

850 G Street, Suite K, Arcata, CA 95521 phone 707.822.9607

TECHNICAL MEMORANDUM

DATE:	February 16, 2020
то:	Salmonid Restoration Federation
FROM:	Joel Monschke PE and Jay Stallman PG, Stillwater Sciences
SUBJECT:	Supplemental Geotechnical Investigations and Slope Stability Analyses for the Marshall Ranch Flow Enhancement Project

During October and November 2020, three significant activities were conducted to further characterize subsurface conditions and assess stability of the proposed Marshall Ranch Flow Enhancement Project. These included the following:

- 1) Supplemental Geotechnical Investigation consisting of two additional boreholes led by SHN
- 2) Shear Wave Velocity Analyses conducted by Dr. Dimitrios Zekkos
- 3) Slope Stability Analyses conducted by Dr. Adda Athanasopoulos-Zekkos

Supplemental Geotechnical Investigation

Drilling of two additional boreholes was conducted in October 2020 and overseen by SHN geologist Paul Sundberg. The key finding from this investigation is that there is an incline in the bedrock-soil interface downslope from the pond which will increase stability of the proposed pond (see Appendix A, Figure 2).

Shear Wave Velocity Analyses

Shear wave velocity analyses was conducted to further characterize subsurface conditions. This analysis utilizes an array of sensers to measure shear wave velocities within the subsurface soil profile – varying soil and rock types have different shear wave velocity signatures. One of the specific data collection sites was located immediately adjacent to one of the new boreholes to relate shear wave velocities to specific subsurface soil/rock conditions. Data collection was focused adjacent to and just downslope from the proposed pond berm as well as one data collection point in the vicinity of the proposed deflector berm on the lower terrace. This analysis is further described in Appendix B.

<u>Slope Stability Analyses</u>

Slope stability analyses was conducted as described in Appendix C. These analyses incorporated data from the geotechnical investigations and shear wave velocity analyses. Results are summarized on page 7 of the report in Appendix C and are generally consistent with Stillwater Sciences' and SHN's previous findings.

The analysis considered two earthquake scenarios including a ~9.0 magnitude subduction zone earthquake and a ~7.0 magnitude earthquake along the San Andreas Fault. These two scenarios

are described on Figure 17 in Appendix C. However, the nearest subduction zone fault is located \sim 25 km from the site, so a maximum ground motion equivalent to a 7.8 magnitude earthquake is expected at the site based on standard Seismic Design Code Specifications for a seismic event with a return period of 2,475 years.

The Slope Stability Analyses determined that the proposed pond site would experience displacements of less than one inch during this earthquake scenario, but more significant displacements of up to several feet are possible along the steeper slope downgradient from the proposed pond.

Additionally, resumes from the lead preparers of the shear wave and slope stability analyses are included in Appendix D for reference.

Appendix A

Supplemental Geotechnical Investigation



Reference: 018135

November 25, 2020

Dana Stolzman, Executive Director Salmonid Restoration Federation 425 Sung Alley, Unit D Eureka, CA 95501

Subject: Supplemental Geotechnical Investigation for Redwood Creek Flow Enhancement, Marshall Ranch, 195 Somerville Road, Briceland, Humboldt County, California; APN 220-061-011

Dana Stolzman:

This letter summarizes the results of a recent supplemental geotechnical investigation for the proposed Redwood Creek Flow Enhancement project on the Marshall Ranch property in Briceland, California. SHN previously prepared a report titled "Geotechnical Investigation Report for a Proposed Water Storage Basin and Associated Infrastructure for Redwood Creek Flow Enhancement, Marshall Ranch, 195 Somerville Road, Briceland, Humboldt County, California; APN 220-061-01—Revision 1," September 30, 2020. The initial investigation was conducted in 2018 related to the development of the storage basin and associated infrastructure.

The project has evolved since our initial investigation, and two additional borings were drilled in October 2020. The purpose of the two additional borings was to gain further understanding of the subsurface conditions below the proposed storage basin, and to inform the design team's ongoing stability analyses. The additional borings, BH-104 and BH-105 (Figure 1), were advanced south and north of the previously drilled boring, BH-101. The borings were advanced using a track-mounted drill rig using hollow-stem augers, operated by Taber Drilling out of West Sacramento, California. Piezometers were installed in the borings for ongoing groundwater monitoring at the site. Groundwater monitoring is to be conducted by Stillwater Sciences. In general, the results of our supplemental investigation were consistent with our previous investigations and reinforce our previous conclusions about the site conditions.

Boring BH-104 was drilled south and upslope of BH-101 (Figure 1), and revealed as much as 35 feet of alluvium (silt, lean clay, sandy lean clay, and clayey sand) over siltstone bedrock to the total depth drilled of 46.5 feet BGS. Lean clay with sand and sandy lean clay is present at this location starting at 6 feet below ground surface (BGS) and continuing to a depth of 31 feet BGS. The clay was tested for unconfined compression in the field using a pocket penetrometer. The tests resulted in unconfined compression values ranging from 1.75 tons per square foot (tsf) to greater than 4.5 tsf.



Dana Stolzman Supplemental Geotechnical Investigation, Redwood Creek Flow Enhancement Project, Briceland, Humboldt County, California; APN 220-061-011 November 25, 2020

Page 2

Boring BH-105 was drilled north and downslope of BH-101 (Figure 1) and revealed up to 16 feet of alluvium (silt, lean clay, and sandy lean clay) over siltstone bedrock to the total depth drilled of 26.5 feet BGS. Lean clay with sand and sandy clay is present at this location starting at approximately 5 feet BGS and continuing to a depth of 16 feet BGS. The clay was tested for unconfined compression in the field using a pocket penetrometer resulting in an unconfined compression value of greater than 4.5 tsf.

A thicker sequence of alluvium is present in the upslope portion of the proposed storage basin. Groundwater was not encountered in either boring at the time of drilling. A generalized geologic cross section of the subsurface conditions encountered in BH-101, BH-104, and BH-105 is presented on Figure 2. Boring logs are included as Appendix 1.

We hope that this summary provides the information you need at this time. If you have additional questions or require clarification of the information presented herein, please call me at (707) 441-8855.

Sincerely,

SHN



Paul R. Sundberg, PG 9723 Project Geologist

PRS:GDS:ame

Appendix: Boring Logs

Reference Cited

 SHN. (September 30, 2020). "Geotechnical Investigation Report for a Proposed Water Storage Basin and Associated Infrastructure for Redwood Creek Flow Enhancement, Marshall Ranch, 195
Somerville Road, Briceland, Humboldt County, California; APN 220-061-011—Revision 1." Eureka, CA:SHN.



Path: \\eureka\projects\2018\018135-RedwCkFlowGEO\GIS\PROJ_MXD\Figure1_SiteMap.mxd User Name: psundberg DATE: 11/23/20, 12:00PM





Boring Logs

		S.L	Σ	BORING NUMBER BH-104 PAGE 1 OF 2						04 DF 2				
	CLIENT Salmonid Restoration Federation					Redw	ood Creek l	Flow E	nhance	ement	Projec	t		
	PROJ	ECT N	UMBER 018135 P	ROJEC	T LOCAT	ion <u>e</u>	Briceland, H	lumbol	dt Cou	nty, Ca	alifornia	<u>a</u>		
	DATE	STAR	COMPLETED 10/13/20 G	ROUNE	ELEVA		667 ft NAV	D 88	HOLE	SIZE	8"			
	DRILL	ING C	ONTRACTOR Taber Drilling G		WATER	DEPTH	4							
	DRILL	ING N	IETHOD Rotary Hollow Stem Auger	¥ AT '	TIME OF	DRILL	ING							
	LOGO	SED B	Y P. Sundberg CHECKED BY G. Vadurro	⊥ AT			NG							
	NOTE	S <u>Pi</u> e									A T T			
EEK2020.GPJ	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)				INES CONTENT (%)
8\018135_REDWOODCRE	0 		(ML) SILT with SAND; Brown, medium stiff to stiff, non- to wea cemented, fine sand. (ALLUVIUM)	kly									<u>.</u>	
FILES/201						-	25-30-39	-						
ROJECTS/PROJECT			(CL) LEAN CLAY with SAND; Brown, hard, dry to moist, low to medium plasticity, fine sand, moderately cemented, slightly mot (ALLUVIUM)	- — — – tled.		-	(69)	>4.5						
Y/BENTLEY/GINTCL/PI	 		becomes very stiff; few coarse sand		SPT	-	6-9-13 (22)	-						
(GEOGROUP/GINT/LIBRAR)	 _ <u>15</u> 		few fine subangular gravel		мс	-	6-10-20 (30)	3.25						
- 11/24/20 13:14 - \\EUREKA	 _ <u>20</u> 		2" layer of coarse sand and charcoal; becomes medium stiff		SPT		2-4-6 (10)	1.75						
DLUMNS - GINT STD US.GDT	 _ <u>25</u> 		(CL) SANDY LEAN CLAY; Olive brown, stiff, moist, coarse ang sand, low plasticity, moderately cemented. (ALLUVIUM)	 ular	мс	-	5-8-15 (23)	4.0						
GEOTECH BH CC														

		SIL	7				BO	RIN	G N	IUM	IBE	PAG	H-1 E 2 0	04 0F 2	
	CLIENT Salmonid Restoration Federation Pl		PROJEC	T NAME	Redw	ood Creek I	-low E	nhance	ement	Projec	x				
	PROJECT NUMBER _018135 PR		PROJEC	T LOCAT	ION _	Briceland, H	umbol	dt Cou	nty, Ca	aliforni	а				
	EPTH (ft)	APHIC LOG	MATERIAL DESCRIPTION		PLE TYPE JMBER	DVERY % RQD)	BLOW DUNTS VALUE)	KET PEN. (tsf)	UNIT WT. (pcf)	ISTURE TENT (%)				CONTENT (%)	
	30	5			SAM	REC	- Ö Z	POC	DRY	M NON	LP C	LIP	PLAS ⁻	FINES	
ODCREEK2020.GPJ			(SC) CLAYEY SAND; Brown, medium dense, wet, fine to coar angular to subangular sand, slightly cohesive, non-cemented. (ALLUVIUM)	rse	SPT	-	(16)								
21_FILES\2018\018135_REDWO	 - 40	*****	SILTSTONE; Very dark gray, very weak field strength, very de grained, highly decomposed, very intensely fractured. (BEDRC	nse, fine DCK)	SPT	-	9-16-25 (41)	-							
Y/GINTCL/PROJECTS/PROJEC	 	****			SPT	-	21-30-39 (69)								
ENTLE		× × × × × × × × ×			SPT		(52)								
3EOTECH BH COLUMNS - GINT STD US.GDT - 11/24/20 13:14 - \\EUREKA\GEOGROUP\GINT\LIBRARY\															

			Σ				BO	RIN	G N	UM	BE	R B PAGI	H-1 ∃ 1 0	05 0F 1
c	LIENT Salmonid Restoration Federation PROJECT NAME Redwood Creek Flow Enhancement Project													
P	ROJECT NUMBER 018135 PROJECT LOCATION Briceland, Humboldt County, California													
			IED 10/14/20 COMPLETED 10/14/20 ONTRACTOR Taber Drilling	GROUND			<u>047 ft NAVI</u> I	<u> 88 C</u>	HOLE	SIZE	8			
	RILL	ING M	ETHOD Rotary Hollow Stem Auger			DRILLI	' ING							
L	OGG	ED B)	CHECKED BY G. Vadurro		END OF I	ORILLII	NG							
N	OTE	S Pie	zometer installed in boring upon completion	TAFT	ER DRIL	LING _								
					Щ	%		ż	<u>н</u> .	(%	AT1		RG	TN.
	(ft)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE TYF NUMBER	RECOVERY (RQD)	BLOW COUNTS (N VALUE)	POCKET PEI (tsf)	DRY UNIT W (pcf)	MOISTURE CONTENT (9	LIQUID	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTE (%)
			(ML) SILT with SAND; Brown, medium stiff to stiff, fine sand (ALLUVIUM)											
			(CL) LEAN CLAY with SAND; Brown, very stiff, dry to moist, plasticity, moderately cemented, fine sand, slightly mottled. (ALLUVIUM)	medium	мс		9-17-28 (45)	>4.5						
	<u>10</u> – –		(CL) SANDY LEAN CLAY with GRAVEL; Brown, very stiff, m plasticity, fine to coarse subangular sand and gravel (15%), w cemented, cohesive. (ALLUVIUM)	oist, low veakly	SPT		6-11-14 (25)	-						
219	15						44.40.50	-						
			SILTSTONE; Very dark gray, weak field strength, very dense, moderately decomposed, very intensely fractured, very thinly fine grained. (BEDROCK)	, highly to bedded,	мс		14-43-50 (93)							
3:15	20	× × ×												
	- - 25_	*****			SPT		10-39-							
	_	× × × × × ×	Pottom of borsheld at 26 5 fact				50/3"							
GEOLECH BH COL			Bollom of Dorenole at 20.5 feet.											

Appendix B

Shear Wave Velocity Analyses

In Situ Shear Wave Velocity

Measurements

Redwood Creek Flow Enhancement Marshall Ranch Briceland, Humboldt County, California

Prepared by ARGO-E LLC

Prepared for

Stillwater Sciences 850 G Street, Suite K, Arcata, CA 95521 tel 707-822-9607 fax 888-766-5110 www.stillwatersci.com

November 24 2020

TABLE OF CONTENTS

1.	INT	RODUCTION	1
2.	FIEI	D TESTING DESCRIPTION	1
3.	MET	THODOLOGY	1
	3.1	MASW Method Field Measurements	1
	3.2	MAM Method Field Measurements	2
	3.3	2D MASW Method Field Measurements	2
	3.4	Dispersion Curve Analysis and Forward Modeling Process	2
4.	RES	ULTS	3
5.	REF	ERENCES	3

FIGURES

APPENDICES

Appendix A. Surface Wave Testing Locations

Appendix B. Shear Wave Velocity Profiles in Tabular Format

LIST OF FIGURES

Figure 1. Google Earth Site Map and Sounding Locations

Figure 2. UAV photo and Sounding Locations

Figure 3. Surface wave testing at Location 1

Figure 4. Surface wave testing at Location 2

Figure 5. Surface wave testing at Location 3

Figure 6. Borehole BH-105 near Location 3

Figure 7. Surface wave testing at Location 4

Figure 8. Schematic of Linear array for surface wave measurements

Figure 9. Dispersion Curve and Shear Wave Velocity Profile at Location 1

Figure 10. Dispersion Curve and Shear Wave Velocity Profile at Location 2

Figure 11. Dispersion Curves and V_S Profiles from 2D MASW at Location 2

Figure 12: 2D Shear Wave Velocity Profile at Location 2

Figure 13. Dispersion Curve and Shear Wave Velocity Profile at Location 3.

Figure 14: Upper 40ft Shear Wave Velocity Profile at Location 3 and Borehole BH-105

Figure 15. Dispersion Curve and Shear Wave Velocity Profile at Location 4

Figure 16. Dispersion Curves and V_S Profiles from 2D MASW at Location 4

Figure 17: 2D Shear Wave Velocity Profile at Location 4

Figure 18: All 1D Shear Wave Velocity Profiles

LIST OF APPENDICES

Appendix A. Surface Wave Testing Locations

Appendix B. Shear Wave Velocity Profiles in Tabular Format

1. INTRODUCTION

At the request of Mr. Joel Monschke, Stillwater Sciences, in situ seismic geophysical surveys have been performed at the Marshall Ranch in Briceland, Humboldt County, California with the intent to characterize the subsurface conditions in areas where boreholes do not exist. Field measurements were performed under the direction of Dr. Dimitrios Zekkos on October 25 2020 with the assistance of Parker Blunts and Brittany Russo. Analyses were conducted with the assistance of Dr. George Zalachoris. This report documents the field testing and was prepared by Dr. Dimitrios Zekkos, and Dr. George Zalachoris with reviews and feedback by Dr. Adda Athanasopoulos-Zekkos.

2. FIELD TESTING DESCRIPTION

Field testing consisted of the measurement of surface wave velocities at four locations at the study site as shown in Figures 1 and 2. One of the location was selected to be adjacent to a borehole, while the remaining were conducted in areas where subsurface data does not exist. The coordinates of the testing locations are shown in Appendix A and are considered accurate within ± 10 ft. Photographs from the various testing locations are shown in Figures 3 through 7.

3. METHODOLOGY

Surface wave seismic methods are used to estimate the shear wave velocity (V_s) profile. Surface methods are appealing because of their advantages compared to other seismic geophysical methods, which require boreholes such as downhole, crosshole, and suspension logging. Among their main advantages are that they are non-intrusive, efficient, and reliable. Specifically, a technique that combines active and passive measurements was performed. The 1D and 2D Multichannel Analysis of Surface Waves (MASW) method (Park et al. 1999a) was used for active measurements, and the Microtremor Analysis Method (MAM) (Okada 2003) was used for passive. Generally, these techniques involve three steps: collection of field measurement data, dispersion curve analysis, and the forward modeling process. The procedure used in the field is described in more detail by Sahadewa et al. (2012).

3.1 MASW Method Field Measurements

In the MASW method, data acquisition was performed by recording the ground roll from a 10-lb sledge hammer blow. The source offset (x_s) was varied and was typically 10-30% of the total array length. Twenty four 2-Hz geophones were positioned with spacing (d_x) of 3 ft or 5 ft in a linear array, at each testing location. Thus, the spread length (*D*) varied from 72 ft to 120 ft. A schematic of the data acquisition setup is shown in Fig. 8. Stacking was performed to improve the signal to noise ratio (S/N). Generally, 5-8 stacks were used to generate one active MASW record.

3.2 MAM Method Field Measurements

The MAM captures surface waves from ambient activities or background noise. The 3ft and 5ft-spacing linear array setup was also used for the passive measurements. At least twenty 32-second recordings were collected from each location and the recordings were combined and analyzed.

3.3 <u>2D MASW Method Field Measurements</u>

Similar to 1D MASW surveys, 2D MASW testing use an active source with a linear spread of geophones. Instead of one shot however, numerous shots are taken at locations in between the geophones. Therefore, a V_S cross-section can be generated. In this study, 2D MASW surveys were performed at two of the testing locations (Locations 2 and 4).

For the 2D MASW surveys, we employed a fixed receiver spread configuration. The geophones were set up in a line at fixed locations and the shot was moved through the spread. The first and last shots were located off-end at a near offset of one-half the geophone interval (5ft). The survey depth was approximately 1/4 to 1/2 of the spread length. Note that, 2D MASW testing with fixed receiver spread configuration and shots in between geophones results in reduced depth of investigation at the sides of the survey, while the maximum depth of investigation is reached at the center of the array. Also, note that the technique has a reduced resolution with depth, i.e., it is easier to discern soil stratigraphy features near the surface than at depth. In addition, its accuracy with depth is reduced. Overall, the depth of each layer of different shear wave velocity should not be considered as deterministic, but as a "best-estimate".

3.4 Dispersion Curve Analysis and Forward Modeling Process

Records from MASW or MAM measurements are independently transformed to a dispersion curve using the Park et al. (1999b) method. Before the transformation, MAM records are processed using Spatial Autocorrelation (SPAC) (Aki 1957). This allows for an independent comparison of the MASW and MAM dispersion curves. If the measured dispersion curves from MASW and MAM overlap over a frequency range, they are combined to generate a single dispersion curve. The combined dispersion curve typically has a greater frequency range and allows for a better identification of the modal identity of the dispersion curve (Park et al. 2005).

To obtain the V_s profile, the measured dispersion curve is compared against a theoretical dispersion curve through a forward modeling process. An assumed V_s profile is used to obtain a theoretical dispersion curve and modifications to the V_s profile are made iteratively until the two dispersion curves closely match. Matching of the measured dispersion curve and its theoretical counterpart was assessed by implementing a non-linear least squares method (Xia et al. 1999). Sensitivity analysis is performed to evaluate the depth to which the V_s profile is reliably estimated, typically yielding results to depth of about one-third of the maximum wavelength (λ_{max}).

Note that there is no single solution to the forward modeling problem. Different combinations of shear wave velocity values and layer thicknesses may yield similar measured results. The available borehole data in one location were used to assess the stratigraphy and restrain the model in an effort to generate representative shear wave velocity values.

4. **RESULTS**

The results of the measurements are shown individually in Figures 9 through 17 along with their corresponding dispersion curves. The numeric values of the 1D V_s profiles are included in Appendix B. The results of the 1D surveys are also combined in Figure 18. On average, Locations 2, 3, and 4, all located at the upper terrace, show similar profiles that are also consistent with the data from Borehole BH-105 (Figure 14). The V_s profile at Location 1, which is situated at the lower terrace, indicates slightly softer layers and a bedrock at a depth of approximately 20.5ft.

5. REFERENCES

- Aki, K. (1957). "Space and Time Spectra of Stationary Stochastic Waves with Special Reference to Micro-tremors." *Bull. Earthq. Res. Inst.*, v. 35: 415-456.
- Okada, H. (2003). "The Microtremor Survey Method." *Geophysical Monograph Series* no. 12. Society of exploration geophysicists: 135.
- Park, C. B., Miller, R.D., and Xia, J. (1999a). "Multichannel Analysis of Surface Wave." *Geophysics*, 64: 800-808.
- Park, C. B., Miller, R. D., Xia, J. (1999b). "Multimodal Analysis of High Frequency Surface Wave." Proc. SAGEEP 99, Oakland, CA, March 14-18.
- Park, C. B., Miller, R. D., Ryden, N., Xia, J., and Ivanov, J. (2005). "Combined Use of Active and Passive Surface Waves." *Journ. of Env. & Eng. Geophys*; September 2005; v. 10: 323-334.
- Sahadewa, A., Zekkos, D., and Woods R. D. (2012). "Observations from the Implementation of a Combined Active and Passive Surface Wave Based

Methodology", Geocongress 2012: State of the Art and Practice in Geotechnical Engineering *Conference*, 25-29 March 2012, Oakland, California, edited by Hryciw, Athanasopoulos-Zekkos and Yesiller, ASCE Geotechnical Special Publication No. 225, pp. 2786-2795.

Xia, J., Miller, R.D., and Park, C.B. (1999). "Estimation of Near-surface Shear-wave Velocity by Inversion of Rayleigh Waves." *Geophysics* v. 64: 691-700.

FIGURES



Locations accurate to ±7-10ft

Figure 1: Googl Soundi	e Earth Site Map and ng Locations	
October 2020	Marshall Ranch, Briceland, CA	ARGO-E LLC





Fig	gure 3	
Surface wave to		
October 2020	Marshall Ranch, Briceland, CA	AKGU-E LLU



Fi Surface wave to		
October 2020	Marshall Ranch, Briceland, CA	ARGO-E LLC



Fig Surface wave to		
October 2020	Marshall Ranch, Briceland, CA	AKGU-E LLC



Borehole BH-1		
October 2020	Marshall Ranch, Briceland, CA	ARGU-E LLU



Fi Surface wave to		
October 2020	Marshall Ranch, Briceland, CA	ARGO-E LLC






















APPENDIX A

Surface Wave Testing Locations

MASW/MAM	Testing	Testing	Near Offset	Spacing	MASW/MAM Ling	WGS84		
Site Name	Site Name Remarks	Date	Туре	ft	ft	Location	Latitude	Longitude
	Lowest torrage near	Oct. 25	Active 1D	10	3	Source	40.1053400	-123.900299
1	Lowest terrace, heat		Passive 1D		3	First Geophone	40.1053510	-123.900354
	neighbol					Farthest Geophone	40.1052950	-123.900603
2 Upper terrace, cer 2 location parallel to ex	Upper terrace, central		Active 1D	15	5	Source	40.1043440	-123.9003260
	location parallel to expected	Oct. 25	Active 2D	varying	5	First Geophone	40.1043710	-123.9002510
	embankment		Passive 1D		5	Farthest Geophone	40.1044650	-123.8997980
	By borehole BH-105 location	Oct. 25	Active 1D	14	3	Source	40.1046028	-123.899567
3						First Geophone	40.1046194	-123.899536
						Farthest Geophone	40.1047167	-123.899369
	Perpendicular to Location 2		Active 1D	20	5	Source	40.1047230	-123.899905
4	array and along geotech Oct. 25		Active 2D	varying	5	First Geophone	40.1046700	-123.899870
	cross-section					Farthest Geophone	40.1044180	-123.899682

Appendix A: Surface Wave Testing Locations.

