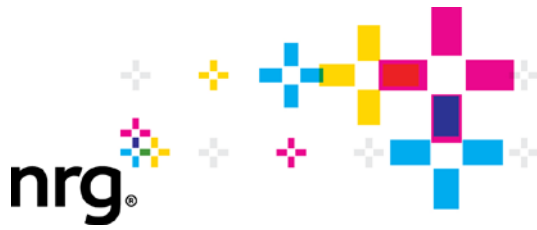


DOCKETED	
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TN #:	231062-1
Document Title:	Annual Report 2018 - part 1
Description:	N/A
Filer:	Cenne Jackson
Organization:	El Segundo Power, LLC
Submitter Role:	Applicant
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PART ONE

EL SEGUNDO ENERGY CENTER PROJECT, DOCKET NO. 00-AFC-14C, CONDITION OF CERTIFICATION COMPLIANCE-7, 2018 ANNUAL COMPLIANCE REPORT, DOCKET NO. 00-AFC-14C



El Segundo Energy Center LLC
301 Vista Del Mar Boulevard
El Segundo, CA 90245
Phone: 310.615.6028
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March 28, 2019

Mr. Joseph Douglas
Compliance Project Manager
Docket No. 07-AFC-6C
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

**RE: EL SEGUNDO ENERGY CENTER PROJECT,
DOCKET NO. 00-AFC-14C, CONDITION OF CERTIFICATION
COMPLIANCE-7, 2018 ANNUAL COMPLIANCE REPORT,
DOCKET NO. 00-AFC-14C**

Dear Mr. Douglas:

El Segundo Energy Center LLC (Project Owner) submits the attached 2018 Annual Compliance Report in compliance with the AFC Docket No. 00-AFC-14C, Conditions of Certification (COCs) COMPLIANCE-7 for the ESEC Project located at 301 Vista Del Mar, El Segundo, California.

This report covers the operational reporting period January through December 2018. The following documents are included per specific project COCs:

Attachment A: COMPLIANCE-5 and COMPLIANCE-7: Annual Compliance Matrix

Attachment B: COMPLIANCE-7: List of Permits

Attachment C: COMPLIANCE-7 and COMPLIANCE-10: 24-Hour Hotline Message System Log for 2018

Attachment D: BIO-7: Summary of Biological Surveys Conducted in 2018

Attachment E: GEO-4: Seventh Annual Shoreline Monitoring Assessment Report

Attachment F: HAZ- 1: List of Hazardous Materials

Attachment G: TLSN-3: Electro Interference Complaints

Attachment H: VIS-2 and VIS-3: Landscape and Seawall Maintenance Activities

Attachment I: VIS- 5: Structure Surface Painting and Treatment Maintenance

Attachment J: VIS-6: Lighting Complaints (Units 5, 6, 7 and 8)

Attachment K: VIS -7: Lighting Complaints (Units 3 and 4)

Attachment L: WASTE-3: Waste Management Methods

Attachment M: WATER RES-5: Water Use Summary Report and Servicing, Testing and Calibration of the Metering Devices Report

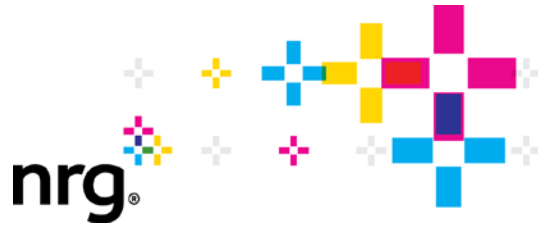
If you have any questions regarding this submittal, please contact Timothy Sisk at (760) 710-2129.

Sincerely,
El Segundo Power, LLC
By: NRG El Segundo Operations Inc.
Its Authorized Agent

By: 
Ken H. Riesz Sr.
Plant Manager

Enclosures: El Segundo Energy Center, Annual Compliance Report 2018,
March 28, 2019

Cc: File



El Segundo Energy Center Project (00-AFC-14C)

California Energy Commission Annual Compliance Report

2018
(January – December 2018)

Submitted by: El Segundo Energy Center LLC
Date Submitted: 3-28-2019

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List of Attachments

- Attachment A: COMPLIANCE-5 and COMPLIANCE-7: Annual Compliance Matrix
- Attachment B: COMPLIANCE-7: Notifications Submitted and Permits Obtained in 2018
- Attachment C: COMPLIANCE-7 and COMPLIANCE-10: 24-Hour Hotline Message System Log-2018
- Attachment D: BIO-7: Summary of Biological Surveys Conducted in 2018
- Attachment E: GEO-4: Eighth Year Shoreline Monitoring Assessment Report
- Attachment F: HAZ-1: List of Hazardous Materials
- Attachment G: TLSN-3: Electro Interference Complaints
- Attachment H: VIS-2 and VIS-3: Landscape and Seawall Maintenance Activities
- Attachment I: VIS-5: Structure Surface Painting and Treatment maintenance
- Attachment J: VIS-6: Lighting Complaints (Units 5, 6, 7, and 8)
- Attachment K: VIS-7: Lighting Complaint (Units 3 and 4)
- Attachment L: WASTE-3: Waste Management Methods
- Attachment M: WATER RES-5: Water Use Summary Report and Servicing, Testing and Calibration of Metering Devices Report

1. Annual Compliance Matrix

A copy of the Annual Compliance Matrix is provided in Attachment A. Conditions of Certification (COCs) fully satisfied since completion of construction activities are not included. No new compliance activities have been added to the matrix during 2018.

2. Project Operating Status

The El Segundo Energy Center (ESEC) project was substantially available during 2018, and ESEC operated January 1 through December 2018 when called upon by CAISO. Average operating status was in combined cycle mode for both power blocks Unit 5 (gas turbine) and Unit 6 (steam turbine) and Unit 7 (gas turbine) and Unit 8 (steam turbine). All ESEC units were unavailable from January 25 through February 1, 2018 for Southern California Edison 220kV transmission maintenance which prevented ESEC from generating and transferring electricity to the electrical grid. ESEC combustion turbine (CT) units 5 and 6 were unavailable from February 25 to March 25, 2018, and units 7 and 8 were unavailable from March 9 through April 9, 2018 due to annual maintenance outages. The ESEC units were periodically unavailable for short periods for routine maintenance and/or repairs to equipment.

3. List of Documents Submitted to Meet Specific Conditions

Per COC COMPLIANCE-7, Annual Compliance Report, the following documents are submitted herein as **Attachments A to M** to satisfy specific Conditions of Certifications:

- a. COMPLIANCE-5 and COMPLIANCE-7: Annual Compliance Matrix is provided in **Attachment A**.
- b. COMPLIANCE-7: Other permits correspondence is provided in **Attachment B**.
- c. COMPLIANCE-5 and COMPLIANCE-7: 24-Hour Hotline Message System Log for 2018 is provided in **Attachment C**.
- d. BIO-7: Biological surveys conducted in 2018 are provided in **Attachment D**.
- e. GEO-4: Quarterly and Sixth Annual Shoreline Monitoring Assessment Reports are provided in **Attachment E**.
- f. HAZ-1: List of hazardous materials is provided in **Attachment F**.

- g. TLSN-3: Electro interference complaints are provided in **Attachment G**.
- h. VIS-2 and VIS-3: Landscape and seawall maintenance activities are provided in **Attachment H**.
- i. VIS-5: Structure Surface Painting and Treatment Maintenance activities are provided in **Attachment I**.
- j. VIS-6: Lighting complaints related to Units 5, 6, 7, and 8 are provided in **Attachment J**.
- k. VIS-7: Lighting complaints related to facility Units 3 and 4 are provided in **Attachment K**.
- l. WASTE-3: Waste management methods are provided in **Attachment L**.
- m. WASTE RES-5: Annual Water Use Summary Report is provided in **Attachment M**.

4. Cumulative List of Post-Certification Changes Approved by the CEC or Cleared by the CPM

- a. Petition to Amend Ammonia Delivery Method, Permitted Ammonia Flow Rate and Project Name Change, dated April 2012. CEC Approved Amendment was docketed by the CEC on August 17, 2012.
- b. Petition to Amend Air Quality Conditions of Certification, submitted October 3, 2014. CEC Order 15-0114-2 - Approving Clarification to Turbine Startup/Restarts was docketed on January 22, 2015.
- c. Petition to Modify Steam Turbine Weatherization Enclosures, dated December 23, 2015. CEC Approved the Amendment was docketed October 28, 2016.
- d. Petition to Amend for Gas Turbine Upgrade Modifications, dated August 15, 2017. CEC staff issued Notice of Determination approving the Amendment, which was docketed on December 6, 2017.

5. List of Submittal Deadlines Missed During Reporting Period

ESEC did not miss any deadline submittal requirements during 2018.

6. List of any filings with, or permits issued by, other governmental agencies during the year

A list of filings with, or permits issued by, other governmental agencies is provided in **Attachment B**. The ESEC operates within the El

Segundo Generating Station (ESGS) facility. The ESGS is operated by El Segundo Power, LLC (ESP), and hence some permits listed are issued to ESP. Some permits obtained or serviced by the ESGS facilitate operation of the ESEC.

7. Projection of Project Compliance Activities Scheduled for 2018

- AQ-2: Annual Calibration of Ammonia Flow Meters
- AQ-3: Annual Calibration of Temperature Gauges
- AQ-4: Annual Calibration of Differential Pressure Gauges
- AQ-5: Annual NH₃ Slip Test
- AQ-7: Annual VOC Source Test
- AQ-C8: Quarterly Operations Report
- AQ-26: Annual Calibration of inlet NO_x Analyzer
- BIO-7: Conduct periodic biological surveys
- GEO-4: Quarterly Shoreline Monitoring Assessments
- VIS-2: Perimeter Landscape Maintenance Activities
- VIS-3: Seawall Maintenance Activities
- VIS-5: Structure Surface Painting and Treatment Maintenance
- WASTE RES-5: Report Annual Water Use

8. Additions to on-site compliance file

Files are maintained on regular basis as operational COCs are implemented. This primarily consists of the AQ-C8 quarterly operational reports, AQ-7 annual and tri-annual source test results, GEO-4 quarterly beach survey reports, BIO-7 designated biologist surveys, VIS-2 landscaping maintenance log, VIS-3 seawall maintenance, and VIS-5 equipment painting log.

Files maintained for routine annual activities (not required to be attached to this Annual Compliance Report submittal) are available for review upon request.

9. Evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date

ESEC submitted the Unplanned Facility Closures/On-Site Contingency Plan for to the CEC on June 24, 2013, in compliance with COMPLAINT-12. ESEC has not received any comments from the CEC as of March 28, 2019. ESEC has evaluated the plan and updated relevant station procedures and emergency evacuation route maps. ESEC reviewed equipment warranties and insurance coverage for the project and found the description still relevant. The updated Unplanned Closure Plan has been updated and will be submitted to the CPM under separate cover letter.

10. List of complaints, notices of violation, official warnings, citations received during year, a description of the resolution of any resolved matters, and the status of any unresolved matters

Messages received on the 24-hour hotline system concerning noise complaints between January 1 and December 31, 2018 are documented on the log provided in Attachment C. There were several telemarketing calls that were received by the 24-hour hotline number in 2018. However, there were no calls logged into the 24-hour hotline number that related to the ESEC Project.

ESEC has not received any notices of violation, official warnings or citations related to the operation of the ESEC during this reporting year.

ATTACHMENT A

COMPLIANCE-5 and COMPLIANCE-7: Annual Compliance Matrix

Condition Verification Summary:

Condition requires ESEC to submit, as part of the Annual Compliance Report, an updated compliance matrix showing the status of all conditions of certification. Satisfied conditions do not need to be included.

ESEC Submission:

An operational phase compliance matrix is provided herein.

Compliance Matric - Annual COCs
El Segundo Energy Center Project
Docket 00-AFC-14C

Technical Area	COC No.	Condition Short Description	Deliverable Req.	Verification Action	Required Prior to Start of Construction?	Action Days	Submittal Timing	Submittal Trigger Event	Expected Submittal Date	Actual Submittal Date	Submittal Action Approval Date	Amended Date	Compliance Status	Priority (Tier 1, 2, or 3)	Comments
AQ	2	Calibrate Flow Meter Annually	Y	The operator shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH3) to the SCR in combined cycle turbines 5 and 7. The operator shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months. The ammonia injection rate shall remain between 1 gallons per hour and 75 gallons per hour.	N	na	Annually	Site Inspections	Annually during operation	NA	NA	22-Jan-15	In Progress	1	Equipment Calibrated Annually - record on file
AQ	3	Calibrate Temperature Gauge Annually	Y	The operator shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor in combined cycle turbines 5 and 7. The operator shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months. The temperature shall remain between 400 degrees F and 750 degrees F. The catalyst temperature shall not exceed 750 degrees F during the startup period.	N	na	Annually	Site Inspections	Annually during operation	NA	NA		In Progress	1	Equipment Calibrated Annually - record on file
AQ	4	Calibrate Flow Meter Annually	Y	The operator shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column in combined cycle turbines 5 and 7. The operator shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months. The pressure drop across the catalyst shall remain between 1 inch of water column and 4 inches of water column. The pressure drop across the catalyst shall not exceed 4 inches of water column during the startup period.	N	na	Annually	Site Inspections	Annually during operation	NA	NA		In Progress	1	CEMS Equipment
AQ	5	NH3 Source Test	Y	1). The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval.	N	45	days prior to	Source Test Date	Annually during operation	See AQ-C8	NA	22-Jan-15	In Progress	1	Reported in AQ-C8
AQ	5	NH3 Source Test	Y	2). The project owner shall notify the District and CPM of the proposed source test date and time.	N	10	days prior to	Source Test Date	Annually during operation	See AQ-C8	NA	22-Jan-15	In Progress	1	Reported in AQ-C8
AQ	5	NH3 Source Test	Y	3). The project owner shall submit source test results to both the District and CPM.	N	60	days following	Source Test Date	Annually during operation	See AQ-C8	NA	22-Jan-15	In Progress	1	Reported in AQ-C8
AQ	7	Three Year Source Tests for Units 5 and 7	Y	1). The project owner shall submit the proposed protocol for the source tests to both the District and CPM for approval.	N	45	days prior to	Three Year Source Test	Every 3 Years	See AQ-C8	NA	22-Jan-15	In Progress	1	2016 completed, next 2019
AQ	7	Three Year Source Tests for Units 5 and 7	Y	2). The project owner shall notify the District and CPM of the proposed source test date and time.	N	10	days prior to	Three Year Source Test	Every 3 Years	See AQ-C8	NA	22-Jan-15	In Progress	1	2016 completed, next 2019
AQ	7	Three Year Source Tests for Units 5 and 7	Y	3). The project owner shall submit source test results to both the District and CPM.	N	60	days following	Three Year Source Test	Every 3 Years	See AQ-C8	NA	22-Jan-15	In Progress	1	2016 completed, next 2019
AQ	7	Annual Source Test for Units 5 and 7	Y	4). Provide results of source test for VOC.	N	60	days following	Annual Source Test	Annually during operation	See AQ-C8	NA	22-Jan-15	In Progress	1	Completed 2016
AQ	11	Monthly Emission Limits	Y	The project owner shall submit the monthly fuel use data and emission calculations to the CPM in the Quarterly Operation Reports (AQ-9).	N	30	days following end of quarter	Quarterly during operation	30-Oct-13	See AQ-C8	NA		In Progress	1	
AQ	14	Install CO CEMS	N	2). The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).	N	na	na	Site Inspections	As Needed	See AQ-C8	NA	22-Jan-15	In Progress	1	CEMs installed in May/April 2013. Certified in August 2013.
AQ	15	Install NOx CEMS	N	1). Install and operate the NOx CEMS within 90 days of turbine first fire according to requirements of Rule 2012.	N	90	days following	Turbine First Fire	23-Jul-13	See AQ-C8	NA	22-Jan-15	Completed	1	First Fires occurred in April 2013
AQ	15	Install NOx CEMS	N	2). The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).	N	na	na	Site Inspections	As Needed	See AQ-C8	NA	22-Jan-15	In Progress	1	CEMs installed in May/April 2013. Certified in August 2013.
AQ	16	Startup and Commissioning Period - 2.0 PPM NOx Exception - Commissioning period limited to 415 operating hours	N	1). The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (ARB), and the Commission.	N	na	na	Site Inspections	As Needed	See AQ-C8	NA	22-Jan-15	In Progress	1	Commissioning Completed July 31, 2013. All required reporting completed by 8-12-13.
AQ	17	Startup and Commissioning Period - 4.0 PPM CO Exception - Commissioning period limited to 415 operating hours	N	1). The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (ARB), and the Commission.	N	na	na	Site Inspections	As Needed	See AQ-C8	NA	22-Jan-15	In Progress	1	Commissioning Completed July 31, 2013. All required reporting completed by 8-12-13.
AQ	20	Startup NOx limit	Y	The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in AQ-C8.	N	30	days following end of quarter	Quarterly during operation	Quarterly	See AQ-C8	NA	22-Jan-15	In Progress	1	Seimens to verify.
AQ	26	NO x Analyzer Calibration	Y	Calibrate NOx analyzer at least once every 12 months.	N	na	na	Annually during operation	April Annually	See AQ-C8	NA		In Progress		Reported in AQ-C8
AQ	26	5 PPMV NH3 Emissions Limit Monitoring	Y	Submit all calibration results performed to the CPM within 60 days of calibration date.	N	60	days following	Calibration Date	Annually during operation	See AQ-C8	NA		In Progress	1	Reported in AQ-C8
AQ	32	2.0 PPM VOC emission limit during turbine commissioning	N	The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).	N	na	na	Site Inspections	As Needed	See AQ-C8	NA	22-Jan-15	In Progress		Commissioning Completed July 31, 2013. All required reporting completed by 8-12-13.
AQ	36	Record keeping, natural gas fuel use after CEMS certification, during commissioning, after commissioning period and prior to the CEMS certification.	Y	The project owner shall submit fuel usage records and all other records and calculations required to demonstrate compliance with this condition as part of the Quarterly Operational Report required in AQ-C8.	N	na	Quarterly	Quarterly during operation	Quarterly	See AQ-C8	NA	22-Jan-15	In Progress		
AQ	37	PM emissions less than 100 tons in any one year	Y	The project owner shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report of Condition of Certification AQ-C8.	N	na	Quarterly	Quarterly during operation	Quarterly	See AQ-C8	NA	22-Jan-15	In Progress		
AQ	39	Operate and maintain equipment according to COCs	N	The project owner shall make the site available for inspection by representatives of the District, CARB, EPA and the Commission.	N	na	na	Site Inspections	As Needed	See AQ-C8	NA	8-Jul-10	As Needed	1	
BIO	7	Designated Biologist Duties	Y	Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports. As necessary during project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.	N	10	working days after beginning of each month	Monthly Compliance Report	Annually during operation	See COM-7 Report	NA	8-Jul-10	In Progress	1	Annual Report to be filed by March 30 each year.
COM	2	Compliance Record	N	Maintain files onsite	N	na	na	Filing Requirement	na	NA	NA		In Progress	1	
COM	3	Compliance Verification Submittals	Y	Verification must include a cover letter and certain minimum requirements.	Y	na	na	General Compliance Requirements	See Individual COCs	NA	NA		In Progress	1	
COM	5	Compliance Matrix	Y	Submit with first monthly report as well as each consecutive monthly report	Y	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
COM	7	Annual Compliance Report	Y	After Construction is complete, begin submitting annual reports in lieu of monthly reports, on a schedule agreed to by the CPM.	N	na	na	Annual Compliance Report	Annually during operation	March 30th the following year	NA		In Progress	1	
COM	9	Annual Energy Facility Compliance Fee	Y	The project owner is required to pay an annual compliance fee, which is adjusted annually.	Y	na	na	General Compliance Requirements	July 1 of each year	NA	NA	8-Jul-10	In Progress	1	
COM	10	Reporting of Complaints, Notices, and Citations	Y	The project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints, or concerns.	Y	1	days prior to	Start of Construction	In Annual Report	See COM-7 Report	NA	8-Jul-10	In Progress		
COM	11	Planned Closure	Y	1). The project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval	Y	365	days prior to	Commencement of Closure Activities	As Needed	NA	NA	8-Jul-10	As Needed	3	
COM	11	Planned Closure	Y	2). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.	Y	na	na	General Compliance Requirements	Not Specified	NA	NA	8-Jul-10	As Needed	3	
COM	11	Planned Closure	Y	3). Prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.	Y	na	na	General Compliance Requirements	As Needed	NA	NA	8-Jul-10	As Needed	3	
COM	12	Unplanned temporary closure contingency plan	Y	1). Submit on-site contingency plan to the CPM for review and approval.	Y	60	days prior to	Start Commercial Operations	In Annual Report	24-Jun-13	NA	8-Jul-10	As Needed	3	
COM	12	Unplanned temporary closure contingency plan	Y	2). Notify the CPM and other responsible agencies of any unplanned closure	Y	1	days following	Facility Closure	As Needed		NA	8-Jul-10	As Needed	3	See BIO-14 and implement as needed.
COM	12	Unplanned temporary closure contingency plan	Y	3). If the CPM determines that the unplanned temporary closure is likely to be permanent or for a duration of more than twelve months, a closure plan consistent with a planned closure shall be submitted to the CPM within 90 days of the CPM's determination	N	90	days following	Facility Closure	As Needed	See COM-7 Report	NA	8-Jul-10	As Needed	3	
COM	13	Unplanned Permanent Closure/On-Site Contingency Plan	Y	1). Notify the CPM and other responsible agencies of the closure and take necessary steps to implement closure plan	N	1	days following	Facility Closure	As Needed	See COM-7 Report	NA	8-Jul-10	As Needed	3	
COM	13	Unplanned Permanent Closure/On-Site Contingency Plan	Y	2). Submit a closure plan consistent with a planned closure to the CPM within 90 days of the permanent closure	N	90	days following	Facility Closure	As Needed	See COM-7 Report	NA	8-Jul-10	As Needed	3	
COM	14	Post Certification Changes to the Energy Commission Decision: Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes	Y	The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility.	N	na	na	Modification of Project Design	As Needed	NA	NA	8-Jul-10	As Needed	3	PTA Filed Oct 2, 2014 for revisions to AQ limits on starts. Commission Approved Changes in 2015.
GEO	4	Conduct a 10 Year Shoreline Monitoring Program and access erosion on the beach area	Y	2). Applicant shall submit the results of assessment as part of its Annual Compliance Report	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA	8-Jul-10	In Progress	1	
GEO	4	Conduct a 10 Year Shoreline Monitoring Program and access erosion on the beach area	Y	3). Applicant shall also, at that time, forward the results to the California Coastal Commission and the City of El Segundo with a copy of the transmittal letter to the CPM.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
GEO	4	Conduct a 10 Year Shoreline Monitoring Program and access erosion on the beach area	Y	5). The tenth annual report shall contain the final report.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	3	
HAZ	1	Advance Approval of Hazardous Materials In Excess of Title 40 or Table 5.15-2 Required	Y	2). Copies of the list should also be provided to the City of El Segundo Fire Department (CESFD) and the City of Manhattan Beach Fire Department (CMBFD).	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
LAND	5	Notification of Plan for Abandoned Fuel Tank Farm Area	Y	1). The project owner shall provide written notification to the planning departments of the City of El Segundo and the City of Manhattan Beach and to the Executive Director of the California Coastal Commission who shall have 30 calendar days to provide written comments to the CPM to review.	N	30	to provide	Written comments to CPM	As Needed	NA	NA		As Needed	3	
LAND	5	Notification of Plan for Abandoned Fuel Tank Farm Area	Y	2). Prior to submitting any building permit applications to any other agency for development of the abandoned fuel tank farm area (Parcel 2); the project owner shall provide a copy of the written notification to the CPM.	Y	60	days prior to	Future Plant Development	As Needed	NA	NA		As Needed	3	

