Key Dates

Event	Last Date
Abstract Acceptance	28/08/2017
Intimation Abstract Acceptance	04/09/2017
Full Paper Submission	30/09/2017
Paper Review Outcomes	10/10/2017
Revised Paper Submission	20/10/2017
Registration	30/11/2017

Conference Registration Fee

Indian Nationals	
Participants from academic institutes	Rs. 4,000/-
ISH Members	Rs. 3,500/-
Student Author	Rs. 2,500/-
Student Author ISH Members	Rs. 2,000/-
Participants from Industry	Rs. 5,000/-
Foreign Nationals	US $ 250/-

Registration fee should be paid by A/C payee demand draft in favour of 'Principal, L. D. College of Engineering, Ahmedabad'.

Contact Details

Organising Secretary, Hydro 2017, L. D. College of Engineering, Ahmedabad - 380 015, Gujarat, India
Email: secretaryhydro2017@gmail.com.

Conference Venue

L. D. College of Engineering, Navrangpura, Ahmedabad - 380 015, Gujarat, India

Conference committee

Patrons	Dr. G. P. Vadodaria, Principal, LDCE
	Dr. M. K. Sinha, Director, CWPRS, Pune
Chairman	Prof. A. M. Malek, Head, CED, LDCE
Co-Chairman	Dr. A. M. Prabhakar, Principal, GEC, Modasa
Organising Secretary	Dr. M. B. Dholakia, Professor, LDCE
Co-Organising Secretary	Dr. L. R. Rangnath, Secretary, ISH
	Dr. N. P. Singh, GEC, Bhuj
	Dr. S. M. Yadav, SVNIT - Surat
	Dr. H. L. Tiwari, MANIT, Bhopal
	Dr. R. B. Khasia, LDCE
	Dr. V. M. Patel, LDCE
	Prof. N. J. Dalal, LDCE
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	Dr. A. D. Ghare, VNIT, Nagpur
	Dr. Anupam Singh, JKLU, Jaipur
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	Dr. G. J. Rajapara, LDRP, Ganghinagar
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Dr. V. V. Bhosekar	CWPRS, Pune

HYDRO-2017

21-23 December-2017

22nd International Conference on Hydraulics, Water Resources & Coastal Engineering

Organized by :
Water Resources Engineering Center
Department of Civil Engineering
L. D. College of Engineering, Ahmedabad

Affiliated to :
Gujarat Technological University, Ahmedabad

Under the aegis of :
The Indian Society of Hydraulics

Registration Form

HYDRO-2017

21-23 December-2017

Name:_____

Qualification:_____

Designation:_____

Institute:_____

Mailing address:_____

Contact no with STD Code:_____

(Office):_____

(Mobile):_____

Email id:_____

ISH membership no:_____

Author/Participant:_____

Paper id no:_____

Demand draft no/ date/ amount :_____

Signature:_____

This is to certify that Mr./Ms./Professor/Dr. _____ working as _____at our institute is permitted to take part in Hydro 2017 conference.

Sign & Seal of Institute Head

The Demand Draft and Form are to be sent to :

The Head, Civil Engineering Department,
L. D. College of Engineering, Navrangpura,
Ahmedabad - 380 015, Gujarat, India.

(Please give title on the cover "HYDRO 2017")

About Ahmedabad City

Ahmedabad is a historical city of Gujarat which truly represents the composite culture of the state. Earlier Ahmedabad used to be the state capital. The capital city of Gandhinagar was later developed as a satellite township of this mega city. Ahmedabad is a hub of education and business. People therefore come here from different parts of the state. It harbours many worth seeing places of historical and archeological importance. The average maximum temperature in the second fortnight of December ranges between 30 to 29 degree centigrade and the minimum temperature ranges from 15 to 14 degree centigrade. The conference venue is about 12 kilometers from Sardar Patel air port and about 8 kilometers from the Kalupur railway station.

About GTU

The primary objective of the Gujarat Technological University is to develop the knowledge of science, engineering and technology. The GTU has won "ICT enabled university of the year award in E-India-2009 and "Manthan award South Asia 2009" for its project "common entrance test, GCET- 2009". The university is established vide state act (20/2007).

About Indian Society of Hydraulics

The Indian Society of Hydraulics is a nonprofit making organization established in the year 1992 .It gives a platform to professionals in the field of water resources engineering to share their ideas. Awards are given to outstanding professionals and researchers every year. The head office of the ISH is located at Central Water and Power Research Station, Pune. The ISH has been instrumental in bringing the water resources professionals under one umbrella. The conference is being organized under the aegis of The Indian Society of Hydraulics.

About L. D. College of Engineering

The institute established in the year 1948 is situated adjacent to the Gujarat University and is at the nucleus of various institutes of national importance such as Indian Institute of management, The Physical Research Laboratory, Center for Environmental Planning and Technology and Ahmedabad Textile Industry Research Association. The 55 acres of land on which L. D. Engineering College sits today was donated by Sri Lal Bhai Dalpat Bhai the textile magnate. The institute earlier with Gujarat University is now affiliated with Gujarat Technological University. There are 14 graduate courses and 17 post graduate courses run by the institute. The water resources management centre was established in the year 1983 with the help of ministry of human resources development government of India. It has been training manpower from industry, government organizations, academic institutes, other private institutes and young students. The centre has also been taking industry sponsored research and consultancy projects.

A bout The Conference

The conference intends to provide a platform to water resources professionals, academicians, and young researches to discuss and share their ideas. The outstanding professionals and researchers are awarded at the conference every year :

ISH Life Time achievement award
Jal Vigyan Purraskar (Best Paper in ISH Journal)
G. M. Natwathe Awards (Best Paper in Hydro Conference)
S. N. Gupta Memorial Lecture
R. J. Garde Research Award
ISH Best PhD Thesis Award
ISH Best M.Tech Thesis Award

The aim of the conference is to catalyze research and academic work in water resources engineering field and interdisciplinary areas. Selected papers will be published in the journal of The Indian Society of Hydraulics. Key note speakers will be invited from well known Universities of India and from abroad.

Details of paper Submission

The paper should be of maximum ten pages in word format. The guide lines for the paper to be submitted will be available at the web site URL www.hydro2017.org.

Themes

❖ Water Resources ❖ Surface Hydrology and Water Shed Management ❖ River Engineering and Fluvial Hydraulics ❖ Hydro Informatics ❖ Hydraulics ❖ Ground Water Hydrology ❖ Coastal Engineering ❖ Climate Changes ❖Draught Modeling and Draught Management

L. D. College of Engineering, Ahmedabad

22nd International Conference on Hydraulics, Water Resources & Coastal Engineering, HYDRO-2017
(21-23 December, 2017)

PROGRAMME SCHEDULE

Day-II
22nd December, 2017, Friday

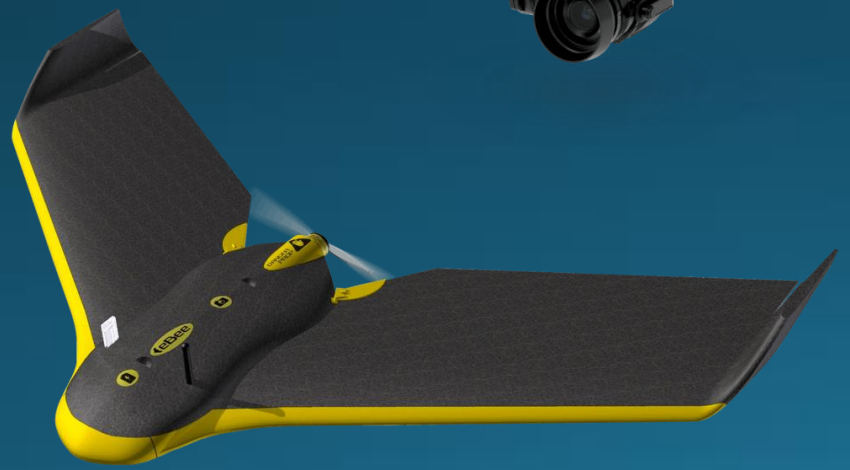
Time	Activities	Proceedings			
09:00 AM - 09:30 AM	High Tea	**KCG Lounge**			
09:30 AM - 10:00 AM	Key Note Lecture 1	Prof. (Dr.) B. R. Chahar, Indian Institute of Technology Delhi			
10:00 AM - 10:30 AM	Key Note Lecture 2	Dr. Theodore Hromadka/Dr. Prasada Rao, California State University , Fullerton, USA			
10:30 AM - 11:00 AM	Key Note Lecture 3	Dr.(Mrs.) V. V. Bhosekar, Vice-President, ISH & Director, CWPRS, Pune			
11:00 AM - 11:15 AM	Sponsor's Demo 1	Maccaferri - India			
11:15 AM - 11:30 AM	Sponsor's Demo 2	Khodiyaar Cad Centre			
11:30 AM - 11:45 AM	Transit Break				
11:45 AM - 01:00 PM	Chairman's Introduction to Theme and Session Papers followed by Key Note Address Technical Session – IVA to IVD	(A) Surface Hydrology & Watershed Management	(B) Hydraulics	(C) River Engineering & Fluvial Hydraulics	(D) Coastal Engineering
	Venue:	**KCG-GRACE**	**KCG-TRUST**	**KCG-PROGRESS**	**KCG-HARMONY**
01:00 PM - 02:00 PM	Lunch	**KCG Dining Hall**			
02:00 PM - 03:15 PM	Technical Session – VA to VD	(A) Surface Hydrology & Watershed Management	(B) Hydraulics	(C) River Engineering & Fluvial Hydraulics	(D) Coastal Engineering
	Venue:	**KCG-GRACE**	**KCG-TRUST**	**KCG-PROGRESS**	**KCG-HARMONY**
03:15 PM - 03:30 PM	Tea	**KCG Lounge**			
03:30 PM - 05:00 PM	Technical Session – VIA to VID	(A) Surface Hydrology & Watershed Management	(B) Hydraulics	(C) River Engineering & Fluvial Hydraulics	(D) Coastal Engineering
	Venue:	**KCG-GRACE**	**KCG-TRUST**	**KCG-PROGRESS**	**KCG-HARMONY**

Computational Engineering Mathematics in Water Resources Related Problems

Dr. Theodore V. Hromadka, Dr. Prasada Rao, Colin Bloor

22 December 2017

Using Drones in CEM Studies



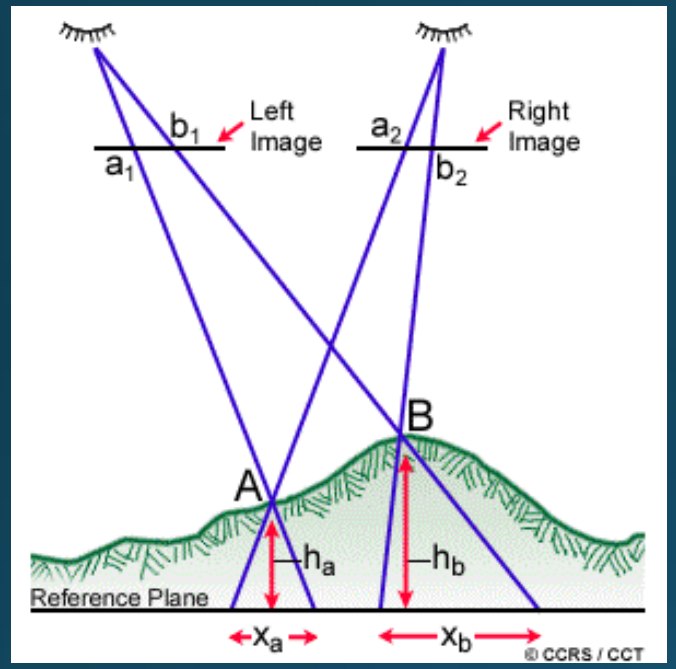
How can we derive topographic information from aerial photos?

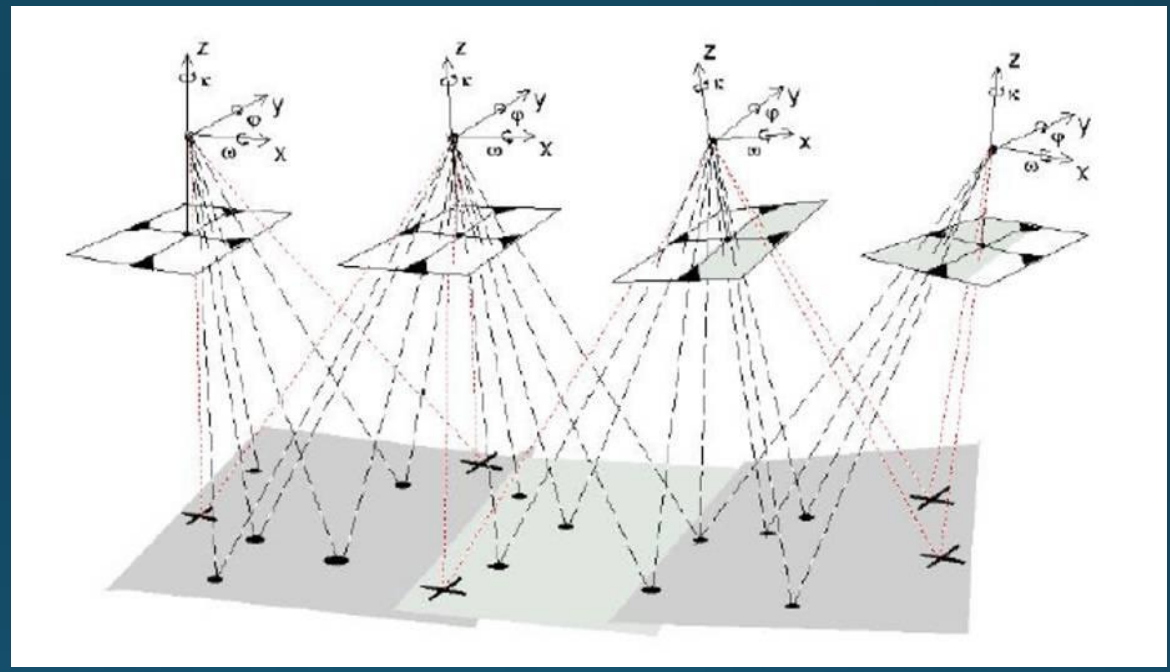
Photogrammetry applications

- Landslide Monitoring
- Differential Mapping
- Debris Flow Mapping
- Debris Basin Sedimentation
- Construction Monitoring
- Stream Channel Erosion/Sedimentation
- Utility inspection (pipeline, aqueduct, wind turbines, high voltage lines, other infrastructure)
- Volume Calculations
- Presentations (Visualizations, 3D animation)