Note: Measurements made using geotagged photos. Uncertainty in each location is +/-7-10 ft

APPENDIX B

Shear Wave Velocity Profiles in Tabular Format

Location 1		Loca	tion 2	Loca	ion 3	Loca	tion 4
Depth	Vs	Depth	Vs	Depth	Vs	Depth	Vs
(ft)	(ft/sec)	(ft)	(ft/sec)	(ft)	(ft/sec)	(ft)	(ft/sec)
0.0	570	0.0	703	0.0	635	0.0	737
4.3	570	4.3	703	2.0	635	4.3	737
4.3	570	4.3	1096	2.0	635	4.3	1020
9.2	570	9.2	1096	5.0	635	9.2	1020
9.2	785	9.2	1393	5.0	1055	9.2	1307
18.5	785	14.8	1393	10.3	1055	14.8	1307
18.5	785	14.8	1295	10.3	1150	14.8	1373
20.6	785	21.0	1295	13.0	1150	21.3	1373
20.6	1470	21.0	1295	13.0	1150	21.3	1373
29.7	1470	31.7	1295	15.7	1150	29.0	1373
29.7	1470	31.7	1559	15.7	1290	29.0	2728
35.6	1470	35.6	1559	25.2	1290	35.6	2728
35.6	1470	35.6	1930	25.2	1750	35.6	2728
43.9	1470	43.8	1930	29.4	1750	47.0	2728
43.9	1700	43.8	2206	29.4	2630	47.0	2590
52.8	1700	52.7	2206	35.0	2630	52.7	2590
52.8	1700	52.7	2325	35.0	3140	52.7	2590
62.3	1700	62.3	2325	41.0	3140	62.3	2590
62.3	1700	62.3	2325	41.0	3140	62.3	2590
72.5	1700	72.5	2325	47.3	3140	72.5	2590
		72.5	2325	47.3	3140	72.5	2430
		83.4	2325	54.0	3140	83.4	2430
		83.4	2325	54.0	3140	83.4	2430
		94.9	2325	61.0	3140	94.9	2430
		94.9	2325	61.0	3140		
		107.1	2325	68.4	3140		
				68.4	2915		
				76.1	2915		
				76.1	2915		
				84.2	2915		

Appendix C

Slope Stability Analyses

Slope Stability Analyses

Redwood Creek Flow Enhancement Marshall Ranch Briceland, Humboldt County, California

Prepared by Adda Athanasopoulos-Zekkos, PhD George Zalachoris, PhD

Prepared for

Stillwater Sciences 850 G Street, Suite K, Arcata, CA 95521 tel 707-822-9607 fax 888-766-5110 www.stillwatersci.com

December 7 2020

TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	SLOPE STABILITY ANALYSIS	1
3.	METHODOLOGY 3.1 Limit Equilibrium Method	2 2
	3.2 Pseudo-Static Seismic Slope Stability	3
	3.3 Seismic Slope Displacements	3
4.	VALIDATION STUDY USING FINITE ELEMENT ANALYSIS	6
5.	RESULTS	6
6.	REFERENCES	7

FIGURES

APPENDICES

Appendix. Simplified Stratigraphies and Index Properties at the Borehole/Test Pit Locations

LIST OF FIGURES

Figure 1. Google Earth Site Map and Field Investigation Locations

Figure 2. 1D Shear Wave Velocity Profiles from MASW Geophysical Surveys

Figure 3. Three-dimensional, conceptual model of the project site

Figure 4. Selected Cross Sections

Figure 5. Approximate Locations of MASW VS Profiles along Selected Cross Section 1

- Figure 6. Selected Cross Section 1
- Figure 7. Approximate Locations of MASW VS Profiles along Selected Cross Section 2
- Figure 8. Selected Cross Section 2

Figure 9. Static Slope Stability Analysis - Cross Section 1

Figure 10. Static Slope Stability Analysis - Sensitivity Analyses - Cross Section 1

Figure 11. Static Slope Stability Analysis - Cross Section 2

Figure 12. Static Slope Stability Analysis – Sensitivity Analyses - Cross Section 2

- Figure 13. Pseudo-Static Slope Stability Analysis Cross Section 1
- Figure 14: Pseudo-Static Slope Stability Sensitivity Analyses Cross Section 1
- Figure 15. Pseudo-Static Slope Stability Analysis Cross Section 2
- Figure 16: Pseudo-Static Slope Stability Sensitivity Analyses Cross Section 2
- Figure 17. Seismic Hazard Deaggregation and ground motion parameter relationships
- Figure 18. Bray and Rathje (1998) Seismic Displacement Approach

Figure 19. Finite Element Model (PLAXIS 2D) - Cross Section 2

Figure 20. Finite Element Analysis - Deformed Shape - Cross Section 2

- Figure 21. Finite Element Analysis Displacement Contours Cross Section 2
- Figure 22. Finite Element Analysis Load-Displacement Curves Cross Section 2

LIST OF APPENDICES

Appendix. Simplified Stratigraphies and Index Properties at the Borehole/Test Pit Locations

1. INTRODUCTION

At the request of Mr. Joel Monschke, Stillwater Sciences, slope stability analyses were performed for the proposed development at the Marshall Ranch in Briceland, Humboldt County, California with the intent to assess the landslide hazard at the project site. Analyses were conducted under the direction of Dr. Adda Athanasopoulos-Zekkos with the assistance of Dr. George Zalachoris. This report documents the analytical results and was prepared by Dr. Adda Athanasopoulos-Zekkos and Dr. George Zalachoris.

2. SLOPE STABILITY ANALYSIS

To assess the slope stability at the project site, initially, a geometrical model was developed, based on LiDAR and topographic data of the area and the proposed development, as provided by Mr. Joel Monschke. Subsequently, a complete threedimensional (3D), conceptual model of the project site was generated by leveraging data from in-situ and laboratory geotechnical investigation efforts, as reported by SHN (2019) (i.e., boreholes, test pits, and index property tests), as well as shear wave velocity (V_S) profiles obtained from four field seismic geophysical surveys performed by Dr. Dimitrios Zekkos in October 2020, using the 1D and 2D Multichannel Analysis of Surface Waves (MASW) method. The project site, and the locations of the field investigations are illustrated in Figure 1. Simplified stratigraphies at each borehole/test pit location, based on the in-situ data, are tabulated in Appendix A, while in Figure 2 the generated Vs profiles from the four MASW arrays are illustrated. Accordingly, the final 3D model of the project site is shown in Figure 3. The 3D model was generated using the commercial software SoilVision SVDESIGNER v.10. Two, two-dimensional (2D) cross-sections within and around the indicated area of interest (Figure 1) were selected as shown in Figure 4, for both static and seismic slope stability analyses. The analyses were performed using the commercial software SoilVision SVSLOPE v10. The selected 2D cross-sections are illustrated in Figures 5 through 8.

Material properties for the soil/rock layers of the model (i.e., unit weight, γ , cohesion, c, and friction angle, φ) were developed based on the in-situ data (Appendix A), and published values in the literature (Lambe and Whitman, 1979; Meyerhof, 1956; Peck et al., 1974; Kulhawy and Mayne, 1990; Budhu, 1999; NAVFAC, 1986). The assigned material properties for the modeled layers are shown in Table 1. Nonetheless, acknowledging the uncertainty around these values, sensitivity analyses were performed, by varying the shear strength parameters (i.e., c and φ) of the layers mostly affecting the slope stability of the system. Finally, the analyses were performed for drained conditions, and the water table was assumed to be located at the ground surface to account for wet season conditions.

Layer	Description	Dry Unit Weight, γ _d (pcf)	Total Unit Weight, γ_t (pcf)	Cohesion, c (psf)	Friction Angle, φ (deg.)
ML	silt and sand	99	118	200	32
SM	sand with silt	113	132	450	34
CL	lean clay with sand	87	100	650	28
GW	well-graded gravel with sand	111	128	0	38
SC	clayey sand	110	127	200	31
Bedrock	siltstone/shale	145	150	50000	30

 Table 1. Material properties of the model layers (Baseline Case)

3. METHODOLOGY

Once the model geometry, soil layering, material properties and ground water conditions have been established, slope stability is assessed by calculating the resisting and destabilizing forces acting on a slope. Thus, a Factor of Safety (FOS) is estimated using one of several Limit Equilibrium Methods (LEM). The seismic slope stability is assessed via pseudo-static analysis, where the value of a limiting yield acceleration (α_y), i.e., the level of seismic acceleration that initiates a slope failure, is obtained. Then, simplified approaches to quantify the seismically induced permanent displacements are employed, by using the obtained α_y and considering the seismicity at the project site and the Seismic Design Code Specifications (ASCE 7-16).

3.1 Limit Equilibrium Method

In the Limit Equilibrium Method (LEM), the Factor of Safety (FOS) is defined by employing the equations of static equilibrium. In essence, the FOS represents the factor by which the shear strength must be reduced so that it is in equilibrium with the shear stress, i.e., the shear stress required to maintain a just-stable slope for a particular slip surface, hence the term *limit equilibrium*. There are several different procedures available to satisfy static equilibrium within a limit equilibrium analysis framework. Herein, we used the General Limit Equilibrium Method (GLE) (Fredlund et al., 1981). The method is based on the calculation of two FOS equations; one equation provides the FOS with respect to the moment equilibrium, while the other gives the FOS with respect to horizontal force equilibrium. The critical slip surface is the one that results in the lowest FOS values. For static conditions, the engineering state-of-practice, typically, requires a FOS greater than 1.5. For the two selected cross sections (Cross Section 1 and Cross Section 2), the computed FOS and critical slip surfaces for the Baseline Case (Table 1) are shown in Figures 9 and 11, respectively. Moreover, in Figures 10 and 12, contour plots of the estimated FOS values obtained through sensitivity analyses for the shear strength parameters of the most critical soil layers, are presented for Cross Sections 1 and 2, respectively.

3.2 <u>Pseudo-Static Seismic Slope Stability</u>

Screening analysis of slope stability under dynamic conditions (i.e., earthquake) are performed using a pseudo-static procedure. The earthquake loading is represented by a static force, equal to the soil weight multiplied by a seismic coefficient, *k*. The pseudo-static force is then input as an additional force in a conventional limit equilibrium slope stability analysis. The limitation of the method is that the seismic pseudo-static force is applied as an additional static force acting on the direction of sliding, while in reality seismic loading is acting in changing directions, thus tending to stabilize rather than destabilize the slope at certain instances in time. In a pseudo-static analysis, the value of a limiting yield seismic coefficient ($k_y = \alpha_y/g$) is obtained when the Factor of Safety is unity. For the two selected cross sections (Cross Section 1 and Cross Section 2), the computed k_y and critical slip surfaces for the Baseline Case (Table 1) are shown in Figures 13 and 15, respectively. Moreover, in Figures 14 and 16, contour plots of the estimated k_y values obtained through sensitivity analyses for the shear strength parameters of the most critical soil layers, are presented for Cross Sections 1 and 2, respectively.

3.3 <u>Seismic Slope Displacements</u>

To evaluate the seismic performance of the slopes at the project site location, simplified seismic slope displacement approaches are employed. Herein, the Bray and Rathje (1998), and Bray and Travasarou (2007) procedures were applied. In general, in a seismic displacement analysis, the critical components are: (1) the earthquake ground motion, (2) the dynamic resistance of the structure, and (3) the dynamic response of the potential sliding mass. Bray and Rathje (1998) use simplified parameters such as the peak ground acceleration (*PGA*), mean period (T_m), and significant duration (D_{5-95}) to characterize the intensity, frequency content, and duration, respectively, of an earthquake ground motion. Bray and Travasarou (2007) utilize the spectral acceleration at a degraded period equal to 1.5 times the initial fundamental period (T_s) of the slope (i.e., $Sa(1.5T_s)$), as the most efficient ground motion parameter. The initial fundamental period of the sliding mass (T_s) can be estimated using the expression: $T_s=4H/V_{S,slope}$, where H is the average height of the potential sliding mass, and $V_{S,slope}$ is the average shear wave velocity of the sliding mass (ex., MASW #2, #3, and #4 profiles, Figure 2). The dynamic resistance

of a slope is represented by the yield coefficient (k_y), obtained through pseudo-static limit equilibrium analyses (see Section 3.2). Finally, the dynamic response of the potential sliding mass is quantified by estimating the maximum seismic coefficient k_{max} , which represents the maximum horizontal equivalent acceleration (*MHEA*) acting on the slope.

For the project site (Latitude/Longitude: 40.104393° ,-123.900098°), the peak ground acceleration at the base of the slope (PGA_{rock}), the spectral acceleration at a degraded period ($Sa(1.5T_S)=S_{DS}$), the mean period (T_m), and significant duration (D_{5-95}) parameters are obtained based on Seismic Design Code Specifications (ASCE 7-16), the seismicity scenario with a 2% probability of exceedance in 50 years (i.e., return period of 2475 years) at the project area ($M_w=7.8$, $R_{rup}=18km$) (USGS Seismic Hazard Tool), and available ground motion parameter empirical relationships (Figure 17). The estimated parameters are tabulated in Table 2.

Table 2. Seismic Design Code Specifications and Seismic Hazard Parameters for Marshall Ranchsite in Briceland, Humboldt County, California (Latitude/Longitude: 40.104393°,-123.900098°).Seismic hazard values correspond to 2% probability of exceedance in 50 years (return period of2475 years).

ASCE 7	-16	Seismic H	azard
V _{s,rock} (ft/sec)	2500	М	7.8
Site Class	В	R (km)	18
$S_{DS}(g)$	1.094	T_{m} (sec)	0.58
$PGA_{rock}(g)$	0.438	D ₅₋₉₅ (sec)	30

Using estimates of k_y (Figures 13 and 15), the seismic displacement, U, can be estimated (in cm), based on the Bray and Rathje (1998) method (Figure 16), as a function of k_y/k_{max} using:

$$\log_{10}(U/k_{max}D_{5-95}) = 1.87 - 3.477(k_y/k_{max}) \pm \varepsilon$$

where $\sigma = 0.35$. The seismic displacement values are estimated at the median (i.e., corresponding to the scenario with 2% probability of exceedance in 50 years), 16% (+1 σ), and 84% exceedance (-1 σ) levels to develop a range of estimated performance. The maximum seismic coefficient, $k_{max}=MHEA/g$, can be estimated as function of *PGA*, the mean period (T_m), and the initial fundamental period of the sliding mass (T_s) (Figure 18).

The Bray and Travasarou (2007) approach of estimating seismically induced displacements has two computations. First, the probability of negligible ("zero") displacement is estimated as:

$$P(D = "0") = 1 - \Phi(-1.76 - 3.22 \ln(k_v) - 0.484(T_s)\ln(k_v) + 3.52 \ln(Sa(1.5T_s)))$$

where P(D="0") is the probability of occurrence of "zero" displacements, and Φ is the standard normal cumulative distribution function. If there is low probability for "zero" displacements, the amount of "nonzero" displacement (D, in cm) is computed using:

$$\ln(D) = -1.10 - 2.83 \ln(k_y) - 0.333 (\ln(k_y))^2 + 0.566 \ln(k_y) \ln(Sa(1.5T_S)) + 3.04 \ln(Sa(1.5T_S)) - 0.244 (\ln(Sa(1.5T_S)))^2 + 1.5T_S + 0.278(M - 7)) \pm \varepsilon$$

where $\sigma = 0.66$. The seismic displacement values are, again, estimated at the median (i.e., corresponding to the scenario with 2% probability of exceedance in 50 years), 16 (+1 σ), and 84% exceedance (-1 σ) levels to develop a range of estimated performance.

The results of the Bray and Rathje (1998), and Bray and Travasarou (2007) simplified seismic displacement approaches, for the Cross Sections 1 and 2, are tabulated in Tables 3 and 4, respectively.

Slope Specif	fic Info		Bray and R	athje (1998)	
H (ft)	35	$\sigma = 0.35$	Median	16% exceedance	84% exceedance
$V_{s,slope}$ (ft/sec)	1100	$\log(U/(k_{max}*D_{5-95}))$	0.16	0.51	-0.19
T_{S} (sec)	0.13	U/(k _{max} *D ₅₋₉₅)	1.44	3.23	0.64
$\mathbf{k}_{\mathbf{y}}$	0.211	U (in.)	7.3	16.4	3.3
T_S/T_m	0.22		Bray and Trav	vasarou (2007)	
NRF	0.98	P(D="0") (%)	1.3E-02		
MHEA (g)	0.429	$\sigma = 0.66$	Median	16% exceedance	84% exceedance
$Sa(1.5T_S)$ (g)	1.094	$\ln(D)$	3.1	3.8	2.4
k _{max}	0.429	D (in.)	8.8	16.9	4.5

Table 3. Estimated Seismic Slope Displacements for Cross Section 1

Table 4. Estimated Seismic Slope Displacements for Cross Section 2

Slope Specif	fic Info		Bray and R	athje (1998)	
H (ft)	35	$\sigma = 0.35$	Median	16% exceedance	84% exceedance
V _{s,slope} (ft/sec)	1100	$\log(U/(k_{max}*D_{5-95}))$	1.00	1.35	0.65
T_{S} (sec)	0.13	U/(k _{max} *D ₅₋₉₅)	10.06	22.51	4.49
k _y	0.107	U (in.)	50.9	114.0	22.8
T_S/T_m	0.22]	Bray and Trav	vasarou (2007)	
NRF	0.98	P(D="0") (%)	1.9E-07		
MHEA (g)	0.429	$\sigma = 0.66$	Median	16% exceedance	84% exceedance
$Sa(1.5T_S)$ (g)	1.094	$\ln(D)$	4.1	4.8	3.5
k _{max}	0.429	D (in.)	24.5	47.5	12.7

4. VALIDATION STUDY USING FINITE ELEMENT ANALYSIS

To validate the results of the pseudo-static, limit-equilibrium seismic slope stability analyses and assess the spatial distribution of the potential seismically-induced permanent displacements at the project site, a Finite Element Analysis (FEA) was performed upon request of Mr. Joel Monschke, Stillwater Sciences. The numerical model was developed using the commercial program PLAXIS 2D CONNECT Edition. Focus was given specifically to Cross Section 2 which, as shown in Figure 15 and Table 4, is characterized by lower yield acceleration ($k_v=0.107$) and larger seismically-induced permanent displacements (median displacement values of 25-51 in.). The geometric model, layering and material parameters used for the Finite Element Analysis were identical to the ones used for the Limit Equilibrium Method (LEM) calculations (Figure 8 and Table 1). The Mohr-Coulomb constitutive model and drained conditions were considered for the analysis. To be able to directly compare numerical results with the ones obtained through LEM and the simplified seismic slope displacement methods (Table 4), the shear wave velocities of the soil materials and the bedrock were set to $V_{s,slope} = 1100$ *ft/sec*, and $V_{s,rock} = 2500$ *ft/sec*, respectively. The developed finite element model is shown in Figure 19.

The finite element analysis was performed using the pseudo-static procedure, as analyzed in Section 3.2. To simulate the seismic load, a maximum horizontal equivalent acceleration (*MHEA*) of 0.429g (i.e., $k_{max}=0.429$), as defined earlier (Table 4), was applied. The numerical results in terms of deformed shape and displacement contours are presented in Figures 20 and 21, respectively. The slope failure mechanism is fully developed when the phase multiplier ΣM_{stage} reaches a value of 0.228. Therefore, the critical horizontal yield acceleration coefficient, k_y , is estimated as:

$$k_{v} = \Sigma M_{stage} \cdot k_{max} = 0.098$$

The resulting numerically obtained yield acceleration validates the computed value from LEM ($k_y=0.107$). Moreover, the critical yield surface from FEA (Figure 21) is similar to the one obtained via LEM (Figure 15). The FEA-computed maximum slope displacements are on the order of ~2.5 *ft* (~30 *in*.) at the toe of the slope (Figures 20 through 22), a value that is within the range of the computed seismically induced slope displacements from the simplified Bray and Rathje (1998) and Bray and Travasarou (2007) procedures (Table 4). Nonetheless, as indicated in Figure 21, the distribution of the displacements is heavily concentrated around the slip surface; i.e., the pond berm and most of the upper terrace are not significantly affected. Indeed, as presented in Figure 22, at a horizontal equivalent acceleration of 0.098g, the crest of the pond berm exhibits only minimal displacements (0.15 in.).

5. **RESULTS**

The results of the static slope stability analyses indicate that the Factors of Safety are borderline acceptable, with static FOS=1.68 for Cross Section 1, and FOS=1.35 for

Cross Section 2, for the Baseline Case material parameters (Figures 9 and 11). Sensitivity analyses do not significantly alter this remark (Figures 10 and 12). Moreover, based on the LEM results, the pond and berm developments on the upper terrace are not expected to have a significant effect on the stability of the slopes, since all the critical slip surfaces are at a substantial distance from the pond.

In terms of screening seismic slope stability, both Cross Sections are characterized by relatively low seismic capacity (i.e., $k_v = 0.211$ and $k_v = 0.107$ for Cross Sections 1 and 2, respectively) (Figures 13 and 15). Considering a seismic scenario with a 2% probability of exceedance in 50 years (return period of 2475 years), the computed, based on simplified methods (Bray and Rathje, 1998; and Bray and Travasarou, 2007), seismically induced displacements could potentially reach 7-9 in. for Cross Section 1, and 25-51 in. for Cross Section 2 (median values in Tables 3 and 4). A validation study involving a pseudo-static Finite Element Analysis of Cross Section 2 yielded similar results with the ones obtained through LEM and the simplified seismic slope displacement methods (Figures 19 through 22). The numerically obtained yield acceleration was estimated as 0.098g, while the maximum displacement at the toe of the slope was on the order of ~ 2.5 ft (30 in.). Nonetheless, the spatial distribution of the seismically-induced permanent displacements are heavily concentrated in the vicinity of the slope, with the pond berm and most of the upper terrace exhibiting only minimal displacements (0.15 in., Figure 22). Therefore, based on the FEA results, the pond and berm developments on the upper terrace are not expected to have a significant effect on the seismic stability of the slopes. Finally, it should be noted that, due to topographic and geomorphological particularities of the project site, it is anticipated that 3D effects could be significant; in general, 3D slope stability analyses tend to produce higher factors of safety both for static and dynamic conditions (Duncan and Wright, 2005).

6. **REFERENCES**

- American Society of Civil Engineers. (2017). ASCE/SEI 7-16 Minimum Design Loads for Buildings and Other Structures. ISBN (print): 9780784414248
- Bray JD, Rathje ER (1998) Earthquake-induced displacements of solid-waste landfills. Journal of Geotechnical and Geoenvironmental Engineering, 124(3): 242–253
- Bray JD, Travasarou T (2007) Simplified procedure for estimating earthquake-induced deviatoric slope displacements. Journal of Geotechnical and Geoenvironmental Engineering, ASCE 133(4): 381–392
- Budhu M (1999) Soil Mechanics and Foundations, J. Wiley
- Carter M, Bentley S (1991) Correlations of Soil Properties, London: Pentech
- Duncan JM, Wright SG (2005) Soil Strength and Slope Stability, John Wiley & Sons

- Fredlund DG, Krahn J, and Pufahl DE (1981) The relationship between limit equilibrium slope stability methods. Proceedings, International Conference on Soil Mechanics and Foundation Engineering, Stockholm, Sweden, Vol. 3, pp. 409-416.
- Kulhawy FH, Mayne PW (1990) Manual on Estimating Soil Properties for Foundation Design, Final Report EL-6800, Electric Power Research Institute, Palo Alto, CA

Lambe TW, Whitman RV (1979) Soil Mechanics, John Wiley & Sons, 553 pp.

- Meyerhof G (1956) Penetration tests and bearing capacity of cohesionless soils. Journal of Soils Mechanics and Foundation Division ASCE, 82(SM1).
- Naval Facilities Engineering Command (1986) Soil Mechanics, Design Manual
- Peck RB, Hanson WE, Thornburn TH (1974) Foundation Engineering, J. Wiley & Sons
- Structural Engineers Association of California's (SEAOC) and California's Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Tool. Accessed 11/23/2020, <u>https://seismicmaps.org/</u>
- United States Geological Survey (USGS) Unified Hazard Tool, Accessed 11/23/2020, https://earthquake.usgs.gov/hazards/interactive/

FIGURES



Locations accurate to \pm 7-10ft

Figure 1: Google Earth Site Map and Field Investigation Locations			
December 2020	Marshall Ranch, Briceland, CA		



Figure 2: 1D Shear Wave Velocity Profiles from MASW Geophysical Surveys

December 2020

Marshall Ranch, Briceland, CA








































APPENDIX

Simplified Stratigraphies and Index Properties at the Borehole/Test Pit Locations

	Test	Pit	TP-3
--	------	-----	------

From Depth (ft)	To Depth (ft)	Corrected Blows per ft	USCS	Description	Water Content (%)	Dry Density (pcf)
0	1.5	-	ML	silt and sand	-	-
1.5	5	-	CL	lean clay with sand	-	-
5	8	-	SM	silty sand with gravel	-	-
8	9.5	-	SC	clayey sand	-	-

Borehole BH-102

From Depth (ft)	To Depth (ft)	Corrected Blows per ft	USCS	Description	Water Content (%)	Dry Density (pcf)
0	10	21	ML	silt and sand	15.3	95.0
10	15.5	25	GW-GM	well graded gravel with silt and sand	15.9	110.5
15.5	51	-	-	siltstone/shale	-	-

Borehole BH-103

From Depth (ft)	To Depth (ft)	Corrected Blows per ft	USCS	Description	Water Content (%)	Dry Density (pcf)
0	3	20	ML	gravelly silt with sand	16.1	99
3	13	21	ML	sandy silt	20.5	100.5
13	20.5	25	SW-SM	well graded sand with silt and gravel	15.1	115
20.5	50.5	-	-	siltstone/shale	-	-

Borehole BH-105

From Depth (ft)	To Depth (ft)	Corrected Blows per ft	USCS	Description	Water Content (%)	Dry Density (pcf)
0	5	-	ML	silt with sand	-	-
5	10	36	CL	lean clay with sand	-	-
10	15.5	24	CL	sandy lean clay with gravel	-	-
15.5	26.5	-	-	siltstone/shale	-	-

Borehole BH-101

From Depth (ft)	To Depth (ft)	Corrected Blows per ft	USCS	Description	Water Content (%)	Dry Density (pcf)
0	20	33	ML	gravelly silt with sand	21.8	100.3
20	24	25	SM	silty sand with gravel	19.2	111
24	27	16	GW-GM	well graded gravel	-	-
27	51	-	-	siltstone/shale	-	-

Borehole BH-104							
Start Depth (ft)	End Depth (ft)	Corrected Blows per ft	USCS	Description	Water Content (%)	Dry Density (pcf)	
0	6	-	ML	silt with sand	-	-	
6	25	30	CL	lean clay with sand	-	-	
25	31	17	CL	snady lean clay	-	-	
31	35	16	SC	clayey sand	-	-	
35	46.5	-	-	siltstone/shale	-	-	

Appendix D

Resumes

Dept. of Civil and Environmental Engineering University of California, Berkeley

EDUCATION

Ph.D., Civil & Environmental Engineering Dept, University of California at Berkeley, 2008
MSc., Civil & Environmental Engineering Dept, University of California at Berkeley, 2004
Ptychion, Civil Engineering Dept (5-year mandatory program), University of Patras, Greece, 2003

ACADEMIC APPOINTMENTS

- Assistant Professor (effective 1/1/2020), Department of Civil and Environmental Engineering, University of California, Berkeley, CA
- **Graduate Chair** (9/2017 12/2019), Department of Civil and Environmental Engineering, University of Michigan at Ann Arbor, Ann Arbor, MI
- Associate Professor (2015 2019), Department of Civil and Environmental Engineering, University of Michigan at Ann Arbor, Ann Arbor, MI
- Assistant Professor (2008 2015), Department of Civil and Environmental Engineering, University of Michigan at Ann Arbor, Ann Arbor, MI
- Graduate Student Instructor (GSI) and Graduate Student Research Assistant (GSRA) (2003-2008), Department of Civil and Environmental Engineering, University of California at Berkeley, Berkeley, CA

AWARDS AND HONORS

- Invited Speaker at the 35th Annual Geoengineering Distinguished Lecture Series, UC Berkeley, 2017
- Excellence in Teaching Award, Chi Epsilon Great Lakes District, 2016
- Thomas Middlebrooks Award, American Society of Civil Engineers (ASCE), 2015
- Arthur Casagrande Professional Development Award: For "contributions in the seismic risk assessment of levee protection systems against flooding", American Society of Civil Engineers (ASCE), 2015
- Excellence in CEE, Departmental Faculty Award, 2014
- National Science Foundation (NSF) CAREER Award, 2013
- National Science Foundation (NSF) Fellow for NEES ENHANCE, 2012
- Elizabeth C. Crosby Research Award, ADVANCE, University of Michigan, 2010, 2011
- Outstanding Graduate Student Instructor Award, University of California, Berkeley, 2006
- National Science Foundation (NSF), Graduate Research Fellowship (GRF) Award, 2004-2007
- Harry Bolton Seed Outstanding Graduate Student Award, University of California, Berkeley, Geoengineering Group, 2004

PROFESSIONAL CONTRIBUTIONS

Professional Affiliations

Member, Association of State Dam Safety Officials (ASDSO), 2011-pres.