Compliance Matric - Annual COCs
El Segundo Energy Center Project
Docket 00-AFC-14C

Technical Area	COC No.	Condition Short Description	Deliverable Req.	Verification Action	Required Prior to Start of Construction?	Action Days	Submittal Timing	Submittal Trigger Event	Expected Submittal Date	Actual Submittal Date	Submittal Action Approval Date	Amended Date	Compliance Status	Priority (Tier 1, 2, or 3)	Comments
LAND	5	Notification of Plan for Abandoned Fuel Tank Farm Area	Y	3). The project owner shall also provide copies of the written notification sent to the Cities of El Segundo, Manhattan Beach and to the Executive Director of the California Coastal Commission to the CPM.	Y	60	days prior to	Future Plant Development	As Needed	NA	NA		As Needed	3	
LAND	8	Maintain lease rights with State Lands Commission and provide copies of new or amended agreements to CPM	Y	1). The project owner shall provide the CPM with a copy of submitted lease applications filed with the State Lands Commission and other relevant correspondence.	N	na	na	New Permits/Licenses	Not Specified	16-Jan-07	NA		As Needed	1	
LAND	8	Maintain lease rights with State Lands Commission and provide copies of new or amended agreements to CPM	Y	2). The project owner shall submit to the CPM a copy of all new or amended lease agreements with the California State Lands Commission.	N	na	na	New Permits/Licenses	Not Specified	10-Mar-07	NA		As Needed	1	
NOI	2	Investigate and resolve Noise Complaints	Y	4). The project owner shall provide to the CPM, in the applicable Monthly and/or Annual Compliance Report, a listing of noise complaints received in that time period, and the status of resolution of each complaint, including all those which have not yet been resolved.	N	10	working days after beginning of each month	Monthly Compliance Report	10th business day of each month	See COM-7 Report	NA		In Progress	1	
NOI	9	Eliminate Vibrations and report complaints	Y	The project owner shall provide, in the applicable Monthly and/or Annual Compliance Report, a listing of vibration complaints received in that time period, and the status of resolution of each complaint, including all those which have not yet been resolved.	N	10	working days after beginning of each month	Monthly Compliance Report	10th business day of each month	See COM-7 Report	NA		In Progress	1	
NOI	10	Loudspeaker use limited to testing and emergencies only	Y	The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction and operation of the project.	Y	With	First	Monthly Compliance Report	As Needed	See COM-7 Report	NA		In Progress		
TLSN	3	Notification of residents and Electro Interference complaint program	Y	1). All reports of line-related complaints shall be summarized and included in the Annual Compliance Report to the CPM.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	First Notification mailed June 12, 2013
VIS	2	Perimeter Screening and On-site Landscape Plan	Y	6). The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
VIS	3	Design treatment of seawall	Y	4). The project owner shall provide a status report regarding wall maintenance.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
VIS	5	Structure Surface Painting and Treatment	Y	4). The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
VIS	6	Project Lighting	Y	4). The project owner shall report any lighting complaints and documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
VIS	7	Site Lighting	Y	4). The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	
WAS	3	Submit and Get Waste Management Plan Approved	Y	4). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA		In Progress	1	Updated March 2015
WRKR	6	Portable automatic cardiac defibrillator (AED) on site	Y	During operations, all power plant employees shall be trained in its use.	Y	30	days prior to	Annual Training	Annually during operation	See COM-7 Report	NA	8-Jul-10	In Progress	1	
WRES	4	Potable Water Supplied by the City of El Segundo	Y	2). The project owner shall submit to the CPM any water quality monitoring reports required by the City in the annual compliance report.	N	na	na	Annually during operation	As Needed	NA	NA	8-Jul-10	In Progress	1	
WRES	4	Potable Water Supplied by the City of El Segundo	Y	3). The project owner shall notify the CPM of any violations of the agreement terms and conditions, the actions taken or planned to bring the project back into compliance with the agreement, and the date compliance was reestablished.	N	na	na	Annually during operation	As Needed	NA	NA	8-Jul-10	In Progress	1	
WRES	5	El Segundo Power Redevelopment Project (ESPRP) Operation	Y	2). The project owner shall submit a Water Use Summary report to the CPM in the annual compliance report. The report shall disaggregate potable water supplied by the City and recycled water supplied by WBMWD for ESPRP industrial and landscape irrigation use.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA	8-Jul-10	In Progress	1	
WRES	5	El Segundo Power Redevelopment Project (ESPRP) Operation	Y	3). The project owner shall provide a report on the servicing, testing and calibration of the metering devices in the annual compliance report.	N	na	na	Annual Compliance Report	Annually during operation	See COM-7 Report	NA	8-Jul-10	In Progress	1	

ATTACHMENT B

COMPLIANCE-7: List of Filings and Permits Obtained List of Filings with Other Governmental Agencies Attached

Date of Filing or Issued	Permit Number	Permit
Monthly	NPDES Permit No. CA0001147	Monthly Discharge Monitoring Reports
Quarterly	NPDES Permit No. CA0001147	Quarterly Discharge Monitoring Reports
Semi-annual	NPDES Permit No. CA0001147	Semi-annual Discharge Monitoring Report
Annual	NPDES Permit No. CA0001147	Annual Discharge Monitoring Report
Issued: 2-12-15 Effective: 4-1-15 5 year Permit.	NPDES Permit No. CA0001147	Individual NPDES Permit for discharge of industrial waste water to El Segundo Power LLC. Includes storm water discharge from El Segundo Energy Center Site.
Issued: 11-25-14 (Issued annually January 1 st)	115663	El Segundo Power, LLC Title V Permit Expires 12-2-2019
Annual Issued: 7-1-18	Facility No. 19-003-300011 CERS No. 10401328	CUPA Permit for Hazardous Material Business Plan, Aboveground Storage Tank, California Accidental Release Plan, Hazardous Waste Generator, Underground Storage Tank, and Stormwater Discharge Activities. Expires 6-30-2019
9-1-18	02552-6	Fire Prevention Permit: Compressed Gasses, Cryogenic Fluids, Store Flammable-Combustible Liquids, Hazardous Material Storage, Hot Work Permit, Batter Systems
12-6-17	00-AFC-14C TN#221912	Notice of Determination - Turbine Upgrade
1-17-18	115663	Title V Minor Permit Revision- Permit to Operate for Turbine Upgrade

ATTACHMENT C

COMPLIANCE-7 and COMPLIANCE-10: 24-Hour Hotline Message System Log - 2018

Condition Verification Summary:

Condition requires ESEC to provide a list of complaints, notices of violation, official warnings, citations received during year, a description of the resolution of any resolved matters, and the status of any unresolved matters in the Annual Compliance Report.

ESEC Submission:

All messages received via e-mail or on the 24-Hour Hotline Message System between January 1 and December 31, 2018 are documented in the log provided herein. There were no calls on the 24-Hour Hotline Message System relating to the ESEC project in 2018.

**El Segundo Energy Center
24-Hour Hotline Message System Log
January 1 through December 31, 2018**

Date	Time	Complaint Log Number	Complainant	COC	Complaint	Resolution	Corrective Action Completion Date

ATTACHMENT D

BIO-7: Summary of Biological Surveys Conducted in 2018

Condition Verification Summary:

Condition requires ESEC to consult a designated biologist concerning biological resources and report as necessary during project operation and submit record summaries in the Annual Compliance Report.

ESEC Submission:

Copies of all biological survey reports completed during 2018 are provided herein. No biological impacts were reported related to the operation of the ESEC.



March 30, 2018

Steve Odabashian
NRG El Segundo Operations Inc.
301 Vista del Mar
El Segundo, California 90245
(310) 615-6331

Progress Report

El Segundo Energy Center, Designated Biologist
P.O. 4501812194

Dear Mr. Odabashian,

The following is a summary of the biological survey conducted March 5, 2018 as part of the Condition of Certification BIO-7 for the El Segundo Energy Center Project. Condition BIO-7 outlines the duties of the Designated Biologist (myself). Among other things, the Designated Biologist advises the Construction/Operation Manager on biological resource conditions, conducts mitigation, monitoring and biological compliance efforts, and marks and inspects sensitive areas. In short, the Designated Biologist works with El Segundo Plant staff to ensure that the El Segundo Energy Center Project operates according to the biological resources Conditions of Certification.

The purpose of the survey was to ensure the continued protection of sensitive resources. The survey was conducted by MBC Biological Monitors Jennifer Rankin and Alyssa Eszlinger. Monitors surveyed the areas around the units, the western road and seaward side of the berm at the South Parking Lot (along 45th Street).

Results

Two abandoned nests are still visible in the cable rack along the wall adjacent to the administration buildings (Figure 1). The abandoned nests were first observed during the December 26th 2017 monitoring event. Neither nest showed signs of recent activity, including old or fresh fecal matter, and there were no birds nearby during the survey. The nests were situated approximately 15-20 feet apart from each other. An updated photograph of the better constructed of the two nests is shown in Figure 2.

Monitors observed two American crows (*Corvus brachyrhynchos*) roosting on a lamp post in the south parking lot. A few small song birds identified as finches were observed in the trees lining 45th Street. Spittlebug egg cases were seen in approximately five percent of plants during the walk through, otherwise the monitors noted that the trees and bushes all looked healthy.

Discussion

No plants or birds listed as threatened or endangered by the federal or state governments were observed during the survey. Two nests were observed, but neither appeared active or showed evidence of recent or old fecal matter. There was no evidence that mammals are using the project site (i.e., no tracks, scat, fur, etc.). The roadways, parking lots and vegetated areas within the plant were very clean and housekeeping measures appear to be successful.

Please let me know if you have any questions or comments.

Sincerely,

MBC Aquatic Sciences

A handwritten signature in blue ink, appearing to read 'Shane Beck', is positioned above the printed name.

Shane Beck
Principal Scientist / Designated Biologist



Figure 1. Cable rack and location of the two nests.



Figure 2. Abandoned nest.



May 11, 2018

Steve Odabashian
NRG El Segundo Operations Inc.
301 Vista del Mar
El Segundo, California 90245
(310) 615-6331

Progress Report

El Segundo Energy Center, Designated Biologist
P.O. 4501812194

Dear Mr. Odabashian,

The following is a summary of the biological survey conducted April 9, 2018 as part of the Condition of Certification BIO-7 for the El Segundo Energy Center Project. Condition BIO-7 outlines the duties of the Designated Biologist (myself). Among other things, the Designated Biologist advises the Construction/Operation Manager on biological resource conditions, conducts mitigation, monitoring and biological compliance efforts, and marks and inspects sensitive areas. In short, the Designated Biologist works with El Segundo Plant staff to ensure that the El Segundo Energy Center Project operates according to the biological resources Conditions of Certification.

The purpose of the survey was to ensure the continued protection of sensitive resources. The survey was conducted by MBC Biological Monitors Jennifer Rankin and Alyssa Eszlinger. Monitors surveyed the areas around the units, the western road and seaward side of the berm at the South Parking Lot (along 45th Street).

Results

Two abandoned nests are still visible in the cable rack along the wall adjacent to the administration buildings (Figure 1). The abandoned nests were first observed during the December 26th 2017 monitoring event. Neither nest showed signs of recent activity, including old or fresh fecal matter, and there were no birds nearby during the survey. The nests were situated approximately 15-20 feet apart from each other. No new photos were taken of the nests as there has been no activity.

Monitors observed two rock doves (*Columba livia*) that had been roosting on the northern most unit, one whimbrel (*Numenius phaeopus*) in the shrubbery that flew towards the beach, and three house finches (*Carpodacus mexicanus*) in the bushes.

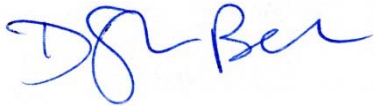
Discussion

There were no plants or birds listed as threatened or endangered by the federal or state governments that were observed during the survey. No active nests were observed onsite. There was no evidence that mammals are using areas within the facility grounds (i.e., no tracks, scat/droppings, fur, etc.). The roadways, parking lots and vegetated areas within the plant were very clean and housekeeping measures appear to be successful.

Please let me know if you have any questions or comments.

Sincerely,

MBC Aquatic Sciences



Shane Beck
Principal Scientist / Designated Biologist



Figure 1. Cable rack and location of the two nests.