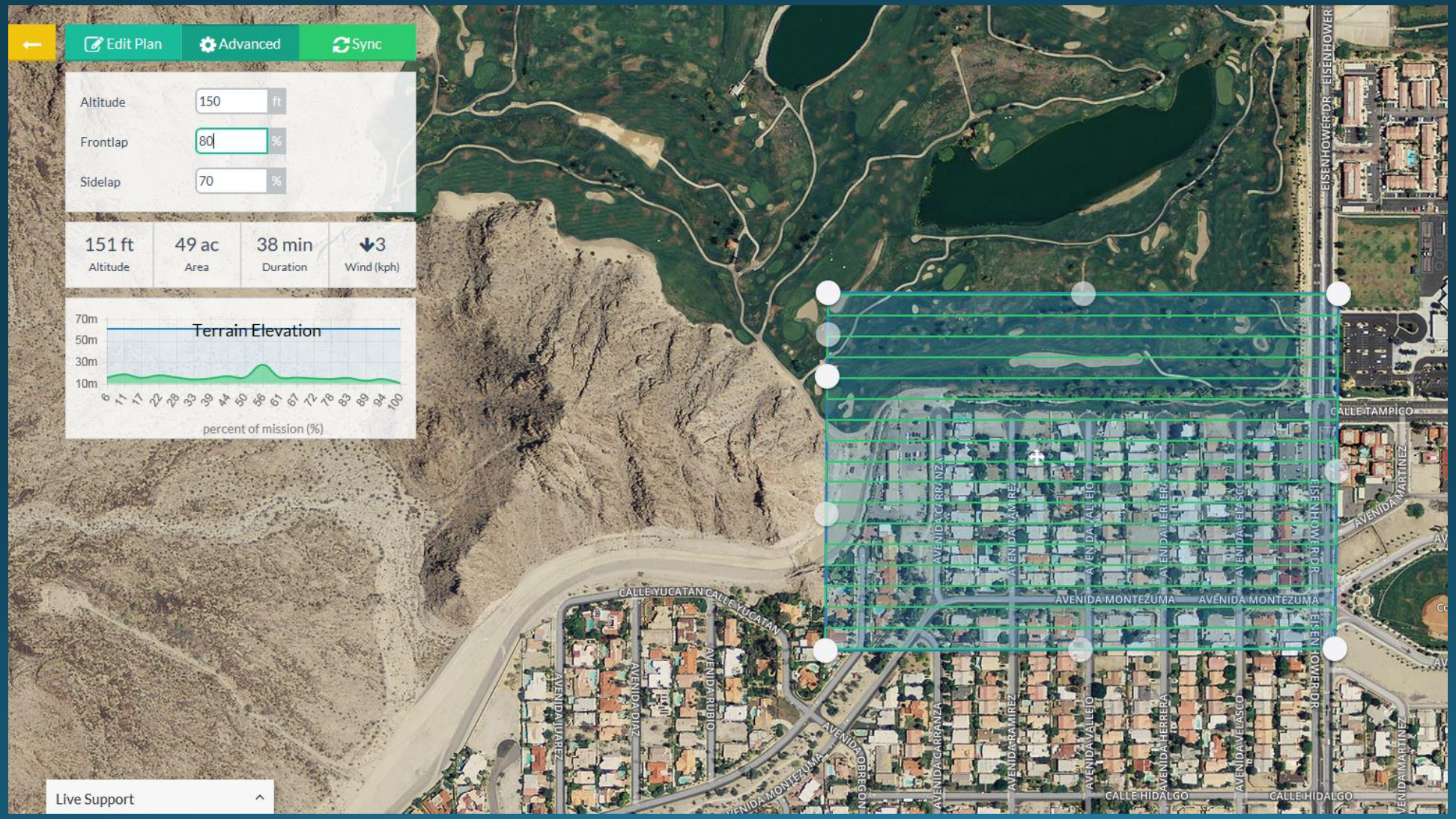
Photogrammetry

Science of making measurement from photographs.





- Aerial photos collected with at least 60% overlap
- Features are matched from one picture to another and over multiple images
- Software process matches and creates 3D point cloud
- Ground Control Points (GCP) used to define locations on the aerial photography to known locations on the earth surface (Georeferencing)
- Image resolution varies with the camera resolution and photo height
- Used to create Digital Surface Model (DSM) and Digital Elevation Model (DEM)


Edit Plan
Advanced
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Altitude
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Sidelap
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Area
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Duration
↓3
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70m
50m
30m
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6 11 17 22 28 33 39 44 50 56 61 67 72 78 83 89 94 100
percent of mission (%)
Live Support
EISENHOWER DR
CALLE TAMPICO
AVENIDA MONTEZUMA
CALLE YUCATAN
CALLE HIDALGO
AVENIDA JUAREZ
AVENIDA DIAZ
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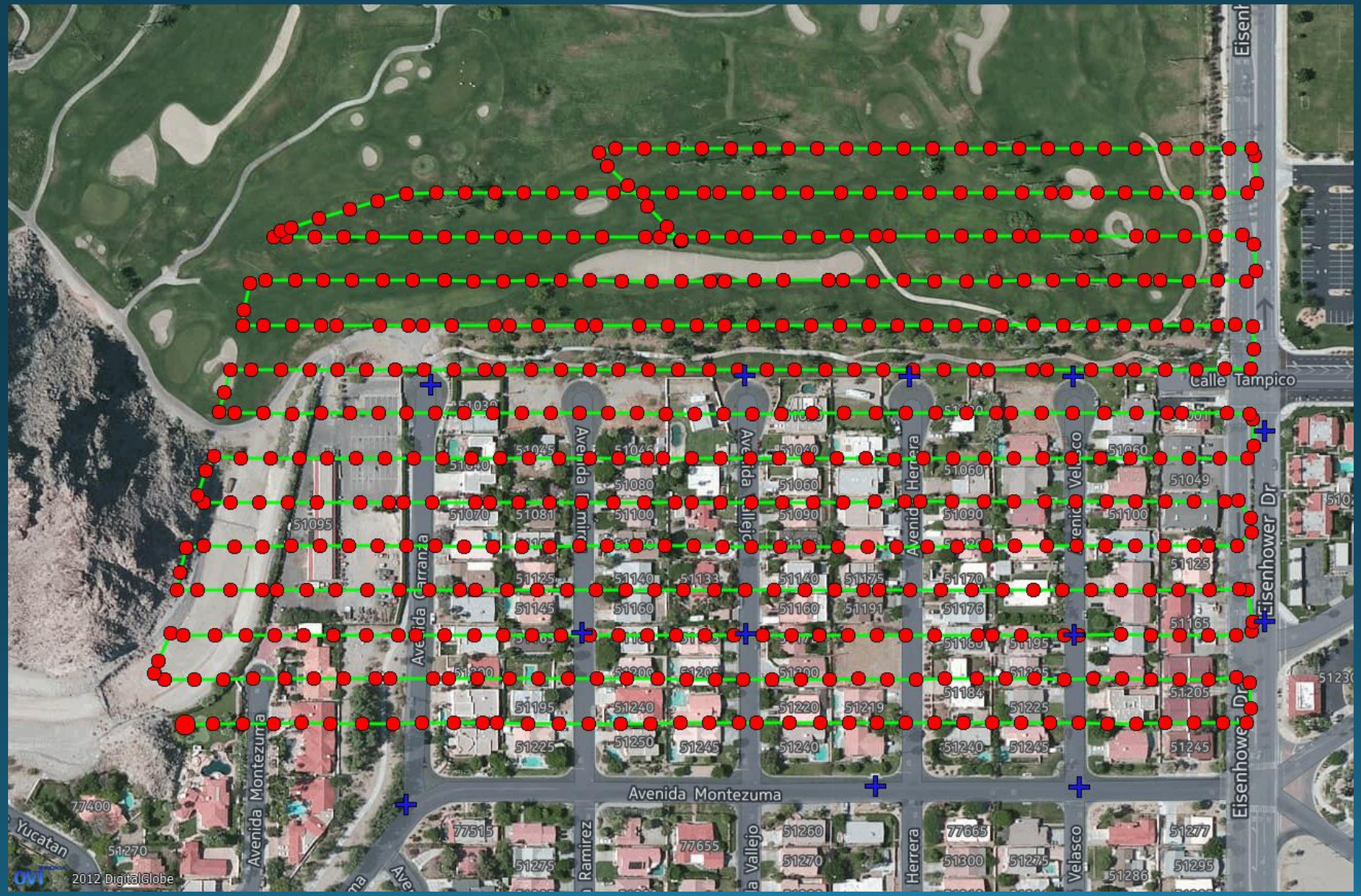
AVENIDA HERRERA
AVENIDA VELASCO
AVENIDA MARTINEZ


Calle Tampico
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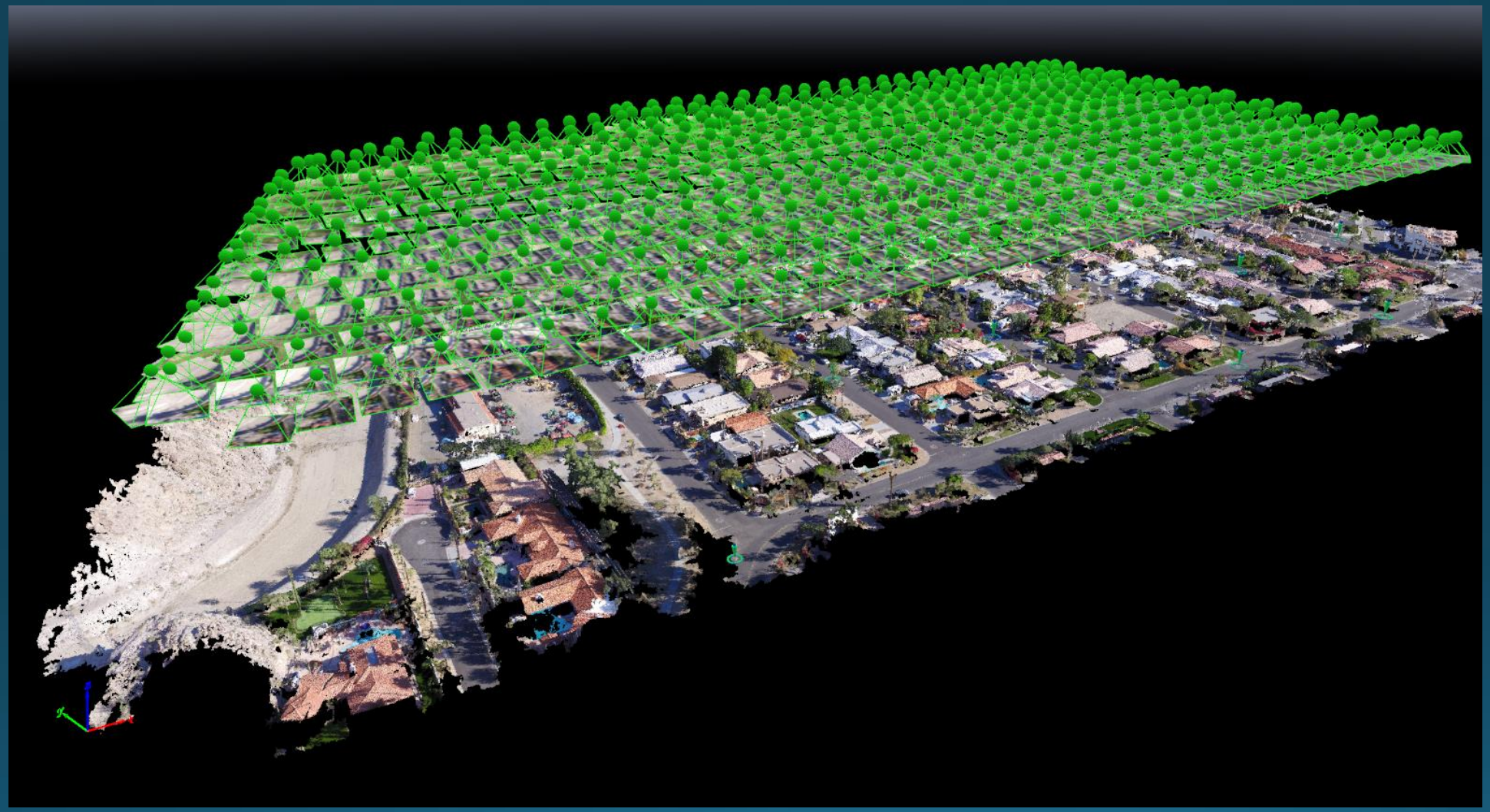
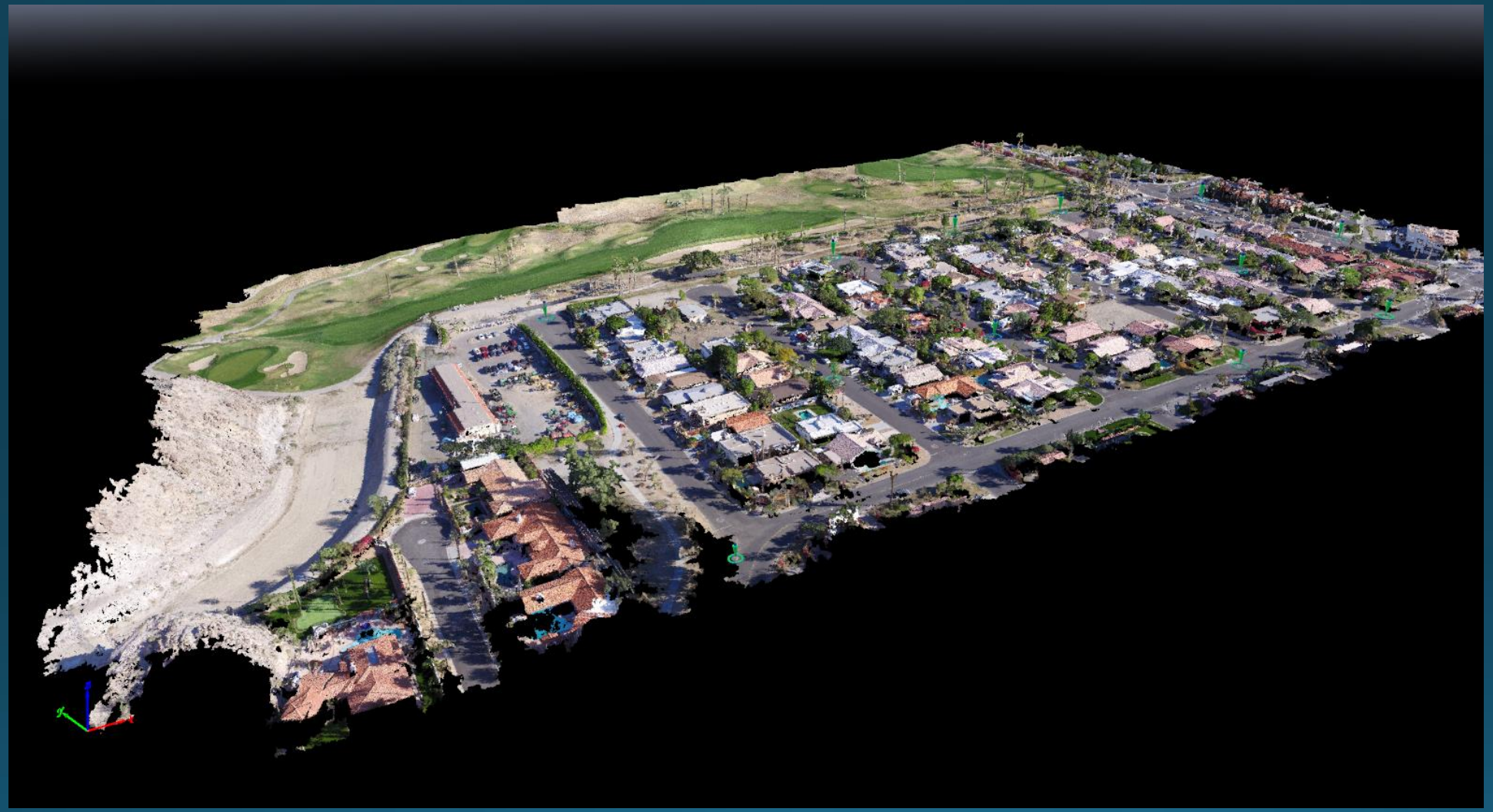
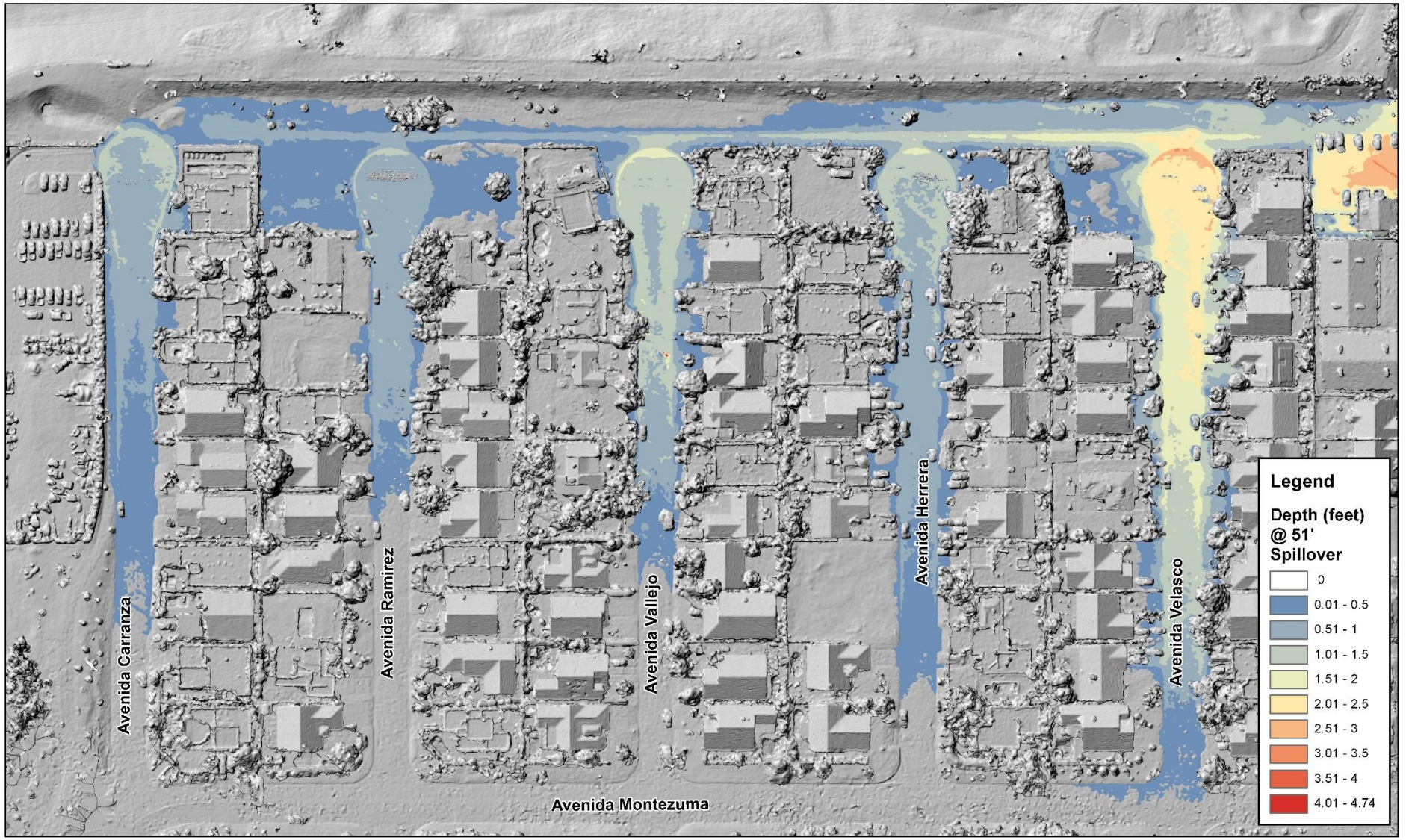
Avenida Ramirez
Avenida Vallejo
Avenida Herrera
Avenida Velasco
Yucatan
2012 DigitalGlobe