Member, International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), 2008-pres. *Member*, Geotechnical Earthquake Engineering Reconnaisance (GEER), 2007-pres.

Member, United States Society of Dams (USSD), 2007-pres.

Member, Earthquake Engineering Research Institute (EERI), 2006-pres.

Member, American Society of Civil Engineers (ASCE), Geo-Institute, 2004-pres.

Professional Service

Committees (National/International)

Member, USUCGER Board, Elected position, 01/2019-pres.

Member, ASCE Geo-Institute Awards Committee, 2018-pres.

Member, NHERI User Forum Committee, Elected position, 2017-pres.

Member, Dykes and Levees Technical Committee (ISSMGE), 2012-pres.

Member, Earthq Eng. and Soil Dyn. Geo-Institute Technical Committee (ASCE), 2011-pres.

Member, Committee on Levees (USSD), 2010-pres.

Member, Embankments, Slopes and Dams Geo-Institute Technical Committee (ASCE), 2008-pres.

Member, Earthquake Geotechnical Engineering and Associated Problems (ISSMGE), 2019-pres.

Editorships

Associate Editor, ASCE Journal of Geotechnical and Geoenvironmental Engineering, 2015-pres.

- Guest Editor, "Special Issue: PBD-III Invited Papers", Soil Dynamics and Earthquake Engineering Journal, July 2018
- *Technical Co-Editor*, 3rd International Conference on Performance-Based Design in Earthquake Geotechnical Engineering, Vancouver, BC, July 2017.
- *Technical Co-Editor* and Member of Organizing Committee, 2012 GeoCongress Conference: State of the Art and Practice in Geotechnical Engineering, ASCE, 2009-2012.

Conference/Event Organization

Session Chair, 2019 USSD 39th Annual Conference and Exhibition, Chicago, April 8-12, 2019.

- Session Chair, 2015 International Foundations Congress and Equipment Expo, Session: "Hurricanes and Floods", ASCE Geo-Institute (G-I), International Association of Foundation Drilling, San Antonio, TX, March 18-21 2015.
- *Session Chair*, 2013 GeoCongress Conference: Stability and Performance of Slopes and Embankments III, Session "Seepage and Slope Stability for Earth Dams and Levees", ASCE Geo-Institute (G-I), 2013.

Professional Activities

Member, 2016 Geotechnical Earthquake Engineering Reconnaissance (GEER) in New Zealand Invited presenter and participant, 2016 US-NZ-Japan International Workshop on Liquefaction Effects Member, 2016 Geotechnical Earthquake Engineering Reconnaissance (GEER) in Ecuador Invited panelist, 2015 IFCEE Student Professional Development Workshop, San Antonio TX Invited Participant, 2012 Second US-PRC Young Researcher's Forum MCEER, IEM in China Participant, 2010 USSD Levee Workshop, Memphis TN

Invited participant and speaker, 2010 Innovative teaching methods in Geotechnical Engineering Workshop, Volos, Greece, workshop sponsored by the 6th National Hellenic Conference on Geot. and Geoenvironmental Engineering, in Volos, Greece, Sept. 29-Oct. 1, 2010

- *Participant*, 2010 Research Summit, East Lansign, MI, Michigan Department of Transportation Office of Research and Best Practices
- Invited Participant, 2010 Vision 2020 Workshop, St. Louis, MO, Sponsored by NSF/NEES
- Invited Participant, 2009 7th NEES/E-Defense planning meeting for Collaborative Research, Kobe, Japan
- *Participant*, 2009 Pile Driving Workshop for Professors, Utah State Univ. Logan, UT, Sponsored by Pile Driving Contr. Of America
- *Participant*, 2009 Workshop for the Multiscale Science Based-Modeling and Simulation and Experimental Validation on Enabling Materials, Northwestern University, IL

Student Team Leader, Independent Levee Investigation (August 2005-May 2006)

STUDENT ADVISEES

Doctoral Thesis Advisees (2 in progress)

- Michelle Basham (expected 2023) Liquefaction assessment of gravelly soils in the field and the laboratory
- Nina Zabihi (expected 2020) Liquefaction analyses of coarse grained soils using the Discrete Element Method (DEM)

Doctoral Thesis Advisees (4 completed)

- Jonathan Hubler "Monotonic and dynamic response of gravelly soils", May 2017 (currently: Assistant Professor at Villanova University)
- Athina Gkrizi "Characterization of *Pile-driving induced ground motions*", December 2016 (currently: Assistant Professor at Notingham University, UK)
- Adam Lobbestael "Feasibility Study of High-Performance Cutoff Walls for Levees in Seismic Regions", September 2014 (currently: Assistant Professor at Lawrence Tech University, MI)
- Mustafa Saadi "GIS-based methodology for assessing spatial variability of soil properties in seismic evaluation of levee systems", December 2011 (currently: Project Engineer at Geosyntec Consultants, Atlanta, GA)

Graduate Research Advisees

- Goldie Gunawan (MSE 2018) Seismically induced landslides after the 2016 New Zealand earthquake
- Josh Colley (MSE 2014) Effect of thin soil layers on progressive failure of earthen levees
- Heidi Pence (MSE 2013) Ground motion selection for seismic clope stability analysis of earthen levees
- Mohammad Kabalan (MSE 2012) Pile-driving induced vibration field measurements.
- Kimberly Lamote (MSE 2011) Seismic isolation of earth retaining structures with use of EPS-Geofoam compressible inclusion

COURSES

- CEE 345 Geotechnical Engineering (4-credits, undergraduate)
- CEE 546 Slopes, Dams and Retaining Structures (3-credits, graduate)
- CEE 548 Geotechnical Earthquake Engineering (3-credits, graduate)
- CEE 543 Numerical Modelling in Geotechnical Engineering (3-credits, graduate)

SPONSORED RESEARCH (Total: \$2.6M, as PI: \$1.9M)

• Collaborative Research: Integrated Field and Laboratory Based Assessment of Liquefaction Triggering and Residual Strength of Gravelly Soil (PI, with co-PI D. Zekkos from U. of Michigan and K. Rollins from BYU)

National Science Foundation, 2017-2020 (total: \$521,889, PI share: \$333,533)

• RAPID: Collaborative research: Topographic Change and Cascading Hazards Following the Mw7.8 Kaikoura (New Zealand) Earthquake (co-PI, with PI M. Clark and co-PI D. Zekkos from U. of Michigan)

National Science Foundation, 2016-2018 (\$46,517)

• Asset Management for Retaining Walls (PI, with co-PI J. Lynch and D. Zekkos from U. of Michigan)

Michigan Department of Transportation, 2016-2019 (\$310,675)

• Collaborative Research: Connecting Women Faculty in Geotechnical Engineering: Thriving in a Networked World (UMich PI, Syracuse Univ. lead)

National Science Foundation, 2016-2019 (total: \$513,019, PI share: \$49,749)

• CAREER: Promoting a Fundamental Understanding of Post-Liquefaction Response and Deformations: A Next-Generation Analytical and Experimental Methodology (PI)

National Science Foundation, 2013-2018 (\$400,000)

• Continuation of UM Network for Women in Civil and Environmental Engineering (NEWinCEE) (co-PI)

Rackham School of Graduate Studies (UM), 2013-2015 (\$77,600)

• Dynamic Response of Levees and Ebmankments (PI)

Rackham Graduate School and ADVANCE at Univ. of Michigan, 2012-2013 (\$10,363)

• On-Line International Network for Women in Geotechnical Engineering (PI)

ADVANCE at the Univ.of Michigan, 2012-2013 (\$4,990)

- Effects of pile-driving induced vibrations on nearby structures and other assets (PI) Michigan Department of Transportation, 2011-2013 (\$229,370)
- UM Network for Excellence in Women in Civil Engineering (co-PI, with G. Parra-Montesinos, A. Demond, D. Zekkos and S. Lee from U. of Michigan)

Rackham School of Graduate Studies (UM), 2011-2013 (\$96,736)

- Feasibility Study of High-Performance Cut-off Walls for Levees in Seismic Regions: Dynamic Wall Analyses and Ductile Slurry Development (PI, with V. Li from U. of Michigan) National Science Foundation, 2010-2014 (\$384,406)
- Seismic isolation of earth retaining structures with use of EPS-Geofoam compressible inclusion Centrifuge Testing (PI)

European Manufacturers of EPS, 2010-2012 (\$37,500)

• Seismic isolation of earth retaining structures with use of EPS-Geofoam compressible inclusion – Centrifuge Testing (PI)

ADVANCE at the Univ.of Michigan, 2010-2011 (\$14,647)

PUBLICATIONS AND PRESENTATIONS

Books

1. Taiebat, M., <u>Athanasopoulos-Zekkos, A.,</u> and Wijewickreme, D. eds (2017) "3rd International Conference on Performance-based Design in Earthquake Geotechnical Engineering", Vancouver BC Hryciw, R.D., <u>Athanasopoulos-Zekkos, A</u>. and Yesiller, N. eds. (2012) "GeoCongress 2012 - State of the Art and Practice in Geotechnical Engineering", Geotechnical Special Publication No. 225, Proceedings of the Annual GeoCongress of the Geo-Institute of ASCE, 4504 pages.

Special Issues

1. Boulanger, R., Taiebat, M., Wijewickreme, D. and <u>Athanasopoulos-Zekkos, A</u>. eds (2018) "Special *Issue: PBD-III Invited Papers*", Soil Dynamics and Earthquake Engineering Journal, July 2018

Chapters in Books

 Zekkos, D., Matasovic, N., El-Sherbiny, R., <u>Athanasopoulos-Zekkos, A.</u>, Towhata, I., Maugeri, M. (2011) "Chapter 4: Dynamic Properties of Municipal Solid Waste", "Geotechnical Characterization, Field Measurement, and Laboratory Testing of Municipal Solid Waste", ASCE Geotechnical Special Publication, No 209.

Refereed Journal Publications (published only)

- Zekkos, D., Greenwood, W., Lynch, J., Manousakis, J., <u>Athanasopoulos-Zekkos, A.</u>, Clark, M., Cook, K.L. and Saroglou, C. (2018). Lessons Learned from The Application of UAV-Enabled Structure-From-Motion Photogrammetry in Geotechnical Engineering. *International Journal of Geoengineering Case Histories*, Vol.4, Issue 4, p.254-274. <u>doi: 10.4417/IJGCH-04-04-03</u>
- Hubler, J., <u>Athanasopoulos-Zekkos, A.</u>, and Zekkos, D. (2018) "Monotonic and Cyclic Simple Shear Response of Gravel-Sand Mixtures", *Soil Dynamics and Earthquake Engineering, Vol 115,* pp. 291-304, Dec 2018, <u>https://doi.org/10.1016/j.soildyn.2018.07.016</u>
- Zekkos, D., <u>Athanasopoulos-Zekkos, A.</u>, Hubler, J., Fei, X., Zehtab, K.H., and Marr, A. (2017) "Development Of A Large-Size Cyclic Direct Simple Shear Device For Characterization Of Ground Materials With Oversized Particles", *Geotechnical Testing Journal* <u>https://doi.org/10.1520/GTJ20160271</u>. ISSN 0149-6115
- Hubler, J., <u>Athanasopoulos-Zekkos, A</u>., and Zekkos, D. (2017). "Monotonic, Cyclic and Post-Cyclic Simple Shear Response of Three Uniform Gravels in Constant Volume Conditions", ASCE *Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 143, Issue 9, <u>doi</u> 10.1061/(ASCE)GT.1943-5606.0001723
- Dellow,S., Massey, C., Cox, S., Archibald, G., Begg, J., Bruce, Z., Carey, J., Davidson, J., Della Pasqua, F., Glassey, P., Hill, M., Jones, K., Lyndsell, B., Lukovic, B., McColl, S., Rattenbury, M., Read, S., Rosser, B., Singeisen, C., Townsend, D., Villamor,P., Villeneuve, M., Godt, J., Jibson, R., Allstadt, K., Rengers, F., Wartman, J., Rathje, E., Sitar, N., <u>Athanasopoulos-Zekkos, A.</u>, Manousakis, J., and Little, M. (2017). "Landslides caused by the M_w7.8 Kaikōura earthquake and the immediate response", *Bulletin of the New Zealand Society for Earthquake Engineering, Vol. 50, No. 2, June 2017*
- 6. Stringer, M., Bastin, S., McGann, C.R., Cappellaro, C., El Kortbawi, M., McMahon, R., Wotherspoon, L.M., Green, R.A., Aricheta, J., Davis, R., McGlynn, L., Hargraves, S., van Ballegooy, S., Cubrinovski, M., Bradley, B.A., Bellagamba, X., Foster, K., Lai, C., Ashfield, D., Baki, A., <u>Athanasopoulos-Zekkos, A.</u>, Lee, R. and Ntritsos, N. (2017). "Geotechnical aspects of the 2016 Kaikōura earthquake on the south island of New Zealand", *Bulletin of the New Zealand Society for Earthquake Engineering, Vol. 50, No. 2, June 2017*
- Stahl, T., Clark, M., Zekkos, D., <u>Athanasopoulos-Zekkos, A.</u>, Willis, M., Medwedeff, W., Knoper, L., Townsend, K., and Jin, J. (2017). "Earthquake Science in Resilient Societies: Earthquakes in Resilient Societies", *Tectonics, April 2017*
- 8. Zekkos, D., <u>Athanasopoulos-Zekkos, A.</u>, Grizi, A., and Greenwood, W. (2016). The May 25th 2011 Railroad Embankment Failure in Ann Arbor, Michigan, As a Means for Teaching Geotechnical

Engineering. International Journal of Geoengineering Case histories, Vol.3, Issue 4, p.234-245. doi: 10.4417/IJGCH-03-04-03

- Grizi, A., <u>Athanasopoulos-Zekkos, A.</u>, and Woods, R. (2016). "Ground Vibration Measurements near Impact Pile Driving." *J. Geotech. Geoenviron. Eng.*, 10.1061/(ASCE)GT.1943-5606.0001499, 04016035.
- <u>Athanasopoulos-Zekkos, A.</u>, Pence, H., and Lobbestael, A. (2016.) "Ground Motion Selection for Seismic Slope Displacement Evaluation of Earthen Levees", *Earthquake Spectra, Earthquake Engineering Research Institute*, doi: 10.1193/062513EQS169M, February 2016, Vol. 32, No. 1, pp. 217-237.
- Carlson, C., Zekkos, D., <u>Athanasopoulos-Zekkos, A</u>. (2016). "Predictive Equations to Quantify the Impact of Spectral Matching on Ground Motion Characteristics", *Earthquake Spectra, Earthquake Engineering Research Institute (EERI) Journal*, doi: 10.1193/090914EQS140M February 2016, Vol. 32, No. 1, pp. 125-142.
- 12. Carlson, C., Zekkos, D., <u>Athanasopoulos-Zekkos, A</u>. and J. Hubler (2014). "Statistical assessment of impact of ground motion modification on ground motion characteristics and time histories" *Earthquake Engineering Journal*, DOI: 10.1080/13632469.2014.898602.
- Saadi, M. and <u>Athanasopoulos-Zekkos, A</u>. (2013). "A GIS-enabled approach for assessing damage potential of levee systems based on underlying geology and river morphology", Journal of *Mathematical Problems in Engineering, Special Issue: Structural Damage Modelling and Assessment Volume 2013 (2013), Article ID 936468, Article can be accessed at:* <u>http://dx.doi.org/10.1155/2013/936468</u>.
- Lobbestael, A., <u>Athanasopoulos-Zekkos, A.</u>, and Colley, J. (2013). "Factor of Safety Reduction Factors for Accounting for Progressive Failure for Earthen Levees with Underlying Thin Layers of Sensitive Soils", Journal of *Mathematical Problems in Engineering, Special Issue: Structural Damage Modelling and Assessment Volume 2013 (2013), Article ID 893602. Article can be accessed at: <u>http://dx.doi.org/10.1155/2013/893602.</u>*
- 15. <u>Athanasopoulos-Zekkos, A.</u>, Vlachakis, V.S. and Athanasopoulos, G.A. (2013). "Phasing issues in the seismic response of yielding, gravity-type earth retaining walls overview and results from a FEM study", *Soil Dynamics and Earthquake Engineering, Vol.55, pp. 59-70.*
- 16. Saadi, M. and <u>Athanasopoulos-Zekkos, A</u>. (2013). "A framework for assessing spatial distribution of soil properties in levee systems based on underlying geology and river morphology", Journal of *Geography and Geology, Vol. 5, No.3, pp.22-42.*
- Athanasopoulos-Zekkos, A. and Seed, R.B., (2013). "Simplified Methodology for Consideration of 2D Dynamic Response of Levees in Liquefaction Triggering Evaluation", ASCE Journal of Geotechnical and Geoenvironmental Engineering, Vol. 139, No. 11, pp.1911-1922.
- <u>A. Athanasopoulos-Zekkos</u>, K. Lamote, and G. A. Athanasopoulos, (2012). "Use of EPS geofoam compressible inclusions for reducing the earthquake effects on yielding earth retaining structures", *Soil Dynamics and Earthquake Engineering Journal, Vol.41, pp.59-71.*
- 19. <u>A. Athanasopoulos-Zekkos</u> and M. Saadi, (2012). "Ground Motion Selection for Liquefaction Evaluation Analysis of Earthen Levees", *Earthquake Spectra, Earthquake Engineering Research Institute, Vol. 28 (4), pp. 1331-1351.*
- J.D. Rogers, G.P. Boutwell, D.W. Schmitz, D. Karadeniz, C.M. Watkins, <u>A. Athanasopoulos-Zekkos</u>, and D. Cobos-Roa, (2008). "Geologic Conditions Underlying the 2005 17th Street Canal Levee Failure in New Orleans", *ASCE Journal of Geotechnical and Geoenvironmental Engineering* Vol.134(5), 583-601.
- R. B. Seed, R. G. Bea, R. I. Abdelmalak, <u>A. Athanasopoulos-Zekkos</u>, G. P. Boutwell, J.-L. Briaud, C. Cheung, D. Cobos-Roa, L. Ehrensing, A. V. Govindasamy, L. F. Harder, K. S. Inkabi, J. Nicks, J. M. Pestana, J. Porter, K. Rhee, M. F. Riemer, J. D. Rogers, R. Storesund, X. Vera-Grunauer, J.

Wartman, (2008). "New Orleans & Hurricane Katrina: I - Introduction, Overview, and the East Flank", *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, Vol.134(5), 701-717.

- 22. R. B. Seed, R. G. Bea, <u>A. Athanasopoulos-Zekkos</u>, G. P. Boutwell, J. D. Bray, C. Cheung, D. Cobos-Roa, L. Ehrensing, L. F. Harder, J. M. Pestana, M. F. Riemer, J. D. Rogers, R. Storesund, X. Vera-Grunauer, and J. Wartman, (2008). "New Orleans & Hurricane Katrina: II The Central Region and the Lower Ninth Ward", *ASCE Journal of Geotechnical and Geoenvironmental Engineering* Vol.134(5), 718-739.
- 23. R. B. Seed, R. G. Bea, <u>A. Athanasopoulos-Zekkos</u>, G. P. Boutwell, J. D. Bray, C. Cheung, D. Cobos-Roa, L. F. Harder, R. E. S. Moss, J. M. Pestana, J. Porter, M. F. Riemer, J. D. Rogers, R. Storesund, X. Vera-Grunauer, and J. Wartman, (2008). "New Orleans & Hurricane Katrina: III The 17th Street Drainage Canal", *ASCE Journal of Geotechnical and Geoenvironmental Engineering* Vol.134(5), 740-761.
- 24. R. B. Seed, R. G. Bea, <u>A. Athanasopoulos-Zekkos</u>, G. P. Boutwell, J. D. Bray, C. Cheung, D. Cobos-Roa, J. Cohen-Waeber, B. D. Collins, L. F. Harder, R.E. Kayen, R. E. S. Moss, J. M. Pestana, J. Porter, M. F. Riemer, J. D. Rogers, R. Storesund, X. Vera-Grunauer, and J. Wartman, (2008). "New Orleans & Hurricane Katrina: IV The Orleans East Bank (Metro) Protected Basin", *ASCE Journal of Geotechnical and Geoenvironmental Engineering* Vol.134(5), 762-779.

Invited Conference Publications

 Seed, R.B., <u>Athanasopoulos-Zekkos, A.</u>, Cobos-Roa, D., Pestana, J.M., and Inamine, M. (2012). "State of the Art: U.S. Levee and Flood Protection Engineering in the Wake of Hurricane Katrina", 2012 GeoCongress Conference: State of the Art and Practice in Geotechnical Engineering, ASCE, 25-29 March, Oakland CA

Refereed Conference Publications

- 1. Zabihi, N. and <u>Athanasopoulos-Zekkos, A.</u> (2020). "Discrete Element Modelling of Large Scale Stacked-Ring Simple Shear Test of Steel Spheres", ASCE *GeoCongress 2020*, February 25-28, 2020, Minneapolis, MN (paper accepted)
- Basham, M., and <u>Athanasopoulos-Zekkos, A.</u> (2020). "The Effect of Static Shear Stress on Cyclic Resistance of Uniform Gravels", ASCE *GeoCongress 2020*, February 25-28, 2020, Minneapolis, MN (paper accepted)
- <u>Athanasopoulos-Zekkos, A.</u>, Zekkos, D., Rollins, K., Hubler, J., Higbee, J. and Platis, A. (2019). "Earthquake Performance and Characterization of Gravel-Size Earthfills in the Ports of Cephalonia, Greece, following the 2014 Earthquakes", 7th International Conference on Earthquake Geotechnical Engineering, Rome 17-20 June, 2019
- 4. Basham, M., <u>Athanasopoulos-Zekkos</u>, <u>A</u>. and Zekkos, D. (2019). "The Importance of Vertical Displacement Control During Constant Volume Cyclic Simple Shear Testing", 7th International Conference on Earthquake Geotechnical Engineering, Rome 17-20 June, 2019
- 5. Gkrizi, A., <u>Athanasopoulos-Zekkos, A.</u>, and Woods, R.D. (2019). "Surface Wave Development during Impact Pile Driving" *XVII European Conference on Soil Mechanics and Geotechnical Engineering*, Reykjavik, Iceland, 1-6 September, 2019
- Kidus A. Admassu, Jerome P. Lynch, <u>Adda Athanasopoulos-Zekkos</u>, Dimitrios Zekkos, "Long-term wireless monitoring solution for the risk management of highway retaining walls," *Proc. SPIE* 10971, Nondestructive Characterization and Monitoring of Advanced Materials, Aerospace, Civil Infrastructure, and Transportation XIII, 1097103 (1 April 2019);
- 7. Gallagher, P, Bhatia, S., Alestalo, S., Soundarajan, S., and <u>Athanasopoulos-Zekkos, A.</u> (2019). "Do Seed Grants Increase Collaboration? A Case Study from the "Geotechnical Engineering Women

Faculty: Networked and Thriving" Project", *Geo-Congress 2019: The Eighth International Conference on Case Histories in Geotechnical Engineering*, March 24-27, 2019