June 20, 2018

Steve Odabashian
NRG El Segundo Operations Inc.
301 Vista del Mar
El Segundo, California 90245
(310) 615-6331

Progress Report

El Segundo Energy Center, Designated Biologist
P.O. 4501812194

Dear Mr. Odabashian,

The following is a summary of the biological survey conducted May 17, 2018 as part of the Condition of Certification BIO-7 for the El Segundo Energy Center Project. Condition BIO-7 outlines the duties of the Designated Biologist (myself). Among other things, the Designated Biologist advises the Construction/Operation Manager on biological resource conditions, conducts mitigation, monitoring and biological compliance efforts, and marks and inspects sensitive areas. In short, the Designated Biologist works with El Segundo Plant staff to ensure that the El Segundo Energy Center Project operates according to the biological resources Conditions of Certification.

The purpose of the survey was to ensure the continued protection of sensitive resources. The survey was conducted by MBC Biological Monitors Jennifer Rankin and Amanda Ramshaw. Monitors surveyed the areas around the units, the western road and seaward side of the berm at the South Parking Lot (along 45th Street).

Results

Two abandoned nests are still visible in the cable rack along the wall adjacent to the administration buildings (Figure 1). The abandoned nests were first observed during the December 26th, 2017 monitoring event. Neither nest showed signs of recent activity, including old or fresh fecal matter (Figures 2 & 3), and there were no birds nearby during the survey. The nests were situated approximately 15-20 feet apart from each other.

Monitors observed one American crow (*Corvus brachyrhynchos*), some American robins (*Turdus migratorius*), and some passerines that were unable to be clearly identified as they flew through the area. Monitors noted that the landscaping and foliage seem to be growing in and healthy (Figure 4).

Discussion

There were no plants or birds listed as threatened or endangered by the federal or state governments that were observed during the survey. No active nests were observed onsite. There was no evidence that mammals are using areas within the facility grounds (i.e., no tracks, scat/droppings, fur, etc.). The roadways, parking lots and vegetated areas within the plant were very clean and housekeeping measures appear to be successful.

Please let me know if you have any questions or comments.

Sincerely,

MBC Aquatic Sciences



Shane Beck
Principal Scientist / Designated Biologist



Figure 1. Cable rack and location of the two nests.



Figure 2. Old nest.



Figure 3. Old nest.



Figure 4. Healthy landscaping.



October 9, 2018

Steve Odabashian
El Segundo Operations Inc.
301 Vista del Mar
El Segundo, California 90245
(310) 615-6331

Progress Report

El Segundo Energy Center, Designated Biologist
P.O. 4501812194

Dear Mr. Odabashian,

The following is a summary of the biological survey conducted October 2, 2018 as part of the Condition of Certification BIO-7 for the El Segundo Energy Center Project. Condition BIO-7 outlines the duties of the Designated Biologist (myself). Among other things, the Designated Biologist advises the Construction/Operation Manager on biological resource conditions, conducts mitigation, monitoring and biological compliance efforts, and marks and inspects sensitive areas. In short, the Designated Biologist works with El Segundo Plant staff to ensure that the El Segundo Energy Center Project operates according to the biological resources Conditions of Certification.

The purpose of the survey was to ensure the continued protection of sensitive resources. The survey was conducted by MBC Biological Monitors Jennifer Rankin and Shannon Eminhizer. Monitors surveyed the areas around the units, the western road and seaward side of the berm at the South Parking Lot (along 45th Street).

Results

Since surveys performed since December 26, 2017, MBC monitors have been checking two abandoned nests in the cable rack along the wall adjacent to the administration buildings (Figure 1). The better-constructed nest now has an egg inside of it that was not present during the last survey conducted on May 17, 2018 (Figure 2 and Figure 4).

The nest with the egg in it still appears to be in the same state of construction, as during previous surveys when compared to photographs. The nest itself is situated in the section of the rack labeled as W00PT9003 E 00CT9003 and is approximately six inches in diameter, primarily constructed of twigs with other items such as twine and feathers as well. There was no sign of fresh or old fecal matter on the nest or surrounding it, however, the monitors did not want to disturb the nesting area and made observations from a distance of one foot. It was unclear if the egg is viable or if the nest is truly active, there

were no birds seen tending the nest during the survey. But the egg did appear clean, and not dusted or dirty as though it were sitting without tend. The more poorly constructed nest was still present but abandoned, and is situated two rack sections to the east, or approximately 15-20 feet from the nest with the egg (Figure 3).

Monitors observed one small raptor, from a distance identified as an American kestrel (*Falco sparverius*) perched on the top of a concrete light post located near the seawall in the southern end of the plant footprint, by the vegetated area (Figure 5). One house finch (*Carpodacus mexicanus*) and other passerines were observed in a tree along 45th Street. Scat from a small mammal was observed on the pavement of the ramp leading to the south, visitor parking lot; based on the size and lack of certain contents like berries or fur it was expected to either be cat or raccoon scat.

Discussion

There were no plants or birds listed as threatened or endangered by the federal or state governments that were observed during the survey. One of the two nests MBC has been monitoring now has an egg, but it is still unclear whether or not the nest is active. MBC will try to schedule the last biological monitoring survey for 2018 in December to check on the activity of the nest. The second nest has been inactive since its original observation. There was evidence that small mammals, possibly raccoons or cats have been present within the grounds based on scat observations. The roadways, parking lots and vegetated areas within the plant were very clean and housekeeping measures appear to be successful.

Please let me know if you have any questions or comments.

Sincerely,

MBC Aquatic Sciences



Shane Beck
Principal Scientist / Designated Biologist



Figure 1. Cable rack and location of the two nests.



Figure 2. Original picture of the better constructed nest.



Figure 3. Original of poorly constructed adjacent nest.



Figure 4. Better constructed nest with egg.



Figure 5. Raptor perched on light post near the vegetated area.



January 8, 2019

Steve Odabashian
NRG El Segundo Operations Inc.
301 Vista del Mar
El Segundo, California 90245
(310) 615-6331

Progress Report

El Segundo Energy Center, Designated Biologist
P.O. 4501812194

Dear Mr. Odabashian,

The following is a summary of the biological survey conducted December 10, 2018 as part of the Condition of Certification BIO-7 for the El Segundo Energy Center Project. Condition BIO-7 outlines the duties of the Designated Biologist (myself). Among other things, the Designated Biologist advises the Construction/Operation Manager on biological resource conditions, conducts mitigation, monitoring and biological compliance efforts, and marks and inspects sensitive areas. In short, the Designated Biologist works with El Segundo Plant staff to ensure that the El Segundo Energy Center Project operates according to the biological resources Conditions of Certification.

The purpose of the survey was to ensure the continued protection of sensitive resources. The survey was conducted by MBC Biological Monitors Jennifer Rankin and Shannon Eminhizer. Monitors surveyed the areas around the units, the western road and seaward side of the berm at the South Parking Lot (along 45th Street).

Results

Since December 26, 2017, MBC monitors have been checking two nests in the cable rack along the wall adjacent to the administration buildings (Figure 1). The better-constructed nest was found to have an egg during the October 2, 2018 survey that was not there previously. During the December 2018 survey monitors observed that the egg had been broken but remained in the nest (Figure 2). Due to the absence of any discernable fecal matter, there was no evidence that the nest had contained a live hatchling or constant parental tending at any point.

The nest with the egg in it still appears to be in the same state of construction, as during previous surveys when compared to photographs. The nest itself is situated in the section of the rack labeled as W00PT9003 E 00CT9003 and is approximately six inches in diameter, primarily constructed of twigs with other items such as twine and feathers as

well. The second, more poorly constructed nest, was still present but abandoned, and is situated two rack sections to the east, or approximately 15-20 feet from the nest with the egg (Figure 3).

The only wildlife observed during the December survey was one small one small raptor, seen from a distance and identified as an American kestrel (*Falco sparverius*) perched on the top of a concrete light post (Figure 4).

Discussion

There were no plants or birds listed as threatened or endangered by the federal or state governments that were observed during the survey. One of the two nests MBC has been monitoring possesses a broken egg, with no further signs of activity. The second nest has been inactive since its original observation. The roadways, parking lots and vegetated areas within the plant were very clean and housekeeping measures appear to be successful. This survey marks the last of 2018 for biological monitoring.

Please let me know if you have any questions or comments.

Sincerely,

MBC Aquatic Sciences



Shane Beck
Principal Scientist / Designated Biologist



Figure 1. Cable rack and location of the two nests.



Figure 2. Nest with cracked egg (image taken from a video of nest and egg area).



Figure 3. Poorly constructed nest, adjacent to that shown in Figure 2.



Figure 4. American kestrel perched on light post near the vegetated area.

ATTACHMENT E

GEO-4: Annual Shoreline Monitoring Assessment Report

Condition Verification Summary:

Condition requires ESEC to submit, as part of the Annual Compliance Report, the results of the 10 Year Shoreline Monitoring Assessment and access erosion on the beach area assessment to the Energy Commission, California Coastal Commission, and the City of El Segundo. The tenth annual report shall contain the final report.

ESEC Submission:

ESEC conducted the Shoreline Monitoring Assessment quarterly during 2018. The Quarterly and Eighth Annual Shoreline Monitoring Assessment Report is provided herein.

El Segundo Energy Center LLC
NRG Energy, Inc.
Quarterly Beach Survey for El Segundo Generating Station

To: Steven Odabashian and George Piantka
From: Chia-Chi Lu
Date: March 20, 2018
RE: First Quarterly El Segundo Beach Monitoring Survey in 2018
CC: Scott Seipel and Srie Coustar

A beach monitoring program, as required by the California Energy Commission, was implemented to assess any potential impacts on the beach conditions at El Segundo Beach for the El Segundo Energy Center Project. The beach monitoring program primarily focuses on beach profile surveys of various onshore/offshore shore-normal transects every few hundred feet four (4) times per year. The program also includes the submittal of annual report documenting the conducted four surveys and variation of shoreline conditions at El Segundo Beach. This beach monitoring program that commenced in 2011 is in the eighth year.

The first quarterly survey of this beach monitoring program in 2018 was conducted on March 8 and 9 respectively. The March 2018 survey was based on the following procedures:

- Applied the previously established survey baseline and transect locations for the shore-normal beach profile survey. In total, 15 transect lines were selected from South Dockweiler Beach to El Porto, as illustrated in Figure 1. Transect locations spacing in several hundred feet are at historic transect lines that were previously used by the County of Los Angeles and the Corps of Engineers.
- Conducted a wading survey on March 8, 2018 using a Leica TCR404 Total Station, extending from the bike path to the surf zone. In addition, six sediment samples were also collected along three transects at the MLLW and MHW positions, respectively.
- Collected the offshore bathymetry soundings on March 9, 2018 extending from the surf zone that overlapped the wading survey limit to approximately 4,000 feet offshore. Horizontal positions and soundings were acquired using the Trimble GPS receiver and the Innerspace Depth Sounder, respectively.
- Performed data processing to merge the wading and hydrographic survey data and generated beach profiles for the 15 survey transects.

The repetitive surveyed beach profiles at the selected 15 transects for this quarterly survey along with the December 2017 survey are shown in Figures 2 to 16. The March 2018 survey compared to the December 2017 survey exhibits an eroded beach condition that typically results from the

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 March 20, 2018

seasonal change of winter weather pattern. Six sand samples (two sediment samples per location) were also collected at three different locations on March 8, 2018, as also identified in Figure 1. At each location, one sand sample was collected on the foreshore face at the approximate Mean High Water (MHW) position and the other in the surf zone near the Mean Lower Low Water (MLLW) elevation. The collected sand samples were forwarded to a soil-testing laboratory for analysis of the sediment grain size distribution. Table 1 summarizes the grain size characteristics of individually sampled sediments, while Figures 17 to 22 respectively illustrate the deduced grain size distributions for the collected sand samples.

Table 1. Summary of Sediment Characteristics for samples collected on March 8, 2018

Sampling Location	Reference Elevation	Soil Type	D50 (mm)
Sta. 0+00	MHW	Poorly Graded Sand	0.33
Sta. 0+00	MLLW	Poorly Graded Sand	0.32
Sta. 30+00	MHW	Poorly Graded Sand	0.24
Sta. 30+00	MLLW	Poorly Graded Sand	0.24
Sta. 62+10	MHW	Poorly Graded Sand	0.21
Sta. 62+10	MLLW	Poorly Graded Sand	0.23

