineering*, doi: [10.1061/\(ASCE\)HE.1943-5584.0001020](https://doi.org/10.1061/(ASCE)HE.1943-5584.0001020)
27. **Kalyanapu**, A.J., Judi, D.R., McPherson, T.N. and Burian, S.J. (2014), Annualised risk analysis approach to recommend appropriate level of flood control: application to Swannanoa river watershed. *Journal of Flood Risk Management*. doi: 10.1111/jfr3.12108
28. **Kalyanapu, A. J.**, Hossain, F., Yigzaw, W., Hossain, A., and C. K. Shum. (2013). "Investigating the performance of American River Flood Control System under changes in Probable Maximum Flood due to effects of Artificial Reservoir Size and Land Use/Land Cover Patterns" *Earth Interactions Journal, Special Issue. (AGU-AMS-AAG)*,17, 1–24. doi: <http://dx.doi.org/10.1175/2012EI000496.1>.
29. Yigzaw, W., Hossain, F., and **Kalyanapu, A. J.** (2013). "Comparison of PMP-driven Probable Maximum Floods with Flood Magnitudes due to Increasingly Urbanized Catchment: The Case of American River Watershed", in Special Issue Edition: "Human Impact on Climate Extremes for Water Resources Infrastructure Design, Operations and Risk Management", *Earth Interactions Journal, AGU-AMS-AAG*, 17, 1–15. doi: <http://dx.doi.org/10.1175/2012EI000497.1>.
30. Burian, S.J., Walsh, T., **Kalyanapu, A.J.**, and Larsen, S.G. (2013). "Climate vulnerabilities and adaptation of urban water infrastructure systems." In: *Climate Vulnerability (Pielke, R. Sr, Editor in Chief), Volume 5: Vulnerability of Water Resources to Climate*, Hossain, F. (Editor), Elsevier Inc., Academic Press, 87-107p.
31. Yigzaw, W., Hossain, F., and **Kalyanapu, A. J.** (2012). "Impact of artificial reservoir size and land use/land cover patterns on estimation of probable maximum flood: The case of Folsom Dam on American River" *Journal of Hydrologic Engineering*, 10.1061/(ASCE)HE.1943-5584.0000722.
32. **Kalyanapu, A. J.**, Judi, D. R., McPherson, T. N., and Burian, S. J. (2011) "Monte Carlo based flood modelling framework for estimating probability weighted flood risk" *Journal of Flood Risk Management*, 5, 37-48.
33. **Kalyanapu, A. J.**, Shankar, S., Pardyjak, E. R., Judi, D. R., and Burian, S. J. (2011). "Assessment of GPU computational Enhancement to a 2D Flood Model." *Environmental Modelling & Software*, 26, 1009-1016.