- Zekkos, D., Clark, M., Willis, M., <u>Athanasopoulos-Zekkos, A.</u>, Manousakis, J., Knoper, L., Stahl, T., Massey, C., Archibald, G., Greenwood, W., and Medwedeff, W. (2018a). "3D models of the Leader Valley using satellite & UAV imagery following the 2016 Kaikoura earthquake", *Eleventh* U.S. National Conference on Earthquake Engineering, Integrating Science, Engineering & Policy, June 25-29, 2018, Los Angeles, California.
- Zekkos, D., Manousakis, J., <u>Athanasopoulos-Zekkos, A.</u>, Clark, M., Knoper, L., Massey, C., Archibald, G., Greenwood, W., Hemphill-Haley, M., Rathje, E., Litchfield, N., Medwedeff, W., Van Dissen, R.J., Ries, W., Villamor, P., Langridge, R.M., and Kearse, J. (2018b). "Structure-from-Motion based 3D mapping of landslides & fault rupture sites during 2016 Kaikoura earthquake reconnaissance", *Eleventh U.S. National Conference on Earthquake Engineering, Integrating Science, Engineering & Policy, June 25-29, 2018, Los Angeles, California.*
- 10. Hubler, J.F., <u>Athanasopoulos-Zekkos, A.</u> and Zekkos, D. (2018). "Post-Liquefaction Volumetric Strain of Gravel-Sand Mixtures in Constant Volume Simple Shear." *Geotechnical Earthquake Engineering and Soil Dynamics V 2018, June 10-13*
- 11. Grizi, A., <u>Athanasopoulos-Zekkos, A.</u>, and Woods, R.D. (2018). "Pile Driving Vibration Attenuation Relationships: Overview and Calibration Using Field Measurements", *Geotechnical Earthquake Engineering and Soil Dynamics V 2018, June 10-13*.
- 12. Grizi, A., <u>Athanasopoulos-Zekkos, A.</u>, and Woods, R.D. (2018). "Understanding the energy transfer mechanism in the near field of impact driven piles", *10th International Conference on Stress Wave Theory and Testing Methods for Deep Foundations*
- 13. Hubler, J.F., <u>Athanasopoulos-Zekkos, A.</u> and Zekkos, D. (2018) "Evaluation of Post-Liquefaction Shear Strength and Shear Wave Velocity of Uniform Gravels." *International Foundations Congress and Equipment Expo, March 5-10, 2018.*
- Grizi, A., <u>Athanasopoulos-Zekkos, A.</u> and Woods, R. D. (2018). "H-Pile Driving Induced Vibrations: Reduced-Scale Laboratory Testing and Numerical Analysis", *IFCEE 2018, March 5-10, ASCE.*
- Gallagher, P.M., Alestalo, S., Bhatia, S.K., <u>Athanasopoulos-Zekkos, A.</u>, and Soundarajan, S. (2018). "Geotechnical Women Faculty From 1989-2017: A U.S. Case Study Outline", *Submitted to International Foundations Congress and Equipment Expo, March 5-10, 2018.*
- 16. Hubler, J., <u>Athanasopoulos-Zekkos, A.</u>, and Zekkos, D. (2017). "Pore Pressure Generation of Pea Gravel, Sand, and Gravel-Sand Mixtures in Constant Volume Simple Shear", 3rd International Conference on Performance-Based Design for Earthquake Geotechnical Engineering, Vancouver, BC, Canada, July 17-19, 2017
- Hubler, J., <u>Athanasopoulos-Zekkos, A.</u>, and Zekkos, D. (2017.) "Monotonic, Cyclic and Post-Cyclic Shear Response of a Gravelly Sand ", 2017 Geofrontiers ASCE conference, Olrando, FL, March 12-15
- Nikolaou, S., Vera-Grunauer X., Gilsanz, R. Luque, R. Kishida, T. Diaz-Fanas, G. Antonaki, N. Toulkeridis T., Miranda, E. Diaz, V. Alzamora, D. <u>Athanasopoulos-Zekkos, A.</u> Lyvers, G. Morales, E. Lopez, P. Rollins, K. Wood, C. O'Rourke, T. Lopez, S. (2017). "GEER-ATC Mw7.8 ECUADOR 4/16/16 EARTHQUAKE RECONNAISSANCE PART I : SEISMOLOGICAL & GROUND MOTION ASPECTS", 16th World Conference on Earthquake Engineering, 16WCEE 2017 Santiago Chile, January 9th to 13th 2017
- Vera-Grunauer, X., Nikolaou, S., Gilsanz, R., Diaz-Fanas, G., Antonaki, N., Lopez, S., Luque, R., Casares, B., Caicedo, A., Alzamora, D., Rollins, K., Wood, C., <u>Athanasopoulos-Zekkos</u>, A., Lyvers, G., Diaz, V., Toulkeridis, T., Morales, E. (2017). "GEER-ATC Mw7.8 ECUADOR 4/16/16 EARTHQUAKE RECONNAISSANCE PART II: SELECTED GEOTECHNICAL OBSERVATIONS", 16th World Conference on Earthquake Engineering, 16WCEE 2017 Santiago Chile, January 9th to 13th 2017

- Kitsis, V., Vlachakis, V., <u>Athanasopoulos-Zekkos, A.</u>, and Athanasopoulos, G. (2015). "Seismic Thrust vs Wall Inertia in Non-Yielding Retaining Walls Under Earthquake Loading: Synchronous or Asynchronous Action?" 2015 International Foundations Congress and Equipment Expo, American Society of Civil Engineers (ASCE), San Antonio, TX, March 17-21.
- 21. Zekkos, D., <u>Athanasopoulos-Zekkos, A.,</u> Grizi, A., Greenwood, W. (2014). "The Railroad Embankment Failure of the City of Ann Arbor, Michigan, Case history As a Means for Teaching Geotechnical Engineering", 7th Hellenic Conference in Geotechnical Engineering, Athens, 5-7 November 2014 (in greek).
- 22. Hubler, J., <u>Athanasopoulos-Zekkos, A.</u>, Ohm, H-S, and Hryciw, R. (2014). "Effect of Particle Morphology on the Monotonic Response of Gravel-sized Soils through Large Scale Simple Shear Testing", GeoCongress 2014, GSP 234-235, ASCE, Atlanta, GA, February 23-26.
- Vlachakis, V., Athanasopoulos, G.A., and <u>Athanasopoulos-Zekkos, A</u>. (2014). "Seismic displacements of yielding gravity-type earth retaining walls Results from a FEM study", GeoCongress 2014, GSP 234-235, ASCE, Atlanta, GA, February 23-26.
- 24. Woods, R.D., <u>Athanasopoulos-Zekkos, A.</u>, Gkrizi, A., Pietrangelo, A., and Zimmerman, A. (2014). "Measurement of Ground Motion near Piles during Driving", ASCE Geotechnical Special Publication (GSP 233): Principles and Practices in Geotechnical Engineering, A GSP Honoring Roy Olson, PhD, PE, NAE, DistMASCE.
- <u>Athanasopoulos-Zekkos, A.</u> and Seed, R.B. (2013). "Seismic Slope Stability of Earthen Levees", Proceedings of the 18th International Conference on Soil Mechanics and Geotechnical Engineering, Paris, September 2-6 2013.
- Lobbestael, A and <u>Athanasopoulos-Zekkos, A.</u> (2013). "The Effect of Input Frequency on the Soil-Structure Interaction during dynamic excitation of Levees with Cutoff Walls", GeoCongress 2013, GSP 231, ASCE, San Diego, March 3-6.
- <u>Athanasopoulos-Zekkos, A.</u>, and Seed, R. (2012). "Dynamic Response and Performance of Earthen Levees", International Conference on Earthquake Engineering Research Challenges in the 21st Century, Institute of Engineering Mechanics (IEM) of the China Earthquake Administration, 18-21 May, 2012, Harbin, China.
- 28. Lobbestael, A., and <u>Athanasopoulos-Zekkos, A</u>. (2011). "The Behavior of Failure Surfaces Resulting from Progressive Failure Through Thin Layers of Soft Sensitive Soil Beneath Earthen Levees", *Dam Safety 2011, ASDSO*, Washington, DC., September 25-29 2011.
- 29. <u>Athanasopoulos-Zekkos, A.</u>, Lamote, K., and Athanasopoulos, G., (2011). "Seismic isolation of earth retaining walls using EPS compressible inclusions Results from centrifuge testing", *4th International Conference on Geofoam Blocks in Construction Applications*, Oslo, Norway, 4-6 June, 2011.
- Lobbestael, A. and <u>Athanasopoulos-Zekkos, A</u>. (2011). "High Performance Cutoff Walls for Levees in Seismic Regions", U.S. Society of Dams 2011 Annual Meeting and Conf., San Diego, CA, April 11-15 2011 (poster).
- Lobbestael, A. and <u>Athanasopoulos-Zekkos, A</u>. (2011). "A Parametric Analysis of the Effects of Progressive Failure on Embankments Founded on Soft Sensitive Soils", *Geo-frontiers 2011, GSP* 211, ASCE, Dallas, Texas, March 13-16, 2011.
- 32. <u>Athanasopoulos-Zekkos, A</u>. and Seed, R. (2010). "A Simplified Methodology for the Seismic Vulnerability Assessment of Earthen Levees", 6th National Hellenic Conference on Geotechnical and Geoenvironmental Engineering, Volos, Greece, Sept. 29-Oct. 1, 2010 (in greek).
- 33. Saadi, M. and <u>Athanasopoulos-Zekkos, A</u>. (2010). "A GIS-enabled approach for the risk assessment of levee systems", 9th US National and 10th Canadian Conference on Earthquake Engineering: Reaching beyond Borders, Toronto, Canada, July 25-29, 2010.
- 34. Zekkos, D., Boominathan, A., and <u>Athanasopoulos-Zekkos, A</u>. (2010). "Engineering Seismology, Ground Motions and Local Site Effects", General Report on Seesion 3, 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, May 24-29, 2010.

- <u>Athanasopoulos-Zekkos, A.</u> (2010). "Variability in earthen levee seismic response due to timehistory selection", 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, May 24-29, 2010.
- <u>Athanasopoulos-Zekkos A.</u>, Zekkos D. and Matasovic N., (2008). "Validation of generic municipal solid waste material properties for seismic design of landfills", *4th Geotechnical Earthquake Engineering and Soil Dynamics Conference*, GSP 181, Sacramento, CA, May 18-22, 2008.
- R. B. Seed, R. G. Bea, R. I. Abdelmalak, <u>A. G. Athanasopoulos</u>, G. P. Boutwell, J. D. Bray, J.-L. Briaud, C. Cheung, J. Cohen-Waeber, B. D. Collins, D. Cobos-Roa, D. Farber, M. Hanenmann, L. F. Harder, K. S. Inkabi, A. M. Kammerer, D. Karadeniz, R.E. Kayen, R. E. S. Moss, J. Nicks, S. Nimala, J. M. Pestana, J. Porter, K. Rhee, M. F. Riemer, K. Roberts, J. D. Rogers, R. Storesund, A. V Govindasamy, X. Vera-Grunauer, J. Wartman, C. M. Watkins, E.Wenk, and S. Yim, (2007). "Investigation of the performance of the New Orleans Regional Flood Protection Systems during Hurricane Katrina: Lessons learned", *Geo-Denver Congress, Geo-Institute, GSP 157-174, ASCE*, Denver, CO, February 2007.
- 38. R. B. Seed, R. G. Bea, <u>A. G. Athanasopoulos</u>, G. P. Boutwell, J. D. Bray, C. Cheung, B. D. Collins, D. Cobos-Roa, J. Cohen-Waeber, L. F. Harder, R.E. Kayen, R. E. S. Moss, J. M. Pestana, J. Porter, M. F. Riemer, J. D. Rogers, R. Storesund, X. Vera-Grunauer, J. Wartman, (2007). "Investigation of levee performance in Hurricane Katrina: The New Orleans drainage canals", *Geo-Denver Congress, Geo-Institute, GSP 157-174, ASCE*, Denver, CO, February 2007.
- R. B. Seed, R. G. Bea, <u>A. G. Athanasopoulos</u>, G. P. Boutwell, J. D. Bray, C. Cheung, B. D. Collins, D. Cobos-Roa, L. F. Harder, R.E. Kayen, J. M. Pestana, J. Porter, M. F. Riemer, J. D. Rogers, R. Storesund, X. Vera-Grunauer, J. Wartman, (2007). "Investigation of levee performance in Hurricane Katrina: The Inner Harbor navigation channel", *Geo-Denver Congress, Geo-Institute*, *GSP 157-174, ASCE*, Denver, CO, February 2007.
- 40. Zekkos, D., Athanasopoulos, G., <u>Athanasopoulos, A</u>. Manousakis, J. (2006). "Elements of engineering geology and geotechnical engineering in the Homeric Poems", *International Symposium on Science and Technology in Homeric Epics*, Ancient Olympia, Greece, 27-30 August 2006.
- Zekkos D.P., Athanasopoulos G.A. and <u>Athanasopoulos A.G.</u>, (2004). "Deep Supported Excavation in Difficult Ground Conditions in the City of Patras, Greece - Measured vs. Predicted Behavior", 5th International Conference on Case Histories in Geotechnical Engineering, 13-17 April 2004, NY

Other Publications

- 1. Gallagher, P.M., Alestalo, S., <u>Athanasopoulos-Zekkos, A.</u>, Bhatia, S.K., and Soundarajan, S. (2017). "Connecting Faculty in Geotechnical Engineering: Thriving in a Networked World", *GeoStrata, March/April Issue, Geo-Institute of ASCE.*
- Lobbestael, A., and <u>Athanasopoulos-Zekkos, A.</u> (2011). "High Performance Cutoff Walls for Levees in Seismic Regions", U.S. Society of Dams Newsletter, Issue No. 154, July 2011
- 3. Zekkos D.P., <u>Athanasopoulos A.G.</u>, (2004). "Milos Island: Working with earth for 9000 years", *AEG News, Association of Engineering Geologists Magazine*, March 2004, Vol.47, Issue 1
- Zekkos, D., <u>Athanasopoulos, A</u>., Manousakis, J., (2003). "Geotechnical Engineering Experiences in the Homeric Poems", *Newsletter of the Technical Chamber of Greece*, Issue 2231, January 20th, 2003.

Technical Reports – Theses

1. Bastin, S., Bradley, B., Bray, J., Capellaro, C., Cubrinovski, M., del la Torre, C., Green, R., McGann, C., Olsen, M., Palermo, A., M., Stringer, Wotherspoon, L., Aricheta, J., <u>Athanasopoulos-</u>

Zekkos, A., et al. (2017). "Geotechnical reconnaissance of the 2016 Mw 7.8 Kaikoura, New Zealand earthquake", GEER report GEER-053, Cubrinovski and Bray eds, Version 1.0, June 2017

- Alvarado, A., Alzamora, D., Antonaki, N., Arteta, C., <u>Athanasopoulos-Zekkos, A.</u>, Bassal, P., Caicedo, A., Casares, B., Davila, D., Diaz, V., Diaz-Fanas, G., Gilsanz, R., González, O., Hernandez, L., Kishida, T., Kokkali, P., López, P., Luque, R., Lyvers, G.M., Maalouf, S., Mezher, J., Miranda, E., Morales Moncayo, E., Nikolaou, S., O'Rourke, T., Ochoa, I., O'Connor, J.S., Ripalda, F., Rodríguez, L.F., Rollins, K., Stavridis, A., Toulkeridis, T., Vaxevanis, E., Vera-Grunauer, X., Villagrán León, N., Wood, C., Yepes, H., Yepez, Y. (2016). "GEER-ATC Earthquake reconnaissance, April 16, 2016 Muisne, Ecuador", GEER report GEER-049, Nikolaou, Grunauer and Gilsanz eds, Version 1.0b, October 2016
- 3. <u>Athanasopoulos-Zekkos, A.</u>, Woods, R.D. and Gkrizi, A. (2014). "Effect of pile-driving induced vibrations on nearby structures and other assets", final report submitted to MDOT, ORBP Number OR10-046, RC-1600
- 4. Cortese, G., Zekkos, D., <u>Athanasopoulos-Zekkos, A</u>. (2012a). "Network for Women in Civil and Environmental Engineering First Annual Report", May 31 2012, University of Michigan
- 5. Cortese, G., Zekkos, D., <u>Athanasopoulos-Zekkos, A</u>. (2012b). "Results of 2011 Undergraduate and Graduate Survey", September 15, 2012, University of Michigan.
- 6. <u>Athanasopoulos, A.G.</u> (2008)., "Select Topics on the Static and Dynamic Response and Performance of Earthen Levees", *Dissertation, Doctor of Philosophy*, Department of Civil and Environmental Engineering, University of California, Berkeley, California, USA.
- 7. <u>Athanasopoulos, A.G.</u> (2006). "Investigation of the performance of the flood-protection systems of New Orleans in Hurricane Katrina, on August 29, 2005", *report for the Technical Chamber of Greece*.
- R. B. Seed, R. G. Bea, R. I. Abdelmalak, <u>A. G. Athanasopoulos</u>, G. P. Boutwell, J. D. Bray, J.-L. Briaud, C. Cheung, D. Cobos-Roa, J. Cohen-Waeber, B. D. Collins, L. Ehrensing, D. Farber, M. Hanemann, L. F. Harder, K. S. Inkabi, A. M. Kammerer, D. Karadeniz, R.E. Kayen, R. E. S. Moss, J. Nicks, S. Nimmala, J. M. Pestana, J. Porter, K. Rhee, M. F. Riemer, K. Roberts, J. D. Rogers, R. Storesund, A. V. Govindasamy, X. Vera-Grunauer, J. E. Wartman, C. M. Watkins, E. Wenk Jr., and S. C. Yim, (2006). "Investigation of the performance of the New Orleans flood protection systems in hurricane Katrina on August 29, 2005", *Report No.UCB/CCRM 06/01*, July 2006, University of California at Berkeley, (http://www.ce.berkeley.edu/~new_orleans/)
- 9. <u>Athanasopoulos, A.</u>, Zekkos D. (2006). "Geoengineering, refereed journals and case histories: A survey", *Geoengineer.org report* GEO/01/06, September 2006.
- 10. <u>Athanasopoulos, A.G.</u> (2003). "Rion Antirion Bridge: The foundation system of the Antirion approach viaduct and results of axial and lateral loading tests on 2m diameter steel pipe piles", *Undergraduate Thesis, Ptychion*, Department of Civil Engineering, University of Patras, Greece.

Invited Lecture Presentations

- 1. "Liquefaction Assessment of Gravelly Soils using the DPT", Impact Testing for Site Characterization Workshop at SuperPile '19, DFI, Seattle, May 1, 2019
- 2. "Liquefaction of Gravelly Soils and Their Impact on Infrastructure", Purdue Geotechnical Society *Workshop on Geotechnics of Natural Hazards*, Lafayette, April 26, 2019
- 3. "Liquefaction of Gravelly Soils and Their Impact on Infrastructure", *Civil and Environmental Engineering Department Seminar*, UC Berkeley, March 1, 2019

- 4. "Laboratory and In-Situ Assessment of Liquefaction of Gravelly Soils", Themed Lecture, Geosystems Session, 3rd International Conference on Performance-based Design in Earthquake Geotechnical Engineering", Vancouver BC, July 18, 2017
- 5. "Liquefaction Triggering and Post-Liquefaction response of Gravelly Soils", 4th Annual ACEC NY Geotechnical Symposium, Syracuse, NY, May 8, 2017
- 6. "Evaluation of Gravelly Soil Liquefaction through Laboratory and Field Testing", 35th Geoengineering Distinguished Lecture Series, UC Berkeley, May 4, 2017
- 7. "Post-Liquefaction Response of Gravelly Soils", US-NZ-Japan International Workshop on Liquefaction-Induced Ground Movement Effects, UC Berkeley, November 3, 2016
- 8. "Characterization of pile-driving induced vibrations", invited by the *Civil Engineering Dept. of the National Technical University of Athens (NTUA) Greece, and the National Scientific Committee of Geotechnical Engineering,* June 1, 2016
- 9. "Pile driving induced vibrations and their effects on nearby structures", *UM, CEE Geotechnical Seminar*, November 4, 2015
- 10. "Pile driving induced vibrations and their effects on nearby structures", UC Davis, CEE Geotechnical Seminar, April 2, 2015
- 11. Keynote presentation: "Assessment of Seismic Vulnerability of Earthen Levees", 22nd Vancouver Geotechnical Society Symposium, Vancouver B.C., June 13, 2014
- 12. "Effect of pile-driving induced vibrations on nearby structures and other assets", 2013 Midwest Geotechnical Conference, Madison, WI, September 24, 2013
- 13. "Levees: Learning from the past Looking to the future", *CEE Department, Syracuse University*, *NY*, April 12, 2013
- 14. "Techniques for reviewing journal articles and the process for getting your work published", UROP/WISE seminar, University of Michigan, October 17, 2012
- 15. "Performance of the flood-protection systems of New Orleans in Hurricane Katrina Lessons Learned", invited by the *Civil Engineering Dept. of the National Technical University of Athens* (NTUA) Greece, the National Scientific Committee of Geotechnical Engineering and the National Committee of Earthquake Engineering, December 17, 2010
- 16. "Investigation of the levee failures in New Orleans after Hurricane Katrina", UROP Research seminar, University of Michigan, October 20, 2010
- "Teaching techniques for increasing female participation and retention in Civil Engineering" at the 6th National Hellenic Conference on Geotechnical and Geoenvironmental Engineering, in Volos, Greece, Sept. 29-Oct. 1, 2010 for the special session titled: "Innovative teaching methods in Geotechnical Engineering", September 30, 2010
- 18. "Lessons learned from the performance of the flood-protection systems after Hurricane Katrina" 2010 CEEFA Spring Technical Session, University of Michigan, April, 2010
- 19. "Levees: Learning from the past Looking to the future", ASCE chapter, University of Michigan, Ann Arbor, MI, February 13, 2009
- 20. "Assessment of Seismic Vulnerability of Levees in Select California Regions", *EERI Student Chapter of the University of Notre Dame*, Notre Dame, IN, January 27, 2009
- 21. "Variability of Levee Response Due to Time History Selection", *COSMOS annual meeting and technical session*, Oakland, CA, November 21, 2008
- 22. "Assessment of Seismic Vulnerability of Levees in Select California Regions", University of California, Berkeley, Geoengineering Wednesday Seminar Series, April 16, 2008

- 23. "Seismic Levee Fragility and Flooding Hazard for Select California Regions", ASCE San Francisco chapter Geotechnical Group Workshop, February 19, 2008
- 24. "Investigation of the performance of the flood-protection systems of New Orleans in Hurricane Katrina, on August 29, 2005", *Technical Chamber of Greece, Special Scientific Committee of Soil Mechanics and Foundations and the Technical Chamber of Greece*, December 19, 2006
- 25. "Overview of the Investigation of the Performance of the New Orleans' Flood Protection Systems in Hurricane Katrina on August 29, 2005", *ASCE-Geo-Institute chapter of Texas A&M University, College Station,* November 16, 2006
- 26. "Performance of the flood-protection systems of New Orleans in hurricane Katrina on August 29, 2005 Lessons Learned", University of California at Berkeley, Civil & Environmental Engineering Graduate Student Societ,. October 24, 2006

Dimitrios Zekkos, Ph.D., P.E.

Associate Professor

Department of Civil and Environmental Engineering, University of California at Berkeley

Founder and CEO, ARGO-E LLC.

Website: http://www.dimitrioszekkos.org

EDUCATION

- 2002 2005 : Doctor of Philosophy (PhD), University of California at Berkeley. Department of Civil & Environmental Engineering, Geoengineering Program.
- 2001–2002 : Master of Science (MSc), University of California at Berkeley. Department of Civil & Environmental Engineering, Geoengineering Program
- 1996 2001 : Joint B.S/M.Eng. (5-year required program), University of Patras, Department of Civil Engineering, Greece.

AWARDS-HONORS

Awards

- <u>2019 Rackham Faculty Recognition Award</u>, University of Michigan. This award recognizes mid-career faculty who have demonstrated remarkable contributions to the University of Michigan through outstanding achievements in scholarly research and/or creative endeavors; excellence as a teacher, advisor and mentor; and distinguished participation in the service activities of the university and elsewhere.
- <u>2017 Shamsher Prakash Research Award</u>, Shamsher Prakash Foundation. International award for excellence in research.
- <u>2014 Collingwood Prize</u>, American Society of Civil Engineers (ASCE). Awarded for the paper: Zekkos, D., Kabalan, M., and Flanagan, M. (2013). "Lessons Learned From Case Histories of Dynamic Compaction at Municipal Solid Waste Sites." Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 139(5), 738-752.
- <u>2013 Outstanding Innovator Award</u>, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). This award is "in recognition of innovations in Geo-engineering that have a pronounced impact on geo-engineering practice, research and education. The term "innovation" is used broadly to describe any major, unprecedented achievements that led to a major advancement in our profession."
- <u>2013 Faculty Excellence Award</u>, Civil and Environmental Engineering Department, University of Michigan.
- <u>2012 ASCE Arthur Casagrande Professional Development Award</u> "for his contributions to the advancement of solid waste engineering and dedicated service and leadership in promoting geo-engineering research, education and practice through the creation of a pioneering website and online journal."
- <u>2012 Great Lakes District of Chi Epsilon James M. Robbins Excellence in Teaching Award</u>. Students in each of the 17 Universities in the Great Lakes District nominate one faculty member per institution to compete for this award for excellence in teaching at the district level.
- <u>2011 Outstanding Research Mentorship Award</u>, Undergraduate Research Opportunities Program (UROP), University of Michigan (awarded to top 5 faculty sponsors out of approximately 750 university-wide).
- <u>2010 Thomas A. Middlebrooks Award</u>, American Society of Civil Engineers (ASCE). Awarded for the paper: Bray, J. D., Zekkos, D., Kavazanjian, E., Jr., Athanasopoulos, G. A., Riemer, M. F. (2009), "Shear Strength of Municipal Solid Waste," Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 135 (6):709-722, which was judged worthy of special commendation for its merit as a contribution to geotechnical engineering.
- <u>2003 Outstanding Graduate Student Instructor Award</u>, University of California at Berkeley. In recognition of exceptional achievements as a Graduate Student Instructor of CE172 "Introduction to Rock Mechanics."
- <u>2002 Harry Bolton Seed Award</u>, University of California at Berkeley. Awarded to the M.S. student who completes "in an exemplary manner" the program in Geoengineering in the Department of Civil & Environmental Engineering.

Other Recognitions

- <u>Prize, Great Challenge Competition</u>, US Bureau of Reclamation (USBR) and US Army Corps of Engineers, "Detecting the Movement of Soils (Internal Erosion) Within Earthen Dams, Canals, Levees, and their Foundations" (with Prof. Jean-Louis Briaud, Texas A&M)
- 2013 Technical Committee of the Year, ASCE Geo-institute, Geoenvironmental Technical Committee, Vice Chair.
- <u>Honorable Award</u>, Eurasian National University, Kazakhstan, for great contributions in ISSMGE Board Activity during 2009-2013 term.

- <u>Eminent Engineer</u>, Tau Beta Pi, December 2012.
- <u>2010 Outstanding Research Mentorship Award</u>, Honorable Mention, Undergraduate Research Opportunities Program (UROP), University of Michigan (awarded to top 8 sponsors out of approximately 700)
- <u>Chi-Epsilon</u>, member, University of Michigan Chapter, Member, December 2009.