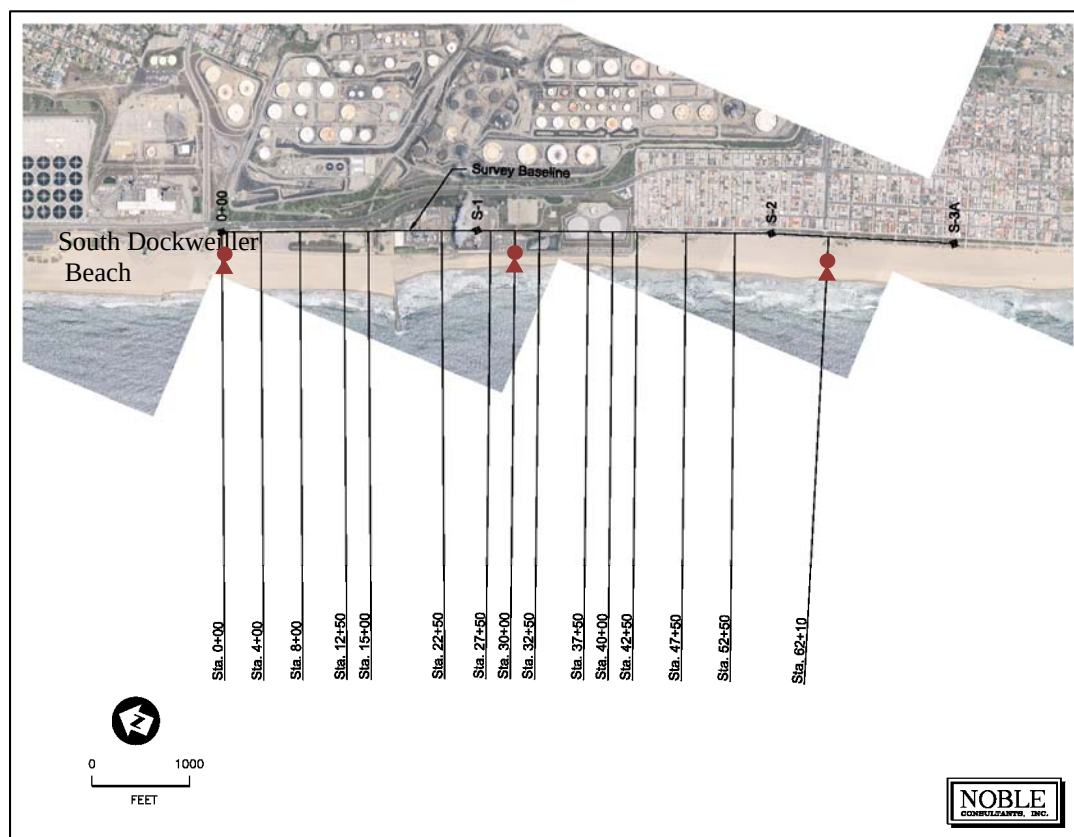


Figure 1. Surveyed Transect and Sediment Sampling Locations

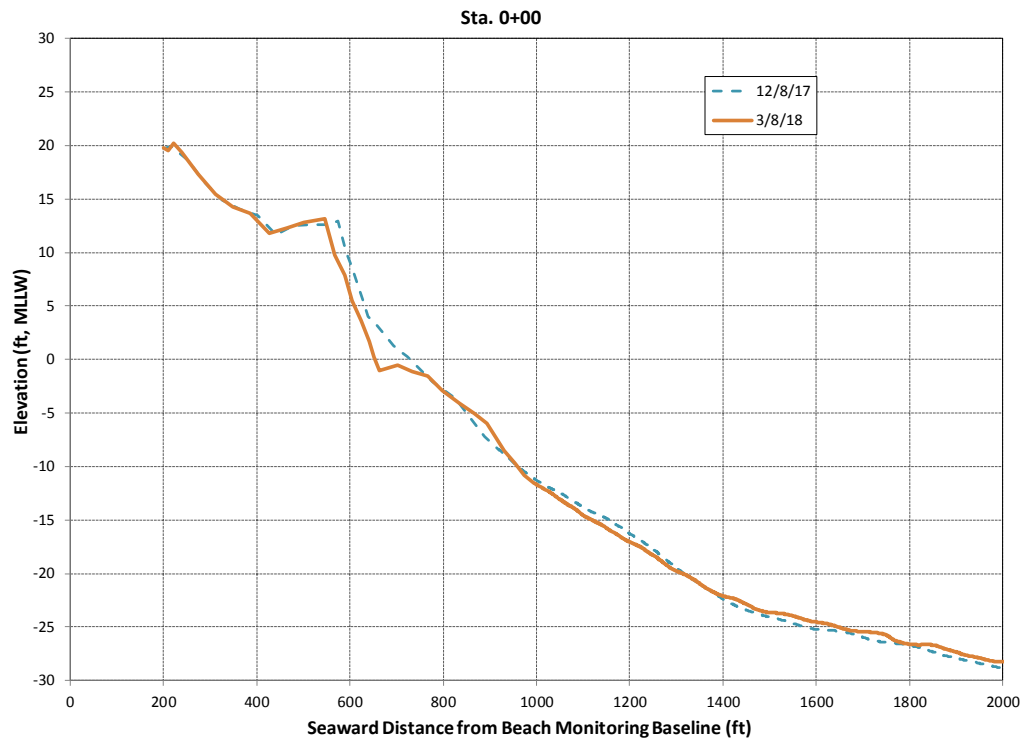


Figure 2. Surveyed Beach Profile at Station 0+00

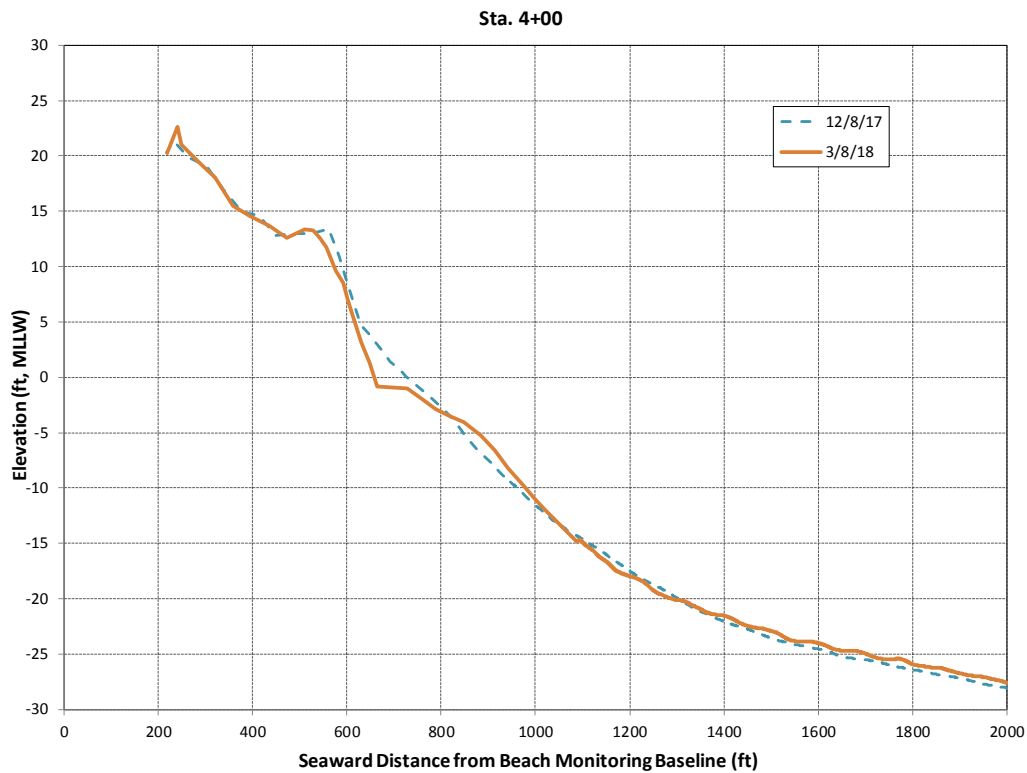


Figure 3. Surveyed Beach Profile at Station 4+00

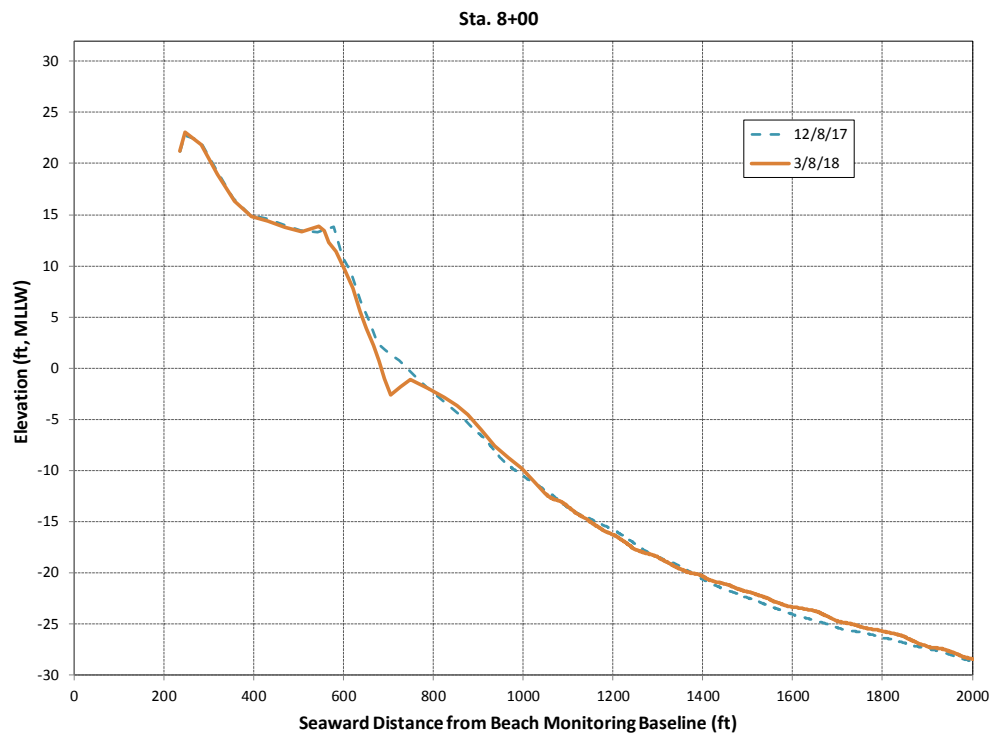


Figure 4. Surveyed Beach Profile at Station 8+00

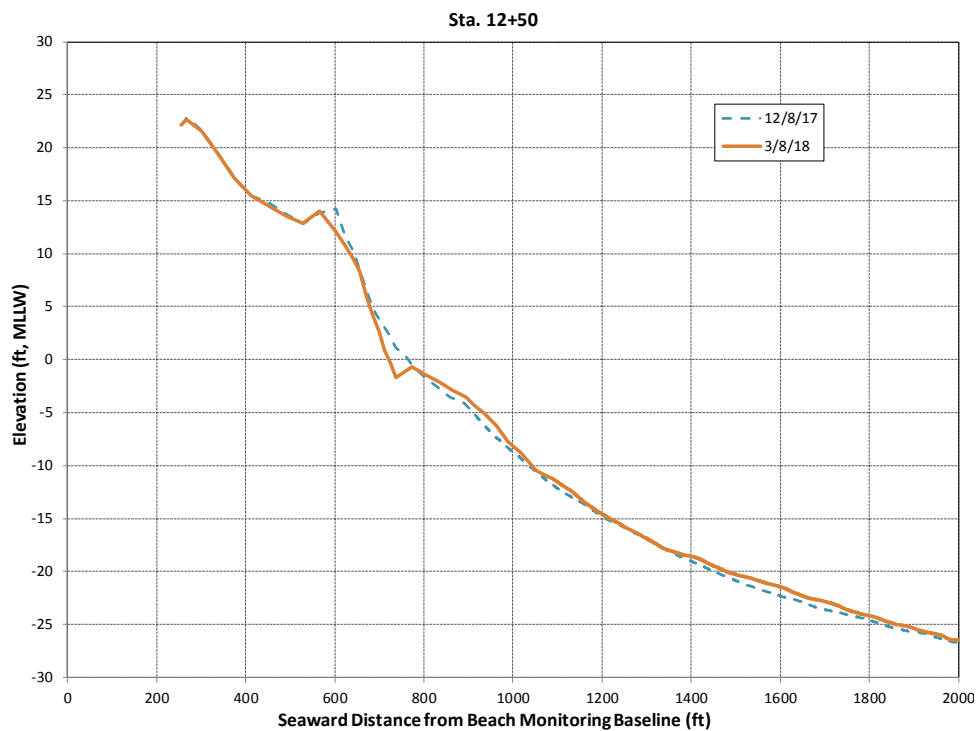


Figure 5. Surveyed Beach Profile at Station 12+50

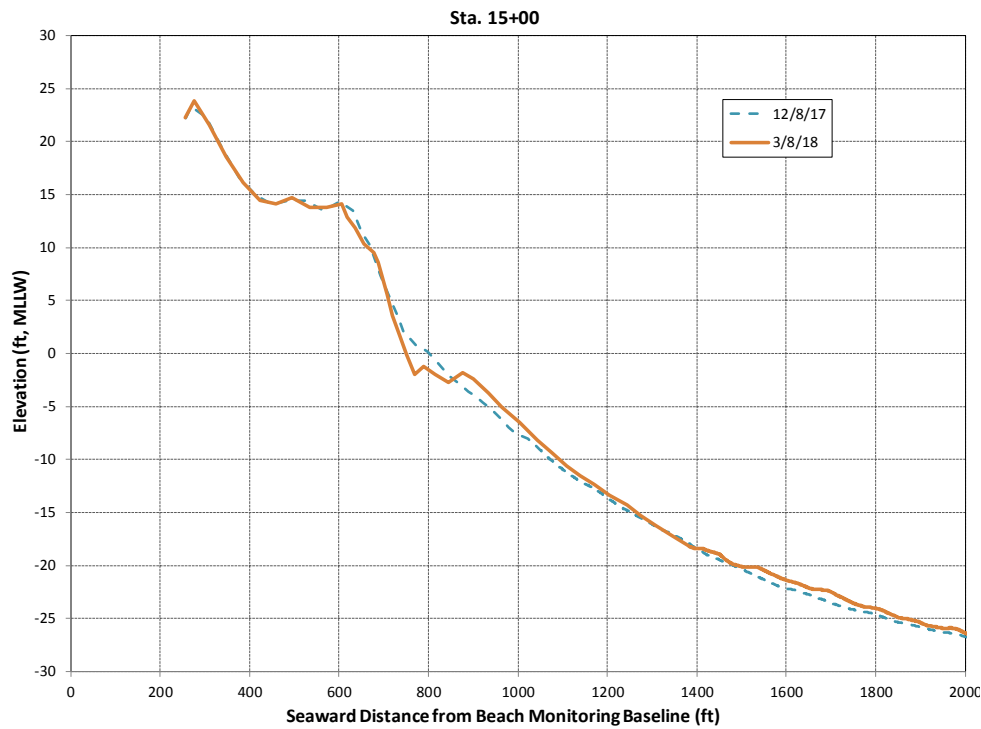


Figure 6. Surveyed Beach Profile at Station 15+00

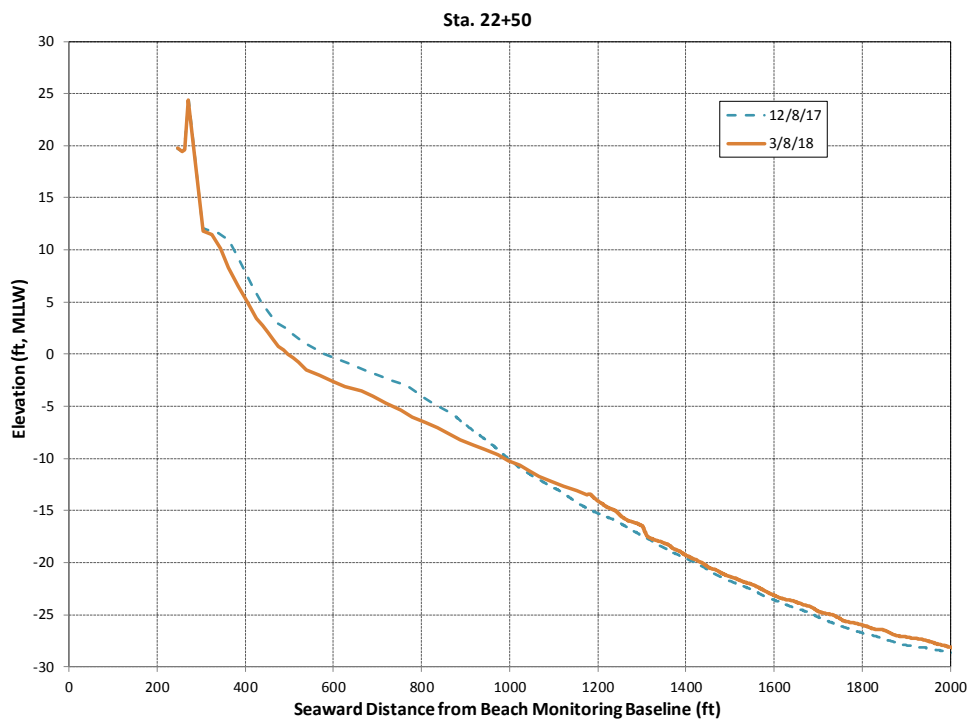


Figure 7. Surveyed Beach Profile at Station 22+50

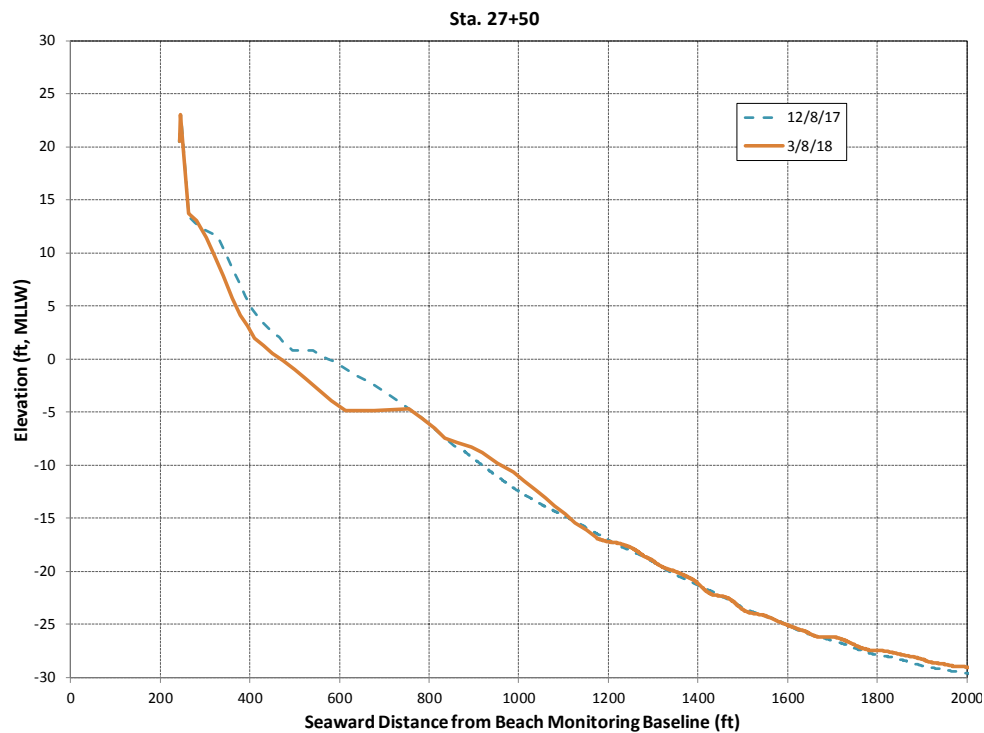


Figure 8. Surveyed Beach Profile at Station 27+50

