Flooding in Southeast Texas: The Science Behind the Floods

An educational conference bringing together stakeholders, including business, scientists, engineers, citizen coalitions and government agencies to exchange current knowledge and ideas for the future.

June 6 – 7, 2018
7:30 a.m. – 5:00 p.m.

University of Houston Student Center • 4455 University Dr, Houston, TX 77204
Organized by the Houston Geological Society in Cooperation with: Area Universities, Science and Engineering Societies, and Governmental Agencies

Registration Fee: $200 Includes Breakfast, Lunch, Coffee Breaks, and 16 PDHs
(Students: call HGS Office 713-463-9476 to receive $75 registration and for volunteer opportunities)
To guarantee a luncheon reservation, you must register before 4 pm May 31

Event Coordinator—Cheryl Desforges: cheryldesforges@hotmail.com
Sponsorships Available

Speakers from industry, academia, and government, including:
University of Houston: Dr. Bill Dupre, Dr. Julia Wellner, Dr. William Sager, Dr. Arturo Leon
Rice University: Dr. Philip B. Bedient, Dr. Jeff Nittrouer, Dr. Lester King
Texas A & M University: Dr. John Nielsen-Gammon (TX State Climatologist), Dr. Gretchen Miller, Dr. Christopher Mathewson
Harris County Flood Control District: Jeff Lindner, Matthew Zeve
Texas Water Development Board: Dr. Leyon Greene
Harris-Galveston Subsidence District: Michael J. Turco
City of Houston: Stephen Costello
Army Corps of Engineers: Sherri Willey
Elected Officials: Senator Paul Bettencourt, Judge Ed Emmett, Congressman John Culberson
Industry: Keith Owens, Mike Allison, Viktor Hlas, Davis Tolman
Greater Houston Flood Mitigation Consortium: Christof Spieler; Houston Stronger: Auggie Campbell
### Day 1 – Wednesday, June 6, 2018 Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:30 a.m.</td>
<td>Doors Open – Registration</td>
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<tr>
<td>8:30 a.m.</td>
<td>Welcome, Overview</td>
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<tr>
<td>8:45 a.m.</td>
<td>Science and Technology Session 1: Historical Overview</td>
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<td></td>
<td>Deep Time Geological/Hydrological Historical Research – Bill Dupre</td>
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<td></td>
<td>Historical Weather Patterns/Expected Frequency of Extreme Rainfall –</td>
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<td></td>
<td>Nielsen-Gammon</td>
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<td>Recent History (Harvey) – Jeff Lindner</td>
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<tr>
<td>10:15 a.m.</td>
<td>Break</td>
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<tr>
<td>10:45 a.m.</td>
<td>Session 2: Causes of Flooding and Risks for the Future</td>
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<tr>
<td></td>
<td>Generic Meteorology – Meteorologists: Leyon Greene, John Nielsen-Gammon, and Bill Read/Alec Garcia</td>
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<td>Annual Cycles</td>
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<td>Decal Cycles</td>
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<td>Longer Cycles – Large Scale Flooding and Atlantic Multi Decadal Oscillation</td>
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<tr>
<td></td>
<td>Generic: Hydrology and Hydraulics of Flooding and Flood Management in an Urban Environment – Christopher Matthewson</td>
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<tr>
<td>11:45 a.m.</td>
<td>Lunch</td>
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<tr>
<td>12:00 p.m.</td>
<td>Economic Impact of Flooding – Paul Bettencourt</td>
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<tr>
<td>1:00 p.m.</td>
<td>Session 2 (continued)</td>
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<td>Topography/Geology/Subsidence – Mike Turco (HGSD); Wanda Grupa and Shuhab Kahn, UH</td>
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<td></td>
<td>Geomorphology Including Drainage Basin Spillover – Jeff Nittroline and Bill Dupre</td>
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<td>Storm Surge – maybe Dr. Merrell, TAMUG or Sebastian, Rice</td>
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<td></td>
<td>Natural vs Concrete or Detention Reservoirs – Bedient</td>
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<td>Meteorology Revisited: The Impact of the Relationship of the Drainage Network to the Path of the Storm.</td>
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<td>History of Flooding and Formerly Proposed Plans – USACE</td>
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<tr>
<td>3:00 p.m.</td>
<td>Session 3: Daily Panel Discussion/Brainstorming</td>
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<tr>
<td>4:45 p.m.</td>
<td>Adjourn For Day</td>
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</table>

### Day 2 - Thursday, June 7, 2018 Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00 a.m.</td>
<td>Session 1 Present Day Design of Mitigation</td>
</tr>
<tr>
<td></td>
<td>What is Modeling Based on?</td>
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<tr>
<td></td>
<td>Rainfall Measurements and Analyses – NOAA's Atlas 14 – presenter</td>
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<td></td>
<td>Topographic Control – Fugro Lidar Survey</td>
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<td>Other</td>
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<td></td>
<td>– Reservoirs</td>
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<td>– Detention Ponds</td>
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<td>– Stormwater sewer system</td>
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<td>– Roads – TXDOT?</td>
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<td>– Levees and Dikes</td>
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<td>– Transfer Canals</td>
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<td>– Pumping Systems for Flood-Prone Areas</td>
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<tr>
<td>10:00 a.m.</td>
<td>Break</td>
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<tr>
<td>10:15 a.m.</td>
<td>Session 2 Current and Proposed Activity to Address Flooding Issues</td>
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<tr>
<td></td>
<td>The Role of Government</td>
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<td>USACE Report to Congress</td>
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<td>NOAA Atlas 14 Rainfall Models – Latest Due in November</td>
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<td></td>
<td>Revising Topographic Maps – use of LIDAR, Current LIDAR Study-Fugro</td>
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<td></td>
<td>Modeling Flood Events</td>
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<td></td>
<td>Drainage Tunnels. Pumping Systems for Flood-Prone Areas</td>
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<td>Injection of Flood Waters into the Subsurface.</td>
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<tr>
<td>11:45 a.m.</td>
<td>Lunch</td>
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<tr>
<td>12:00 p.m.</td>
<td>Session 2 (continued)</td>
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<td>Use of Roads and Stormwater Sewer Systems for Storage and Conduits – Possibly TXDOT or Houston</td>
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<td></td>
<td>Cities – City of Houston – Stephen Costello; also possibly Bellaire's Flood Mitigation Task Force</td>
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<td>TexMesnet – Leyon Greene – TWDB</td>
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<tr>
<td>2:15 p.m.</td>
<td>The Role of Developers</td>
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<td>3:00 p.m.</td>
<td>The Role of Citizen Coalitions</td>
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<td>Helping Governments/Agencies Define the Problem – e.g. JUV drone study</td>
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<tr>
<td>3:00 p.m.</td>
<td>Session 3: Daily Panel Discussion/Brainstorming</td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>Adjourn</td>
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Register online – www.hgs.org/civicrm/event/info?id=1958