Academic Scholarships/Fellowships

- Graduate Research Assistantship, University of California at Berkeley (8/2002 11/2005)
- Graduate Fellowship, Civil & Environmental Engineering Department, University of California at Berkeley (January 2002).
- Graduate Teaching Assistantship, University of California at Berkeley (Fall 2001-CEE171; Spring 2002-CE172).

PROFESSIONAL HISTORY

- 1/2020-present: Associate Professor, Department of Civil and Environmental Engineering, University of California at Berkeley
- 2015-present: Founder & CEO, ARGO-E LLC, Ann Arbor, Michigan, USA
- 2002- present: Board Member and Vice President, Elxis Group S.A., Athens, Greece
- 6/2014- 12/2019: Associate Professor, Department of Civil and Environmental Engineering, University of Michigan.
- 9/2017-12/2019: Associate Professor, Department of Earth and Environmental Science, University of Michigan (dry appointment).
- 1/2016-7/2016: Visiting Professor, Geotechnical Engineering Department, School of Civil Engineering, National Technical University of Athens (NTUA).
- 9/2008-6/2014: Assistant Professor, Department of Civil and Environmental Engineering, University of Michigan.
- 11/2005-6/2008: Engineer, Geosyntec Consultants, Oakland California.

PUBLICATIONS

The ASCE reference format (http://www.asce.org/Content.aspx?id=29605) is used for the references. Current graduate student names are single underlined. Former graduate student names are double underlined. Undergraduate student names are single underlined and noted by an asterisk * after their name.

Books / Chapters in books - Special Publications

Books Edited

- Zekkos, D., Farid, A., De, A., Reddy, K., Yessiler, N., (eds.) (2016) Sustainability and Resiliency in Geotechnical Engineering, Proceedings of Geo-Chicago 2016, ASCE Geotechnical Special Publication 269, Chicago, Illinois, August 14–18, 2016.
- Farid, A. De, A., Reddy, K., Yessiler, N., Zekkos, D. (eds.) (2016). *Geotechnics for Sustainable Energy*, Proceedings of Geo-Chicago 2016, ASCE Geotechnical Special Publication 270, Chicago, Illinois, August 14–18, 2016.
- De, A., Reddy, K., Yessiler, N., Zekkos, D., Farid, A.(eds.) (2016). Sustainable Geoenvironmental Systems, Proceedings of Geo-Chicago 2016, ASCE Geotechnical Special Publication 271, Chicago, Illinois, August 14–18, 2016.
- Reddy, K., Yessiler, N., Zekkos, D., Farid, A., De, A., (eds.) (2016). Sustainable Materials and Resource Conservation, Proceedings of Geo-Chicago 2016, ASCE Geotechnical Special Publication 272, Chicago, Illinois, August 14–18, 2016.
- Yessiler, N., Zekkos, D., Farid, A., De, A., Reddy, K., (eds.) (2016) Sustainable Waste Management and Remediation, Proceedings of Geo-Chicago 2016, ASCE Geotechnical Special Publication 273, Chicago, Illinois, August 14–18, 2016.
- 6. Zekkos, D. (2015). Geotechnical Section co-Editor, "*Encyclopedia of Earthquake Engineering*" Springer. Editorsin-Chief: Michael Beer, Ioannis A. Kougioumtzoglou, Edoardo Patelli, Ivan Siu-Kui Au.
- 7. Rollins, K., Zekkos, D. (2012), eds. "Geotechnical Engineering State of the Art and Practice, Keynote Lectures from Geocongress 2012," March 25-29, 2012, Geotechnical Special Publication No. 226, ASCE, Va., 832 pp.
- 8. Zekkos, D. (2011) ed., "Geotechnical Characterization, Field Measurements, and Laboratory Testing of Municipal Solid Waste," ASCE Geotechnical Special Publication No. 209, ASCE, Va., 249 pp.

Chapters in Books

- 1. Gourc, J-P., and Zekkos, D. (2019). "Chapter 5.1. Waste Mechanical Properties." In *Solid Waste Landfilling*, Cossu R. & Stegmann R. (eds.), Elsevier, 193-210.
- 2. Gourc, J-P., and Zekkos, D. (2019). "Chapter 5.2. Mechanical Stability at Landfill Scale." In *Solid Waste Landfilling*, Cossu R. & Stegmann R. (eds.), Elsevier, 211-228.
- Zekkos, D., Matasovic, N., El-Sherbiny, R., Athanasopoulos-Zekkos, A., Towhata, I., Maugeri, M. (2011). "Chapter 4: Dynamic Properties of Municipal Solid Waste," in *Geotechnical Characterization, Field Measurements, and Laboratory Testing of Municipal Solid Waste*, ASCE Geotechnical Special Publication No. 209, Zekkos, D. ed., ASCE, Va., 112-134.
- Bray, J. D., Zekkos, D., Merry, S. M. (2011). "Chapter 3: Shear Strength of Municipal Solid Waste," in Geotechnical Characterization, Field Measurements, and Laboratory Testing of Municipal Solid Waste, ASCE Geotechnical Special Publication No. 209, Zekkos, D. ed., ASCE, Va., 44-75.

Refereed Journal Papers

- Athanasopoulos, G. A., Kechagias, G. C., Zekkos, D., Batilas, A., Karatzia, X., Lyrantzaki, F., & Platis, A. (2020). Lateral spreading of ports in the 2014 Cephalonia, Greece, earthquakes. Soil Dynamics and Earthquake Engineering, 128, 105874.
- 2. <u>Greenwood, W.</u>, Lynch, J., Zekkos, D. (2019). Applications of UAVs in Civil Infrastructure, *Infrastructure Systems*, *J. Infrastruct. Syst.*, 2019, 25(2): 04019002.
- 3. <u>Datta, S.</u>, Zekkos, D., <u>Fei, X.</u>, McDougall, J. (2018). Waste-composition-dependent 'HBM' model parameters based on degradation experiments, Environmental Geotechnics, *Environmental Geotechnics*, 1-10.
- Zekkos, D., <u>Greenwood, W.</u>, Manousakis, J., Athanasopoulos-Zekkos, A., Clark, M., Cook, K.L. and Saroglou, C. (2018). Lessons Learned from the Application of UAV-Enabled Structure-From-Motion Photogrammetry in Geotechnical Engineering. *International Journal of Geoengineering Case Histories*, Vol.4, Issue 4, p.254-274. doi:10.4417/IJGCH-04-04-03
- 5. <u>Hubler, J. F.</u>, Athanasopoulos-Zekkos, A., & Zekkos, D. (2018). Monotonic and cyclic simple shear response of gravel-sand mixtures. *Soil Dynamics and Earthquake Engineering*, 115, 291-304.
- Saroglou, H., <u>Asteriou, P</u>., Zekkos, D., Tsiambaos, G., Clark, M., Manousakis, J. (2018) "UAV-enabled reconnaissance and trajectory modeling of a co-seismic rockfall in Lefkada", *Natural Hazards and Earth System Sciences*, 18(1):321-333. DOI: 10.5194/nhess-18-321-2018
- 7. <u>Fei, X.</u>, Zekkos, D. (2018), "Coupled experimental assessment of physico-biochemical characteristics of municipal solid waste undergoing enhanced biodegradation" *Geotechnique*, DOI: 10.1680/jgeot.16.p.253
- Zekkos, D., Athanasopoulos-Zekkos, A., <u>Hubler, J., Fei, X.</u>, Zehtab, K. H., Marr, W. A. (2017) "Development of a large-size cyclic direct simple shear device for characterization of ground materials with oversized particles", ASTM *Geotechnical Testing Journal*, March 2018 Volume 41 (2), 263-279, DOI: 10.1520/GTJ20160271.
- Nevett, L., Tsigarida, E., Archibald, Z., Stone, D., Horsley, T., Ault, B., Panti, A., Lynch, K. M., Pethen, H., Stallibras, S. M., Salminen, E., Gaffney, C., Sparrow, T. J., Taylor, S., Manousakis, J., and Zekkos, D. (2017). Towards a multi-scalar, multidisciplinary approach to the classical greek city: The Olynthos project. *The Annals of the British School at Athens*, 112, 155-206. doi:10.1017/S0068245417000090
- <u>Von Voigtlander, J</u>., Clark, M., K., Zekkos, D., <u>Greenwood, W</u>., W., Anderson, S. P., Anderson, R. S., Godt, J. W. (2017) Influence of Weathering on Seismic Velocities of a Basalt Climosequence, *Earth Surface Processes and* Landforms. DOI: 10.1002/esp.4290.
- 11. <u>Fei, X</u>., Zekkos, D. (2017), "Comparison of Direct Shear and Simple Shear Response of MSW", Environmental Geotechnics Journal, September 2017, DOI: 10.1680/jenge.16.00036
- Zekkos, D., Clark, M., Whitworth, M., <u>Greenwood, W</u>., West, J., Roback, K., Li, G., Chamlagain, D., Manousakis, J., Quackenbush, P., <u>Medwedeff, W</u>., Lynch, J., (2017). Observations of landslides caused by the April 2015 Gorkha earthquake in Nepal based on land, UAV and satellite reconnaissance. *Earthquake Spectra*, 33(S1), S95–S114, December 2017; DOI: 10.1193/121616EQS237M.
- <u>Carlson, C</u>., Zekkos, D. (2017) "A Metric to Screen Acceptable Velocity and Displacement Time Histories of Modified Ground Motions", Earthquake Spectra, 33 (4), 1495-1512 https://doi.org/10.1193/011117EQS012M.
- Stahl, T., Clark, M. K., Zekkos, D., Athanasopoulos-Zekkos, D., Willis, M., <u>Medwedeff, W.</u>, Knoper, L., Townsend, T., and Jin, J. (2017). Earthquake science in resilient societies, *Tectonics*, doi: 10.1002/2017TC004604
- Hubler, J., Athanasopoulos-Zekkos, A., Zekkos, D. (2017). "Monotonic, Cyclic and Post-Cyclic Simple Shear Behavior of Three Uniform Gravels." *Journal of Geotechnical and Geoenvironmental Engineering*, 143(9), September 2017. DOI: http://dx.doi.org/10.1061/(ASCE)GT.1943-5606.0001723. Editor's Choice paper in October 2017.
- Roback, K., Clark, M. K., West, J., Zekkos, D., Li, G., Gallen, S. F., Chamlagain, D., Godt, J. W. (2018). "The size, distribution, and mobility of landslides caused by the 2015 Mw7.8 Gorkha earthquake, Nepal." *Geomorphology*, 301, 121-138, https://doi.org/10.1016/j.geomorph.2017.01.030.

- 17. Zekkos, D., <u>Fei, X</u>. (2016). "Comparison of Constant Load and Constant Volume Shearing Response in Simple Shear Testing of Municipal Solid Waste." *Waste Management*, http://dx.doi.org/10.1016/j.wasman.2016.09.029.
- Zekkos, D., Athanasopoulos-Zekkos, A., <u>Grizi, A.</u>, <u>Greenwood, W</u>. (2016). "The May 25th 2011 Railroad Embankment Failure in Ann Arbor, Michigan, As a Means for Teaching Geotechnical Engineering." *International Journal of Geoengineering Case Histories*, 3 (4), 234-245. doi: 10.4417/IJGCH-03-04-03
- Zekkos, D., <u>Fei, X., Grizi, A.</u> Athanasopoulos, G. A. (2016). "Response of Municipal Solid Waste to Mechanical Compression." *Journal of Geotechnical and Geoenvironmental Engineering*, 10.1061/(ASCE)GT.1943-5606.0001608, 04016101.
- <u>Fei, X.</u>, Zekkos D., Lei, L., Woods, R. D., Sanford, L. (2015). "Geoenvironmental Characterization of Water Treatment Lime Sludge" *Environmental Geotechnics Journal*. 2 (6), 319-325.
- <u>Greenwood, W.</u>, Zekkos, D., and <u>Sahadewa, A.</u> (2015). "Spatial Variation of Shear Wave Velocity of Waste Materials from Surface Wave Measurements." *Journal of Environmental and Engineering Geophysics*, 20(4), 287-301.
- <u>Fei, X.</u>, Zekkos, D., Raskin, L. (2016). "Quantification of parameters influencing methane generation due to biodegradation of municipal solid waste in landfills and laboratory experiments." Waste Management 55, 276-287. http://dx.doi.org/10.1016/j.wasman.2015.10.015
- 23. <u>Carlson, C.</u>, Zekkos, D., Athanasopoulos-Zekkos, A. (2015) Predictive Equations to Quantify the Impact of Spectral Matching on Ground Motion Characteristics. Earthquake Spectra, 32 (1), 125-142.
- 24. <u>Sahadewa, A</u>., Zekkos, D., Woods, R. D., Stokoe, K. H. (2015). "Field Testing Method for Evaluating the Smallstrain Shear Modulus and Shear Modulus Reduction of Solid Waste." ASTM Geotechnical Testing Journal, June 2015, 38 (4), 427-441.
- Hoyos, L R., DeJong, J. T., McCartney, J. S., Puppala, A. J., Reddy, K. R., and Zekkos, D. (2014). "Environmental Geotechnics in the U.S. Region: A Brief Overview." *Environmental Geotechnics Journal*, DOI: 10.1680/envgeo.14.00024, Available online: March 31 2015.
- 26. <u>Carlson, C. P.</u>, Zekkos, D. and McCormick, J. P. (2014). "Impact of time and frequency domain ground motion modification on the response of a SDOF system." *Earthquakes and Structures*, 7(6), 1283-1301. DOI: 10.12989/eas.2014.7.6.1283
- 27. <u>Fei, X.</u>, Zekkos, D., Raskin, L. (2014). "Archaeal Community Structure in Leachate and Solid Waste is Correlated to the Methane Generation and Volume Reduction during Biodegradation of Municipal Solid Waste." *Waste Management Journal* (http://dx.doi.org/10.1016/j.wasman.2014.10.027)
- <u>Sahadewa, A.</u>, Zekkos, D., Woods, R. D., Stokoe, K. H., II, Matasovic, N. (2014). "In-situ assessment of the dynamic properties of municipal solid waste at a landfill in Texas." *Soil Dynamics and Earthquake Engineering*, 65 (2014), 303–313.
- <u>Carlson, C.</u>, Zekkos, D., Athanasopoulos-Zekkos, A. & <u>Hubler, J.</u> (2014). "Impact of modification on ground motion characteristics and geotechnical seismic analyses for a California site", *Journal or Earthquake Engineering* DOI: 10.1080/13632469.2014.898602.
- Zekkos, D., <u>Sahadewa, A</u>., Woods, R. D., Stokoe, K. II (2014). "Development of a model for shear wave velocity of Municipal Solid Waste", *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, March 2014, 140 (3), 04013030(14).
- <u>Fei, X.</u>, Zekkos, D., Raskin, L. (2014). "An Experimental Setup for Simultaneous Physical, Geotechnical, and Biochemical Characterization of Municipal Solid Waste Undergoing Biodegradation in the Laboratory", ASTM Geotechnical Testing Journal, 37 (1), 1–12.
- 32. Zekkos, D., Vlachakis, V. S., Athanasopoulos, G. A. (2014). "The 2010 Xerolakka Landfill Slope Instability", *Environmental Geotechnics Journal*, 1 (EG1), 55-65.
- 33. Zekkos, D., <u>Gkrizi, A.</u>, Athanasopoulos, G. A. (2013) "Investigation of fibrous reinforcement effect on shear resistance of soil-waste mixtures", *ASTM Geotechnical Testing Journal*, 36 (6), 867-880.
- Ohm, H.-S., <u>Sahadewa, A</u>., Hryciw, R. D., Zekkos, D., and <u>Brant, N. (2013).</u> "Sustainable Soil Particle Size Characterization through Image Analysis." *Journal of Geotechnical and Geological Engineering*, December 2013, 31(6), 1647-1652
- Zekkos, D. <u>Kabalan, M., Syal*, S. M., Hambright, M.</u>, and <u>Sahadewa, A.</u> (2013). "Geotechnical Characterization of a Municipal Solid Waste Incineration Ash from a Michigan Monofill." *Waste Management Journal*, 33, 1442– 1450.
- Zekkos, D., <u>Kabalan, M.</u>, and <u>Flanagan, M.</u> (2013). "Lessons Learned From Case Histories of Dynamic Compaction of Municipal Solid Waste Sites." *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, Va., 139(5), 738-752.
- Fei, X. and Zekkos, D. (2013). "Factors Influencing Long-Term Settlement of Municipal Solid Waste in Laboratory Bioreactor Landfill Simulators." ASCE Journal of Hazardous, Toxic and Radioactive Waste, 17 (4), 259-271.
- Cox, B. R., Boulanger, R. W., Tokimatsu, K., Wood, C. M., Abe, A. Ashford, S. Donahue, J., Ishihara, K., Kayen, K., Katsumata, K., Kishida, T., Kokusho, T., Mason, H. B., Moss, R., Stewart, J. P., Tohyama, K., and Zekkos, D. (2013). "Liquefaction at Strong Motion Stations and in Urayasu City During the 2011 Great East Japan,"

Earthquake." Earthquake Spectra Journal, 29 (S1), 55-80.

- 39. Zekkos, D., <u>Carlson, C</u>., Nisar, A. and <u>Guisbert, S.</u> (2012). "Effect of Ground Motion Modification Technique on Seismic Geotechnical Engineering Analyses." *Earthquake Spectra*, 28 (4), 1643-1662.
- 40. Zekkos, D., Bray, J. D., and Riemer, M. F. (2012). "Drained Response of Municipal Solid Waste in Large-Scale Triaxial Shear Testing." *Waste Management*, 32 (10), 1873–1885.
- 41. Medley, E. W., and Zekkos, D. (2011). "Geopractitioner Approaches to Working with Antisocial Mélanges," in: Wakabayashi, J., and Dilek, Y., eds., *Mélanges: Processes of Formation and Societal Significance*, Geological Society of America Special Paper 480, 261-277. Note: invited, peer reviewed special paper.
- Zekkos, D., Kavazanjian, E. Jr., Bray, J. D., Matasovic, N., and Riemer, M. F. (2010). "Physical Characterization of Municipal Solid Waste for Geotechnical Purposes." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Va., 136 (9), 1231-1241.
- 43. Zekkos, D., Athanasopoulos, G. A., Bray, J. D., Theodoratos, A., and <u>Grizi, A.</u> (2010). "Large-Scale Direct Shear Testing of Municipal Solid Waste." *Waste Management Journal*, 30, 1544–1555.
- Bray, J. D., Zekkos, D., Kavazanjian, E., Jr., Athanasopoulos, G. A., and Riemer, M. F. (2009). "Shear Strength of Municipal Solid Waste." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Va., 135 (6), 709-722.
- 45. Zekkos, D., Bray, J.D., and Riemer, M.F. (2008). "Shear Modulus and Material Damping of Municipal Solid Waste Based on Large-Scale Cyclic Triaxial Testing." *Canadian Geotechnical Journal*, 45 (1), 45-58.
- Zekkos, D., Bray, J. D., Kavazanjian, E. Jr., Matasovic, N., Rathje, E. M., Riemer, M. F., and Stokoe, K. H. (2006). "Unit Weight of Municipal Solid Waste." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 132 (10), 1250-1261.

Shorter communications, letters, notes or briefs in refereed Journals

- Bray, J. D., Zekkos, D., Kavazanjian, E., Jr., Athanasopoulos, G. A., Riemer, M. F. (2009). Closure of "Shear Strength of Municipal Solid Waste", *Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 136, No. 12, December 2010, pp. 1731-1732.
- Bray, J. D., Athanasopoulos, G. A., Bathurst, R., Myers Bohlke, B., Brandl, H., Christian, J., Doe, T., Duncan, M., Gue, S. S., de Mello, L. G. Hynes, M., Katzenbach, R., Kavazanjian, E., Jr., Koutsoftas, D., Lacasse, S., Marinos, P.G., Mayne, P. W., Morgenstern, N., Phoon, K. K., Poulos, H., Powderham, A., Prakash, S., Romo, M. P., Seed, R. B., Tokimatsu, K., Van Impe, W., Zekkos, D. P. (2004). "Foreword." *International Journal of Geoengineering Case Histories*, 1 (1), 1-3.

Refereed Conference Papers & Geotechnical Special Publications

- 1. <u>Champagne, C. L.</u>, Zekkos, D., Lynch, J. P., and O'Loughlin, S. (2020) "Waste Settlement Measurements using Unmanned Aerial Vehicles at a Municipal Solid Waste Landfill in Michigan, Geocongress 2020 (accepted).
- Draughon, G. T., Lynch, J. P., Zekkos, D., & O'Laughlin, S. (2019). Development of an autonomous flux chamber for continuous methane measurements at MSW landfills. Sardinia 2019.
- <u>Kallimogiannis, V.</u>, Saroglou, H., Zekkos, D., and Manousakis, J. (2019) "2D and 3D Back-analysis of a landslide in Egremnoi caused by the November 17 2015 Lefkada earthquake." 2nd International Conference on Natural Hazards and Infrastructure, 23-26 June 2019, Chania, Greece.
- 4. Zekkos, D., Tsavalas-Hardy, A., Mandilaras, G., and Tsantilas, K. (2019) "Using social media to assess earthquake impact on people and infrastructure: Examples from earthquakes in 2018." 2nd International Conference on Natural Hazards and Infrastructure, 23-26 June 2019, Chania, Greece.
- Saroglou, H., <u>Kalimogiannis, V.</u>, Bar, N., Manousakis, J., and Zekkos, D. (2019) "Analysis of slope instabilities in the Corinth Canal using UAV-enabled mapping" 2nd International Conference on Natural Hazards and Infrastructure, 23-26 June 2019, Chania, Greece.
- <u>Basham, M.</u>, Athanasopoulos-Zekkos, A., Zekkos, D. (2019) "The importance of vertical displacement control during constant volume cyclic simple shear testing, 7th International Conference on Earthquake Geotechnical Engineering, Rome, Italy, June 17-20 2019.
- Athanasopoulos-Zekkos, A., Zekkos, D., Rollins, K., <u>Hubler, J.</u>, Higbee, J. and Platis, A. (2019) "Earthquake Performance and Characterization of Gravel-Size Earthfills in the Ports of Cephalonia, Greece, following the 2014 Earthquakes", 7th International Conference on Earthquake Geotechnical Engineering, June 17-20 2019.
- <u>Admassu, K. A.</u>, Lynch, J. P., Athanasopoulos-Zekkos, A., Zekkos, D. (2019). Long-term Wireless Monitoring Solution for the Risk Management of Highway Retaining Walls, *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems*, March 2019.
- <u>Zhou, H.,</u> Lynch, J., Zekkos, D. (2019). Vision-based Precision Localization of UAVs for Sensor Payload Placement and Pickup for Field Monitoring Applications, *Sensors and Smart Structures Technologies for Civil, Mechanical,* and Aerospace Systems, March 2019.DOI: 10.1117/12.2516049
- 10. Fei, X., & Zekkos, D. (2018). Cyclic Simple Shear Testing of Degraded Municipal Solid Waste from California

Under Constant Volume and Constant Load Conditions. In 8th International Congress on Environmental Geotechnics (pp. 35-42). 28 October – 1 November 2018, Springer, Singapore.