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1. Kalyanapu, A. J., and Datta, T. (2023). “Feasibility of monitoring floods using cost-effective devices”, 2023 EWRI Currents, 25(1), Winter 2023, available online at: <https://tinyurl.com/22ydhx5f>
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1. **Nur***, F., **Darkwah***, G. K., Gangrade, S., Ghimire, G. R., Kao, S.-C., and Kalyanapu, A. J. (2023). “Application of Triton-Lite, a deep-learning surrogate model for flood risk management”, 32nd Tennessee Water Resources Symposium, Proc., 2023 Tennessee Water Resources Symposium, TNAWRA, Montgomery Bell State Park, April 12-14, 2023, Burns, TN.
2. **Fordjour***, G. K., **Darkwah***, G. K., and Kalyanapu, A. J. (2023). “Flood early warning systems using machine learning techniques: The case of the Cumberland River at Ashland City, Tennessee”, 32nd Tennessee Water Resources Symposium, Proc., 2023 Tennessee Water Resources Symposium, TNAWRA, Montgomery Bell State Park, April 12-14, 2023, Burns, TN.
3. **Owusu***, C., and Kalyanapu, A. J. (2023). “Shallow water depth estimation in inland wetlands using Landsat imagery”, 32nd Tennessee Water Resources Symposium, Proc., 2023 Tennessee Water Resources Symposium, TNAWRA, Montgomery Bell State Park, April 12-14, 2023, Burns, TN.
4. Ghimire, G. R., Gangrade, S., Kao, S. -C., Hernández, M. M., Kelleher, M., and A. J. **Kalyanapu**, A. J. Yoon, Y., Getirana, A., Kumar, S. V., and Weigel, J. (2023), Hydrodynamic Inundation Simulation for Large Global Watersheds – A Proof of Concept, American Meteorological Society 2023, 37th Conference on Hydrology, January 8-12, 2023, Denver, CO.
5. Gangrade, S., Ghimire, G. R., Kao, S. -C., Hernández, M. M., Kelleher, M., and A. J. **Kalyanapu**, A. J. (2022), Towards the Development of a High-Resolution Historical Flood Inundation Reanalysis Dataset for the Conterminous United States, American Geophysical Union 2022 Fall Meeting, December 12-16, 2022, Chicago, IL.
6. **England***, B., **Arms***, M., **Brackins***, J., **Kalyanapu**, A.J. (2022). “Flood Risk Education in the Trace Creek Watershed Using HEC-RAS and ArcGIS Story Maps”. 17th Research and Creative Inquiry Day, Tennessee Technological University, Cookeville, TN.
7. **Arms***, M., **England***, B. **Brackins***, J. **Kalyanapu**, A.J. (2022). “Communicating Flood Risk with ArcGIS Story Maps Using the Trace Creek Watershed as a Case Study”. Virtual 2022 Tennessee Water Resources Symposium (TWRS). TNAWRA, Virtual.
8. **Arms***, M., Datta, T. **Kalyanapu**, A.J. (2022). “Watershed-wide Stormwater Management Issues in an Underserved Community of Tennessee through Community-

- University Partnership.” 2022 World Environmental & Water Resources Congress, Environmental & Water Resources Institute (EWRI), Atlanta, GA.
9. **Arms***, M., Datta, T., **Kalyanapu**, A.J. (2022). “Investigating Stormwater Issues in a Rural TN Watershed through a Community-University Partnership Program.” 2022 AEESP Research & Education Conference, Association of Environmental Engineering & Science Professors (AEESP), St. Louis, MO.
 10. **England***, B. **Arms***, M. **Brackins***, J. **Kalyanapu**, A.J. (2022). “Flood Risk Education in the Trace Creek Watershed Using HEC-RAS and ArcGIS Story Maps”. 2022 Kentucky/Tennessee Water Professionals Conference, KY/TN Section of AWWA and CWP-KT, Lexington, KY.
 11. **Snigdha***, N. J., **Martin***, M. T., **Owusu***, C., **Kalyanapu**, A. J., & Murdock, J. (2021). “RS/GIS-Based Analyses for Wetland Restoration Evaluation: A Case Study of St. Arbor Slough Wetland” Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
 12. **Martin***, M. T., **Owusu***, C., **Snigdha***, N. J., **Kalyanapu**, A. J., & Murdock, J. (2021). “Development of a 2D Model in St. Arbor Wetland for an Assessment of Levee Breaching” Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
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 14. **Kalyanapu**, A. J., **Kaczmarek***, C., **Ravinutala***, V., and **Ngernkuakal***, P. (2021). “Low-Cost, Real-Time Water Level Monitoring Network for Falling Water River Watershed”, Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
 15. **Darkwah***, G., & **Kalyanapu**, A. J. (2021). Automated Flood Forecasting System for Window Cliffs State Natural Area, TN. Tennessee Water Resources Symposium, 2021.
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 17. **Owusu***, C., **Snigdha***, N. J., **Martin***, M. T., **Kalyanapu**, A. J., & Murdock, J. (2021). Reconstructing Historical Wetland Surface Water Hydrographs Through Remote Sensing, Machine Learning, And Cloud Computing. Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
 18. **Dhanvada***, V., A., **Kalyanapu**, A., J., Datta, T., and Adkins, J. (2021). “Development of a GIS-Based Watershed Vulnerability Assessment Tool for the Loosahatchie Watershed in Tennessee” Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
 19. **Arms***, M., **Harris***, H. T., **Kalyanapu**, A., and Datta, T. (2021). “Watershed-Wide Stormwater Management in an Underserved Community of Tennessee Through Community-University Partnership” Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)