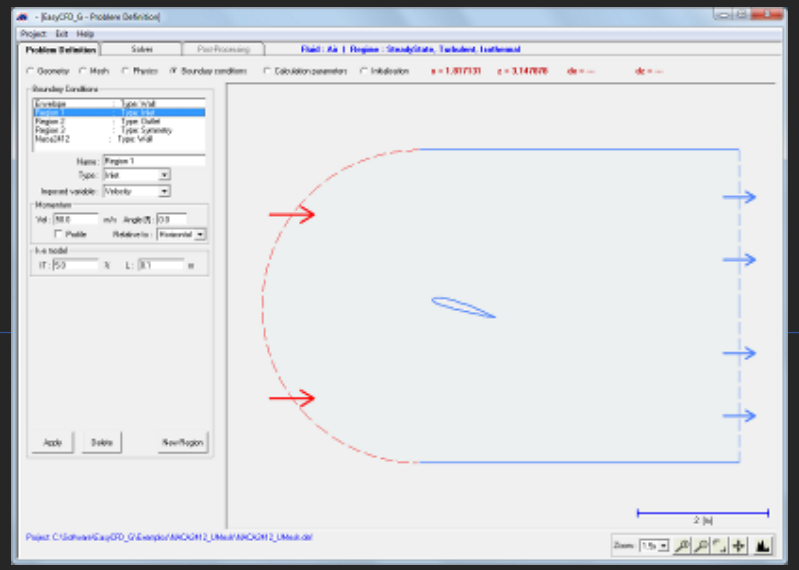

PIX4D
mapper

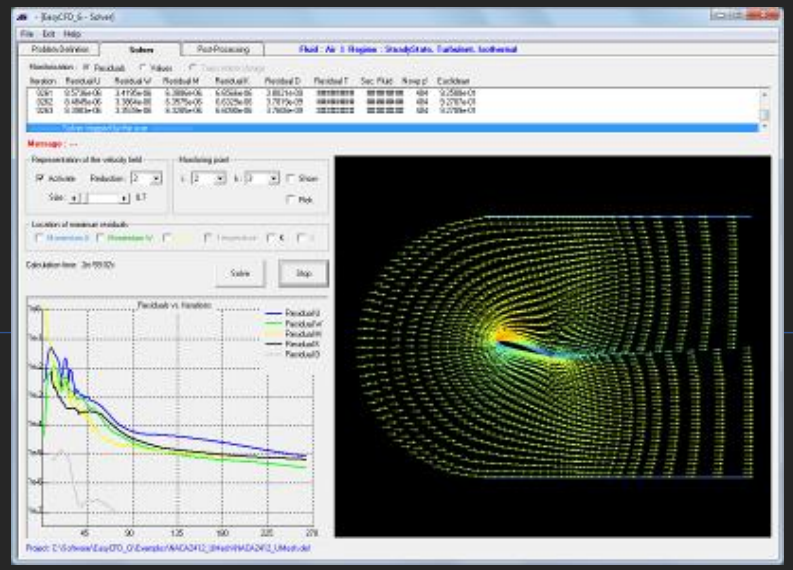
Inundation Mapping

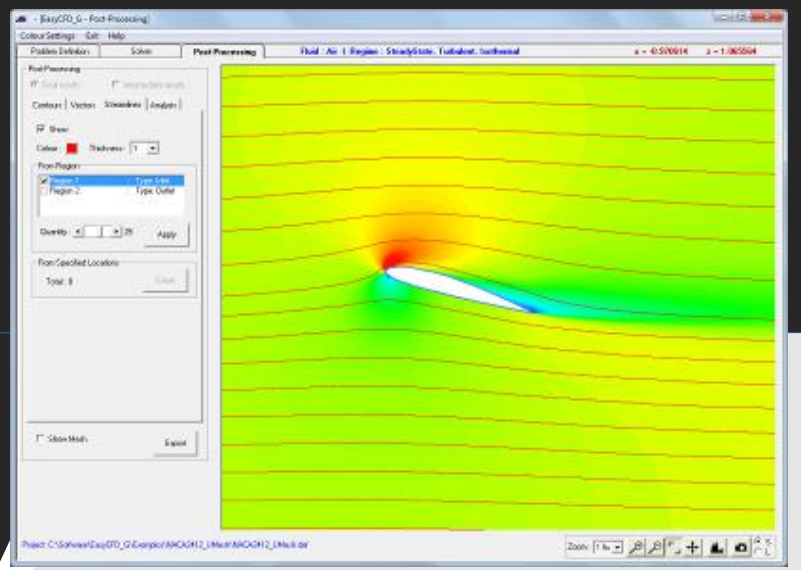


Class Example: Practical Applications of Computational Engineering Mathematics

Using EasyCFD to simulate 2D fluid flow and to make informed design decisions

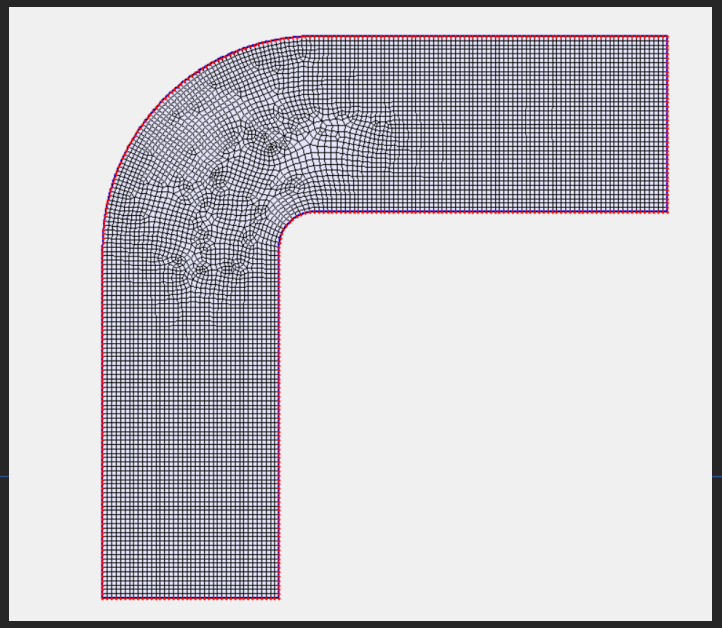


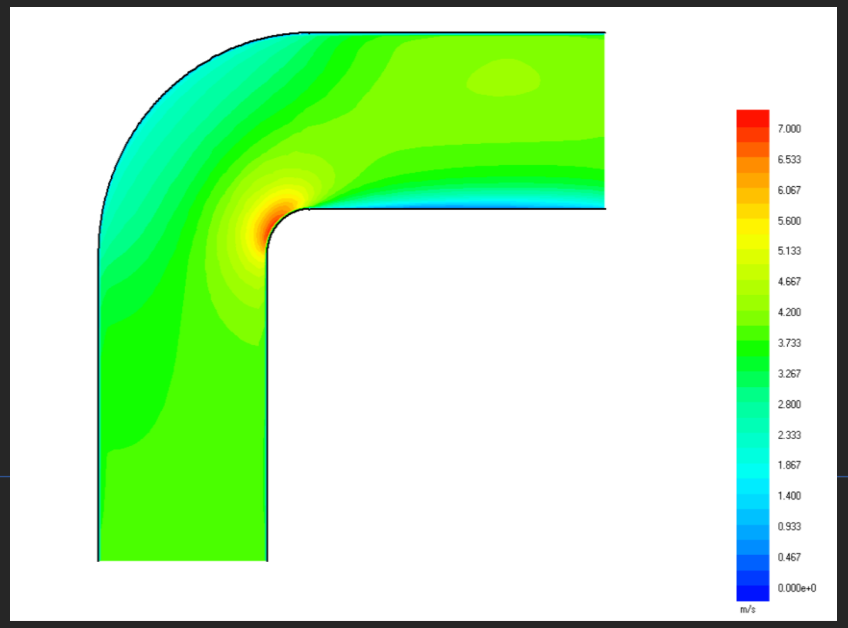


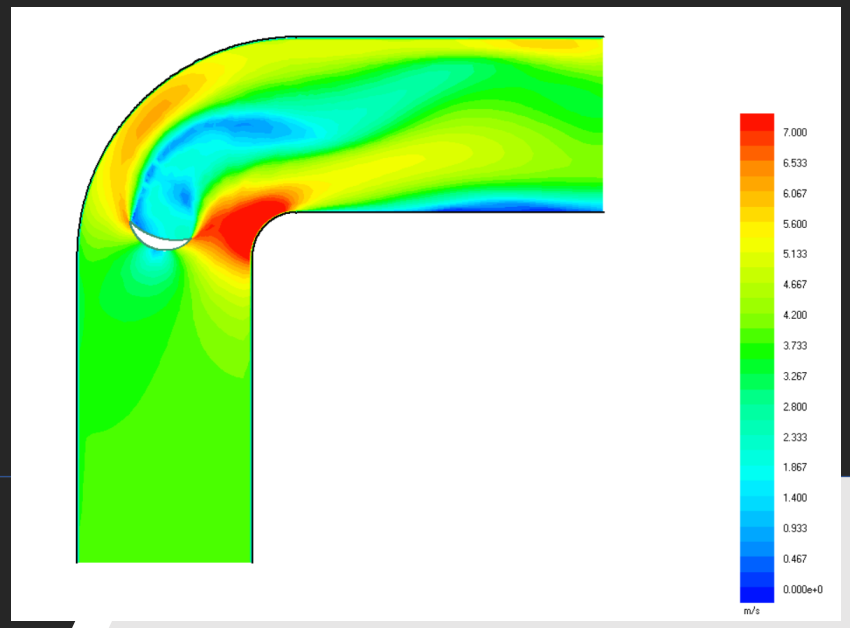


- A computational fluid dynamics (CFD) software designed to introduce students to the basics of setting up and running computational models of 2D fluid flow

EasyCFD





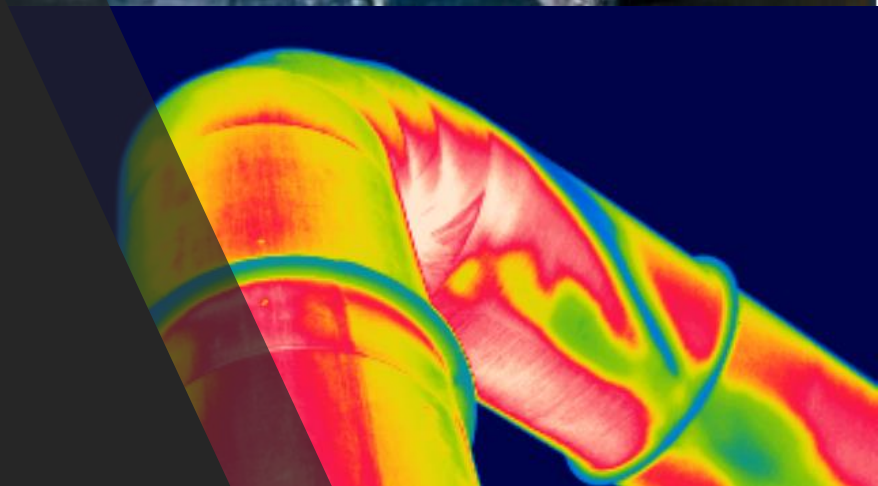


- Question: how do objects affect the flow characteristics of a fluid moving through a 90-degree bend
- Goal: identify the optimum solution by analyzing designs, balancing opposing criteria, and ensuring accuracy of the numerical model
- Applications:
  - River Management – maintaining navigable waterways, minimizing erosion, developing habitats
  - Pipe Engineering – minimizing pipe corrosion, ensuring uniformity of flow, calculating pressure losses

Fluid Flow in a 90-Degree Bend

Fluid Flow in a Bend: Why is this Important?