- <u>Datta, S.</u>, and Zekkos, D. (2018). "Waste Composition Dependent Landfill Gas Generation Parameters for Large-Size Laboratory Degradation Experiments" 8th International Congress on Environmental Geotechnics, Hangzhou, China, 28 October – 1 November 2018, Springer, Singapore
- Zekkos, D., Clark, M., Willis, M., Athanasopoulos-Zekkos, A., Manousakis, J., Knoper, L., Stahl, T., Massey, C., Archibald, G., <u>Greenwood, W.</u>, and <u>Medwedeff, W</u>. (2018a). 3D models of the Leader Valley using satellite & UAV imagery following the 2016 Kaikoura earthquake, *Eleventh U.S. National Conference on Earthquake Engineering*, Integrating Science, Engineering & Policy, June 25-29, 2018, Los Angeles, California.
- 13. Zekkos, D., Manousakis, J., Athanasopoulos-Zekkos, A., Clark, M., Knoper, L., Massey, C., Archibald, G., <u>Greenwood, W.</u>, Hemphill-Haley, M., Rathje, E., Litchfield, N., <u>Medwedeff, W.</u>, Van Dissen, R.J., Ries, W., Villamor, P., Langridge, R.M., and Kearse, J. (2018b). Structure-from-Motion based 3D mapping of landslides & fault rupture sites during 2016 Kaikoura earthquake reconnaissance, *Eleventh U.S. National Conference on Earthquake Engineering*, Integrating Science, Engineering & Policy, June 25-29, 2018, Los Angeles, California.
- <u>Greenwood, W., Zhou, H., Zekkos, D., Lynch, J. (2018)</u>. "Experiments using a UAV-Deployed Impulsive Source for Multichannel Analysis of Surface Waves Testing." *Geotechnical Earthquake Engineering and Soil Dynamics V*, June 10-13 2018, Austin, TX.
- Matasovic, N., Zekkos, D., <u>Sahadewa, A., Carlson, C. P.</u>, (2018). "In-Situ Testing for Evaluation of Modulus and Damping of Solid Waste at a Hazardous Waste Landfill." *Geotechnical Earthquake Engineering and Soil Dynamics* V, June 10-13 2018, Austin, TX.
- 16. <u>Carlson, C.</u>, Zekkos, D. (2018). "Impact of Ground Motion Modification on Results of Newmark-type Displacement Analyses." *Geotechnical Earthquake Engineering and Soil Dynamics V*, June 10-13 2018, Austin, TX (accepted).
- Hubler, J.F., Athanasopoulos-Zekkos, A. and Zekkos, D. (2018). "Post-Liquefaction Volumetric Strain of Gravel-Sand Mixtures in Constant Volume Simple Shear." *Geotechnical Earthquake Engineering and Soil Dynamics V*, June 10-13 2018, Austin, TX.
- Hubler, J.F., Athanasopoulos-Zekkos, A. and Zekkos, D. (2018) "Evaluation of Post-Liquefaction Shear Strength and Shear Wave Velocity of Uniform Gravels." *International Foundations Congress and Equipment Expo*, Orlando, March 5-10, 2018.
- 19. <u>Greenwood, W.</u>, Zekkos, D., Lynch, J., Clark, M. (2017). Data Fusion of Digital Imagery and Seismic Surface Waves for a Rock Road Cut in *Hawaii. 3rd International Conference on Performance-based Design in Earthquake Geotechnical Engineering*, July 16-19 2017, Vancouver.
- Hubler, J., Athanasopoulos-Zekkos, A., and Zekkos, D. (2017) "Pore Pressure Generation of Pea Gravel, Sand, and Gravel-Sand Mixtures in Constant Volume Simple Shear", 3rd International Conference on Performance-Based Design for Earthquake Geotechnical Engineering, Vancouver, BC, Canada, July 17-19, 2017.
- 21. <u>Hubler, J.F.</u>, Athanasopoulos-Zekkos, A. and Zekkos, D. (2018) "Evaluation of Post-Liquefaction Shear Strength and Shear Wave Velocity of Uniform Gravels." *International Foundations Congress and Equipment Expo*, Orlando, March 5-10, 2018.
- <u>Datta, S.,</u> Zekkos, D., <u>Fei, X.</u>, McDougall, J. (2017). Experimental Assessment and Modelling of Coupled Biochemical-Physical-Mechanical Biodegradation Process of a Municipal Solid Waste Sample from Michigan, September 2017. Second International Symposium on Coupled Phenomena in Environmental Geotechnics, Leeds, United Kingdom.
- 23. <u>Datta S., Fei X.</u>, Zekkos, D. (2017) Large-Scale Experimental Assessment of the Effect of Degradation on Shear Strength of Municipal Solid Waste from a Texas Landfill. In: Sivakumar Babu G., Reddy K., De A., Datta M. (eds) Geoenvironmental Practices and Sustainability. *Developments in Geotechnical Engineering*. Springer, Singapore
- 24. Zekkos, D., Clark, M., Cowell, K., <u>Medwedeff, W.</u>, Manousakis, J, Saroglou, H., Tsiambaos, G. (2017) Satellite and UAV-enabled mapping of landslides caused by the November 17th 2015 M_w 6.5 Lefkada earthquake, 19th International Conference on Soil Mechanics and Geotechnical Engineering, 17-22 September 2017, Seoul, South Korea.
- Saroglou, C., <u>Asteriou, P.</u>, Tsiambaos, G., Zekkos, D., Clark, M. (2017). Investigation of two co-seismic rockfalls during the 2015 Lefkada and 2014 Cephalonia Earthquakes in Greece, 3rd North American Symposium on Landslides, June 4-8 2017, Roanoke, Virginia, USA, 521-528.
- 26. Matasovic, N., & Zekkos, D. (2017). Modulus Reduction and Damping Curves for Landfill Covers. In *Geotechnical Frontiers 2017*, 101-108.
- 27. Manousakis, J., Zekkos, D., Saroglou, F., and Clark, M. (2016). Comparison of UAV-enabled photogrammetrybased 3D point clouds and interpolated DSMs of sloping terrain for rockfall hazard analysis, *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLII-2/W2, 71-77, doi:10.5194/isprs-archives-XLII-2-W2-71-2016, 2016.
- Zekkos, D., Manousakis, J., <u>Greenwood, W.</u>, and Lynch, J. D. (2016). "Immediate UAV-enabled infrastructure reconnaissance following recent natural disasters: Case Histories from Greece." *Ist International Conference on Natural Hazards and Infrastructure*, 28-30 June 2016, Chania, Greece.
- 29. Greenwood, W., Zhou, H., Lynch, J. P., and Zekkos, D. (2016). "UAV-Deployed Impulsive Source Localization

with Sensor Network," 5th International Conference on Smart and Multifunctional Materials, Structures and Systems (CIMTEC 2016), Perugia, Italy. (Invited Presentation)

- <u>Zhou, H.</u>, Hirose, M., <u>Greenwood, W.</u>, Xiao, Y., Lynch, J., Zekkos, D., Kamat, V. (2016) "Demonstration of UAV deployment and control of mobile wireless sensing networks for modal analysis of structures ", Proc. SPIE 9803, *Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2016*, 98031X (April 20, 2016); doi:10.1117/12.2223441; http://dx.doi.org/10.1117/12.2223441
- Fei, X. and Zekkos, D. (2016) The Influence of Waste Composition on the Physico-Biochemical-Hydraulic Characteristics of the Degradation Process of Municipal Solid Waste. *Geo-Chicago 2016*: pp. 297-306. doi: 10.1061/9780784480144.029
- <u>Bateman, J.</u>, Zekkos, D., Olson, E., Messenger, S., Kershaw, C., <u>Fei, X.</u>, and Lynch, J. (2016) Preliminary Observations from Robot-Enabled Surface Methane Concentration Monitoring at a MSW Landfill. *Geo-Chicago* 2016: pp. 740-749. doi: 10.1061/9780784480168.072
- Michalowski, R. and Zekkos, D. (2016) Limit Analysis of the Reinforced Soil and Modeling Strength of Solid Waste in Landfills Using the Concepts of Soil Reinforcement. Geosynthetics, Forging a Path to Bona Fide Engineering Materials: pp. 106-115. doi: 10.1061/9780784480182.010
- <u>Greenwood, W.</u>, Zekkos, D., Lynch J., and Bateman, J., Clark, M., and Chamlagain, D., 2016. "UAV-Based 3-D Characterization of Rock Masses and Rock Slides in Nepal." 50th US Rock Mechanics/Geomechanics Symposium, American Rock Mechanics Association, Houston, TX, 26-29 June 2016.
- <u>Hirose, M.</u>, Xiao, Y.,Zuo, Z., Kamat, V. R., Zekkos, D. and Lynch, J. (2015). "Implementation of UAV Localization Methods for a Mobile Post-Earthquake Monitoring System." Environmental, Energy and Structural Monitoring Systems, July 9-10, 2015, Trento, Italy.
- Nikolaou, S., Zekkos, D., Assimaki, D. Gilsanz, R. and Deming, P. W. (2015). "Reconnaissance Highlights of the 2014 Sequence of Earthquakes in Cephalonia, Greece." 6th International Conference on Earthquake Geotechnical Engineering (6ICEGE), Christchurch, New Zealand, 2-4 November 2015.
- <u>Fei, X</u>., Zekkos, D. (2015). "Large-size controlled degradation and simple shear testing of municipal solid waste from Michigan", *XVI European Conference on Soil Mechanics and Geotechnical Engineering*, 13-17 September 2015, Edinburg.
- <u>Greenwood, W.</u>, and Zekkos, D. (2015). "Opening the Classroom to the Civil Engineering Profession through Webbased Class Projects: Assessment of Student Learning." *122nd American Society for Engineering Education (ASEE) Annual Conference & Exposition*, Seattle, WA, June 14-17 2015.
- Tsitsas, G., Dimitriadi, V., Zekkos, D., Dumitru, M., Ciortan, R., Manea, S. (2015). "Dynamic Compaction of Collapsible Soils – Case Study from a Motorway Project in Romania." XVI European Conference on Soil Mechanics and Geotechnical Engineering, Edinburgh, 13-17 September 2017.
- 40. Zekkos, D. Athanasopoulos-Zekkos, A., <u>Grizi, A.</u> and <u>Greenwood, W.</u> (2014). "The Railroad Embankment Failure of the City of Ann Arbor, Michigan, Case History As a Means for Teaching Geotechnical Engineering," 7th Hellenic Conference in Geotechnical Engineering, Athens, 5-7 November 2014.
- Zekkos, D. and Tsantilas, K. (2014). A New Web-Based Outreach Platform for Classroom Projects: An Application Example in Geoenvironmental Remediation, *Information Technology in Geo-Engineering*, D.G. Toll et al. (Eds.), IOS Press, 2014, 229-234.
- 42. <u>Sahadewa, A.</u>, Zekkos, D., <u>Fei, X., Li, J</u>.*, Zhao, X. (2014). "Recurring Shear Wave Velocity Measurements at Smith's Creek Bioreactor Landfill," *Geocongress 2014*, Atlanta, Georgia, February 23-26 2014, 2072-2081.
- Zekkos, D. and Lynch, J., <u>Sahadewa, A.</u>, Hiroshi, M. (2014). "Proof-of-Concept Shear Wave Velocity Measurements Using an Unmanned Autonomous Aerial Vehicle," *Geocongress 2014*, Atlanta, Georgia, February 23-26 2014, 953-962.
- 44. <u>Fei,, X.</u>, Zekkos D. and Raskin. L. (2014). "Impact of composition of municipal solid waste on methane generation rate and volume in laboratory batch and simulator tests." *GeoShanghai 2014*, ASCE. Shanghai, China, May 26-28, 2014. GSP 241: 100-109.
- Zekkos, D., <u>Sahadewa A</u>., Woods, R. D., Stokoe, K., II. Matasovic, N. (2013). "In Situ Assessment of the Nonlinear Shear Modulus of Municipal Solid Waste." *Proc., 18th International Conference on Soil Mechanics and Geotechnical Engineering*, September 2-6, 2013, Paris, France, 1663-1666.
- Athanasopoulos, G. A., Zekkos, D., Vlachakis, V., Spiliotopoulos, G. (2013). "The December 29th 2010 Xerolakka Municipal Solid Waste Landfill Failure." *Proc.*, 18th International Conference on Soil Mechanics and Geotechnical Engineering, September 2-6, 2013, Paris, France, 309-312.
- 47. Zekkos, D. (2013). "Experimental Evidence of Anisotropy in Municipal Solid Waste." *Proc., Symposium on Coupled Phenomena in Environmental Geotechnics,* Politecnico di Torino, Torino, Italy, July 1-3, 2013, 69-79.
- <u>Fei, X.</u>, Zekkos. D., Raskin, L. (2013). "A Laboratory Landfill Simulator for Physical, Geotechnical, Chemical, and Microbial Characterization of Solid Waste Biodegradation Processes." *Proc., Symposium on Coupled Phenomena in Environmental Geotechnics*, Politecnico di Torino, Torino, Italy, July 1-3, 2013, 321-328.
- 49. Zekkos, D., Matasovic, N., Vellone, D. (2013). "Case Histories of Geological, Rock and Mining Engineering, Underground Structures and Excavations – General Report, for Session 5." *Proc., Seventh International Conference*

on Case Histories in Geotechnical Engineering, April 29-May 4, 2013, Chicago, IL.

- Ohm, H.-S., <u>Sahadewa, A</u>., Hryciw, R. D., Zekkos, D. <u>Brant, N</u>. (2012). "Sustainable Soil Particle Size Characterization through Image Analysis." *Proc.*, 17th Great Lakes Geotechnical and Geoenvironmental Conference, May 24, 2012, Cleveland, OH, 26-33.
- Sahadewa, A., Zekkos, D., Woods R. D. (2012). "Observations from the Implementation of a Combined Active and Passive Surface Wave-Based Methodology." *Proc., Geocongress 2012: State of the Art and Practice in Geotechnical Engineering Conference*, March 25-29, 2012, Oakland, CA, Hryciw, R., Athanasopoulos-Zekkos, A., and Yesiller, N. eds., ASCE Geotechnical Special Publication No. 225, 2786-2795.
- <u>Fei, X.</u>, and Zekkos, D. (2012). "Settlement Due to Anaerobic Biodegradation from Laboratory Landfill Simulators." *Proc., Geocongress 2012: State of the Art and Practice in Geotechnical Engineering Conference,* March 25-29, 2012, Oakland, CA, Hryciw, R., Athanasopoulos-Zekkos, A., and Yesiller, N. eds., ASCE Geotechnical Special Publication No. 225, 2786-2795.
- 53. Kayen, R.E., Ishihara, K., Stewart, J.P., Tokimatsu, K., Cox, B.R., Tanaka, Y., Kokusho, T., Mason, H.B., Moss, R.E.S, Zekkos, D., Wood, C.M., Katsumata, K., Estevez, I.A., Cullenward, S.S., Tanaka, H., Harder, L.F., Kelson, K.I., Kishida, T. (2012). "Geotechnical Deformations at Ground Failure Sites from the March 11, 2011 Great Tohoku Earthquake, Japan: Field Mapping, LiDAR Modeling, and Surface Wave Investigation." *Proc.*, 9th *International Conference on Urban Earthquake Engineering/4th Asia Conference on Earthquake Engineering*, March 6-8, 2012, Tokyo, Japan.
- Maugeri, M., Zekkos, D., Castelli, F. (2011). "Seismic Performance of Landfills." Proc., European Technical Committee (ERTC-12) Workshop on Evaluation of Eurocode 8, XV European Conference on Soil Mechanics & Geotechnical Engineering, September 11, 2011, Athens, Greece.
- 55. <u>Sahadewa, A.</u>, Zekkos, D., <u>Lobbestael, A.</u>, Woods, R. D. (2011). "Shear Wave Velocity of Municipal Solid Waste in Michigan Landfills." *Proc.*, 14th Pan-American Conference on Soil Mechanics and Geotechnical Engineering and 64th Canadian Geotechnical Conference, Geo-Innovation Addressing Global Challenges, October 2-6, 2011, Toronto, Canada.
- Zekkos, D., <u>Carlson, C</u>. (2011). "Scaling vs. Modification of Ground Motions and Impact on Seismic Analyses of a MSW Landfill." *Proc.*, 5th International Conference on Earthquake Geotechnical Engineering, January 10-13, 2011, Santiago, Chile.
- 57. Zekkos, D., and <u>Flanagan, M.</u> (2011). "Case Histories-Based Evaluation of the Deep Dynamic Compaction Technique on Municipal Solid Waste Sites." *Proc., Geocongress 2011*, March 13-16, 2011, Dallas, TX.
- Bray, J. and Zekkos, D. (2011). "Research Needs in Solid Waste Mechanics." Proc., Geotechnical Characterization, Field Measurement, and Laboratory Testing of Municipal Solid Waste, International Symposium on Waste Mechanics 2008, March 13, 2008, New Orleans, LA, 228-234.
- Zekkos, D., <u>Flanagan, M</u>. (2010). "Effectiveness of the Deep Dynamic Compaction Technique on Municipal Solid Waste Landfills." *Proc., 6th Hellenic Geotechnical and Geoenvironmental Engineering Conference*, September 27-30, 2010, Volos, Greece.
- <u>Guisbert, S.</u>, Zekkos, D., and Nisar, A., (2010). "Time vs. Frequency Domain Ground Motion Modification: Effects on Site Response Analyses and Seismic Displacements." *Proc., Ninth U.S. National and Tenth Canadian Conference on Earthquake Engineering*, July 25-29, 2010, Toronto, Canada, paper #1115.
- 61. Zekkos, D., Boominathan, A., Athanasopoulos-Zekkos, A. (2010). "Engineering Seismology, Ground Motions, & Local Site Effects: General Report on Session 3." *Proc., 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics*, May 24-29, 2010, San Diego, CA.
- 62. Zekkos, D. (2010). "Geoengineering and Refereed Journals: A Survey." *Proc., Geo-Florida 2010: Advances in Analysis, Modeling & Design, ASCE GSP No. 199, February 20-24, 2012, Orlando, FL, 3285-3294.*
- 63. Zekkos, D., Guisinger, A. L., Medley, E., Vellone, D. A. (2008). "Geological, Rock and Mining Engineering, Including Underground Structures and Excavations, and Subsidence of Deltas." General Report on Sessions 6a and 6b, 6th International Conference on Case Histories in Geotechnical Engineering, August 11-16, 2007, Arlington, VA.
- 64. Zekkos, D., Cohen-Waeber, J., Medley, E., Jesionek, K. (2008). "Characterization of Weak Rock Mass and Geoengineering Analyses for a Canyon Landfill in Northern California." 6th International Conference on Case Histories in Geotechnical Engineering, August 11-16, 2007, Arlington, VA, Paper #6.05a.
- 65. Athanasopoulos-Zekkos A., Zekkos D. and Matasovic N. (2008). "Validation of Generic Municipal Solid Waste Material Properties for Seismic Design of Landfills." *Proc., 4th Geotechnical Earthquake Engineering and Soil Dynamics Conference*, May 18-22, 2008, Sacramento, CA.
- 66. Athanasopoulos, G., Grizi, A., Zekkos, D., Founta P., Zisimatou, E. (2008). "Municipal Solid Waste as a Reinforced Soil: Investigation Using Synthetic Waste." Proc., Geocongress 2008, The Challenge of Sustainability in the Geoenvironment - Geotechnics of Waste Management and Remediation, March 9-12, 2008, New Orleans, LA, ASCE, Geotechnical Special Publication (GSP) #177, 168-175.
- 67. Zekkos, D., Bray, J. D., Stokoe, K., Kavazanjian, E., Rathje, E., Athanasopoulos, G. A., Riemer, M., Matasovic, N., Lee, J. J., Seos, B. (2008). "Recent Findings on the Static and Dynamic Properties of Municipal Solid Waste."

Proc., Geocongress 2008, The challenge of sustainability in the geoenvironment - Geotechnics of Waste Management and Remediation, March 9-12 2008, New Orleans, LA, ASCE, Geotechnical Special Publication (GSP) #177, 176-183.

- Zekkos, D., Bray, J.D., Riemer, M., Kavazanjian, E., Athanasopoulos, G.A. (2007). "Response of Municipal Solid Waste from Tri-Cities Landfill in Triaxial Compression." *Proc.*, 11th International Waste Management and Landfill Symposium, Sardinia 2007, S. Margherita di Pula, Sardinia, Italy, October 1-5, 2007.
- Zekkos, D., Bray J. D., Athanasopoulos, G.A., Riemer, M. F., Kavazanjian, E., Founta, X., Grizi, A. (2007). "Compositional and Loading Rate Effects on the Shear Strength of Municipal Solid Waste." *Proc., 4th International Conference on Earthquake Geotechnical Engineering,* June 25-28, 2007, Thessaloniki, Greece, paper no. 1525.
- Medley, E., Zekkos, D., (2007). "Seismic Performance of Rock Block Structures With Observations From the October 2006 Hawaii Earthquake." *Proc.*, 4th International Conference on Earthquake Geotechnical Engineering, June 25-28, 2007, Thessaloniki, Greece.
- 71. Zekkos, D., Athanasopoulos, G., Athanasopoulos, A. Manousakis, J. (2006). "Elements of Engineering Geology and Geotechnical Engineering in the Homeric Poems." *Proc., International Symposium on Science and Technology in Homeric Epics*, August 27-30, 2006, Ancient Olympia, Greece.
- Zekkos, D. P. (2006). "Surface Excavations, Fills and Embankments in Ancient Greece." Proc. 5th Hellenic Conference in Geotechnical & Geoenvironmental Engineering, May 30-June 1, 2006, Xanthe, Greece, Technical Chamber of Greece and the Hellenic Society of Soil Mechanics and Foundation Engineering, 1, 521-528 (in Greek).
- 73. Zekkos, D. P., Bray, J. D., Riemer, M., (2006). "Laboratory Investigation of MSW Dynamic Properties." Proc., 5th Hellenic Conference in Geotechnical & Geoenvironmental Engineering, May 30-June 1, 2006, Xanthe, Greece, Technical Chamber of Greece and the Hellenic Society of Soil Mechanics and Foundation Engineering, 1, 513-520 (in Greek).
- 74. Theodoratos, A., Georgiopoulos, D., Zekkos, D. P., Athanasopoulos, G. A., Bray, J. D., Riemer, M. (2006). "Laboratory Investigation of MSW Shear Strength from Large Direct Shear Tests." *Proc 5th Hellenic Conference in Geotechnical & Geoenvironmental Engineering*, May 30 – June 1, 2006, Xanthe, Greece, Technical Chamber of Greece and the Hellenic Society of Soil Mechanics and Foundation Engineering, 1, 537-544 (in Greek).
- Zekkos, D. P., Bray, J. D., Riemer, M. F. (2006). "Shear Modulus Reduction and Material Damping Relationships for Municipal Solid-Waste." *Proc.*, 8th U.S. National Conference on Earthquake Engineering, April 18-22, 2006, San Francisco, CA, Paper No. 1324.
- Zekkos, D., Manousakis, J., Athanasopoulos, A. (2005). "Geotechnical Engineering Practice in the Mycenaean Civilization (1600-1100 BC)." Proc., 2nd International Conference on Ancient Greek Technology, October 17-21, 2005, Athens, Greece.
- 77. Zekkos, D. P., Bray, J. D., Kavazanjian, E., Riemer, M., Matasovic, N., Stokoe K.H., Rathje, E. (2005). "A Framework for Developing the Unit Weight Profile of Municipal Solid Waste." *Proc.*, 10th International Waste Management and Landfill Symposium, Sardinia 2005, October 3-7, 2005, S. Margherita di Pula, Sardinia, Italy.
- Zekkos, D.P., Bray, J.D., Der Kiureghian, A. (2004). "Reliability of Shallow Foundation Design using the Standard Penetration Test." *Proc.*, 2nd International Conference on Site Characterization, September 19-22, 2004, Porto, Portugal, 2, 1575-1582.
- 79. Zekkos, D.P., Athanasopoulos, A.G., Athanasopoulos, G.A. (2004). "Deep Supported Excavation in Difficult Ground Conditions in the City of Patras, Greece – Measured vs. Predicted Behavior." *Proc., 5th International Conference on Case Histories in Geotechnical Engineering*, April 13-17, 2004, New York, NY

Refereed conference summaries or abstracts

- 1. Clark, M., West, A. J., Li, G., Roback, K., Zekkos, D., (2016). "Landslide mobility and connectivity with fluvial networks during earthquakes" (invited), Eos Trans., Fall Meet. Suppl., Abstract session EP32C-08.
- Clark, M., Anderson, S. P., Anderson, R. S., Zekkos, D., (2016). "Effect of weathering on the mechanical strength of layered basalts", Geological Society of America Annual Meeting, Denver, CO USA 2016. Sesion T55, Paper no. 6-6.
- Clark, M. K., Gallen, S., West, A. J., Chamlagain, D., Roback, K., Lowe, K., Niemi, N., <u>W. Greenwood, J.</u> <u>Bateman</u>, D. Zekkos, (2015). "Coseismic landslides associated with the 2015 Gorkha earthquake sequence in Nepal" (invited), Eos Trans., Fall Meet. Suppl., Abstract session S42C-02.
- Clark, M., Zekkos, D., West, A. J., Gallen, S., Roback, K., Chamlagain, D., Athanasopoulos-Zekkos, A., <u>Greenwood, W., Bateman, J., Partenio, M., Li, G., Cook, K., Godt, J., Howat, I., Morin, P., (2016). Coseismic</u> landsliding associated with the 2015 Gorkha earthquake sequence, Nepal, Geophysical Research Abstracts, vol. 18, EGU2016-9361-1, EGU General Assembly 2016.
- <u>Greenwood, W.</u>, Clark, M., Zekkos, D., Von Voigtlander, J., Bateman, J.,Lowe, K., Hirose, M., Anderson, S., Anderson, R., and Lynch, J. (2016). Assessment of rock mechanical properties and seismic slope stability in variably weathered layered basalts, Geophysical Research Abstracts, Vol. 18, EGU2016-11787, 2016, EGU General

Assembly 2016

- 6. <u>Fei, X</u>., and Zekkos, D. (2015). "Influential factors on methane generation and settlement of municipal solid waste during degradation experiments and literature synthesis." Proc., 1st International Conference on Geo-Energy and Geo-Environment, The Hong Kong University of Science and Technology.
- Fei, X., Zekkos, D., <u>Tibbetts*, S.</u>, Raskin, L., (2013). "Characterization of Microbial Community During Anaerobic Digestion of the Organic Fraction of Municipal Solid Waste in Bioreactor Landfill Simulators." *Proc.*, 13th World Congress on Anaerobic Digestion. June 25-28 2013, Santiago de Compostela, Spain.

Abstracts in non-refereed conference proceedings

- 1. Zekkos, D. (2012). "In Situ Assessment of the Linear and Nonlinear Dynamic Properties of Municipal Solid Waste." *Quake Summit 2012*, July 9-12, 2012, Boston, MA.
- <u>Fei, X.</u>, Zekkos, D., Raskin, L. (2011). "Characterization of Biodegradation Processes in Municipal Solid Waste Landfills for Long Term Performance Prediction." 2011 AEESP Education and Research Conference, Association of Environmental Engineering and Science Professors, July 10-12, 2011, Tampa, FL.
- Zekkos, D., <u>Sahadewa, A</u>., Woods. R. D. (2011). "Shear Wave Velocity of Municipal Solid Waste. Field Measurements – Model Development and Calibration." *Quake Summit 2011*, July 9-11, 2011, Buffalo, NY.
- 4. Zekkos, D., Zalachoris, G., Stokoe, K. II, <u>Sahadewa, A.</u>, Woods, R. D. (2010). "Towards an In Situ Evaluation of Dynamic Properties of Municipal Solid Waste." *Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP)*, April 10-14, 2011, Charleston, SC.
- Zekkos, D. (2001). "Deep Supported Excavation in Soft Saturated Cohesive Soil for the Construction of a two story underground garage in Patras. Construction – Measurement – Behavior Analysis." 1st Hellenic Civil Engineering Students Conference, 7-8 May 2001, Patras, Greece.