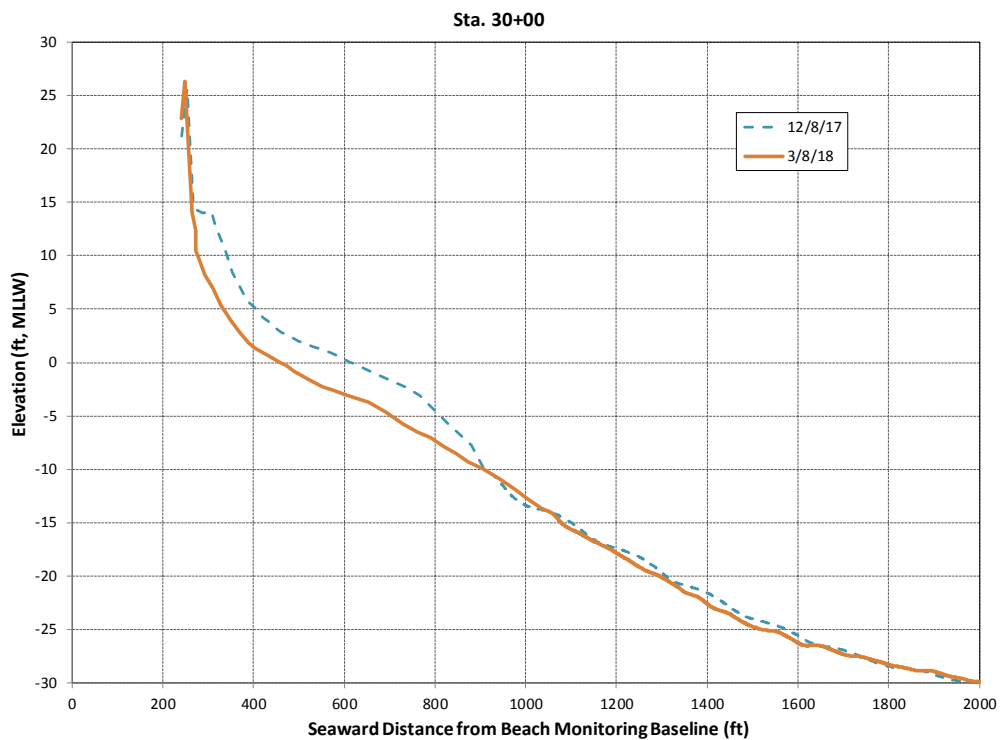


Figure 9. Surveyed Beach Profile at Station 30+00

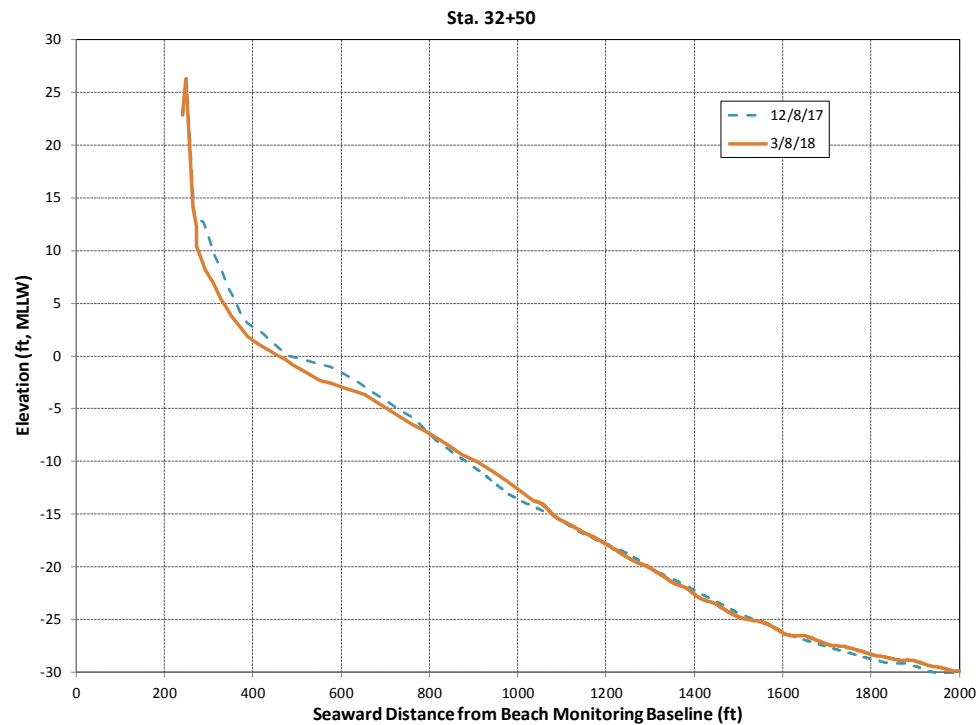


Figure 10. Surveyed Beach Profile at Station 32+50

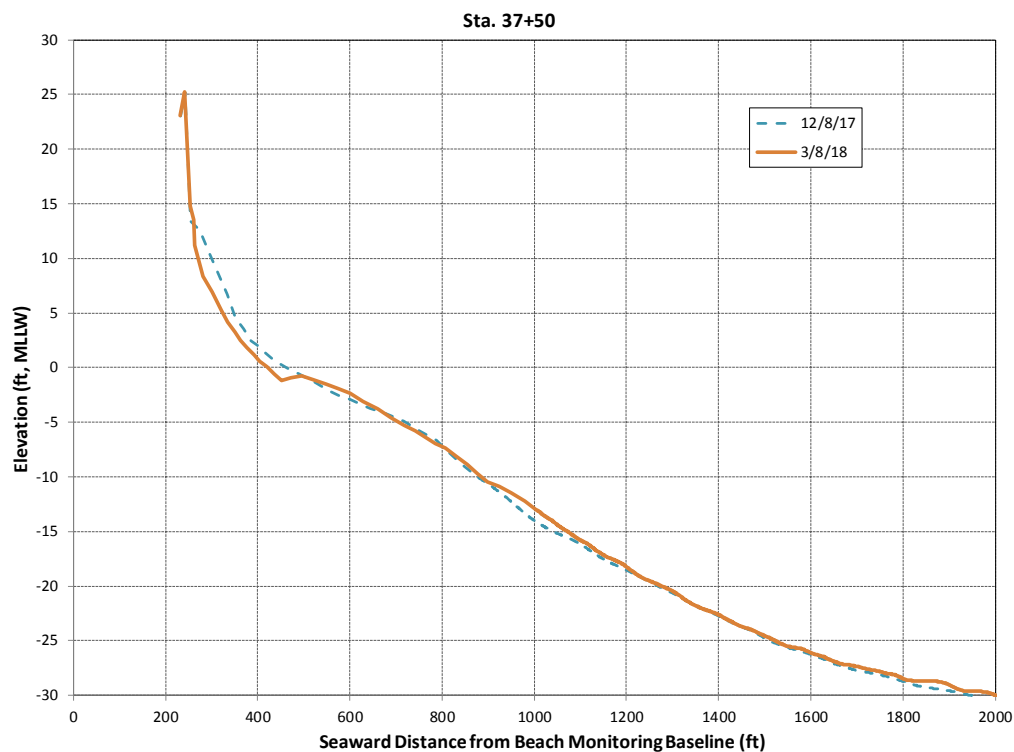


Figure 11. Surveyed Beach Profile at Station 37+50

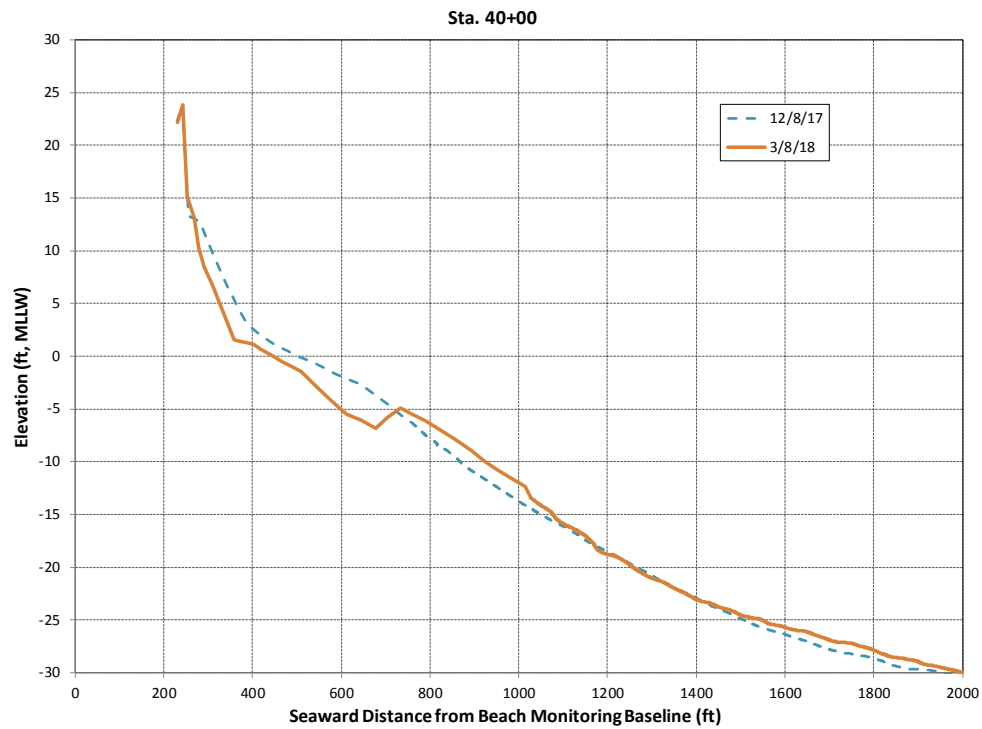


Figure 12. Surveyed Beach Profile at Station 40+00

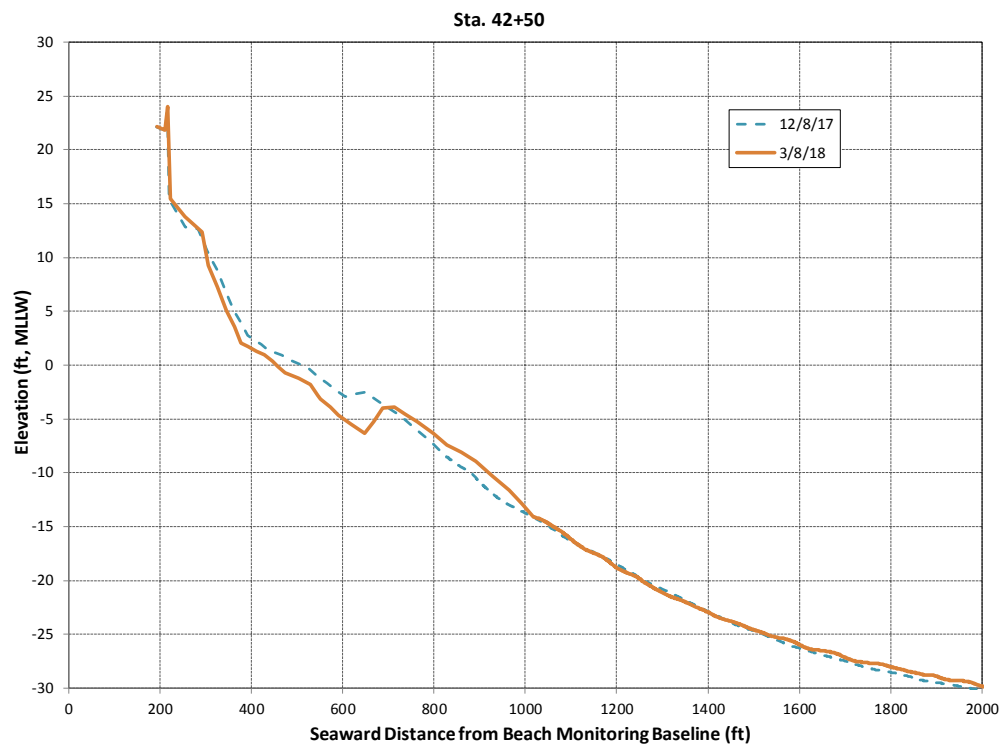


Figure 13. Surveyed Beach Profile at Station 42+50

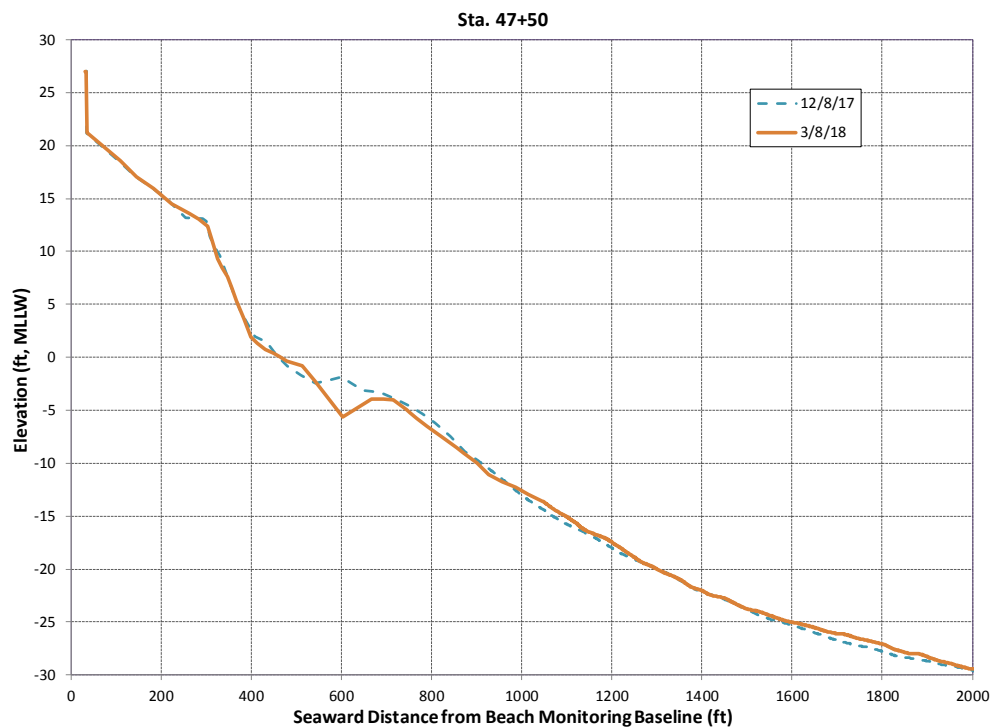


Figure 14. Surveyed Beach Profile at Station 47+50

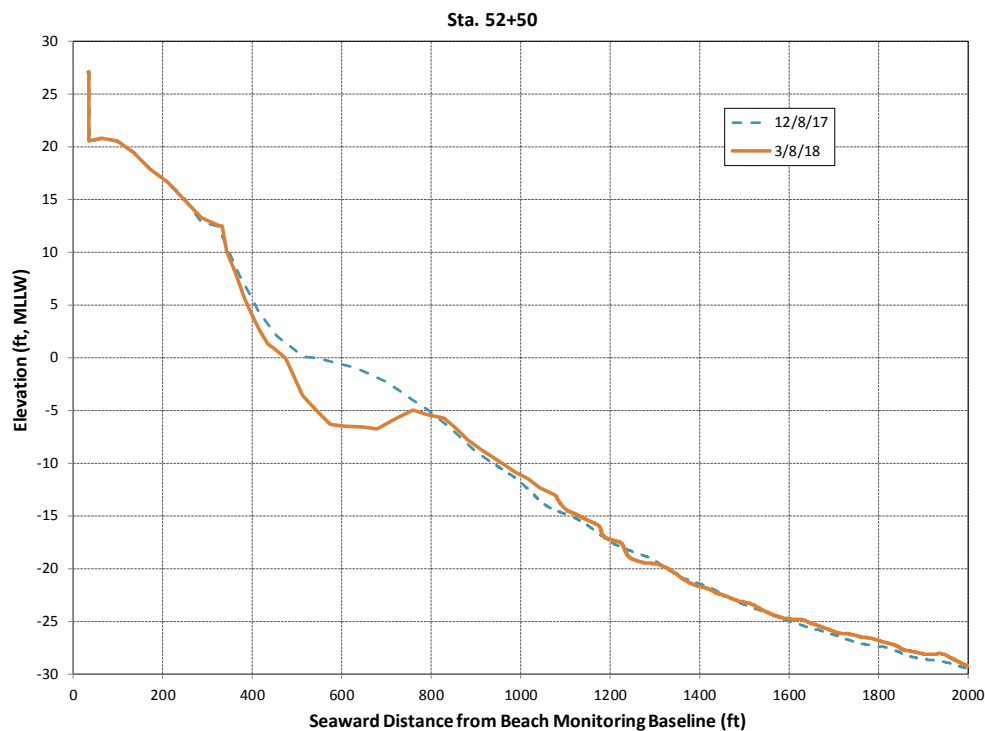


Figure 15. Surveyed Beach Profile at Station 52+50

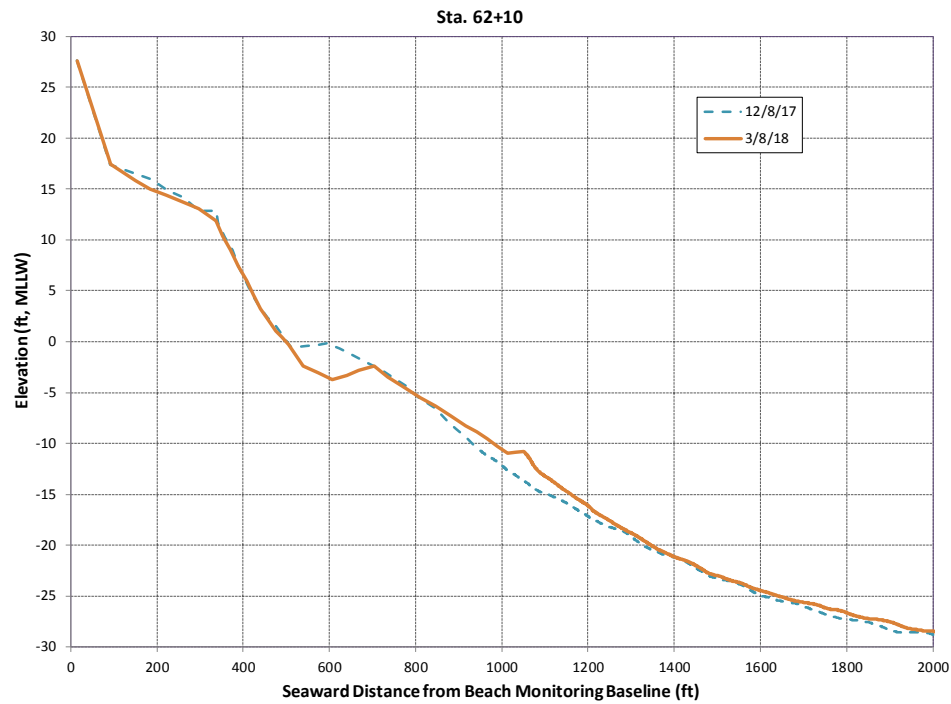