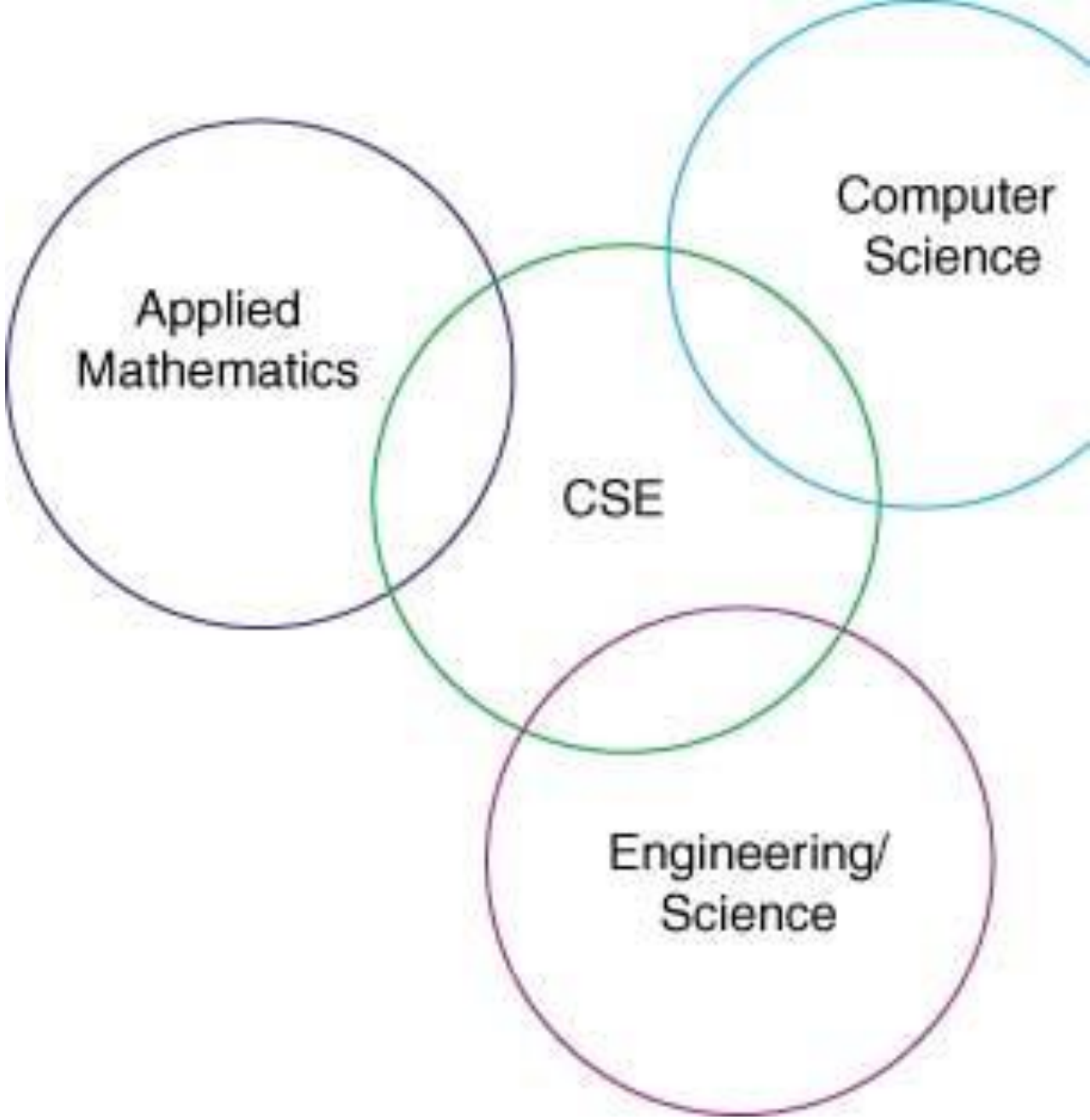
- Pipe bends are required to provide flexibility in fluid routing, yet they disrupt laminar flow creating turbulent flow
- Turbulent Flow = Energy Losses = Decreases in Efficiency
- Turbulent Flow= Increased Erosion
  - One of the major causes of part replacement in the Nuclear Industry
- Turbulent Flow = Improved Heat Transfer
  - This may be positive (i.e. Heat Exchanger)
- Turbulent Flow = Noise



SIAM: Graduate Education for Science and Engineering

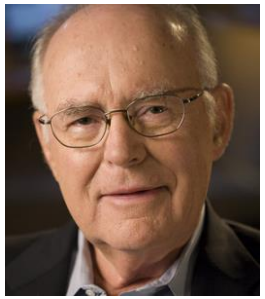
- What is it? A multidisciplinary area with connections to Applied Mathematics, Computer Science, and Engineering/Science
- Why is it important? Computation is now regarded as an equal and indispensable partner, along with theory and experiment, in the advance of scientific knowledge and engineering practice. Numerical simulation enables the study of complex systems and natural phenomena that would be too expensive or dangerous, or even impossible, to study by direct experimentation.
- For more information see:

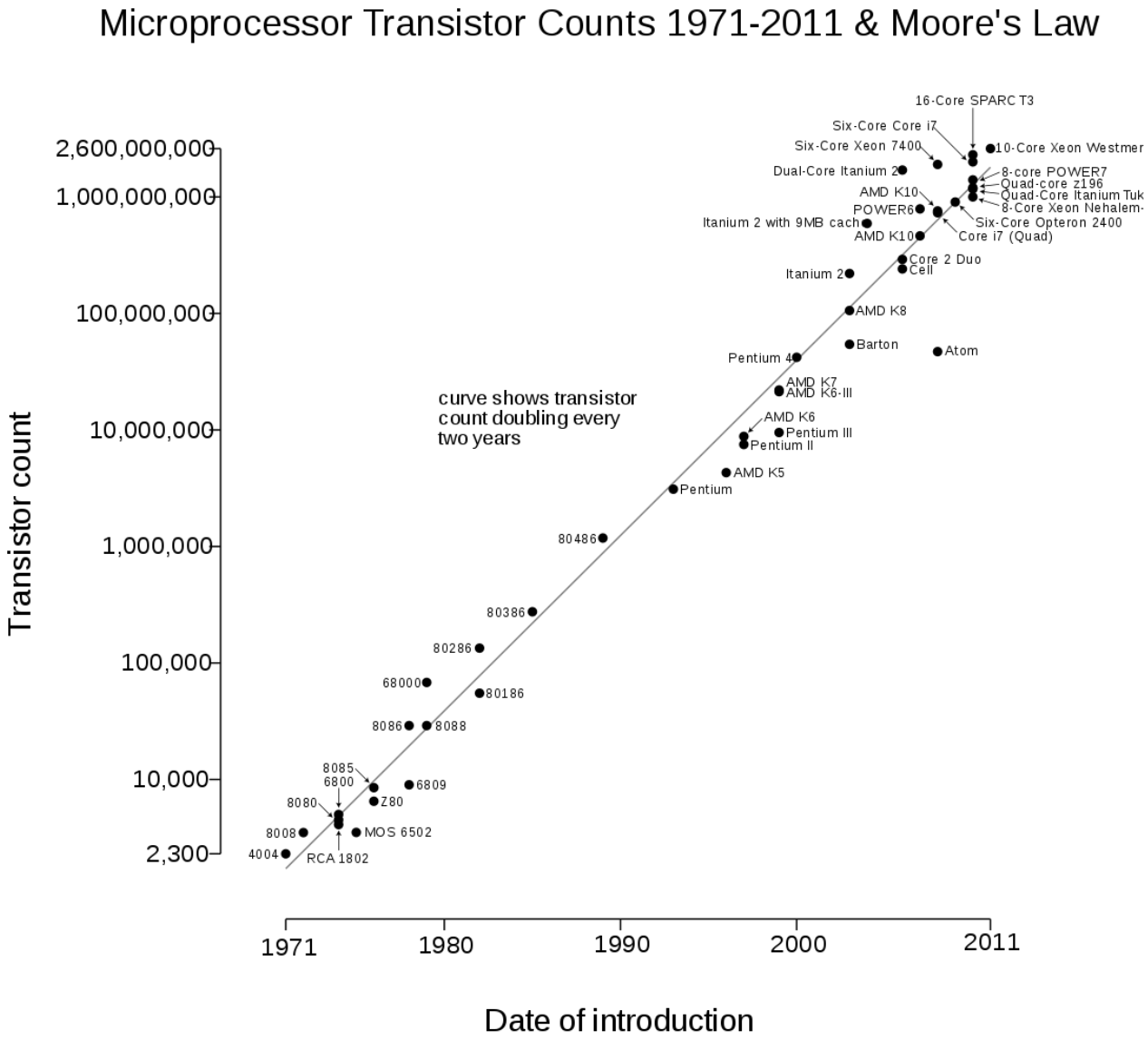
https://www.siam.org/students/resources/report.php



Moore’s Law

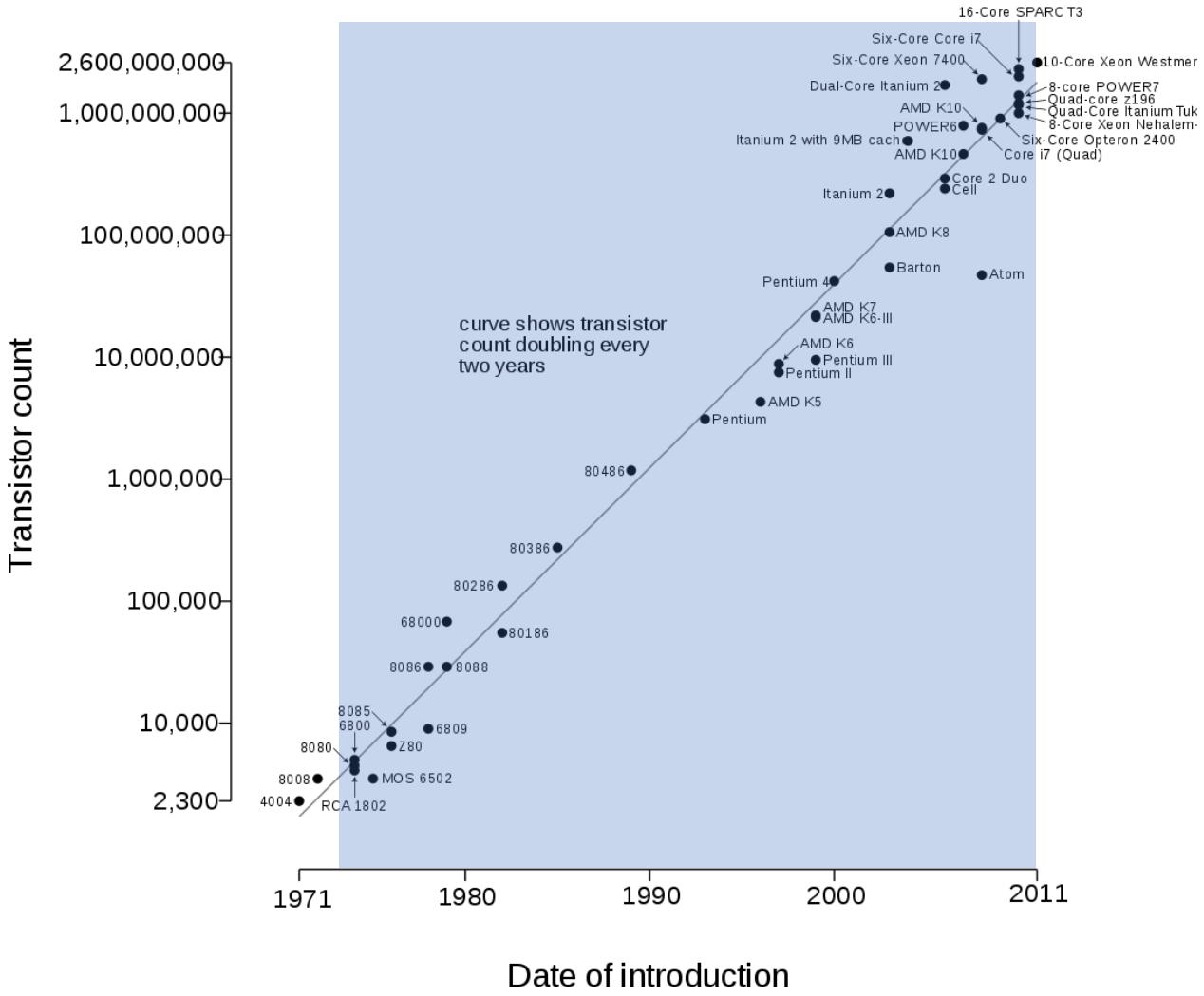
- Generally: Computer processing power will double approximately every two years
- Specifically: the number of transistors on an affordable CPU will double approximately every two years
- Gordon E. Moore
  - Co-founder Intel
  - Author Moore’s Law