Publications in popular press/magazines

- 1. Zekkos, D., Clark, M., Gong, W., Manousakis, J., Greenwood, W. (2019). "Landslides Driven by Extreme Events Can We Learn More From More of Them?" Geo-Strata Magazine, May-June issue (accepted).
- 2. Zekkos, D., <u>Greenwood, W.</u>, Manousakis, J., Lynch, J. (2016). The Rise of UAVs signals A New Era In Geotechnics, Geo-Strata Magazine, September-October issue, 72-77.
- 3. Zekkos, D. (2016). "Military geotechnics in the ancient world." Geo-Strata, January-February 2016, 34-38.
- 4. Zekkos, D. (2013). "Updated Methods for Estimating Geotechnical Properties of Municipal Solid Waste." *Geo-Strata*, July-August 2013, ASCE, Reston, VA, 17(4), 28-33.
- <u>Carlson, C</u>. and Zekkos, D. (2011). "Understanding the Impact of Ground Motion Modification Techniques on the Seismic Design of Geotechnical and Structural Systems." U.S. Society for Dams (USSD) Newsletter, (154), 30-33.
- 6. Zekkos, D. (2007). "The Siege of Ancient Tyre in 332 B.C.: An Offshore Construction Success." *Geo-Strata*, September-October 2007, 8 (5), 14-16 and 28.
- 7. Zekkos, D. P., Athanasopoulos, A. (2004). "Milos Island: Working with Earth for More than 9000 Years." Cover story in *AEG (Association of Engineering Geologists) News*, 47 (1), 16-18.
- 8. Zeccos, D. (2003). "The Geoengineer Website: An Invitation for Resource and Experience Exchange," *Geo-Strata*, Fall 2003.
- 9. Zekkos, D., Athanasopoulos, A., Manousakis, J. (2003). "Geotechnical Engineering Experiences in the Homeric Poems," *Newsletter of the Technical Chamber of Greece*, issue 2231, January 20, 2003.

Reports & Theses

- 1. Nikolaou, S., Zekkos, D., Assimaki, D. and Ramon Gilsanz (2014). "Earthquake Reconnaissance January 26/February 2nd 2014 Cephalonia Events, Greece." Version 1 Report for Web Dissemination GEER Association Report No. GEER-034 in collaboration with EERI and ATC. Available at: http://geerassociation.org/
- 2. Dimitriadi V., and Zekkos D., (2014), "2014 Resource Guide for Educators in Geotechnical Engineering." Geoengineer.org Report GEO-2014-01, October 2014. Available at: <u>http://www.geoengineer.org/publications/2014-resource-guide-for-educators-in-geotechnical-engineering</u>
- <u>Sahadewa, A.</u>, Zekkos D. (2012). "In Situ Shear Wave Velocity Measurements, BKK Landfill, West Covina, California." University of Michigan Geotechnical Engineering Research Report UMGE-2012/01, December 17 2012
- 4. <u>Cortese, G.*</u>, Zekkos, D., Athanasopoulos-Zekkos, A. (2012a). "Network for Women in Civil and Environmental Engineering First Annual Report." May 31 2012, University of Michigan.
- 5. <u>Cortese, G</u>.*, Zekkos, D., Athanasopoulos-Zekkos, A. (2012b). "*Results of 2011 Undergraduate and Graduate Survey*." September 15, 2012, University of Michigan.
- 6. Athanasopoulos, A., Zekkos D. (2006), "Geoengineering, refereed journals and case histories: A survey." Geoengineer.org report GEO/01/06, September 2006.

- 7. Zekkos (Zeccos), D. P. (2005), "Evaluation of static and dynamic properties of Municipal Solid-Waste." dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, Department of Civil and Environmental Engineering, University of California, Berkeley, Fall.
- 8. Zekkos, D. (2001), "Deep Supported Excavation in soft saturated cohesive soil for the construction of a two story underground garage in Patras. Construction - Measurement - Behavior Analysis." Undergraduate Degree thesis, University of Patras, Greece, June 2001.

Non-refereed conference proceedings

1. Nikolaou, S., Pehlivan, M., Sacks, A., Volterra, J. L., Hashash, Y., Asimaki, D., Zekkos, D. (2015). "Rapid Geotechnical Reconnaissance Technologies for Multi Hazards." ASCE Metropolitan Section Infrastructure Group technical seminar on Emerging Technology in Infrastructure Management and Monitoring, March 17 2015.

Abstracts in non-refereed conference proceedings

- 1. Zekkos, D. (2012). "In Situ Assessment of the Linear and Nonlinear Dynamic Properties of Municipal Solid Waste." Ouake Summit 2012, July 9-12, 2012, Boston, MA.
- 2. Fei, X., Zekkos, D., Raskin, L. (2011). "Characterization of Biodegradation Processes in Municipal Solid Waste Landfills for Long Term Performance Prediction." 2011 AEESP Education and Research Conference, Association of Environmental Engineering and Science Professors, July 10-12, 2011, Tampa, FL.
- 3. Zekkos, D., Sahadewa, A., Woods. R. D. (2011). "Shear Wave Velocity of Municipal Solid Waste. Field
- Measurements Model Development and Calibration." *Quake Summit 2011*, July 9-11, 2011, Buffalo, NY.
 Zekkos, D., Zalachoris, G., Stokoe, K. II, <u>Sahadewa, A.</u>, Woods, R. D. (2010). "Towards an In Situ Evaluation of Dynamic Properties of Municipal Solid Waste." Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP), April 10-14, 2011, Charleston, SC.
- 5. Zekkos, D. (2001). "Deep Supported Excavation in Soft Saturated Cohesive Soil for the Construction of a two story underground garage in Patras. Construction - Measurement - Behavior Analysis." 1st Hellenic Civil Engineering Students Conference, 7-8 May 2001, Patras, Greece.

FUNDED RESEARCH GRANTS (total of \$6,034,012)

As Principal Investigator (external grants) (total of \$2,590,436):

- 1. World Bank, "UAV-enabled mapping of damaged sites in Dominica," \$49,725, August 18 2017 August 31 2018. PI: Dimitrios Zekkos. Co-PI: Marin Clark (UM EES).
- 2. USGS, "Characterization of landslides and rock mass strength leveraging the 2015 Mw 6.5 Lefkada earthquake in Greece," \$90,740, August 1 2017 - July 31 2018. PI: Dimitrios Zekkos. Co-PI: Marin Clark (UM EES).
- 3. Geosyntec Consultants, "Simple Shear Testing of Hazardous Waste at BKK Landfill," \$111,000, June 2015 -September 2016. PI: Dimitrios Zekkos.
- National Science Foundation, "CyberSEES: TYPE 2: Sustainably Unlocking Energy from Municipal Solid Waste 4. Using a Sensor-Driven Cyber-Infrastructure Framework," \$1,199,600, Sept. 2014-August 2018. PI: Dimitrios Zekkos, Co-PIs: Edwin Olson, (UM ECS), Jerome Lvnch (UM CEE).
- 5. National Science Foundation, "Scalable and Autonomous Post-Event Geo-Characterization from UAAV-based Quantitative Surface Measurements," \$389,845, Sept. 2014-August 2017. PI: Dimitrios Zekkos. Co-PIs: Vineet Kamat (UM CEE), Jerome Lynch (UM CEE).
- 6. National Science Foundation, "NEESR-CR: Seismic Response of Landfills: In situ Evaluation of Dynamic Properties of Municipal Solid Waste: Comparison to Laboratory Testing and Impact on Numerical Analyses," \$693,770, Sept. 2010-August 2014. PI: Dimitrios Zekkos. Co-PIs: Neven Matasovic (Geosyntec Consultants) and Mark Tufenkjian (California State University, Los Angeles).
- 7. <u>Conetec, Inc.</u>, "Collaboration Agreement between the University of Michigan and Conetec Education Foundation," \$106,500, January 2013 – December 2017.
- 8. Geosyntec Consultants, "In Situ Characterization of Dynamic Properties of Hazardous Waste at BKK Landfill," \$24,996, June 2012 – June 2015. PI: Dimitrios Zekkos.
- 9. Geosynthetics Research Institute, "Impact of municipal solid waste biodegradation on separator geotextile," \$15,000, May 2012 – May 2014. PI: Dimitrios Zekkos (with PhD advisee Xunchang Fei).

As Principal Investigator (internal grants) (total of \$349,336) :

- <u>University of Michigan</u>, "U-M as an Agent of Change in Transforming a Greenhouse Gas Emission Problem into a Sustainable Energy Production Solution", \$60,000, Planet Blue Renewable Energy Demonstration Project, Sept 2018-May 2020. PI: Zekkos
- 11. <u>University of Michigan</u>, "Pipeline Enhancement to support a community of excellence for under-represented minority students in civil and environmental engineering programs", \$11,000, Rackham Graduate School. PI: Dimitrios Zekkos. Co-PIs: Athanasopoulos-Zekkos, Love, Demond, Clack.
- 12. <u>University of Michigan</u>, "MCUBED: Drone-enabled Photogrametry for the Characterization of Earthquake-Induced Landslides" \$60,000, Sept. 2015-August 2017. PI: Dimitrios Zekkos. Co-PIs: Marin Clark (EES), Jerome Lynch (CEE).
- 13. <u>University of Michigan Plane Blue Initiatives</u>, "PBSIF: Transforming Campus Waste", \$30,000, May 2016 May 2017 (with PhD advisee Julie Bateman).
- 14. <u>University of Michigan Center for Research on Learning and Teaching</u> (CRLT), "Gilbert Whitaker Grant Fund: Enhancing Undergraduate Student Engagement in Geotechnical Engineering Beyond the Classroom Using Online Applications" \$6,000, January 2015-December 2016. PI: Dimitrios Zekkos
- <u>University of Michigan Center for Research on Learning and Teaching</u> (CRLT), "Opening the Classroom to the Profession: Assessment of Web-based Class Projects on Student Learning," \$8,000, May 2014-April 2015. PI: Dimitrios Zekkos
- Horace Rackham School of Graduate Studies (UM), "Continuation of UM Network for Women in Civil and Environmental Engineering (NEWinCEE)," \$77,600, September 2013 – August 2015. PI: Dimitrios Zekkos. Co-PIs: Adda Athanasopoulos-Zekkos (UM CEE), Avery Demond (UM CEE) and Nancy Love (UM CEE).
- Horace Rackham School of Graduate Studies (UM), "UM Network for Female Excellence in Civil Engineering (NEWinCEE)," \$96,736, September 2011 – August 2013. PI: Dimitrios Zekkos. Co-PIs: Adda Athanasopoulos-Zekkos (UM CEE), Gustavo Parra-Montesinos (UM CEE), Avery Demond (UM CEE), Sang-Huyn Lee (UM CEE).

As Co-Principal Investigator (external grants) (total of \$3,089,240)

- <u>National Aeronautical Space Agency (NASA)</u>, "Enabling landslide disaster risk reduction and response throughout the disaster life cycle with a multi-scale toolbox" \$1,856,663.36, May 2019-April 2023, Co-PI(s): Zekkos, D., Clark, M. U of M share: \$695,103
- <u>National Science Foundation</u>, "Collaborative Research: Integrated Field and Laboratory Based Assessment of Liquefaction Triggering and Residual Strength of Gravelly Soils," \$322,124, September 2017 – August 2018, PI: Athanasopoulos-Zekkos, Co-PI: D. Zekkos
- <u>National Science Foundation</u>, "RAPID: Collaborative Research: Topographic Change and Cascading Hazards Following the Mw7.8 Kaikoura (New Zealand) Earthquake," \$46,517, December 2016-November 2017, PI: Marin Clark (UM EES), co-PI: D. Zekkos, A. Athanasopoulos-Zekkos.
- <u>National Science Foundation</u>, "Collaborative Research: Landslides related to the 2015 Mw7.8 Gorkha earthquake, from ground motion and hazard to geomorphic response," \$285,660.00, September 2016 – August 2019. PI: Marin Clark (UM EES), Co-PI: D. Zekkos.
- Michigan Department of Transportation (MDOT), "Asset Management of Retaining Walls," \$314,943.19. Sept. 2016 – August 2018. PI: Adda Athanasopoulos-Zekkos (UM CEE). Co-PI: Dimitrios Zekkos (UM CEE), Jerome Lynch (UM CEE)
- 23. <u>Michigan Department of Transportation (MDOT)</u>, "Sedimaging: Image-Based Soil Characterization," \$130,000. September 2010 – August 2011. PI: Roman Hryciw (UM CEE). Co-PI: Dimitrios Zekkos (UM CEE).
- 24. <u>Chinese National Science Foundation</u>, "Strength Evolution and Disaster Mechanism of Sewage Sludge and MSW Mixture Landfill," \$133,333, Sept. 2014-August 2017, PI: Dr. Li Lei, Hohai University. Co-PI: D. Zekkos.

As Co-Principal Investigator (internal grants) (total of \$5,000)

25. University of Michigan ADVANCE, "Faculty Leading Change in CEE" \$5,000. PI: Clack, Co-PI: Love, Zekkos

RESEARCH STUDENTS SUPERVISED

PhD students

1. <u>Andhika Sahadewa</u>, Thesis title: "In-Situ Assessment of Linear and Nonlinear Dynamic Properties of Municipal Solid Waste". Graduation Date: 5/2014.

Currently Assistant Professor, Civil Engineering, Bandung Institute of Technology, Indonesia.

- <u>Clinton Carlson</u>, Thesis title: "Assessment of the Effects of Ground Motion Modification on Ground Motions and Seismic Response of Geotechnical Systems". Graduation Date: 9/2014. Currently with Geosyntec Consultants, Atlanta, Georgia.
- 3. <u>Xunchang Fei</u>, PhD Candidate, Thesis title: "Experimental Assessment of coupled physical-biochemicalmechanical-hydraulic processes of Municipal Solid Waste Undergoing Biodegradation" Graduation Date: 12/2015.

Currently: Assistant Professor, Civil and Environmental Engineering Department, Nanyang Technological University (NTU), Singapore

- <u>William Greenwood</u>, PhD student, "UAV-enabled Surface and Subsurface Characterization for Post-Earthquake Geotechnical Reconnaissance", Graduation Date: 5/2018.
- Currently Assistant Professor, Department of Civil and Environmental Engineering, San Jose State University
- 5. <u>Sampurna Datta</u>, PhD student, "A multi-physics model for the degradation of Municipal Solid Waste." Graduation date: 12/2019 (expected)
- 6. <u>Hao Zhou</u>, PhD student, "UAV-enabled Multichannel Analysis of Surface Waves." Graduation date; 12/2020 (expected)
- 7. <u>William Medwedeff</u>, PhD student, "Geomechanical characterization of landslides from the 2015 Gorkha earthquake, Nepal." Graduation date: 6/2021 (expected)
- 8. <u>Cassandra Champagne</u>, PhD student, "Robotics-based assessment of emissions from Municipal Solid Waste landfills." Graduation date: 6/2021 (expected)
- 9. <u>Gabriel Draughon</u>, PhD student, "Sensing-based Energy Harvesting from Solid Waste." Graduation date: 6/2021 (expected)
- 10. Weibing Gong, PhD student, "Regional landslide modelling." Graduation date: 6/2023 (expected)

MSc students

- 1. Michael Flanagan, 2010, "Deep Dynamic Compaction of Municipal Solid Waste Landfills."
- 2. Matt Hambright, 2010, "Characterization of Municipal Solid Waste Incineration Ash."
- 3. Mohammad Kabalan, 2010, "Development of Triaxial Testing Device for Testing of Incinerated Ash."
- 4. <u>Stephanie Guisbert</u>, 2010, "Impact of Ground Motion Modification on Geotechnical Seismic Response Analyses."
- 5. Lu Chen, 2014, "Reuse of Municipal Water Treatment Sludge."
- 6. Lauren Riedle, 2015, "Life Cycle Analysis of Sustainable Energy Reactor Facilities."
- 7. Michael Partenio, 2016, "Mechanical Properties Characterization of Hazardous Waste."
- 8. Julie Bateman, 2017, "Field Measurements of Emissions on MSW landfills."
- 9. Chenghang Liu, 2018, "Soil characterization using Infrared Thermography."

Undergraduate Students

Total number of undergraduate students directed on research projects: 47 Number of women undergraduate students: 22 (47%) Number of underrepresented minority undergraduate students: 6 (13%)

- 1. <u>Iain Ferguson</u>, Fall 2017-Winter 2018, "Understanding the impact of natural disasters on infrastructure using social media"
- 2. Shurong Liang, Winter 2017-Winter 2018, "Effect of initial shear stress on the cyclic response of gravels"
- 3. <u>Nataly Figueroa</u>, Spring 2016-Winter 2017, "Assessment of composting as a sustainable waste management technology"
- 4. Brinda Yarlagadda, Spring Summer 2016, "Energy from Waste", Marian-Sarah Parker Program
- 5. <u>Mehul Kulkarni</u>, Fall 2015-Winter 2016, "Degradation of MSW with septage in laboratory landfill simulators", UROP
- 6. Andrea Ventola, Fall 2015-Winter 2016, "Cyclic Simple Shear Testing of Gravelly Soils", independent study
- 7. Tianhao Zhou, Summer 2015, "Image-based characterization of basaltic rock specimens", SURE
- 8. Jad Zalzal, Summer 2015, "Degradation of MSW in laboratory landfill simulators", international visiting UG
- 9. Paul Maamari, Summer 2015, "Laboratory testing of Elastizel foam cement" international visiting UG
- 10. Alesha Jackson, Summer 2015, "Cyclic Simple Shear Testing of Gravelly Soils", SROP
- 11. Theau Heral, Fall 2014-Winter 2015, "Use of drone technology in civil engineering infrastructure", UROP
- 12. Shihcheng Chu, Fall 2014-Winter 2015, "Simple shear testing of MSW", UROP
- 13. <u>Rebecca Martin</u>, Fall 2014-Winter 2015, "A review of ancient hydraulic projects", UROP.
- 14. <u>Michael Schiavone</u>, Fall 2014-Winter 2015, "A review of ancient fortifications projects", UROP.
- 15. Danielle Park, Fall 2014-Winter 2015, "A review of ancient engineering projects in the Bible", UROP.
- 16. <u>Andrew Tamer</u>, Spring-Summer 2014, "Large-scale Simple Shear Testing of Municipal Solid Waste,"
- 17. <u>Rachel Thompson</u>, Spring-Summer-Fall 2014, "Liquefaction Resistance of Gravelly Soils," Network for Women in Civil and Environmental Engineering (NeWinCEE) Summer Program.
- 18. <u>Hannah Wasserman</u>, Spring-Summer 2014, "Undrained Shear Strength of Gravelly Soils," Network for Women in Civil and Environmental Engineering (NeWinCEE) Summer Program.
- 19. <u>Charles Davis</u>, Spring-Summer 2014, 'Characterization of Municipal Water Treatment Sludge," Summer Research Opportunities Program (SROP).
- 20. Paro Sen, Fall-Winter 2014, "Degradation of Municipal Solid Waste," UROP.
- 21. Alex Gildee, Fall-Winter 2014, "Simple Shear Testing of Municipal Solid Waste," UROP
- 22. <u>Xavier Rivera-Hernandez</u>, Spring-Summer 2013, "Large-Scale Simple Shear Testing of Gravelly Soils," Summer Research Opportunities Program (SROP).
- 23. Jose Rivera-Perez, Spring-Summer 2013, "Large-Scale Simple Shear Testing of Gravelly Soils," SROP.
- 24. <u>Calvin Nyakundi</u>, Spring-Summer 2013, "Large-Scale Simple Shear Testing of Municipal Solid Waste," College Outreach and Diversity Program.
- Jane Gregg, Spring-Summer 2012 & Spring-Summer 2013, "Monitoring of Degradation of Municipal Solid Waste in Landfill Simulators," Network for Women in Civil and Environmental Engineering (NeWinCEE) Summer Program.
- 26. <u>Jiacheng Li</u>, Winter 2013 and Spring-Summer 2013. "In-situ Crosshole and Downhole of Municipal Solid Waste," 2 credits of independent study and Summer Undergraduate Research in Engineering Program (SURE).
- 27. <u>Saya Kajiwara</u>, Fall 2012-Winter 2013, "Shear Wave Velocity Measurements on Various Waste Materials," Undergraduate Research Opportunities Program (UROP).
- 28. <u>Kelley Langlois</u>, Fall 2012-Winter 2013, "Monitoring of Degradation of Municipal Solid Waste in Landfill Simulators," UROP.
- 29. Renee Wiwel, Fall 2012-Winter 2013, "In-situ Crosshole and Downhole of Municipal Solid Waste," UROP.
- 30. Sachin Jain, Fall 2012-Winter 2013, "Development of Landfill Simulators in the Laboratory," UROP.
- 31. Gina Cortese, Spring-Summer 2012, "Development of Outreach Material for NeWinCEE," NeWinCEE.
- 32. <u>Savannah Tibbets</u>, Spring-Fall 2012, "Monitoring of Degradation of Municipal Solid Waste in Landfill Simulators," Marian Sarah Parker Scholars Program (MSP) & NeWinCEE.
- 33. <u>Kristina Vaclarek</u>, Spring-Summer 2012, "Assessment of the Impact of Ground Motion Modification on the Response of a Single Degree of Freedom System," SURE.
- 34. Michael Klein, Spring-Summer 2012, "Large-Scale Cyclic Simple Shear Testing in Ottawa Sand," SURE.
- 35. <u>Stacia Simonsen</u>, Spring-Summer 2011, "Monitoring of Degradation of Municipal Solid Waste in Landfill Simulators," MSP.
- 36. <u>Mohammad Kabalan</u>, Fall 2010-Winter 2011, Spring Summer 2011, "Laboratory Testing of Incinerated Waste," UROP and SURE.
- 37. <u>Alex Demetriou</u>, Fall 2011-Winter 2012, "Monitoring of Degradation of Municipal Solid Waste in Landfill Simulators," UROP.
- Zach Jones, Fall 2011-Winter 2012, "Monitoring of Degradation of Municipal Solid Waste in Landfill Simulators," UROP.
- 39. <u>Rob Glew</u>, Fall 2011-Winter 2012, "Development of a Software for the Evaluation of damping from surface wave measurements," UROP.
- 40. Dimitris Tolios, Fall 2010-Winter 2011, "Evaluation of Damping from Surface Wave Measurements," UROP.
- 41. Sita Syal, Fall 2009-Winter 2011, "Characterization of Incinerated Waste," UROP.
- 42. <u>Sarah Chronister</u>, Spring-Summer 2010, "Geotechnical Characterization of Incinerated Waste," Michigan STEM Academy.
- 43. <u>Anna Kathleen James</u>, Spring-Summer 2010 "Geotechnical Characterization of Waste Materials," SURE.
- 44. Zaher Hamzeh, Fall 2009-Winter 2010, "Inversion of Shear Wave Velocity Measurements," UROP.
- 45. Osai Robinson, Fall 2009-Winter 2010, "Dam Construction in the Ancient World," UROP.
- 46. <u>Stephanie Guisbert</u>, Spring Summer 2009, "Impact of Ground Motion Modification on Analyses," Summer independent study.
- 47. <u>Adam Lobbestael</u>, Spring -Summer 2009, "Application of Seismic Geophysics in Landfills," Summer independent study.

Post-Doctoral Advisees

1. <u>Xunchang Fei</u>, January 2016-September 2016

Research Scholars Hosted

- 1. <u>Renee Gerring</u>, University of Liberia, University of Michigan African Presidential Scholars Program (UMAPS), September 2014-February 2015.
- 2. Lilei Li, Associate Professor, Hohai University, China

TEACHING EXPERIENCE

Faculty Instructor:

- CEE 345 undergraduate level course "<u>Geotechnical Engineering</u>", University of Michigan, Ann Arbor (Fall 2018, Fall 2017, Fall 2016, Fall 2015, Fall 2013, Winter 2012, Fall 2010, Winter 2010).
- CEE 544 graduate level course "<u>Rock Mechanics</u>", University of Michigan, Ann Arbor (Winter 2017, Winter 2015, Fall 2012, Fall 2009).
- CEE 549 graduate level course "<u>Geoenvironmental Engineering</u>", University of Michigan, Ann Arbor (Fall 2019, Fall 2017, Fall 2015, Winter 2014, Winter 2013, Fall 2010, Winter 2009).
- CEE 542 graduate level course "Soil and Site Improvement", University of Michigan, Ann Arbor (Fall 2016, Winter 2014, Fall 2011, Fall 2008).
- CEE 546 graduate level course "<u>Slopes, Dams and Retaining Structures</u>", University of Michigan, Ann Arbor (Winter 2008).
- CEE 541 graduate level course 'Soil Sampling and Testing", University of Michigan, Ann Arbor (Fall 2013) (instructor for 25% of the course).
- CEE 840 "Geotechnical Seminar Series", University of Michigan, Ann Arbor (Fall 2014, Winter 2013, Fall 2012, Winter 2012, Fall 2011, Winter 2010, Fall 2009).