Figure 16. Surveyed Beach Profile at Station 62+10

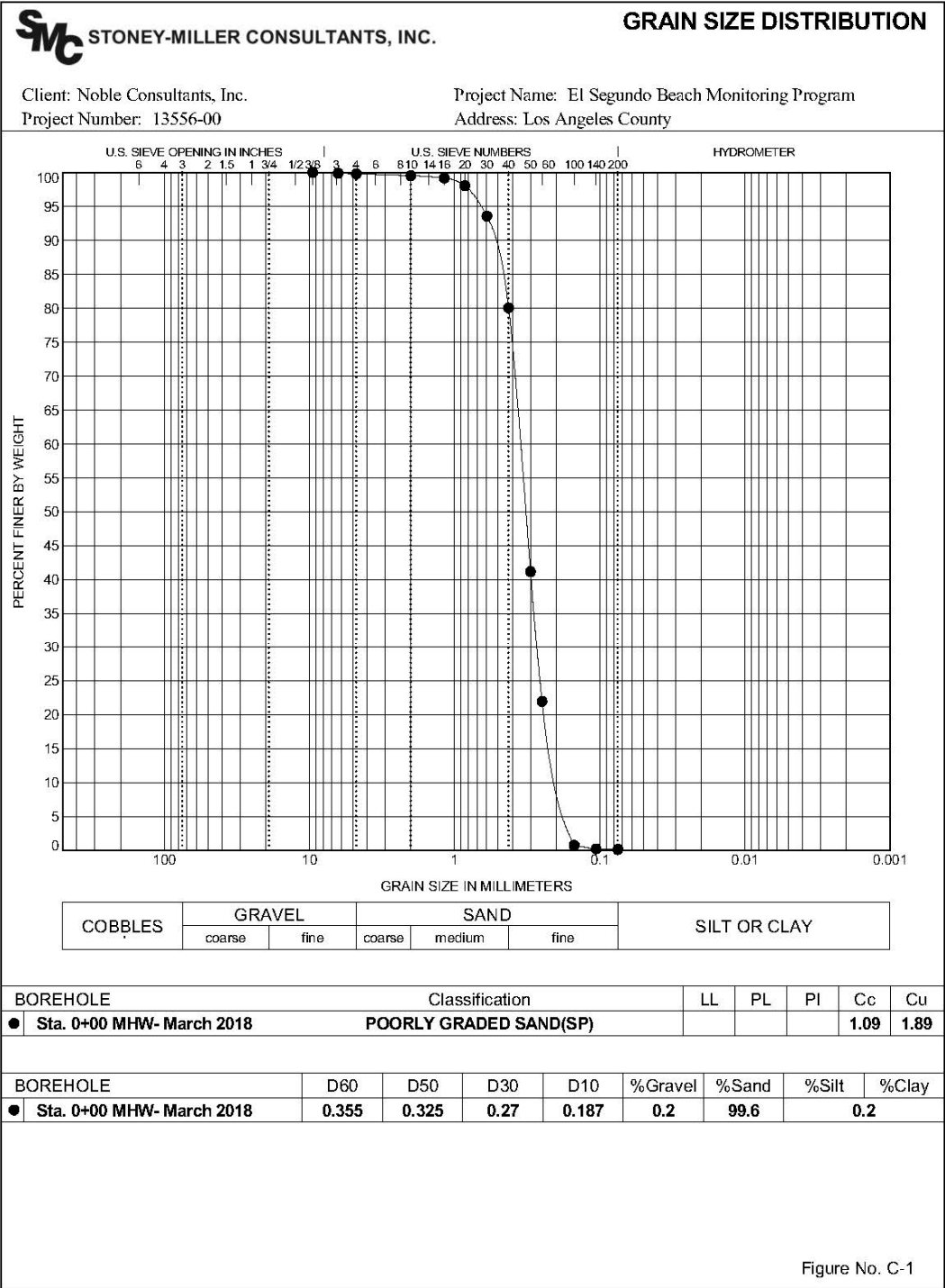


Figure 17. Grain Size Distribution at Sta. 0+00 MHW Line

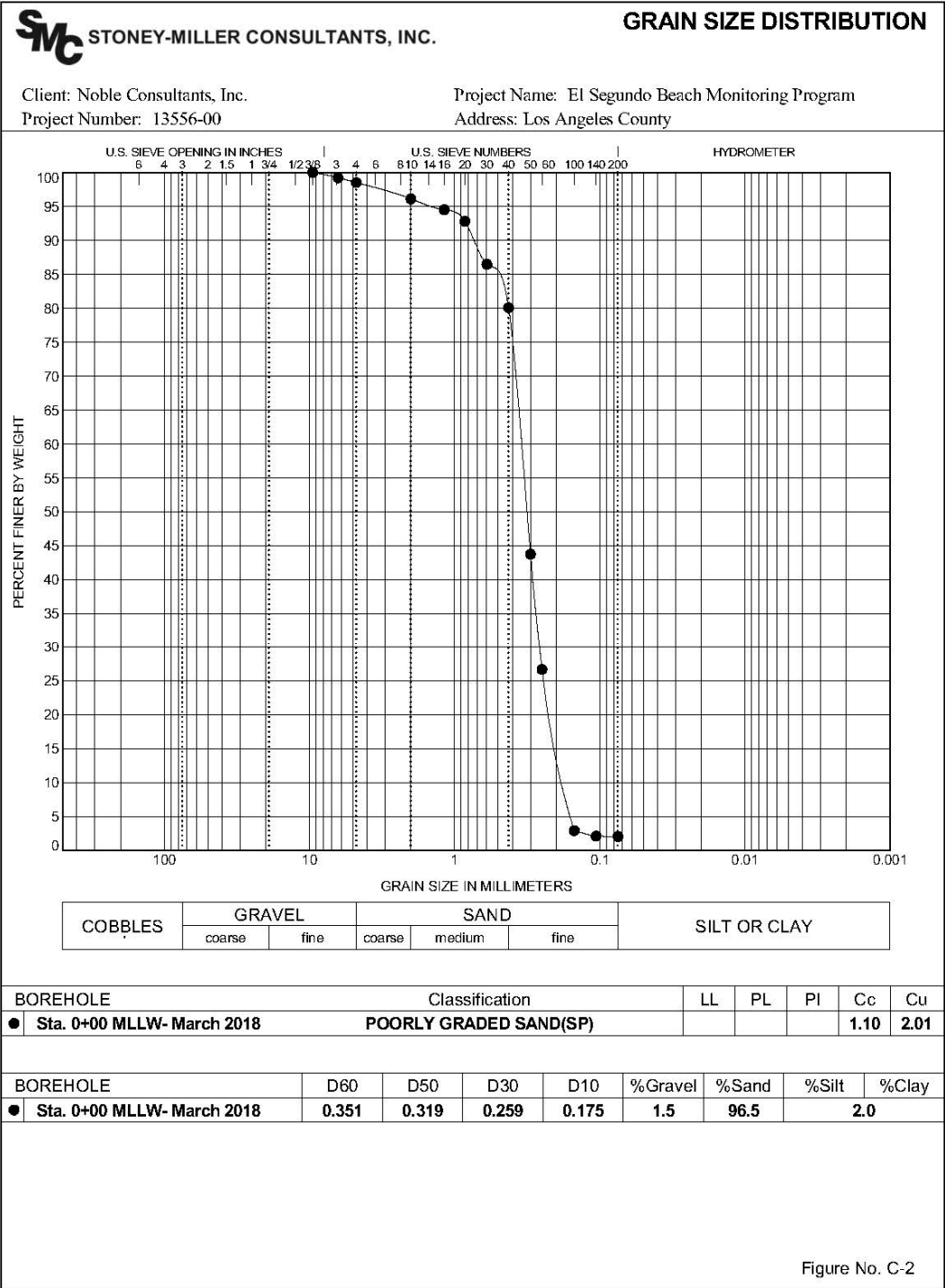


Figure 18. Grain Size Distribution at Sta. 0+00 MLLW Line

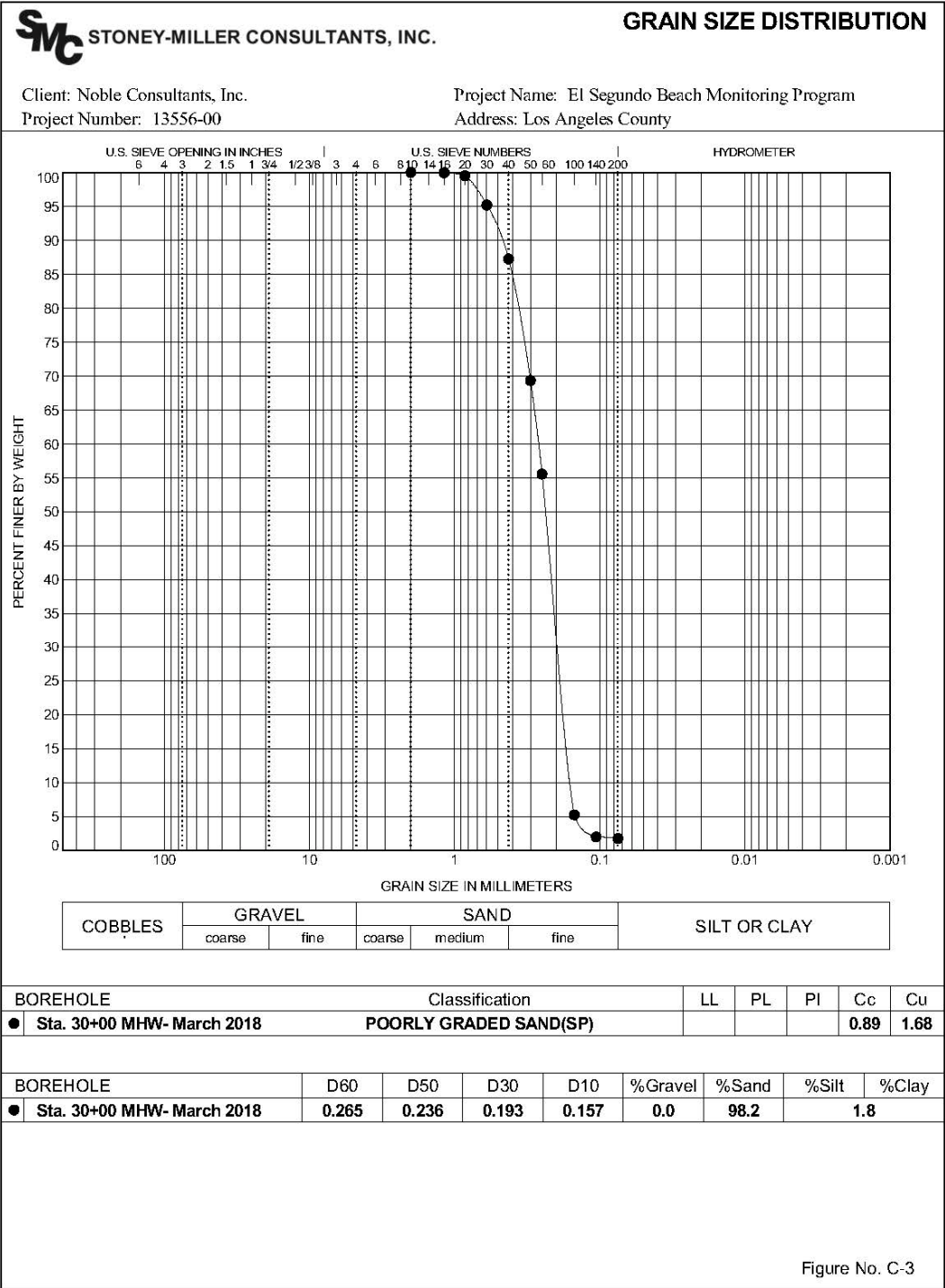


Figure 19. Grain Size Distribution at Sta. 30+00 MHW Line

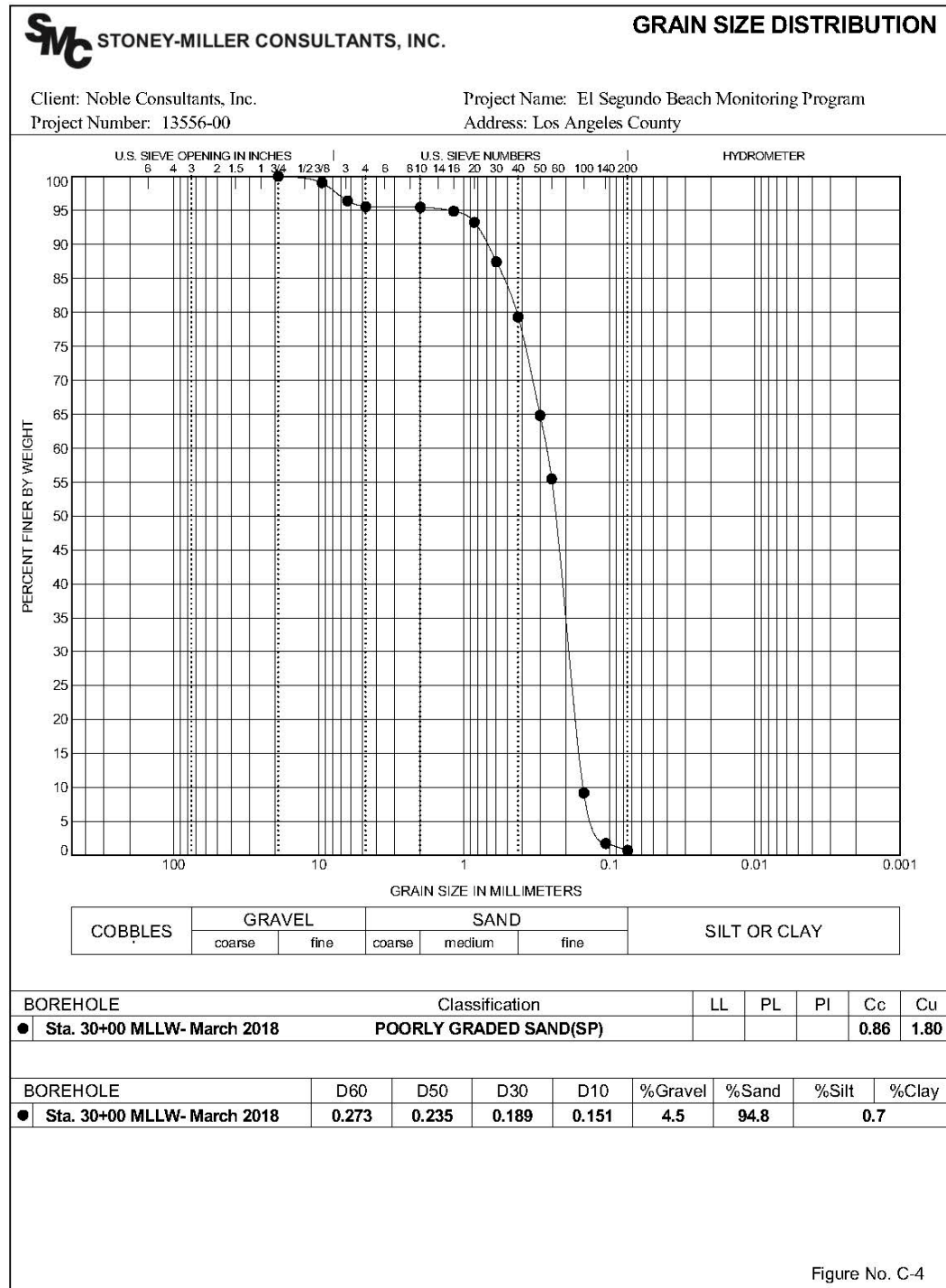


Figure 20. Grain Size Distribution at Sta. 30+00 MHW Line

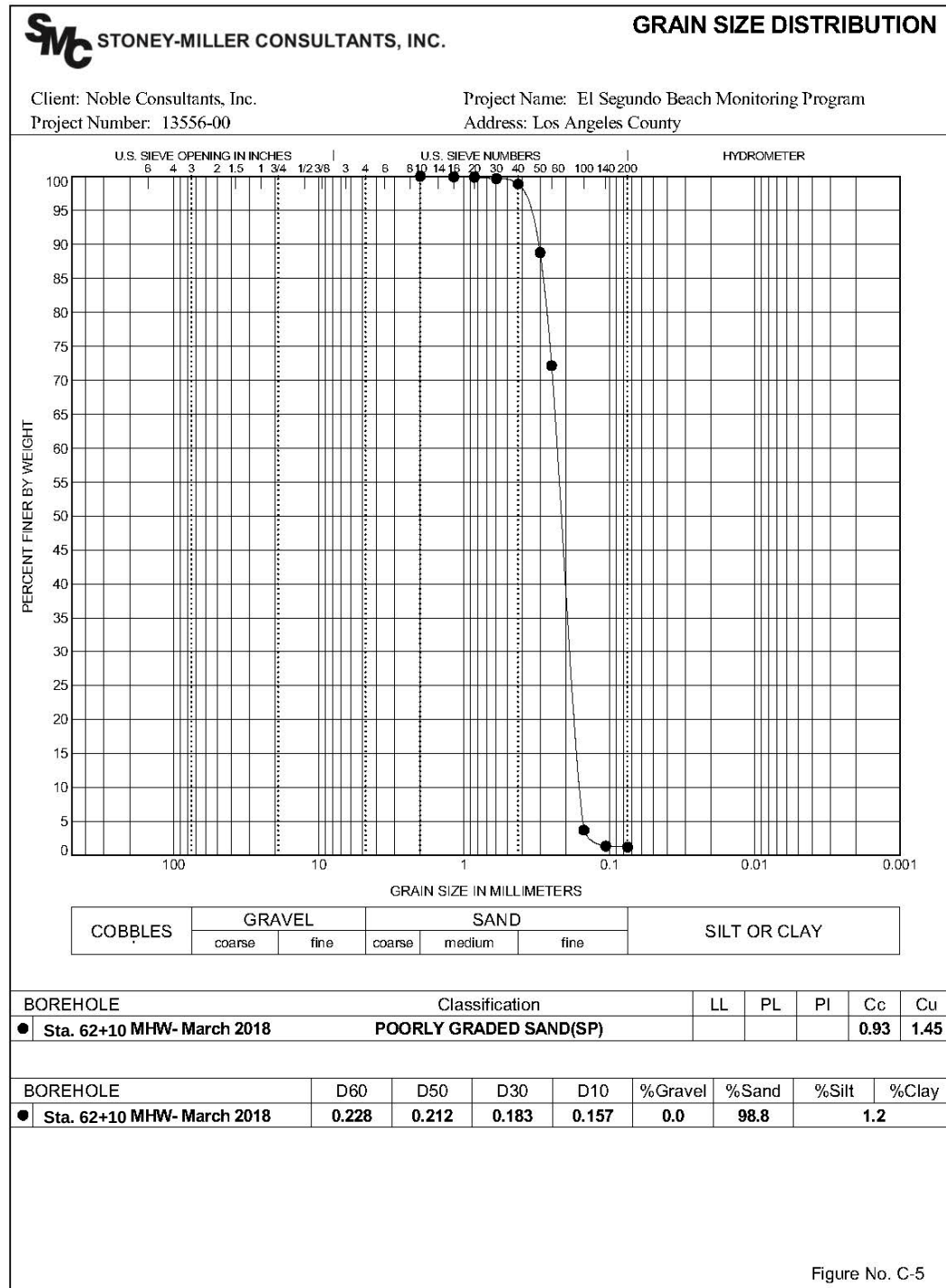


Figure 21. Grain Size Distribution at Sta. 62+10 MHW Line

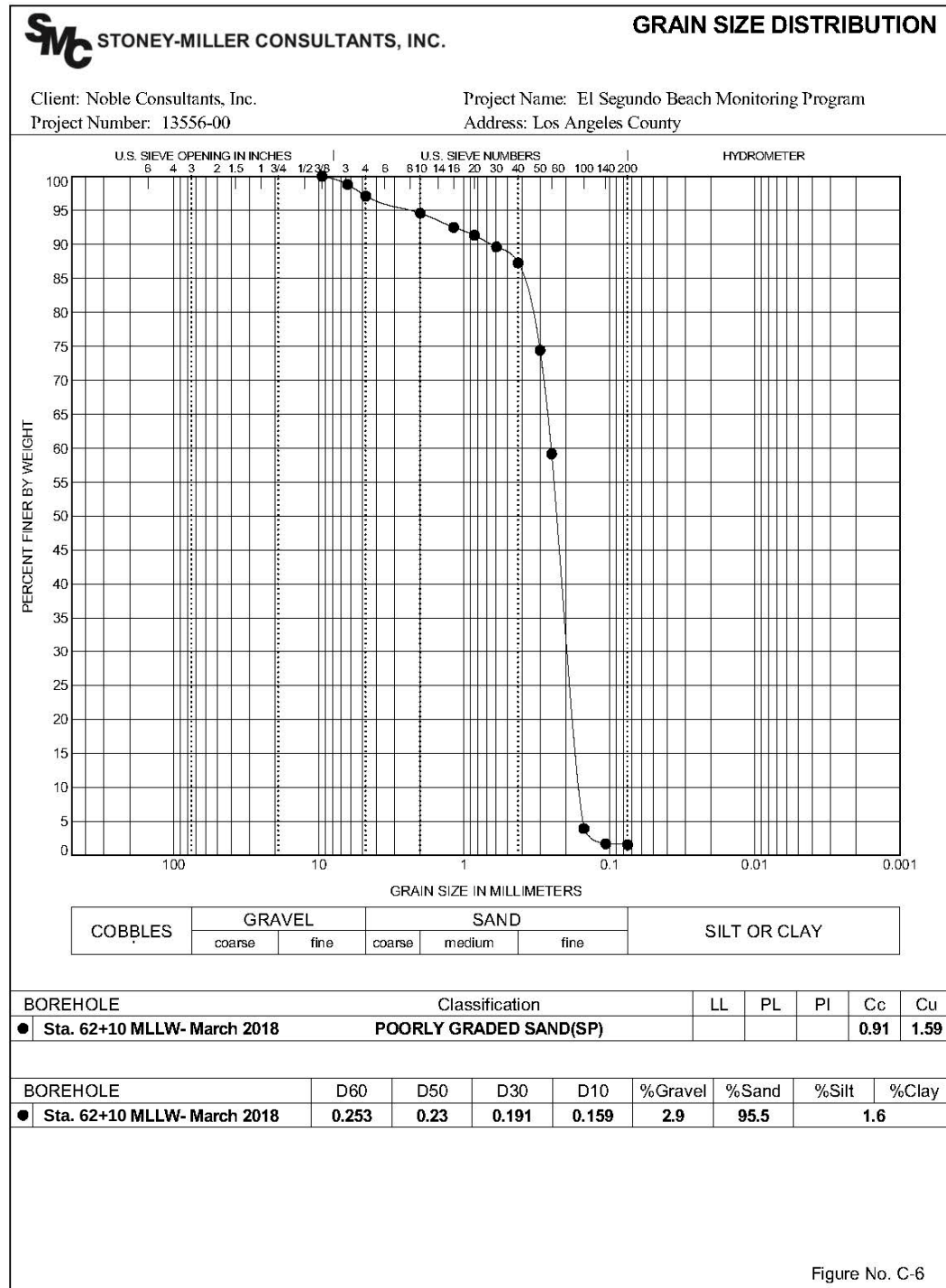


Figure 22. Grain Size Distribution at Sta. 62+10 MLLW Line

El Segundo Energy Center LLC
NRG Energy, Inc.
Quarterly Beach Survey for El Segundo Generating Station