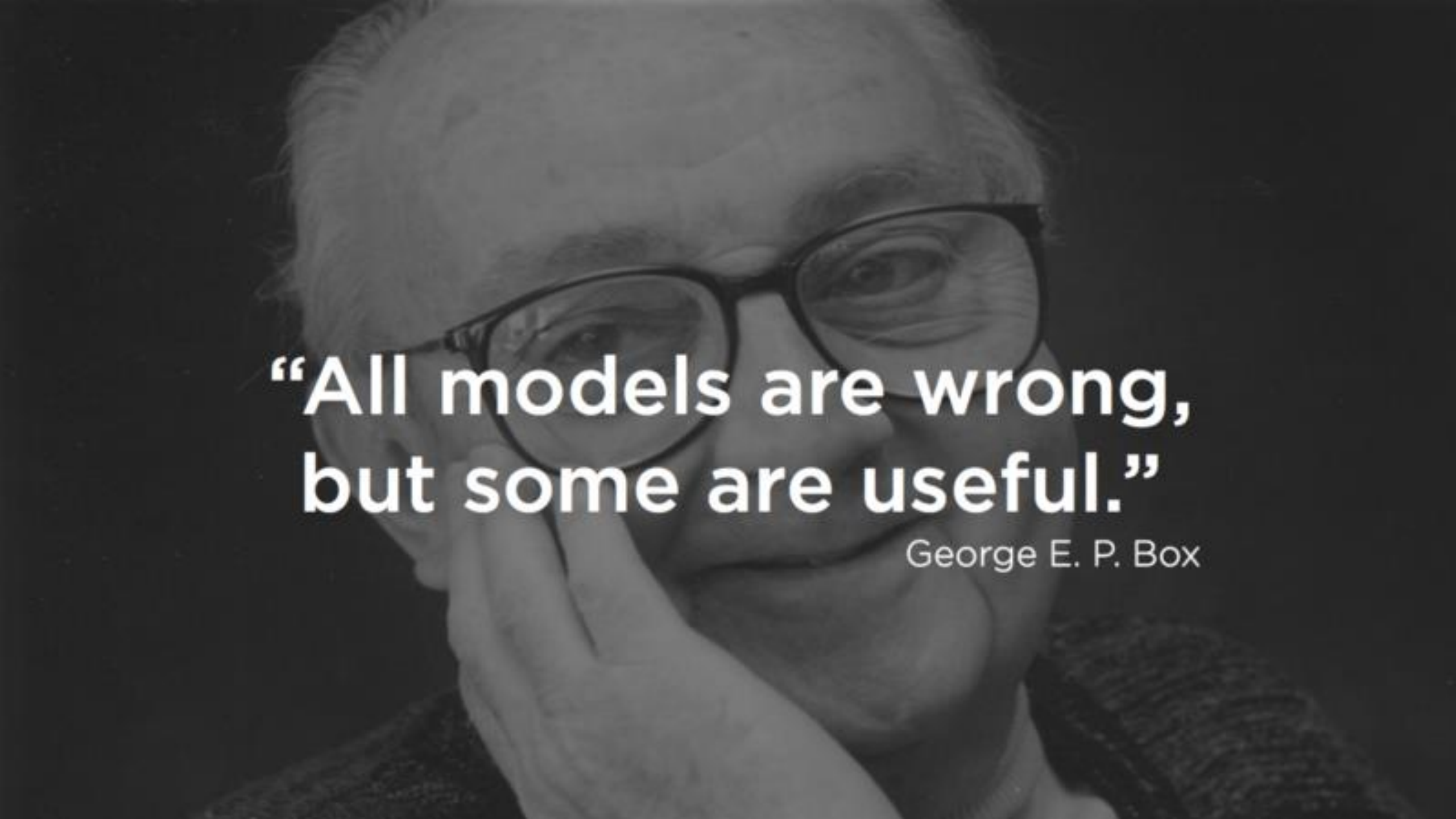




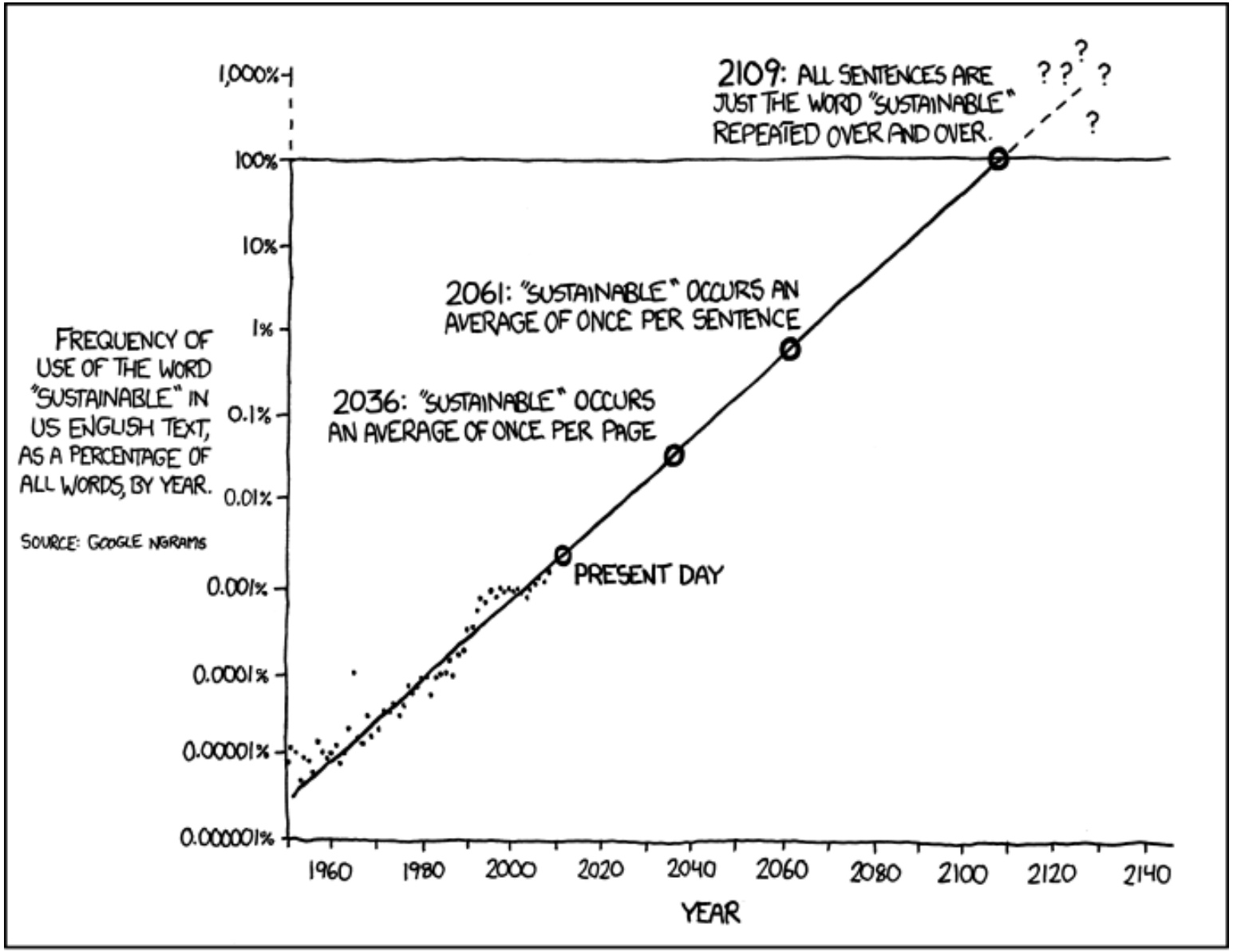
Moore’s Law during Dr. Ted’s Career

- Transistor count has increased over 1,000,000X in 40 years.
- Today’s smart phone has more computing power than all of NASA during the Apollo program




“All models are wrong,
but some are useful.”
George E. P. Box

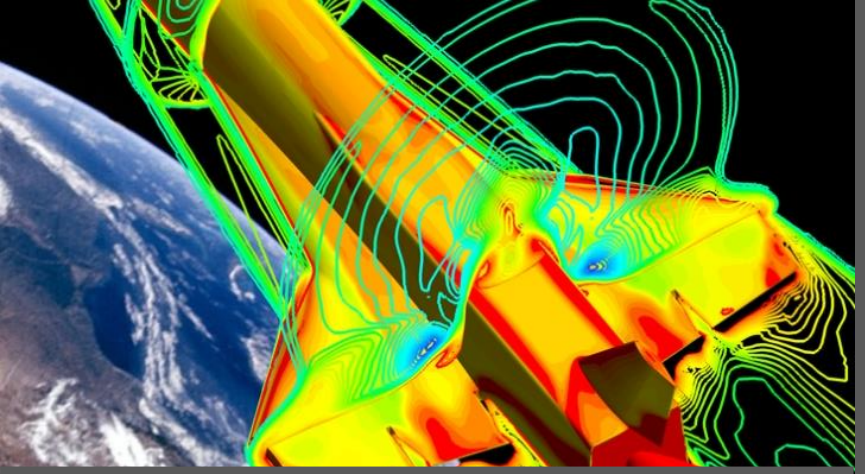
Misusing Statistics

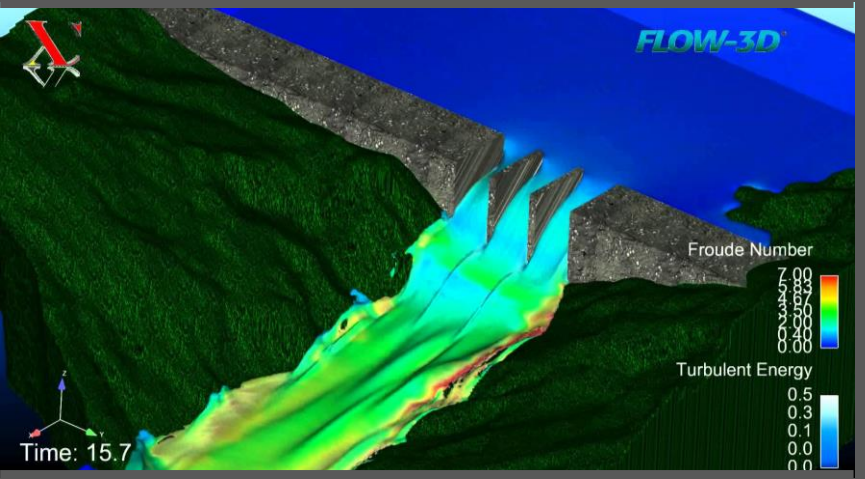


THE WORD "SUSTAINABLE" IS UNSUSTAINABLE.

Topics in Computational Engineering Mathematics

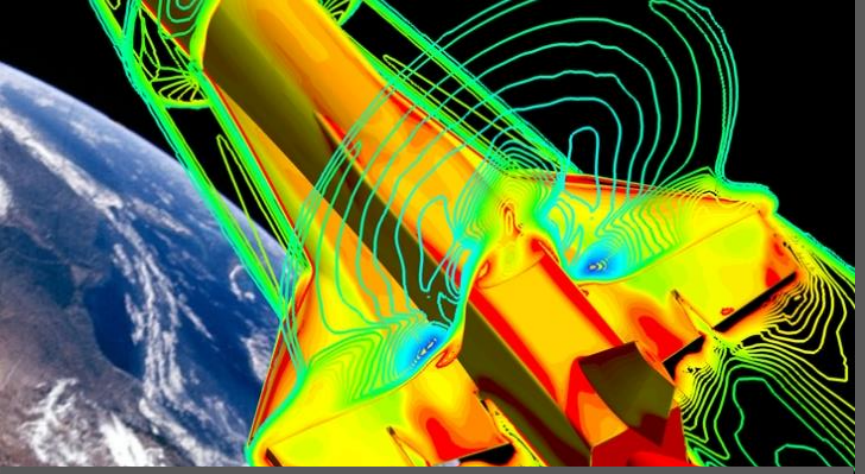
- Computational Fluid Dynamics
- Computational Geoscience
- Computational Hydrology and Hydraulics

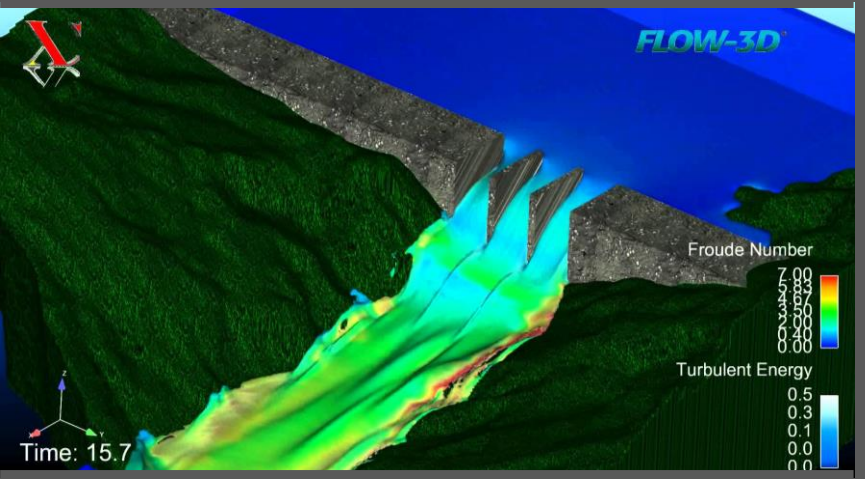




Computational Fluid Dynamics

- Computational Fluid Dynamics (CFD) is the development and application of computational models, simulations, and numerical methods to solve and analyze problems involving fluid flow, both liquids and gases.
- Applications include: automotive, aerospace, marine, defense, chemical, biomedical, electronic, environmental
- A brochure on Computational Fluid Dynamics is available for anyone interested in additional information



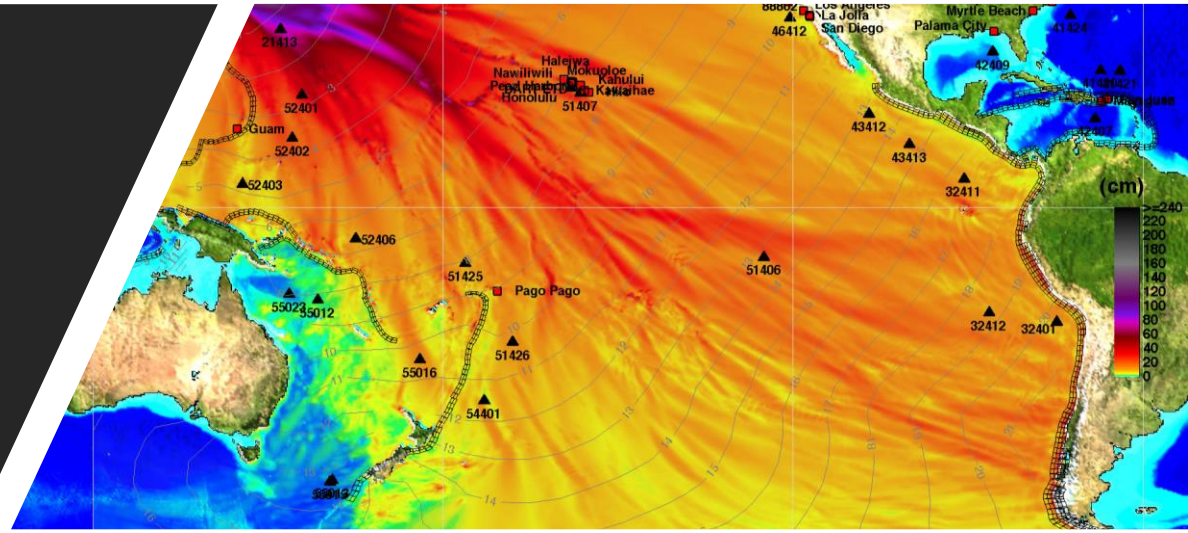


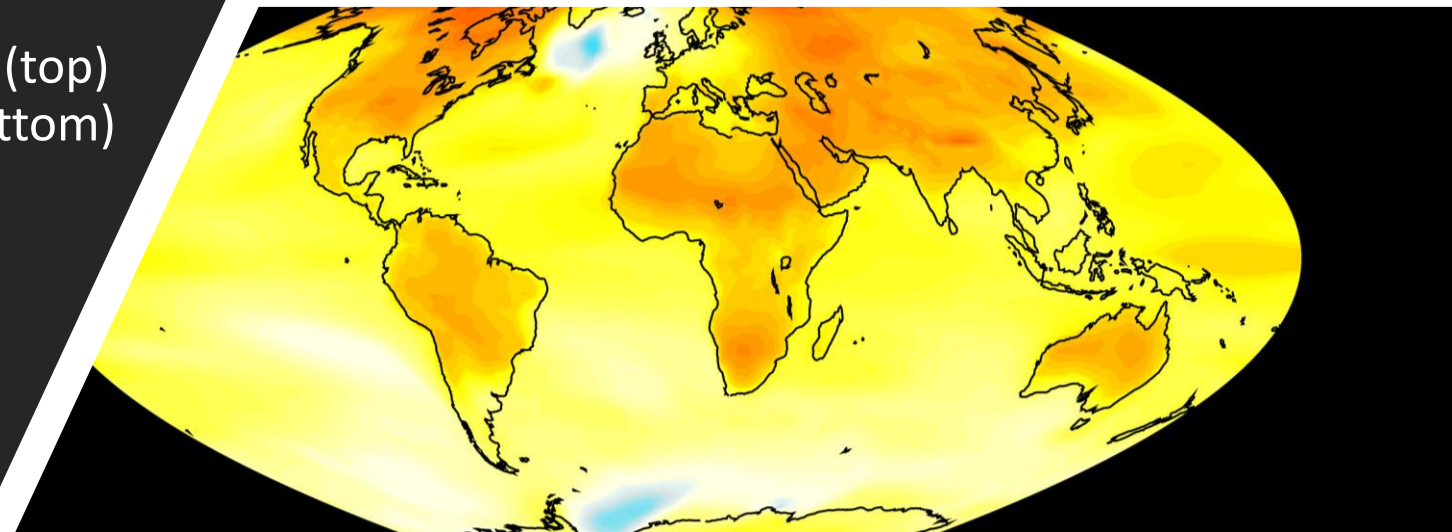
Uses of Computational Fluid Dynamics

- Simulation of Physical Processes: fluid flow, mass transport, heat transport, particle tracking, plasma, chemical reactions
- Examples:
  - Vehicle aerodynamics
  - Heat management of electronic components
  - Urban drainage systems
  - Hull design
  - Wind turbine placement
  - ….