Information – HGS 713-463-9476

Event Coordinator—Cheryl Desforges: cheryldesforges@hotmail.com

Sponsorships Available
<table>
<thead>
<tr>
<th>SPEAKER</th>
<th>ASSOCIATION</th>
<th>GENERAL TOPIC</th>
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<tbody>
<tr>
<td>Sherri Willey</td>
<td>U.S. Army Corps of Engineers, Galveston District</td>
<td>History of evaluating flooding and mitigation; plans for the future</td>
</tr>
<tr>
<td>Dr. Philip B. Bedient</td>
<td>Herman Brown Professor of Engineering in Civil and Environmental Engineering at Rice University</td>
<td>Detention reservoirs and natural vs. concrete channels</td>
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<tr>
<td>Dr. Arturo Leon</td>
<td>Associate Professor, Department of Civil Engineering at University of Houston</td>
<td>Technology of flood mitigation</td>
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<tr>
<td>Dr. Gretchen Miller</td>
<td>Associate Professor, Zachry Department of Civil Engineering at Texas A&amp;M University</td>
<td>Subsurface injection of flood waters for mitigation</td>
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<tr>
<td>Dr. Christopher Mathewson</td>
<td>Regents Professor Emeritus, Department of Geology &amp; Geophysics at Texas A&amp;M University</td>
<td>Hydrology and hydraulics of flooding and flood management in an urban environment</td>
</tr>
<tr>
<td>Stephen Costello</td>
<td>City of Houston Mayor's Office Chief Resilience Officer “Flood Czar”</td>
<td>Harvey impacts, sources of funding, the recovery and resilience efforts. He usually then focuses on a few key resilience projects</td>
</tr>
<tr>
<td>Dr. John Nielsen-Gammon</td>
<td>Texas State Climatologist, Regents Professor at Texas A&amp;M University</td>
<td>Meteorological risk assessment and frequency of rainfall</td>
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<tr>
<td>Keith Owens</td>
<td>Technical and Business Development Manager Fugro USA Land, Inc.</td>
<td>Topography update using LIDAR</td>
</tr>
<tr>
<td>Mike Allison</td>
<td>Raptor Aerial Services</td>
<td>Use of drones for aerial surveys</td>
</tr>
<tr>
<td>Jeff Lindner</td>
<td>Director Hydrologic Operations Division/Meteorologist, Harris County Flood Control District</td>
<td>Recent history- Harvey</td>
</tr>
<tr>
<td>Matthew Zeve</td>
<td>Director of Operation, Harris County Flood Control District</td>
<td>Post Harvey future plans</td>
</tr>
<tr>
<td>Dr. Jeff Nittrouer</td>
<td>Assistant Professor, Department of Earth, Environmental and Planetary Sciences, Rice University</td>
<td>Fluvial Geomorphology and its relationship to flooding</td>
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<tr>
<td>Name</td>
<td>Institution</td>
<td>Topic</td>
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<tr>
<td>Dr. Bill Dupre</td>
<td>Professor Emeritus, University of Houston</td>
<td>Pleistocene controls on modern drainage patterns</td>
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<tr>
<td>Dr. Julia Wellner and Dr. William Sager</td>
<td>Professors, Department of Earth and Atmospheric Sciences University of Houston</td>
<td>Coastal impacts from inland flooding</td>
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<tr>
<td>Dr. Leyon Greene</td>
<td>Texas Water Development Board</td>
<td>TexMesoNet</td>
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<tr>
<td>Michael J. Turco</td>
<td>General Manager, Harris-Galveston Subsidence District, Fort Bend Subsidence District</td>
<td>Impact of subsidence on flooding</td>
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<tr>
<td>Viktor Hlas</td>
<td>OptiRTC, Inc</td>
<td>Preventing Flooding through Intelligent Stormwater Management</td>
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<tr>
<td>Davis Tolman</td>
<td>D Tolman Interests LLC</td>
<td>The Use of LIDAR and Residual Mapping to Communicate Flood Risk</td>
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<tr>
<td>Dr. Lester King</td>
<td>Research Scientist and Lecturer in the School of Natural Sciences, Rice University</td>
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<tr>
<td>John Culberson</td>
<td>U. S. Congressman</td>
<td>5-10 minute talk (federal funding? et al)</td>
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<tr>
<td>Judge Ed Emmett</td>
<td>Harris County Judge</td>
<td>Economics</td>
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<td>Senator Paul Bettencourt</td>
<td>Texas State Senator District 7</td>
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<tr>
<td>Greater Houston Flood Mitigation Consortium and Houston Stronger</td>
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<td>Panel discussion</td>
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