To: Steven Odabashian and George Piantka
From: Chia-Chi Lu
Date: June 8, 2018
RE: Second Quarterly El Segundo Beach Monitoring Survey in 2018
CC: Scott Seipel and Srie Coustar

A beach monitoring program, as required by the California Energy Commission, was implemented to assess any potential impacts on the beach conditions at El Segundo Beach for the El Segundo Energy Center Project. The beach monitoring program primarily focuses on beach profile surveys of various onshore/offshore shore-normal transects every few hundred feet four (4) times per year. The program also includes the submittal of annual report documenting the conducted four surveys and variation of shoreline conditions at El Segundo Beach. This beach monitoring program that commenced in 2011 is in the eighth year.

The second quarterly survey of this beach monitoring program in 2018 was conducted between May 23 and May 25. The May 2018 survey was based on the following procedures:

- Applied the previously established survey baseline and transect locations for the shore-normal beach profile survey. In total, 15 transect lines were selected from South Dockweiler Beach to El Porto, as illustrated in Figure 1. Transect locations spacing in several hundred feet are at historic transect lines that were previously used by the County of Los Angeles and the Corps of Engineers.
- Conducted a wading survey on May 23 & 25, 2018 using a Leica TCR404 Total Station, extending from the bike path to the surf zone. In addition, six sediment samples were also collected along three transects at the MLLW and MHW positions, respectively.
- Collected the offshore bathymetry soundings on May 24, 2018 extending from the surf zone that overlapped the wading survey limit to approximately 4,000 feet offshore. Horizontal positions and soundings were acquired using the Trimble GPS receiver and the Innerspace Depth Sounder, respectively.
- Performed data processing to merge the wading and hydrographic survey data and generated beach profiles for the 15 survey transects.

The repetitive surveyed beach profiles at the selected 15 transects for this quarterly survey along with the December 2017 survey are shown in Figures 2 to 16. The May 2018 survey compared to

El Segundo Energy Center LLC
NRG Energy, Inc.
Quarterly Beach Survey for El Segundo Generating Station

To: Steven Odabashian and George Piantka
From: Chia-Chi Lu
Date: September 20, 2018
RE: Third Quarterly El Segundo Beach Monitoring Survey in 2018
CC: Scott Seipel and Srie Coustar

A beach monitoring program, as required by the California Energy Commission, was implemented to assess any potential impacts on the beach conditions at El Segundo Beach for the El Segundo Energy Center Project. The beach monitoring program primarily focuses on beach profile surveys of various onshore/offshore shore-normal transects every few hundred feet four (4) times per year. The program also includes the submittal of annual report documenting the conducted four surveys and variation of shoreline conditions at El Segundo Beach. This beach monitoring program that commenced in 2011 is in the eighth year.

The third quarterly survey of this beach monitoring program in 2018 was conducted on September 5 and 7, respectively. The September 2018 survey was based on the following procedures:

- Applied the previously established survey baseline and transect locations for the shore-normal beach profile survey. In total, 15 transect lines were selected from South Dockweiler Beach to El Porto, as illustrated in Figure 1. Transect locations spacing in several hundred feet are at historic transect lines that were previously used by the County of Los Angeles and the Corps of Engineers.
- Collected the offshore bathymetry soundings on September 5, 2018 extending from the surf zone that overlapped the wading survey limit to approximately 4,000 feet offshore. Horizontal positions and soundings were acquired using the Trimble GPS receiver and the Innerspace Depth Sounder, respectively.
- Conducted a wading survey on September 7, 2018 using a Leica TCR404 Total Station, extending from the bike path to the surf zone. In addition, six sediment samples were also collected along three transects at the MLLW and MHW positions, respectively.
- Performed data processing to merge the wading and hydrographic survey data and generated beach profiles for the 15 survey transects.

The three repetitive surveyed beach profiles at the selected 15 transects in 2018 along with the December 2017 survey are shown in Figures 2 to 16. The September 2018 survey shows the continuous recovery from winter/early spring eroded beach condition. Six sand samples (two

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 September 20, 2018

sediment samples per location) were respectively collected at three different locations on September 7, 2018, as also identified in Figure 1. At each location, one sand sample was collected on the foreshore face at the approximate Mean High Water (MHW) position and the other in the surf zone near the Mean Lower Low Water (MLLW) elevation. The collected sand samples were forwarded to a soil-testing laboratory for analysis of the sediment grain size distribution. Table 1 summarizes the grain size characteristics of individually sampled sediments, while Figures 17 to 22 respectively illustrate the deduced grain size distributions for the collected sand samples.

Table 1. Summary of Sediment Characteristics for samples collected on September 7, 2018

Sampling Location	Reference Elevation	Soil Type	D50 (mm)
Sta. 0+00	MHW	Poorly Graded Sand	0.33
Sta. 0+00	MLLW	Poorly Graded Sand	0.33
Sta. 30+00	MHW	Poorly Graded Sand	0.26
Sta. 30+00	MLLW	Poorly Graded Sand	0.20
Sta. 62+10	MHW	Poorly Graded Sand	0.27
Sta. 62+10	MLLW	Poorly Graded Sand	0.22

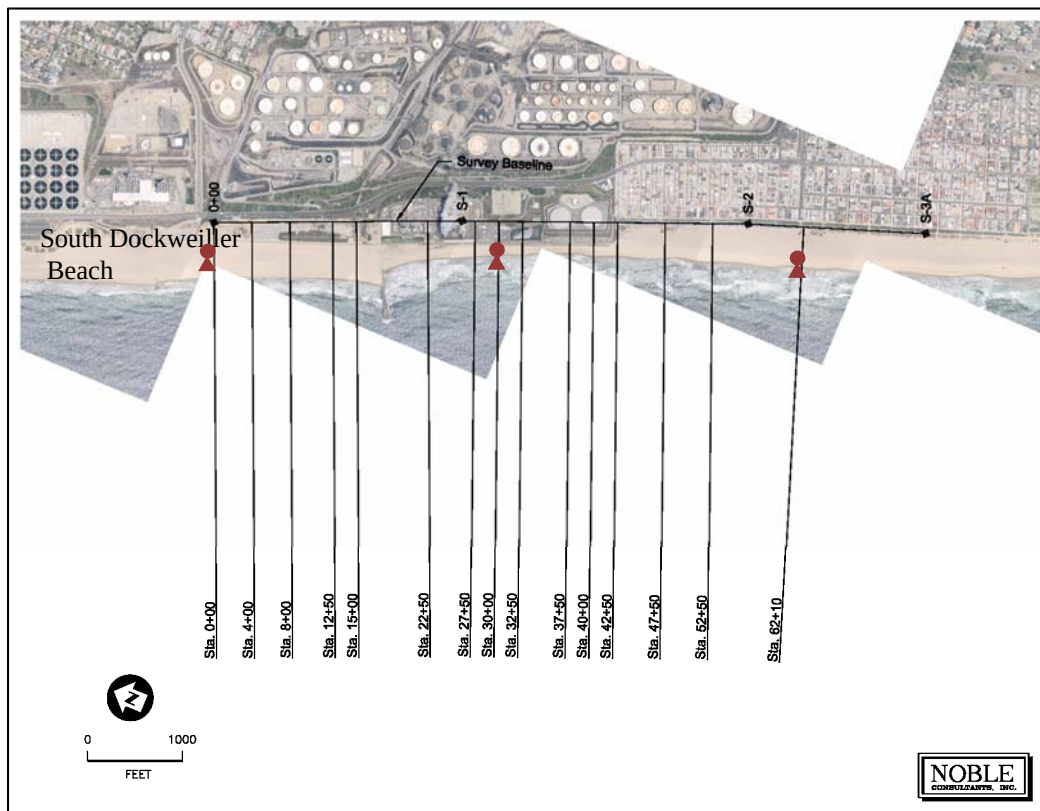
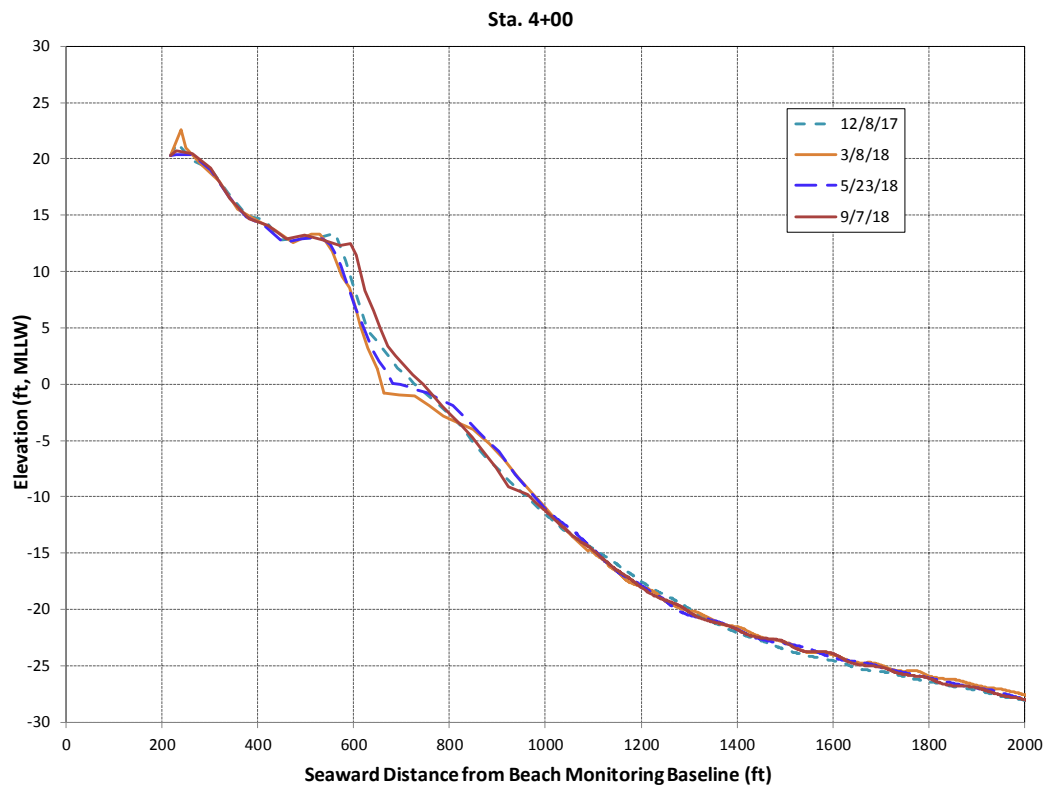
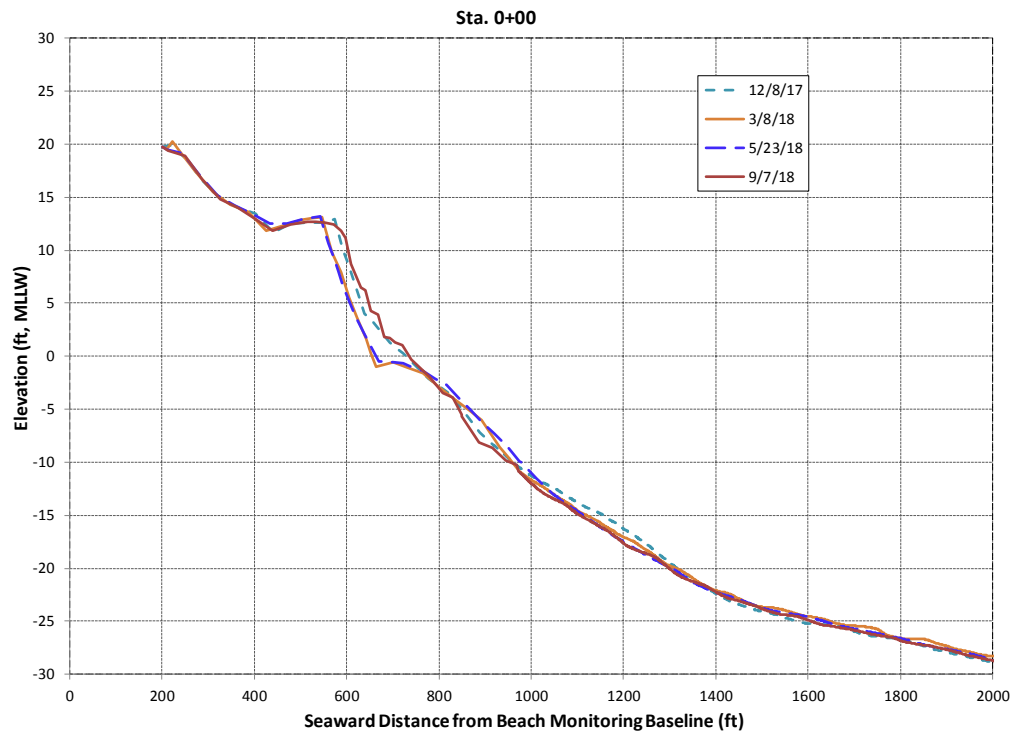