Computational Geoscience

- Computational Geoscience is the development and application of computational models, simulations, and numerical methods to solve complex physical problems arising in the Earth Sciences.
- Applications include: subsurface, surface, and atmospheric processes in addition to signal processing and data imaging
- To the right, NOAA models of a tsunami (top) and surface air temperature change (bottom)

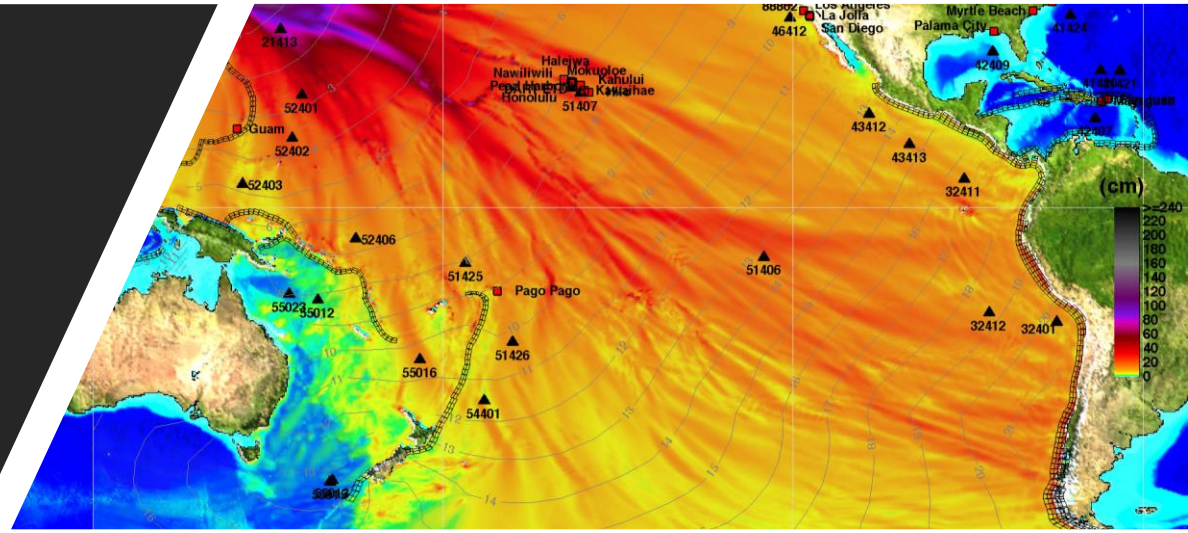


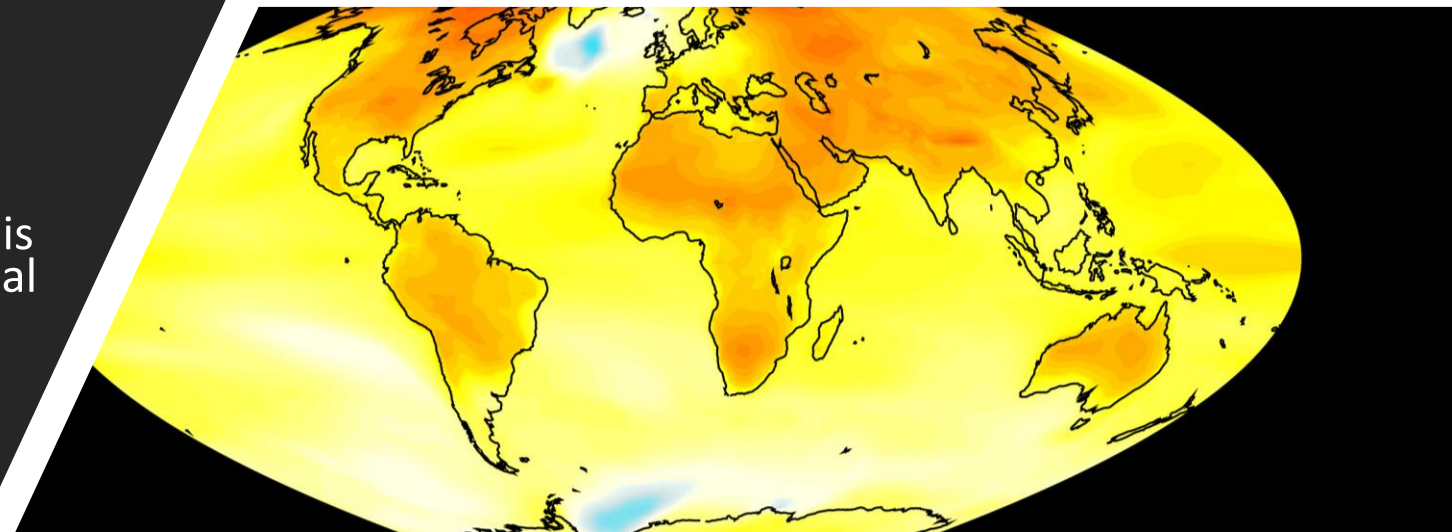


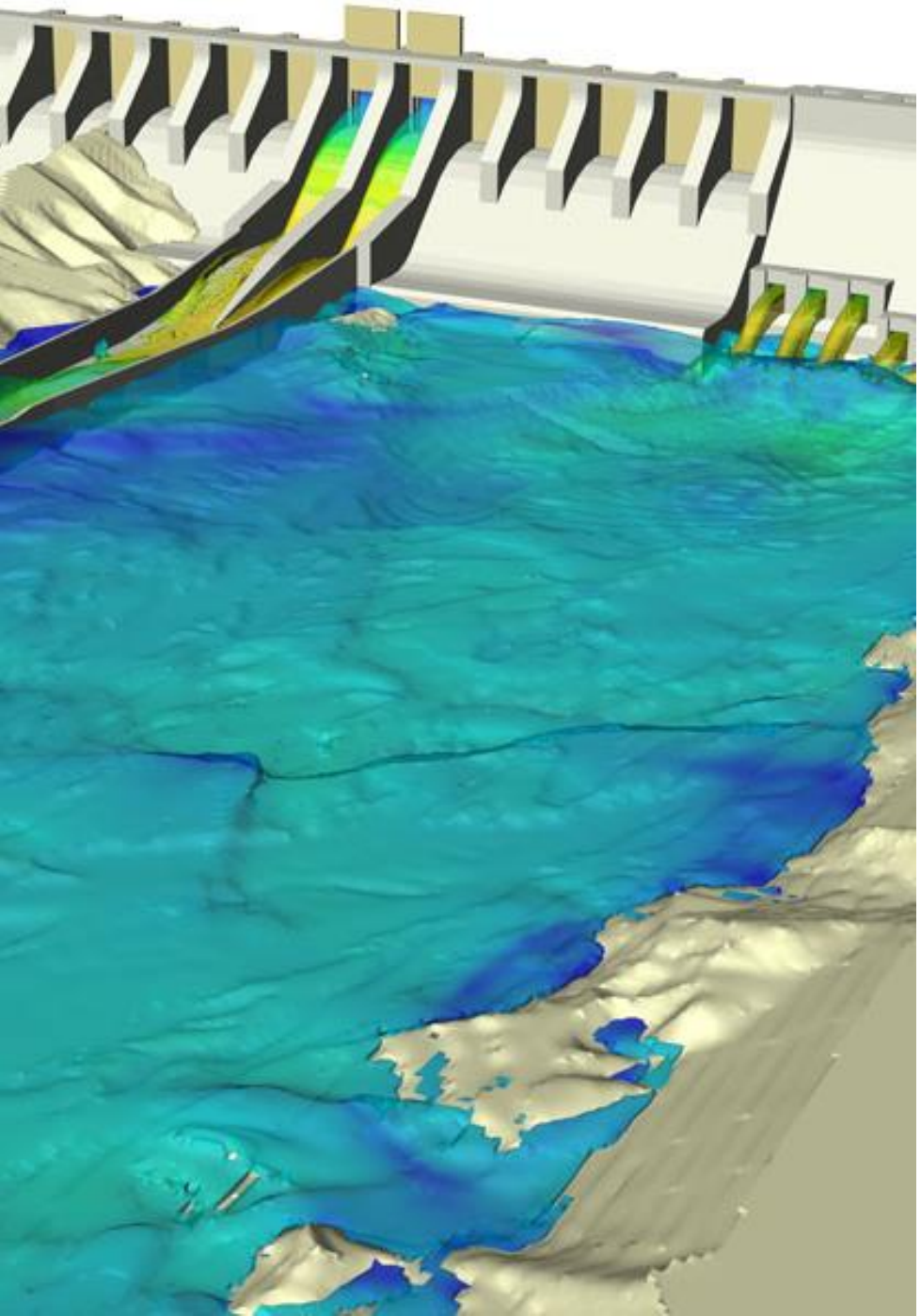
Uses of Computational Geoscience

- Climate modelling
- Earthquake and tsunami modelling
- Petroleum geology
- Reservoir planning and construction
- Radar imaging
- Carbon capture and storage
- Geophysics
- Seismic reflection data analysis
- …

- A brochure on Computational Geoscience is available for anyone interested in additional information

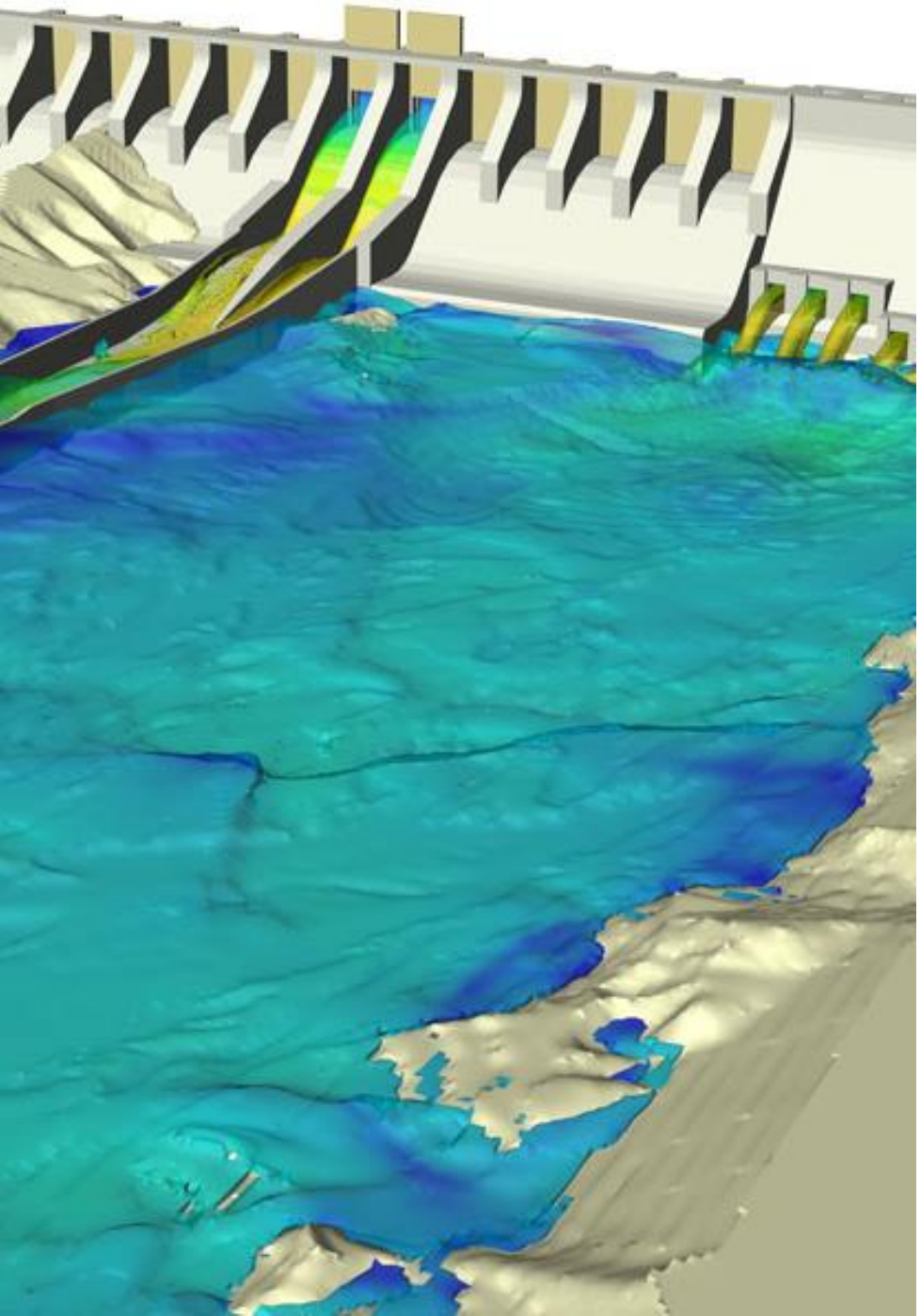






Computational Hydrology and Hydraulics

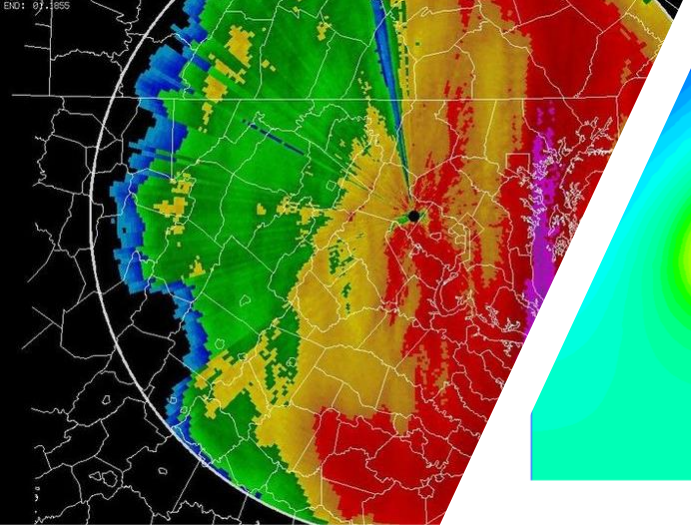
- Computational hydrology is the development and application of computational models, simulations, and numerical methods to solve complex physical phenomena related to the movement of Earth's water.
- Computational hydraulics is focused on Earth's water movement as it relates to bulk fluid flow, which may include natural processes such as river flow or involve interaction with man-made objects such as urban sewage and drainage system and dams.
- To the left, a simulation of a dam, the color represents the absolute velocity