Course Evaluations

Q1: Overall, this was an excellent course. (5: Strongly Agree, 1: Strongly Disagree)

Course #	Course title	Term	Zekkos'	College-Wide Score	
			score		
				Median	Top 25%
				(50%)	
CEE 549	Geoenvironmental Engineering	Fall 2019	4.80	4.50	NR
CEE 345	Geotechnical Engineering	Fall 2018	4.70	4.30	NR
CEE 546	Slopes, Dams & Retaining Str.	Winter 2018	4.00	4.50	4.75
CEE 549	Geoenvironmental Engineering	Fall 2017	4.83	4.53	4.79
CEE 345	Geotechnical Engineering	Fall 2017	4.00	4.19	4.55
CEE 544	Rock Mechanics	Winter 2017	5.00	4.50	4.75
CEE 542	Soil and Site Improvement	Fall 2016	4.90	4.53	4.75
CEE 345	Geotechnical Engineering	Fall 2016	4.62	4.17	4.50
CEE 549	Geoenvironmental Engin.	Fall 2015	4.79	4.61	4.79
CEE 345	Geotechnical Engineering	Fall 2015	4.68	4.17	4.58
CEE 544	Rock Mechanics	Winter 2015	4.50	4.30	4.70
CEE 542	Soil and Site Improvement	Winter 2014	4.58	4.50	4.75
CEE 549	Geoenvironmental Engin.	Winter 2014	4.60	4.50	4.75
CEE 345	Geotechnical Engineering	Fall 2013	4.44	4.22	4.61
CEE 549	Geoenvironmental Engin.	Winter 2013	4.73	4.50	4.75
CEE 544	Rock Mechanics	rs Fall 2012 4.79		4.42	4.75
CEE 345	Geotechnical Engineering	Winter 2012	4.59	4.10	4.50
CEE 542	Soil and Site Improvement	Fall 2011	4.80	4.43	4.68
CEE549	Geoenvironmental Engin.	Fall 2010	4.86	4.33	4.68
CEE 345	Geotechnical Engineering	Fall 2010	4.59	4.17	4.50
CEE 345	Geotechnical Engineering	Winter 2010	4.59	4.00	4.50
CEE 544	Rock Mechanics	Fall 2009	4.94	4.33	4.70
CEE549	Geoenvironmental Engin.	Winter 2009	4.88	4.33	4.69
CEE542	Soil and Site Improvement	Fall 2008	4.88	4.38	4.63

NR: No longer reported by the University

O2:	Overall,	the	instructor	was an	excellent	teacher.	(5:	Strongly	Agree,	1: Strongly	Disagree)
•	,						< -	0,	0,	0,	0 /

Course #	Course title	Torm	Zakkas?	College Wide Score
Course #	Course the	Term	Lekkus	College- wide Scole

Dimitrios Zekkos, Ph.D., P.E.

			score			
				Median	<i>Top 25%</i>	
				(50%)		
CEE 549	Geoenvironmental Engineering	4.90	4.60	NR		
CEE 345	Geotechnical Engineering	Fall 2018	4.90	4.40	NR	
CEE 546	Slopes, Dams & Retaining Str.	Winter 2018	4.40	4.71	4.88	
CEE 549	Geoenvironmental Engineering	Fall 2017	4.93	4.71	4.83	
CEE 345	Geotechnical Engineering	Fall 2017	4.60	4.64	4.85	
CEE 544	Rock Mechanics	Winter 2017	5.00	4.72	4.86	
CEE 542	Soil and Site Improvement	Fall 2016	5.00	4.72	4.90	
CEE 345	Geotechnical Engineering	Fall 2016	4.90	4.60	4.79	
CEE 549	Geoenvironmental Engin.	Fall 2015	4.94	4.68	4.88	
CEE 345	Geotechnical Engineering	Fall 2015	4.82	4.50	4.75	
CEE 544	Rock Mechanics	Winter 2015	4.90	4.59	4.85	
CEE 542	Soil and Site Improvement	Winter 2014	4.81	4.69	4.83	
CEE 549	Geoenvironmental Engin	Winter 2014	4.85	4.69	4.83	
CEE 345	Geotechnical Engineering	Fall 2013	4.82	4.44	4.75	
CEE 549	Geoenvironmental Engin.	Winter 2013	4.93	4.63	4.83	
CEE 544	Rock Mechanics	Fall 2012	4.94	4.67	4.83	
CEE 345	Geotechnical Engineering	Winter 2012	4.90	4.45	4.71	
CEE 542	Soil and Site Improvement	Fall 2011	4.92	4.59	4.82	
CEE549	Geoenvironmental Engin.	Fall 2010	4.94	4.53	4.79	
CEE 345	Geotechnical Engineering	Fall 2010	4.88	4.38	4.71	
CEE 345	Geotechnical Engineering	Winter 2010	4.67	4.17	4.65	
CEE 544	Rock Mechanics	Fall 2009	4.94	4.50	4.83	
CEE549	Geoenvironmental Engin,	Winter 2009	5.00	4.63	4.83	
CEE542	Soil and Site Improvement	Fall 2008	4.88	4.50	4.79	

NR: No longer reported by the University

Guest Lecturer in Courses

- CEE 200: "What is geotechnical Engineering", January 25 2017, November 6 2018.
- EARTH287: "Documenting natural disasters using Unmanned Aerial Vehicles", February 22nd 2017

Short Courses / Webinars Taught

• Franke, K., and Zekkos, D. "<u>The use of small unmanned aerial vehicles for post-disaster geotechnical reconnaissance</u>." Webinar delivered on April 20 2016, Geotechnical Engineering Extreme Event Reconnaisance Association (GEER). Available at: http://geerassociation.org/geer-activities/short-courses

PROFESSIONAL CONTRIBUTIONS

Conference – Workshop Organization

- Conference Chair, 9th International Congress on Environmental Geotechnics, June 2022, Chania, Greece.
- <u>Member</u>, International Scientific Board, *TRANSCOLD2019 Transportation Soil Engineering in Cold Regions*. 20 23 May, 2019, Saint-Petersburg, Russia.
- <u>Member, Steering Committee</u>, 2nd Int. Conference on Natural Hazards and Infrastructure, 23-26 June 2019, Chania, Greece.
- <u>Member, Scientific Committee</u>, 8th International Congress on Environmental Geotechnics, 28 October 1 November 2018, Hangzhou, China.
- <u>Member of Conference Organizing Committee</u>, Geotechnical Earthquake Engineering and Soil Dynamics Conference, June 10-13 2018, Austin, TX, ASCE Geo-Institute.
- Member, Scientific Committee, 4th GeoShanghai International Conference, May 27-30 2018.
- <u>Session Chair</u>, "Bio-Stabilization Session 1 & 2", co-chaired with Jason Dejong and Kenichi Soga, *International Foundation Congress and Expo*, March 5-10 2018, Orlando, FL,
- <u>Member, Scientific Committee</u>, 16th World Conference on Earthquake Engineering, January 9-12, 2017, Santiago, Chile.
- <u>Member, Scientific Committee</u>, TGG-2017 «Transportation Geotechnics and Geoecology», St. Petersburg, Russia, 17-19 May, 2017

- <u>Member, Steering Committee</u>, 1st Int. Conference on Natural Hazards and Infrastructure, 28-30 June 2016, Chania, Greece.
- <u>Technical Program Chair and Proceedings Lead Editor</u>, *Geo-Chicago 2016: Sustainability, Energy and the Geoenvironment Conference*, ASCE Geo-Institute, Chicago, IL, August 14-18 2016.
- <u>Conference Chair</u>, *Geocongress 2012: State of the Art and Practice in Geoengineering Conference*, ASCE Geo-Institute, San Francisco, CA, March 25-28, 2012.
- <u>Co-Chair</u>, Plenary Forum Session on Promoting Innovation in Geotechnical Engineering, International Conference on Soil Mechanics and Geotechnical Engineering, 18th International Conference on Soil Mechanics and Geotechnical Engineering, September 2-6, 2013, Paris, France.
- <u>Member, Organizing Committee</u>, 7th Conference on Geotechnical Engineering Case Histories, organized by Missouri S&T, Chicago, IL, September16-21, 2013.
- <u>Member, Organizing Committee</u>, *Annual Michigan Solid Waste Conference*, Engineering Society of Detroit, Detroit, MI, 2011-2018.
- Member, International Scientific Committee, Advances in Civil Engineering, Ankara, Turkey, October17-19, 2012.
- <u>Chair, Organizing Committee</u>, *International Symposium on Waste Mechanics*, ASCE Geo-Institute, New Orleans, LA, March 11-13, 2008.
- <u>Member, Organizing Committee</u>, 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics and Symposium in honor of Professor I. M. Idriss, San Diego, CA, May 24-29, 2010.
- <u>Member, International Advising Committee</u>, 12th International Conference of the International Association for Computer Methods and Advances in Geomechanics, October 1-6, 2008.
- <u>Member, Organizing Committee</u>, 6th Conference on Geotechnical Engineering Case Histories, Arlington, VA, August 11-16, 2008.
- <u>Member, Organizing Committee</u>, Workshop "Geotechnical Earthquake Engineering Related to Monuments and Historical Sites," 4th International Conference on Earthquake Geotechnical Engineering, Thessaloniki, Greece, June 25-28, 2006.
- <u>Chair, Workshop</u> "International Journal of Geoengineering Case Histories: Case Histories in the Information Technology Age," *ASCE Geo-Institute Geocongress 2006*, Atlanta, GA, February 26-March 1, 2006.
- Conference Chair, 1st Hellenic Civil Engineering Students Conference, Patras, Greece, May 7-8, 2001.

Journal and Conference Paper Reviews

Journals & Special Publications

- <u>Editor-in-Chief</u>, *International Journal of Geoengineering Case Histories*, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), 2017-present.
- Associate Editor, Journal of Geotechnical and Geoenvironmental Engineering, ASCE, 2014-present.
- Editorial Board Member, Environmental Geotechnics Journal, Institution of Civil Engineers, 2012-present.
- <u>Reviewer</u>, Journal of Aerospace Information Systems, 2018
- <u>Reviewer</u>, Applied Geophysics, 2018
- <u>Reviewer</u>, *Canadian Geotechnical Journal*, 2009, 2017, 2018.
- <u>Reviewer</u>, Journal of Aerospace Information Systems, 2018
- <u>Reviewer</u>, Computers and Geotechnics, 2017
- <u>Reviewer</u>, Soil Dynamics and Geotechnical Earthquake Engineering, 2017
- <u>Reviewer</u>, *Natural Hazards*, 2017
- <u>Reviewer</u>, *Engineering Mechanics*, ASCE, 2016.
- <u>Reviewer</u>, Bridge Engineering, ASCE, 2015
- <u>Reviewer</u>, Geotextiles and Geomembranes, Elsevier, 2014, 2015, 2016.
- Reviewer, Earthquakes and Structures, Techno-Press, 2014, 2015
- <u>Reviewer</u>, Geomechanics and Engineering, 2014
- <u>Reviewer</u>, Earthquake Spectra, EERI, 2014
- <u>Reviewer</u>, Waste Management Journal, Elsevier, 2008-2018.
- <u>Reviewer</u>, Waste Management and Research, SAGE, 2014
- <u>Reviewer</u>, Journal of Solid Waste Technology and Management, 2014
- <u>Reviewer</u>, ASCE Journal of Geotechnical and Geoenvironmental Engineering, 2006-2014.
- <u>Reviewer</u>, Journal of Geotechnical and Geological Engineering, 2011-2013.
- <u>Reviewer</u>, ASCE Journal of Hazardous, Toxic, and Radioactive Waste Management, 2012.
- <u>Reviewer</u>, *Earthquake Engineering Journal*, 2011.
- <u>Reviewer</u>, Geosynthetics International Journal, 2006.

• <u>Reviewer</u>, ASCE Geotechnical Special Publication in Honor of Prof. Robert Holtz, 2011.

Conferences

- <u>Reviewer</u>, 8th International Conference on Geotechnical Engineering Case Histories Geocongress 2019, Philadelphia, PA, Mar 24-27, 2019.
- Reviewer, 8th International Congress on Environmental Geotechnics, Hangzhou, China, Oct. 28 Nov. 1, 2018
- <u>Reviewer</u>, 7th International Conference on Unsaturated Soils, Hong Kong, 3-5 August 2018.
- Reviewer, International Foundations Congress and Expo, Orlando, FL, March 5-10 2018.
- <u>Reviewer</u>, 19th International Conference on Soil Mechanics and Geotechnical Engineering, Seoul, Korea, 17-22 September 2017.
- <u>Reviewer</u>, 3rd International Conference on Performance-based Design in Earthquake Geotechnical Engineering, July 16-19 2017, Vancouver
- Reviewer, International Foundations Congress and Equipment Expo 2015, San Antonio, Texas, March 17-21 2015
- <u>Reviewer</u>, ASCE Geo-Institute GeoCongress 2014, Atlanta, GA, February 23-26, 2014.
- <u>Reviewer</u>, GeoShanghai International Conference, Shanghai, China, May 26-28, 2014.
- <u>Reviewer</u>, *Transportation Research Board* (TRB) 92nd Annual Meeting, Washington, DC, January 13-17, 2013.
- <u>Reviewer</u>, 10th International Conference on Advances in Civil Engineering, Ankara, Turkey, October 17-19, 2012.
- <u>Reviewer</u>, ASCE Geo-Institute GeoFrontiers, 2011, Dallas TX, March 13-16, 2011.
- <u>Reviewer</u>, ASCE Geo-Institute GeoFlorida, 2010, West Palm Beach, FL, February 20-24 2010.
- <u>Reviewer</u>, 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics and Symposium in Honor of Professor I. M. Idriss, San Diego, CA, May 24-29, 2010.
- <u>Reviewer</u>, 17th International Conference of Soil Mechanics and Geotechnical Engineering (ICSMGE), Alexandria, Egypt, October 5-9, 2009.
- Reviewer, International Foundation Congress & Equipment Expo, Orlando, FL, March 15-19, 2009.
- <u>Reviewer</u>, 4th Decennial Geotechnical Earthquake Engineering and Soil Dynamics Conference (GEESD), EESD Committee of ASCE Geo-Institute, Sacramento, CA, May 18-22, 2008.
- <u>Reviewer</u>, 42nd U.S. Rock Mechanics Symposium & 2nd U.S.-Canada Rock Mechanics Symposium, San Francisco, CA, June 29-July 2, 2008.
- <u>Reviewer</u>, 6th Conference on Geotechnical Engineering Case Histories, Arlington, VA, August 11-16, 2008.
- <u>Reviewer</u>, "The Challenge of Sustainability in the Geoenvironment," ASCE Geo-Institute GeoCongress 2008, New Orleans, LA, March 9-12, 2008.

Other Major Professional Activities

- <u>Chair (2014-present), Vice-Chair (2011-2014) & Member (2006-2010)</u>, Geoenvironmental Engineering Technical Committee, ASCE Geo-Institute, 2006-present.
- <u>Chair, Board-Level Committee on Innovation and Development</u>, *International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)*, 2009-present.
- Member, International Advisory Council, ASCE Geo-Institute, 2013-present.
- <u>Member, Environmental Geotechnics Technical Committee (TC 215)</u>, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), 2011-present.
- Board Member, Hellenic Geosynthetics Society, 6/2016-present
- <u>Member, Selection committee</u>, Research Projects on Field Experimentation *for the "10 year NEES retrospective volume"*, 2013.
- <u>Member, Website Development Task Force</u>, ASCE Geo-Institute, 2010-2012.
- <u>Member, Student Participation Committee</u>, ASCE Geo-Institute, 2008-2009.
- <u>Chair, Steering Committee</u>, Berkeley Geoengineering Alumni Association, 2006-2008.
- <u>Member, Steering Committee</u>, ASCE San Francisco Section Geotechnical Group, 2004-2008.

University Service

UM: University or College-Wide service; CEE: CEE Department service; GeoT: Geotechnical Program

Present

- <u>Member</u>, Faculty Ally for Diversity (UM), Rackham Graduate School, 9/2010-present.
- Group Leader, Civil Infrastructure Systems Engineering (CISE) Group, (CEE), 9/2017-present.
- Chair (CEE), Strategic Planning Committee, (CEE), 9/2017-present
- <u>Co-director</u>, Geotechnical Engineering Laboratories (GeoT), 2008-present.
- <u>Director</u>, Geoenvironmental Engineering Laboratory (GeoT), 2010-present.

- <u>Member</u>, Tenure Committee for Krista Wigginton, (CEE), 8/2018-present.
- Faculty Advisor, Geo-Institute Graduate Student Organization (CEE), 8/2018-present.

Previous

- Faculty Reviewer (UM), 2017-2018, Rackham Merit Fellowships (RMF) Selection Committee for Rackham School
- Faculty Reviewer (UM), Transformative grants for Rackham Sustainability Institute, 2018
- <u>Member (CEE)</u>, Facilities Committee, 9/2017-6/2018
- Member, Safety Committee (CEE), 9/2012-6/2017
- Faculty Reviewer (UM), Dow Sustainability Fellows Doctoral program, 2017
- Chair (CEE), Laboratory Staff Search Committee, 2/2017-8/2017.
- Chair (CEE), Laboratory Staff Strategic Hiring Task Force, 11/2016-2/2017
- <u>Chair</u>, Information Technology Committee (CEE), 9/2014-6/2017.
- Elected Member, Executive Committee (CEE), 9/2014-8/2016.
- Member, President Schlissel's Committee on Landfill Waste Reduction, (UM), 09/2014-06/2015
- <u>Member</u>, Strategic Implementation Committee (CEE), 9/2013-8/2015
- Member, Casebook Committee for Glen Daigger's candidacy as Professor of Practice (CEE), 11/2014-1/2015
- Judge, Richard and Eleanor Towner Prize for Outstanding Ph.D. Research Award (College), Fall 2015.
- Faculty Reviewer (UM), 2015 NextProf Workshop, Summer 2015.
- Faculty Reviewer (UM), 2014 NextProf Workshop, Summer 2014.
- Faculty Search Committee (CEE) on Water-Geo-Energy Systems, 9/2013-4/2014, member.
- <u>Curriculum Committee</u> (CEE) 9/2011-8/2012, member.
- Faculty Search Committee (CEE) on Resilient Infrastructure Systems, 9/2011-6/2012, member.
- Faculty Search Committee (CEE) on Environmental Systems Engineering, 9/2011-6/2012, member.
- ABET Accreditation Committee (CEE), 1/2011-9/2011, member.
- MS Student Admissions (GeoT), 2010-2011.
- <u>Operating Budget Committee</u> (CEE), 9/2009-5/2011, member.
- <u>Information Technology Committee</u> (CEE), 9/2008-8/2014, member.
- <u>Strategic Research Faculty Committee</u> (CEE), 2/2008-3/2008, member.
- Departmental Visitation Committee (CEE), 01/2008-3/2008, member.
- Member, Ph.D. Committees (completed):
 - o Vasilis Kitsis, University of Patras, 2018 (Chair: George Athanasopoulos)
 - o Jonathan Huber, U of M, 2017 (Chair: Adda Athanasopoulos-Zekkos)
 - o Pavlos Asteriou, National Technical University of Athens, 2016 (Chair: George Tsiambaos)
 - Derya Ayral, U of M, 2014 (Chair: Avery Demond)
 - o Adam Lobestael, , U of M, 2014 (Chair: Adda Athanasopoulos-Zekkos).
 - o Zhang Yao, U of M, 2014 (Chair: Radoslaw Michalowski)
 - o Srinivasa Nudukuru, U of M, 2013 (Chair: Radoslaw Michalowski).
 - o Hyon-Sohk Ohm, U of M, 2013 (Chair: Roman Hryciw).
 - o Mustafa Saadi, U of M, 2012 (Chair: Adda Athanasopoulos-Zekkos).

CONSULTING EXPERIENCE

Dr. Zekkos has been involved in the design, analysis or construction of a number of projects in the US, Greece, Peru, Finland, Romania and Angola including ground improvement projects, in-situ characterization, landfill design and construction, foundation design of power plant facilities, settlement prediction of dams, monitoring and analyses of deep supported excavations, rockmass excavations, field and laboratory testing for highway construction, tunnelling construction with the New Austrian Tunnelling Method (NATM), seismic site response analyses, liquefaction engineering evaluation, ground motion selection and spectral matching for offshore platforms and LNG facilities, and onshore and offshore construction on soft soils. In addition, he has been engaged in forensics investigations involving geosynthetic performance, deep fill settlement, and landslides. Indicative project titles can be found here: http://dimitrioszekkos.org/consulting/indicative-consulting-projects

INVITED LECTURES

Invited Presentations at Conferences or Symposia

- 1. Zekkos, D. (2019). "Use of Unmanned Aerial Vehicles for the Characterization of Ground Instability, Workshop on Urban Geotechnics, Geotechnical Society of Singapore. March 11 2019, Singapore.
- 2. Zekkos, D. (2018). "Recent Advances on Municipal Solid Waste Properties, Degradation and Implications in Design", 19th Annual Michigan Solid Waste Conference, April 11-12 2018, Lansing, MI.
- Zekkos, D. (2018). "Applications of Aerial and Land-Based Robotic Platforms in Landfills", 19th Annual Michigan Solid Waste Conference, April 11-12 2018, Lansing, MI.
- 4. Zekkos, D. (2017). Opportunities for professional networking through GeoWorld, Geotechnical Women Faculty Network Workshop, April 11 2017, Washington DC (invited).
- 5. Zekkos, D. (2016). ISSMGE Innovations for a cyber-interconnected Geo-profession" Monday February 15 2016, "Geo-Structures 2016: Phoenix, AR.
- 6. Zekkos, D. (2014). "Ground Improvement Technologies in Landfill Engineering", 24th Annual Solid Waste Technical Conference, Lansing, MI, March 17-18 2014.
- 7. Zekkos, D. (2013). "Experimental Evidence of Anisotropy in Municipal Solid Waste," *Proc., Coupled Phenomena in Environmental Geotechnics, Politecnico di Torino*, Torino, Italy, July 1-3, 2013 (invited keynote presentation).
- 8. Zekkos, D. (2013). "Case Histories of Geological, Rock and Mining Engineering, Underground Structures and Excavations General Report for Session 5." *Seventh International Conference on Case Histories in Geotechnical Engineering*, April 29-May 4, 2013, Chicago, IL.
- 9. Zekkos D. (2013). "From Waste Containment to Energy Harvesting: Ongoing Research." *Texas A&M University International Geo-Engineering Symposium in Honor of ISSMGE Board Members*, April 26, 2013, College Station TX.
- Zekkos, D. (2011). "Life after Graduation in Industry and Academia." Student Symposium, Network for Earthquake Engineering Simulation (NEES) & Multidisciplinary Center for Earthquake Engineering Research MCEER Annual Meeting: Quake Summit 2011, Buffalo, NY, June 9, 2011.
- 11. Zekkos, D. (2010). "Use of Case Histories and Technology in Geotechnical Engineering Education," 6th Hellenic Geotechnical and Geoenvironmental Engineering Conference, September 27-30, 2010, Volos, Greece.
- Zekkos, D. (2011). "Engineering Considerations for Post-Closure Development of Landfills." 21st Annual Solid Waste Conference, Michigan Solid Waste Industries Association and Engineering Society of Detroit April 10-11, 2011, Lansing, MI.
- Zekkos (2010). "Stability of Municipal Solid Waste Landfills: Fundamentals and Recent Advances." 20th Annual Solid Waste Conference, Michigan Solid Waste Industries Association and Engineering Society of Detroit, March 23-24, 2010, Lansing, MI.
- Zekkos, D., Boominathan, A., Athanasopoulos-Zekkos, A. (2010). "Engineering Seismology, Ground Motions, & Local Site Effects: General Report on Session 3." 5th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, May 24-29, 2010, San Diego, CA.
- 15. Zekkos, D. (2007). "Geological, Rock and Mining Engineering, Including Underground Structures and Excavations, and Subsidence of Deltas General Report for Sessions 6a and 6b." *6th International Conference on Case Histories in Geotechnical Engineering*, August 11-16, 2007, Arlington, VA.

Seminars or Invited Lectures at Institutions & Organizations

- 1. "Recent Advances in Infrastructure and Geosystems Resiliency empowered by Autonomy", University of California at Berkeley, April 29 2019.
- 2. "Applications of Unmanned Aerial Vehicles for Infrastructure and Geosystem Resiliency", Nanyang Technological University, NTU-JTC Industrial Infrastructure Innovation Centre, March 12 2019.
- 3. "Applications of Aerial and Land-Based Robotic Platforms in Landfills." CTI Associates, Novi, August 29 2018.
- 4. "Robot-enabled Research Efforts to Promote Resiliency and Sustainability of Geo-Systems." Department of Earth and Environmental Science, University of Michigan, January 27 2017.
- 5. "Evaluation of the mechanical properties of Municipal Solid Waste." Hellenic Society for Soil Mechanics and Geotechnical Engineering, June 15 2016, Athens.
- "From Waste Containment to Energy Harvesting: Experimental Assessment of Coupled Physico-Biochemical & Mechanical Processes of Municipal Solid Waste Undergoing Biodegradation." February 19 2016, Department of Civil and Environmental Engineering, University of California at Berkeley.
- 7. "Seismic Characterization of Municipal Solid Waste Landfills," University of Illinois, Chicago, Civil and Materials Departmental Lecture, April 10, 2014.
- 8. "Recent Advances on the Dynamic Properties of Municipal Solid Waste," Queen's University and RMC Geoengineering Centre, Kingston, Canada, February 15, 2012.
- 9. "Stability of Municipal Solid Waste Landfills: Fundamentals and Recent Advances," Waste and Hazardous Materials Division, Michigan Department of Environmental Quality (MDEQ), Lansing, MI, June 17, 2010.

- 10. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," Department of Civil and Environmental Engineering, Texas A&M, College Station, TX, April 28, 2008.
- 11. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," Department of Civil and Environmental Engineering, University of Michigan, Ann Arbor, MI, April 7, 2008.
- 12. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," Department of Civil and Environmental Engineering, University of Washington, Seattle, WA, April 2, 2008.
- 13. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," Department of Structural Engineering, University of California, San Diego, CA, February 22, 2008.
- 14. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," ASCE-Geo-Institute Chapter of Texas A&M University, College Station, TX, November 14, 2006.
- 15. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," webinar presented to all offices of Geosyntec Consultants, June 30, 2006.
- 16. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," Berkeley Geoengineering Society, University of California at Berkeley, Berkeley, CA, September 7, 2005.
- 17. "Evaluation of Static and Dynamic Properties of Municipal Solid Waste," ASCE San Francisco Geotechnical Group, Oakland, CA, August 23, 2005.
- 18. "Recent Advances in the Properties of Municipal Solid Waste," Fugro West, Oakland, CA, July 11, 2005.

PROFESSIONAL REGISTRATIONS

- Licensed Civil Professional Engineer, California, USA (#71745) (since 2007)
- Licensed Civil Professional Engineer, Greece (#93932)
- Licensed Remote Pilot of Unmanned Aerial Vehicle, Federal Aviation Authority (# 3930747) (since 2016)

PROFESSIONAL MEMBERSHIP & AFFILIATIONS

- Geo-Institute of American Society of Civil Engineers, member
- Hellenic Society for Soil Mechanics and Geotechnical Engineering, member
- International Society for Soil Mechanics and Geotechnical Engineering, member
- Earthquake Engineering Research Institute, member
- American Rock Mechanics Association (ARMA), lifetime member
- International Society for Rock Mechanics (ISRM), lifetime member
- American Society for Engineering Education, member
- Berkeley Geoengineering Society, member
- Technical Chamber of Greece, member