20. **Arms***, M. **Harris***, H. **Wright***, T. Datta, T. **Kalyanapu**, A.J. (2021). "Watershed-wide Stormwater Management in an Underserved Community of Tennessee through Community-University Partnership". Kentucky/Tennessee Water Professionals Conference, KY/TN Section of AWWA and CWP-KT, Chattanooga, TN.
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22. Murdock, J., Brown, R., Womble, S., Duwadi, S., Michael, M., and **Kalyanapu**, A. J. (2021). "Nutrient Recovery Trajectories of Restored Riparian Wetlands in Agricultural Watersheds" Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
23. Alexander, N. R., Baxley, D., Bradley, T., Brown, R., Duwadi, S., Flinn, M., Fore, J., **Kalyanapu**, A., Michael, M., Morris, S., Murdoc, J., Veum, K., Walker, D., Webb, L., Womble, S., and Whiteman, H. (2021). "Patterns of Microbial Assemblage in Wetland Ecosystems Across Habitat Type and Core Incubations" Proc., 2021 Tennessee Water Resources Symposium, TNAWRA, (Virtual)
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25. **Owusu***, C., **Snigdha***, N. J., **Martin***, M. T., & **Kalyanapu**, A. J. (2021). Reconstructing Historical Wetland Surface Water Dynamics Through Remote Sensing And Cloud Computing. Proc., 2021 Fall Meeting, AGU, New Orleans, LA & Online Everywhere
26. **Arms***, M. Datta, T. **Kalyanapu**, A.J. (2020). "Data Collection towards Understanding Stormwater Management and Flooding Issues in the Town of Gainesboro, Jackson County, TN". Posters at the Capitol, Nashville, TN.
27. **Arms***, M. Datta, T. **Kalyanapu**, A.J. (2020). "Investigating Stormwater Management and Flooding Issues in the Town of Gainesboro, Jackson County, TN". 29th Tennessee Water Resources Symposium, TNAWRA, Nashville, TN. *Accepted but cancelled due to COVID-19*
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29. **Brackins***, J. **Kalyanapu**, A.J. (2020). "Evaluation of tropical cyclone flood discharges estimated with rainfall from parametric models for flood risk studies". Proc., 28th Tennessee Water Resources Symposium, TNAWRA, Nashville, TN.
30. **Bhuyian***, M. N., **Dullo***, T. T., **Kalyanapu**. A. J., Gangrade, S., and Kao, S. -C. (2019). "Application of Geomorphic Correlations for River Bathymetry Correction in Two-dimensional Hydodynamic Modeling for Long-term Flood Risk Evaluation", World Environmental & Water Resources Congress, Pittsburgh, PA, May 20, 2019.

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41. **Bhuyian***, M. N., and **Kalyanapu**, A. J. (2018). "Predicting Future Flood Risk in a Morphologically Active River - a Case Study in the Obion River". Proc., 27th Tennessee Water Resources Symposium, TNAWRA, Nashville, TN, April 11-13, 2018.
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 61. **Ahmadisharaf***, E., and **Kalyanapu**, A. (2015). "Investigation of the impact of streamflow temporal variation on dam overtopping risk: Case study of a high-hazard dam" World Environmental and Water Resources Congress 2015.
 62. **Thornton***, J., Clark, Y., George, D., Datta, T., **Alamdari***, N., and **Kalyanapu**, A. "Modeling Impacts of Land Use/ Land Cover Change of Obed River Watershed Using Watershed Quality Index (WQI) Model" World Environmental and Water Resources Congress 2015.

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