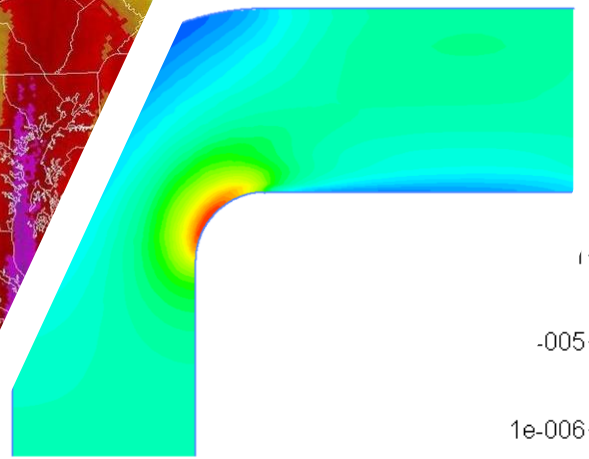


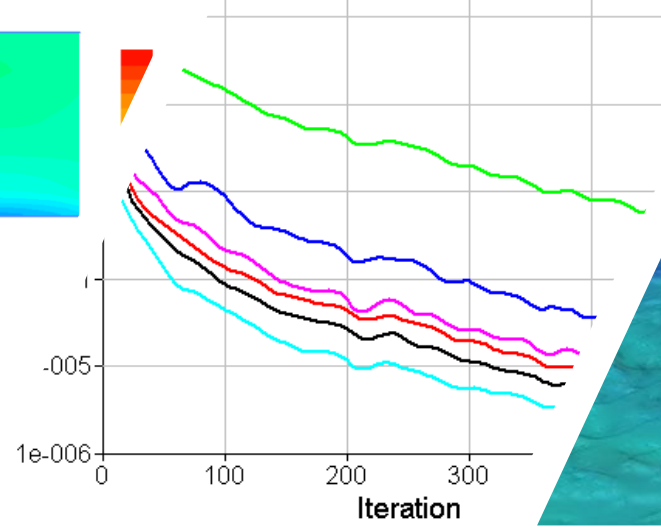
Uses of Computational Hydrology and Hydraulics

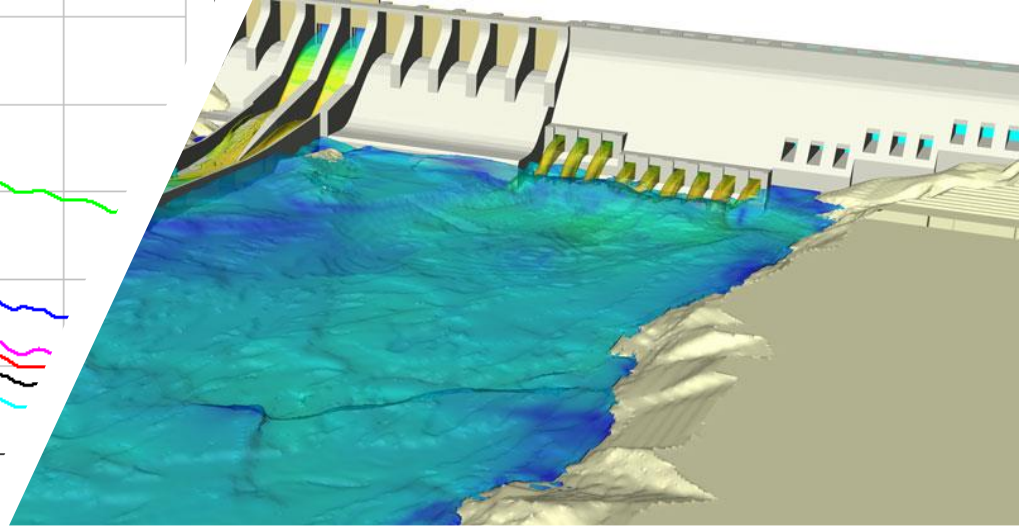
- River management
- Water contamination
- Urban drainage and sewage design
- Dam construction
- Flood forecasting
- Drinking water safety
- ….

- A brochure on Computational Hydrology and Hydraulics is available for anyone interested in additional information







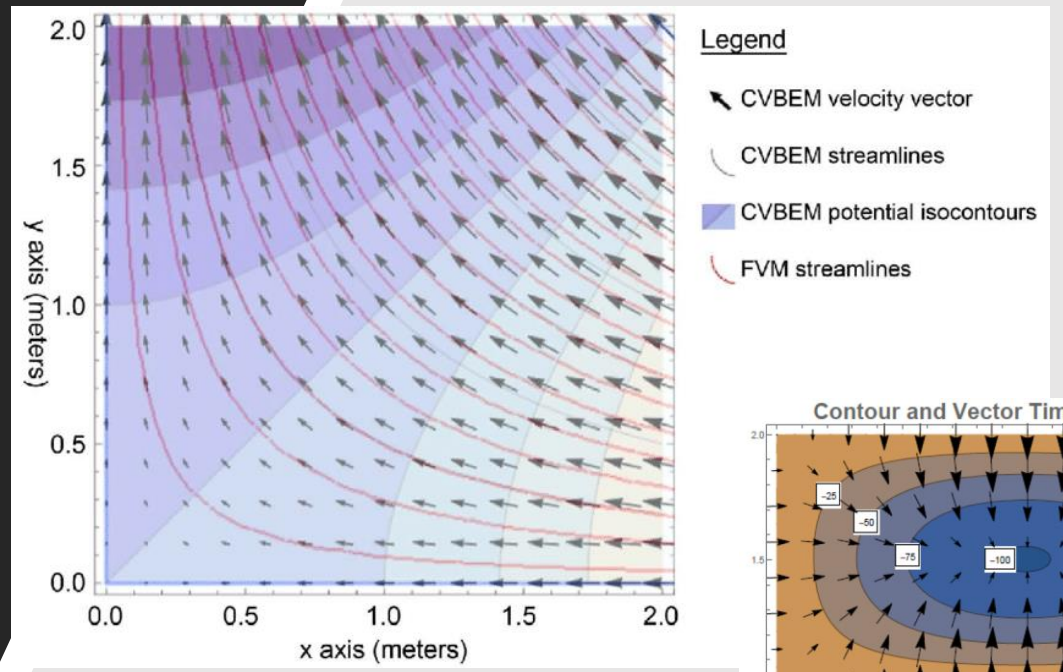


- CVBEM and Flow Modelling
- Surface and Groundwater Hydrology
- Assessment of Computational Model Accuracy

Research Threads In-Progress: Topics

Research Threads in Progress: CVBEM and Flow Modelling

1. Using the CVBEM to Estimate Arrival Time of Groundwater Contamination; with Cadet Stanley Gorzelnik, Civil Engg
2. Wilkins, B., Hromadka II, T.V., Hood, K., McInvale, D., Boucher, R., Computational Model of Groundwater Mound Evolution Using the Complex Variable Boundary Element Method and Generalized Fourier Series
3. Johnson, A.N., Hromadka II, T.V., Phillips, M., Williams, J., Predicting Thaw Degradation in Algid Climates along Highway Embankments using a Boundary Element Method. (Published! See Pub #384)
4. Bloor, C., Hromadka II, T.V., Wilkins, B., McInvale, H., CVBEM and FVM Computational Model Comparison for Solving Ideal Fluid Flow in a 90-Degree Bend. (Published! See Pub #397)
5. Using the CVBEM to Model Groundwater Flow Mechanics



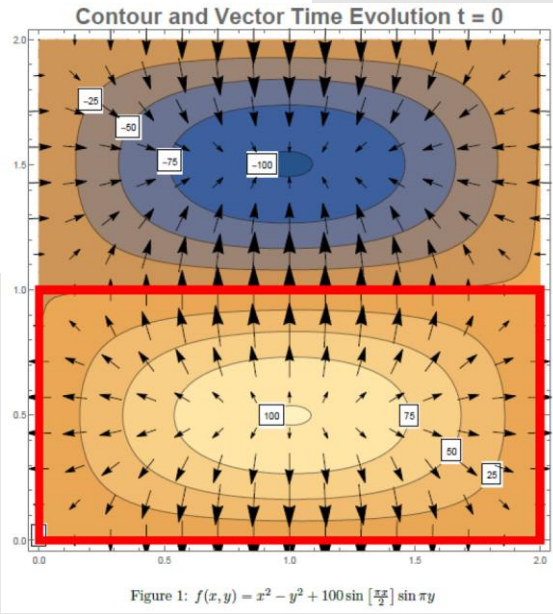


Figure 1: $f(x,y) = x^2 - y^2 + 100\sin\left[\frac{\pi x}{2}\right]\sin \pi y$

Research Threads in Progress: Surface and Groundwater Hydrology

1. A conceptual model to estimate long term infiltration into soils subject to distress
2. Rainfall Infiltration Threshold and Land Slides (Published! See Pub # 371)
3. Rao, P., Hromadka II, T.V., Numerical Modeling of rapidly varying flows using HEC-RAS and WSPG Models. (Published! See Pub #387)
4. Hanus, J.P., Hromadka II, T.V., Phillips, M.D., 2015, Reducing Flood Risk by Use of Better Hydrologic and Hydraulic Data and Methods.
5. Earthen Dam-Break Regression Equation assessment (with CPT Karoline Hood)

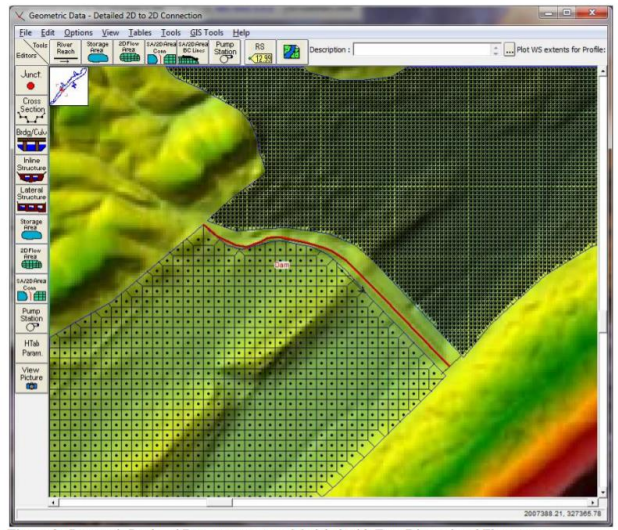


Figure 3. Reservoir Pool and Downstream Area Modeled with Two-Dimensional Flow Areas

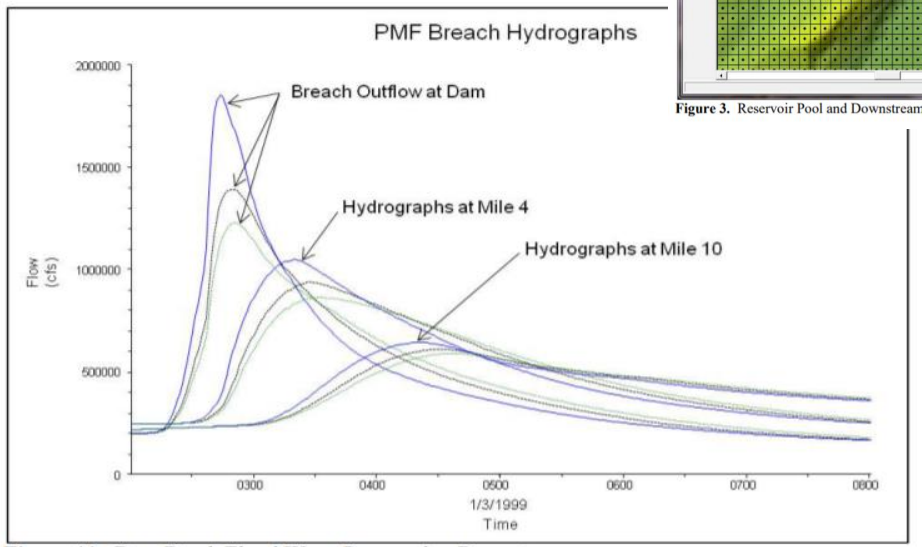
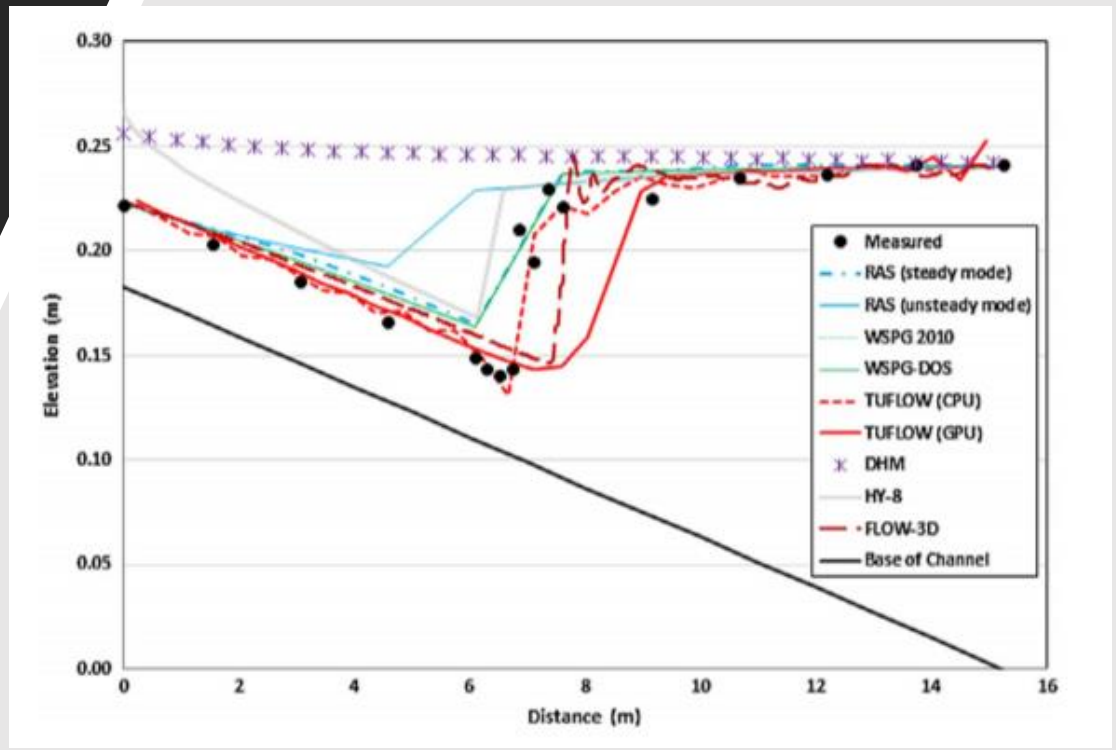
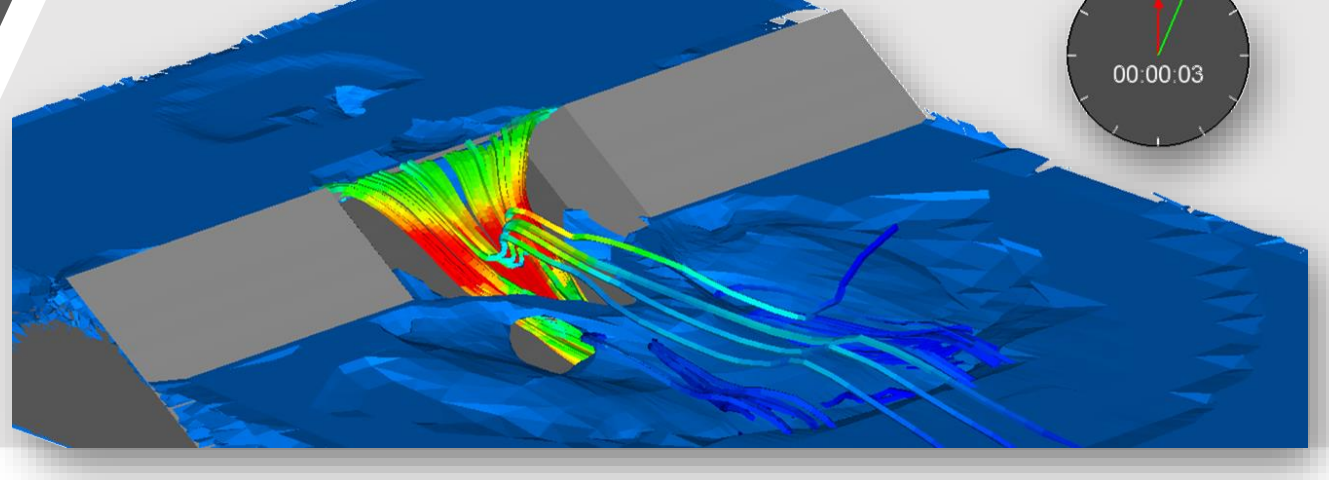


Figure 11. Dam Break Flood Wave Progression Downstream

Research Threads in Progress: Assessment of Computational Model Accuracy

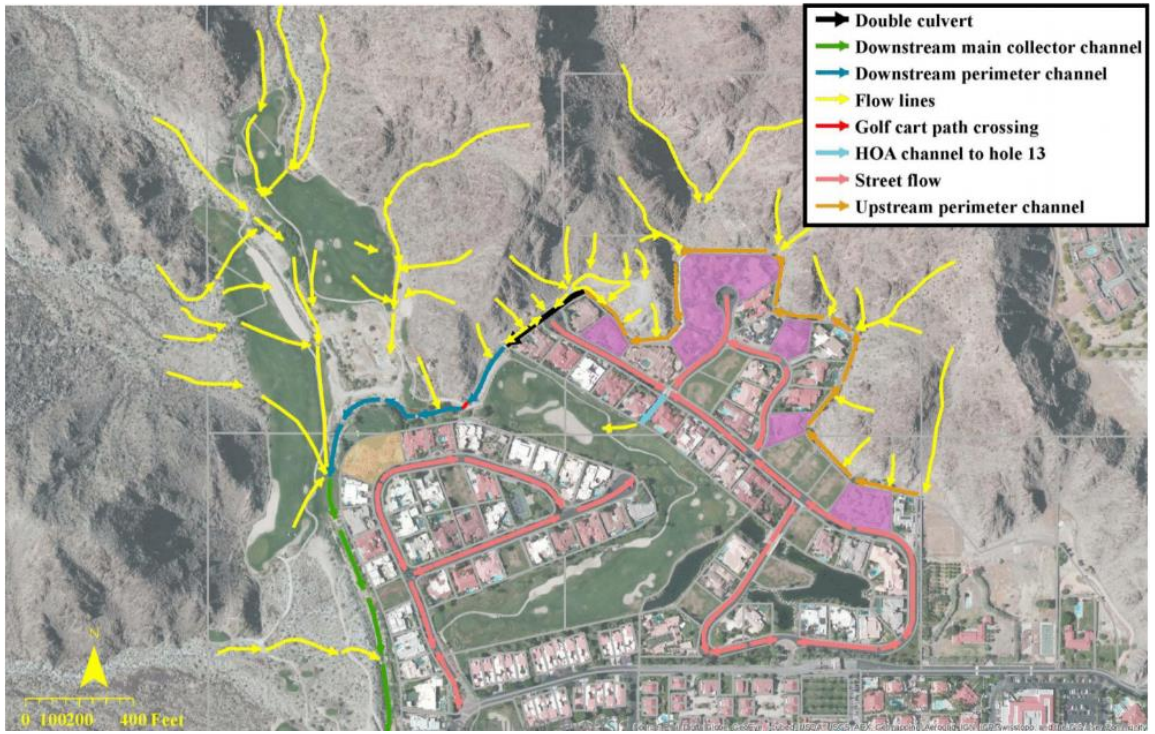
1. Hromadka II, T.V., Bloor, C., Jordan N., Analysis of Stability, Consistency, and Convergence: Diffusion Hydrodynamic Model (DHM)
2. Rao, P., Hromadka II, T.V.,Huxley, C., Souders, D., Jordan, N., Yen, C.C., Bristow, E., Biering, C., Horton, S., Espinosa, B., Assessment of Computer Modeling Accuracy in Floodplain Hydraulics. (Published See Pub #391)
3. Flowerday, N., Kratch, A., Wilkins, B.D., Greenberg, J., Redmond, B., Baily, A., Hromadka II, T.V., Boucher, R., Johnson, A., McInvale,H.D., Horton, S., A Procedure for Groundwater Model Numerical Testing
4. Hromadka II, T.V., Rao, P., Assessment of Computer Modeling Accuracy in Floodplain Hydraulics. (Published! See Pub #398)
5. Hromadka II, T.V., Isenhour, M., Rao. P., Yen, C.C., Crow, M., Computational Biopsy to Validate Large Scale Computational Models of Groundwater Flow



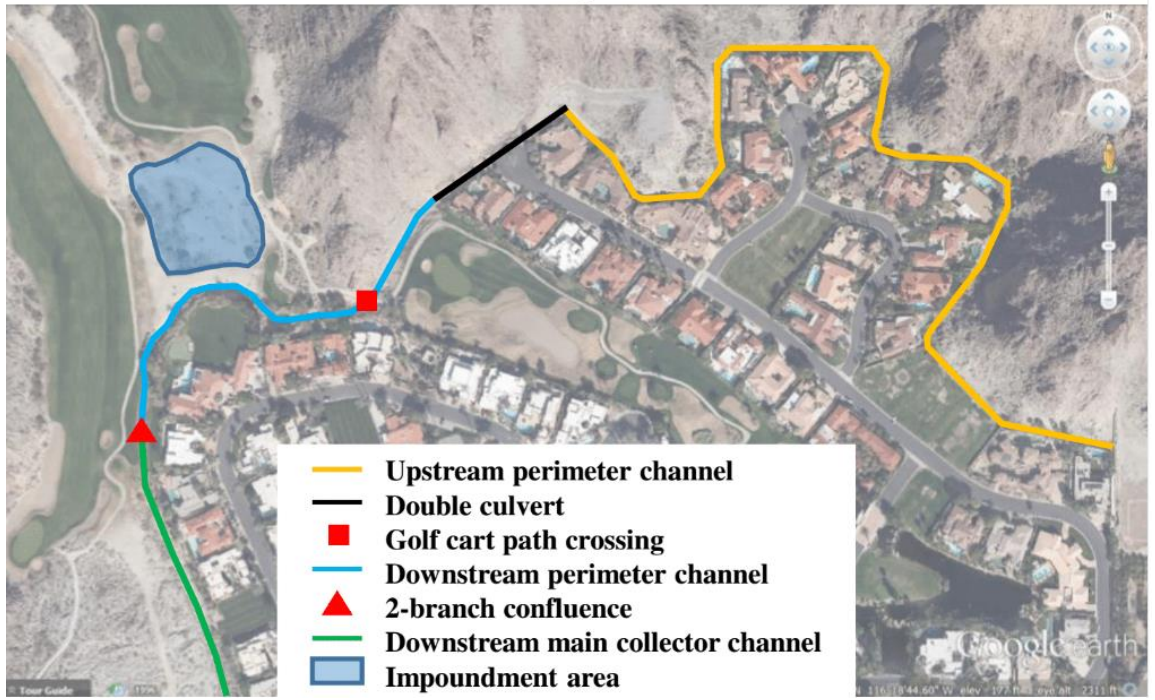


Case Study: Impoundment Breach and Flooding

Current Flowpaths



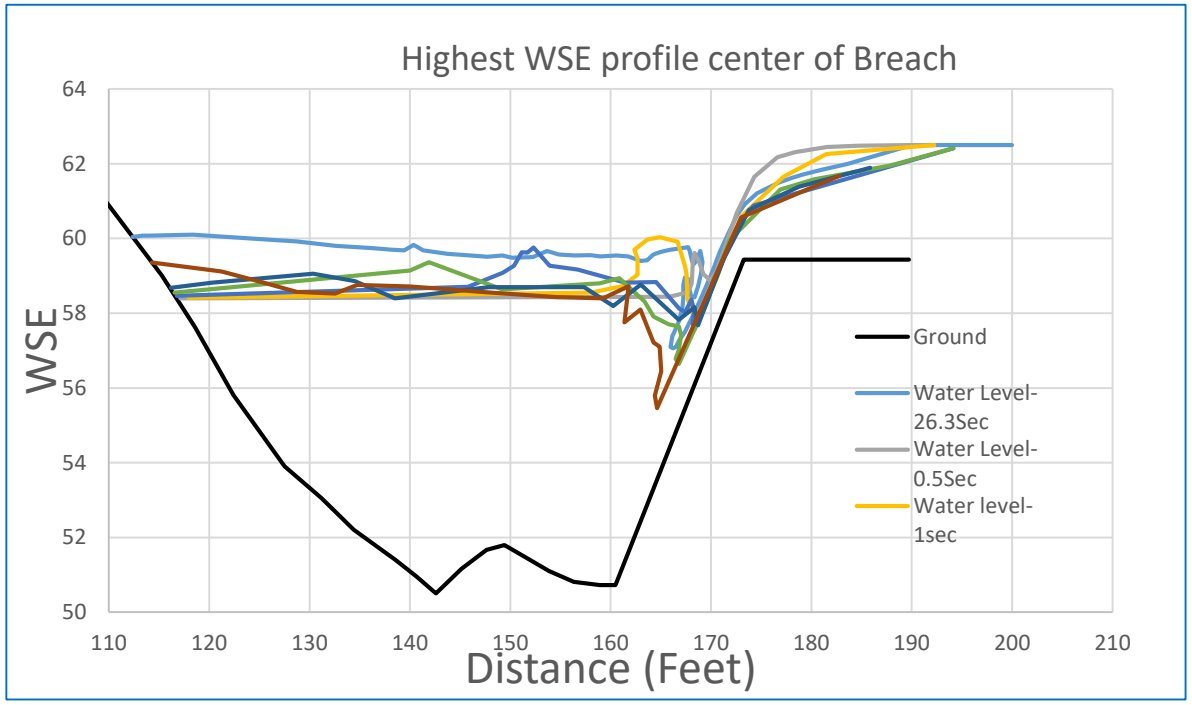
Flood Control System Elements

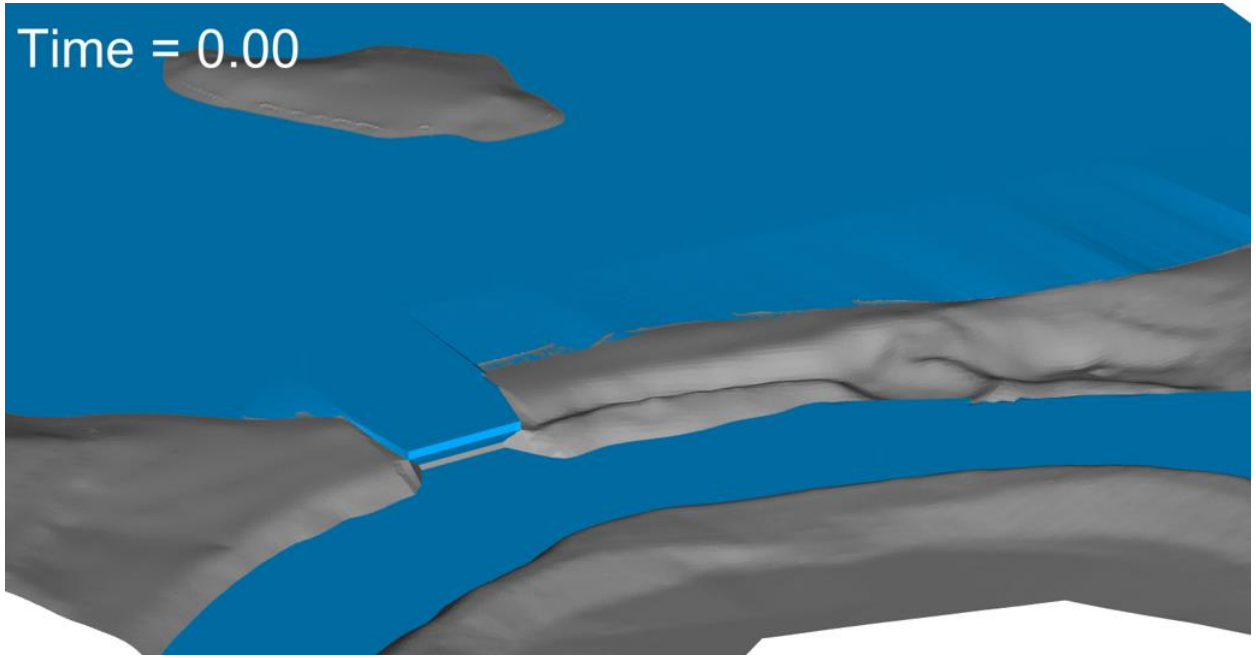


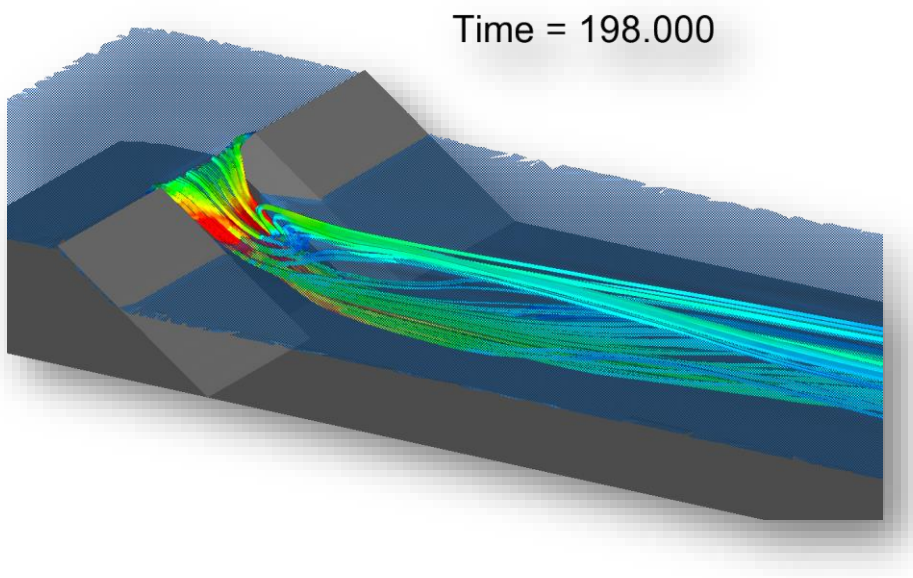
Impoundment Breach and Flooding: Overview

Breach and Flooding: Physical Mock-Up

Breach and Flooding: Physical Mock-Up Videos







Breach and Flooding: Computational Fluid Dynamics

Breach and Flooding: Computational Fluid Dynamics