Figure 1. Surveyed Transect and Sediment Sampling Locations



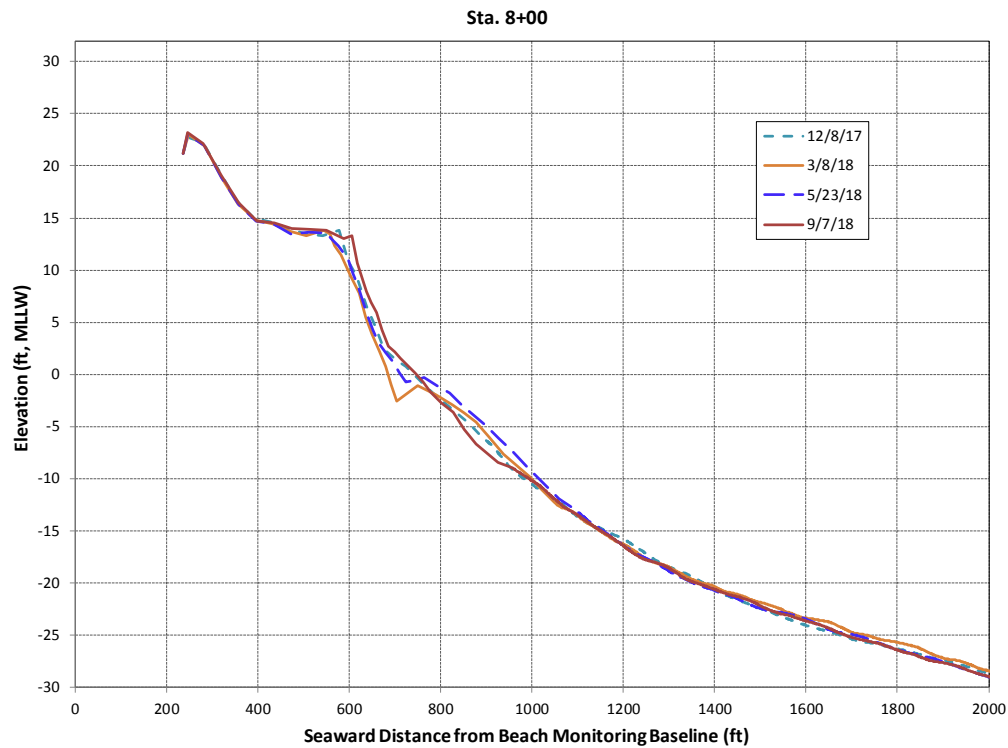


Figure 4. Surveyed Beach Profile at Station 8+00

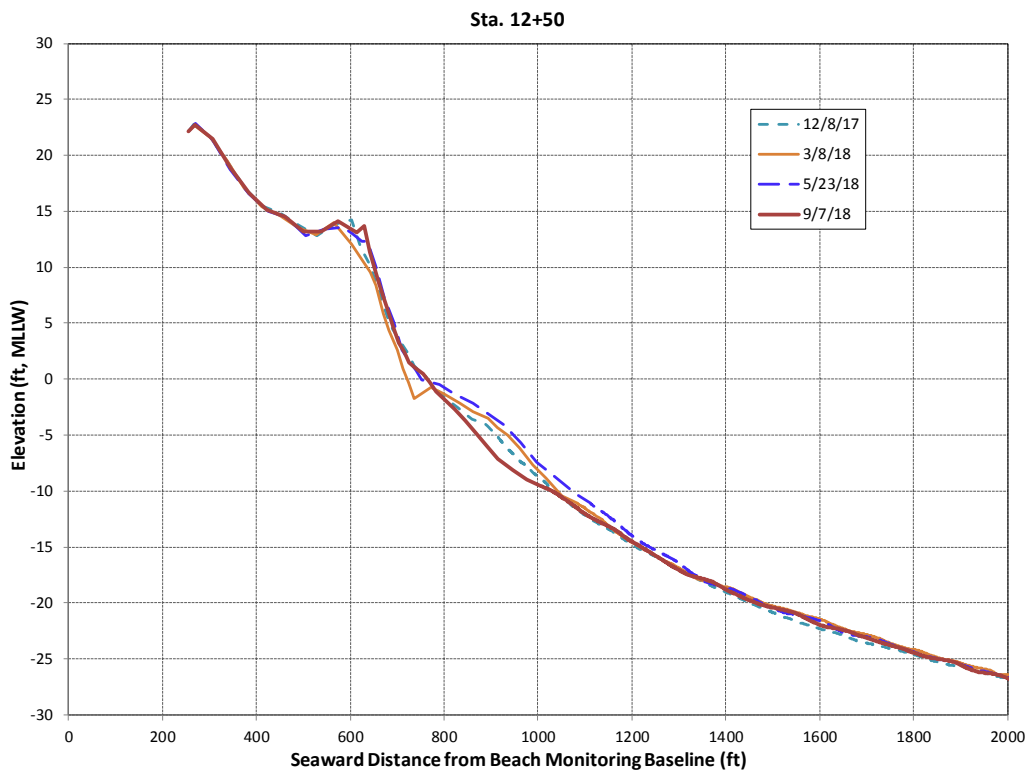


Figure 5. Surveyed Beach Profile at Station 12+50

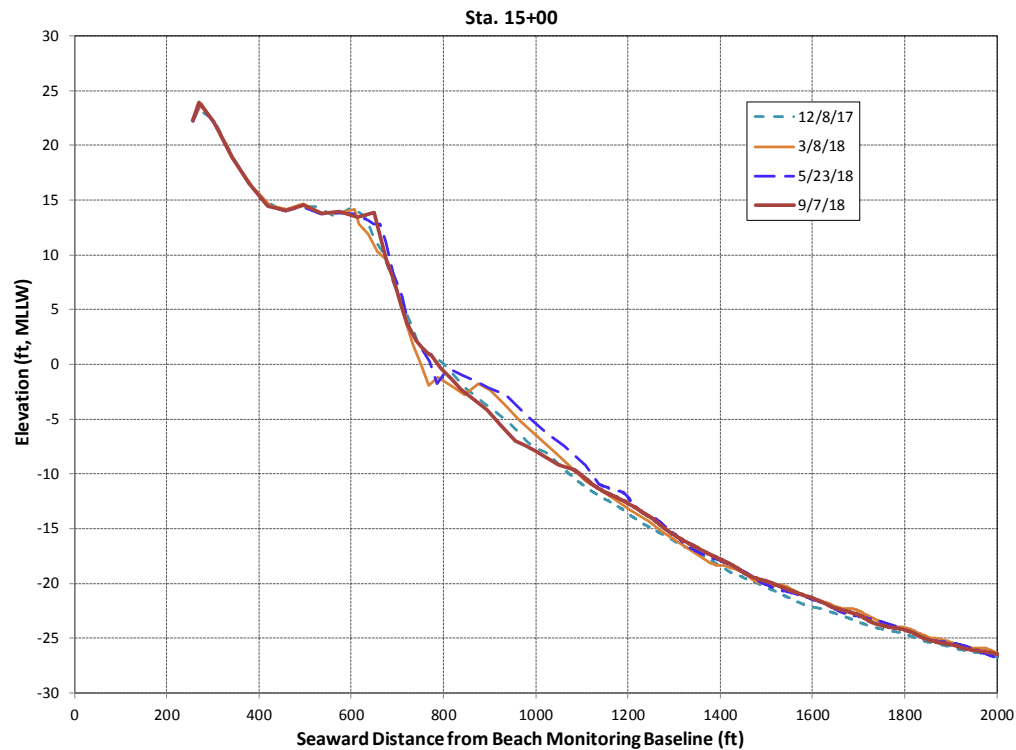


Figure 6. Surveyed Beach Profile at Station 15+00

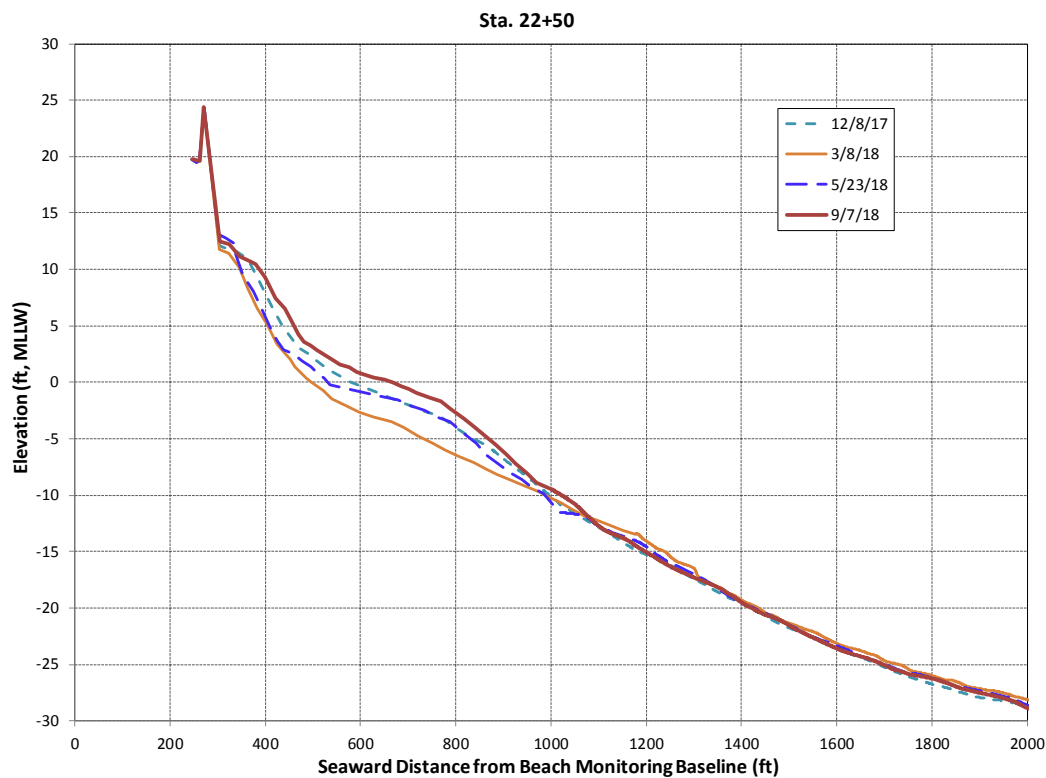


Figure 7. Surveyed Beach Profile at Station 22+50

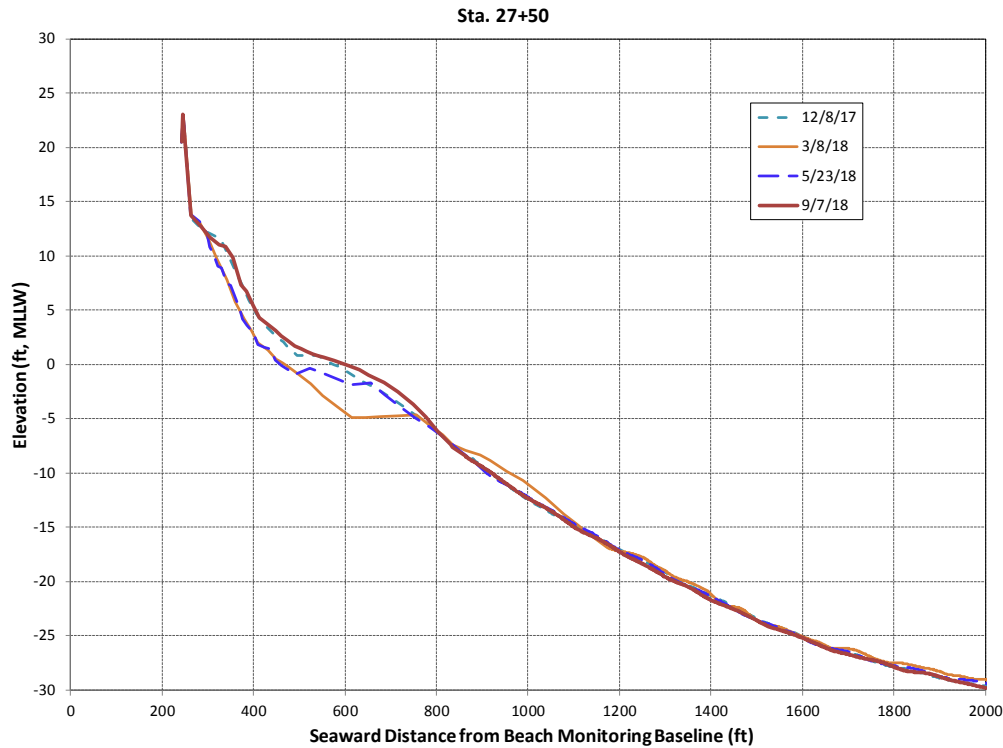


Figure 8. Surveyed Beach Profile at Station 27+50

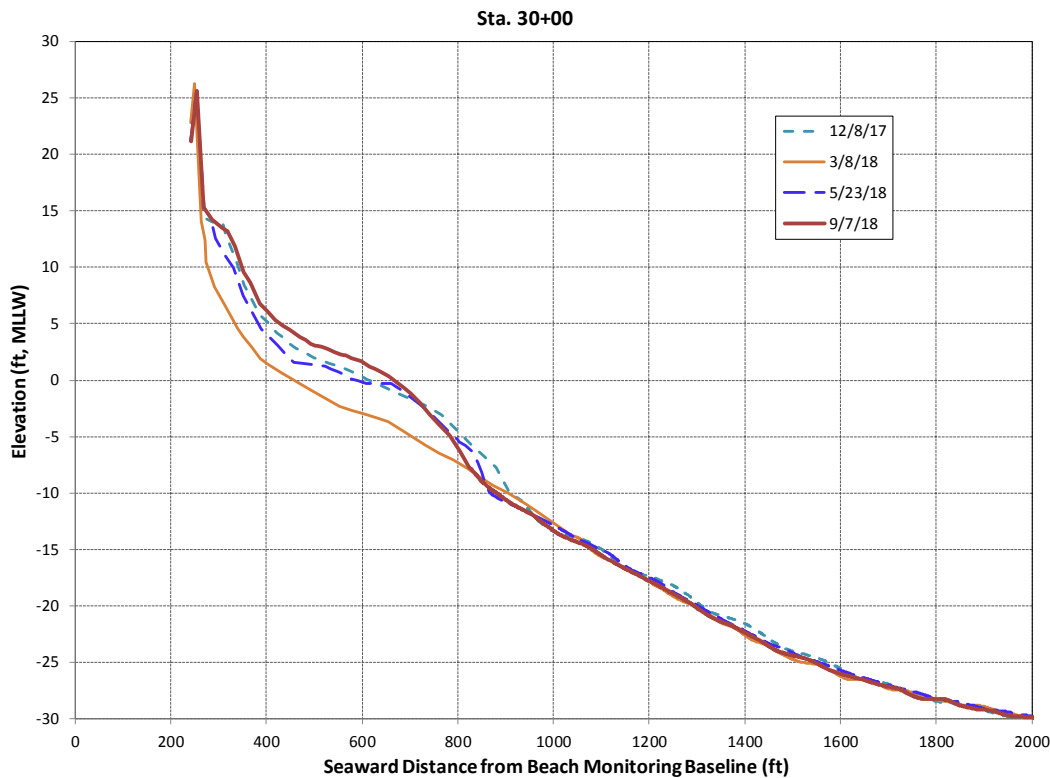


Figure 9. Surveyed Beach Profile at Station 30+00

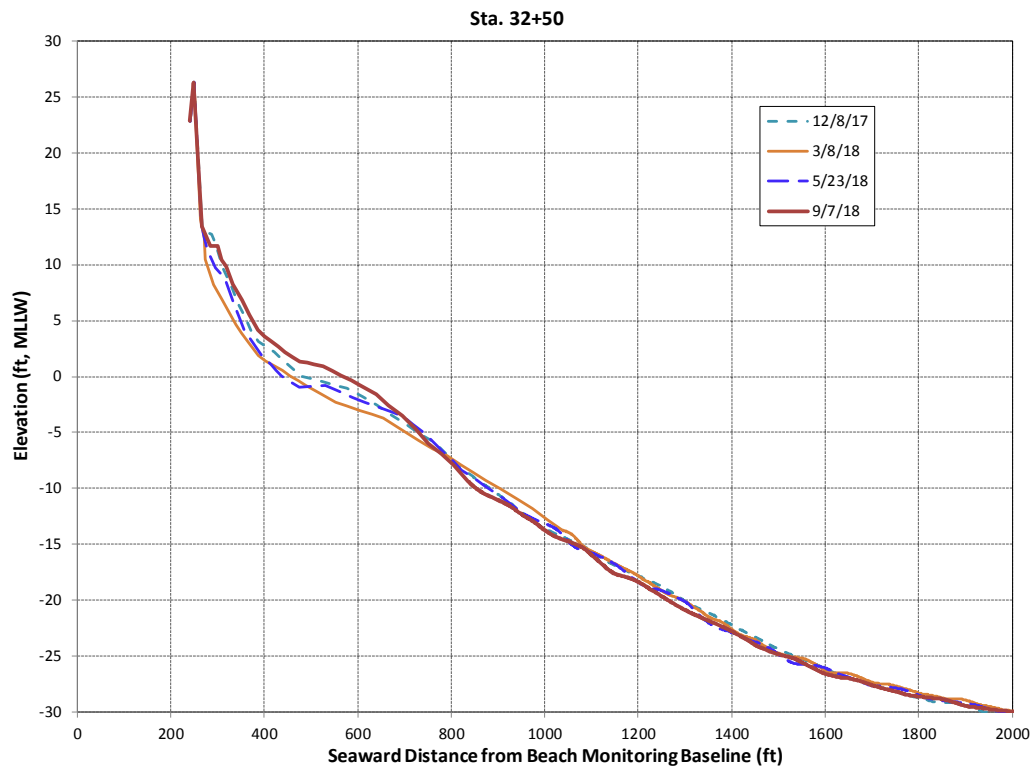


Figure 10. Surveyed Beach Profile at Station 32+50

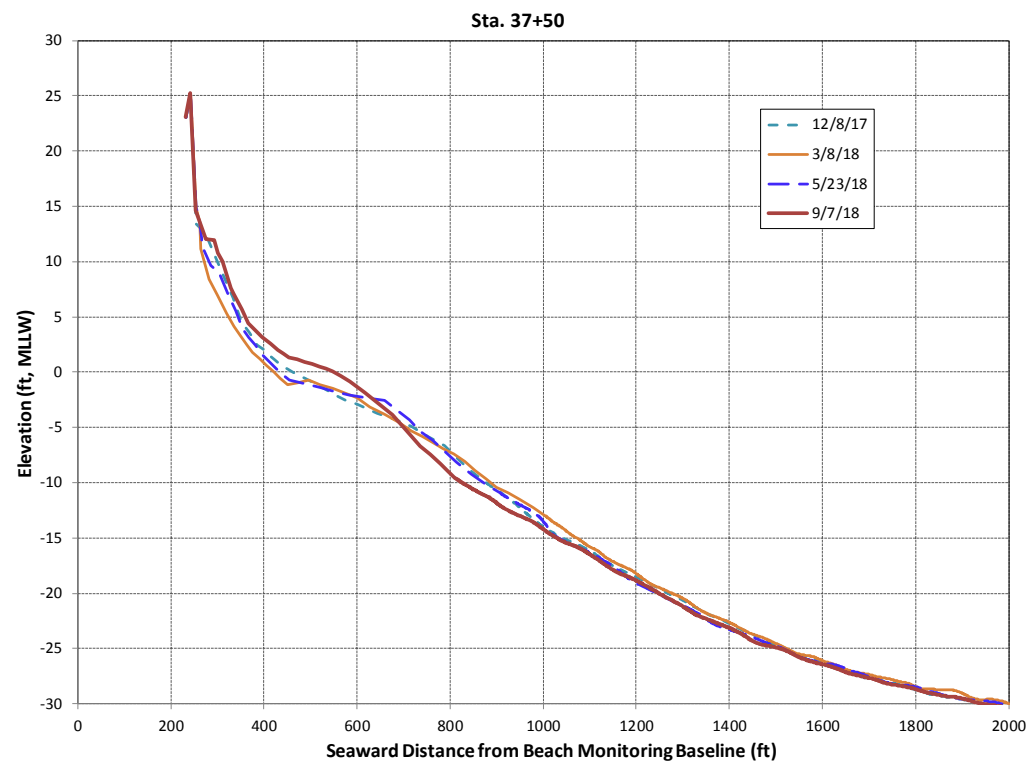


Figure 11. Surveyed Beach Profile at Station 37+50

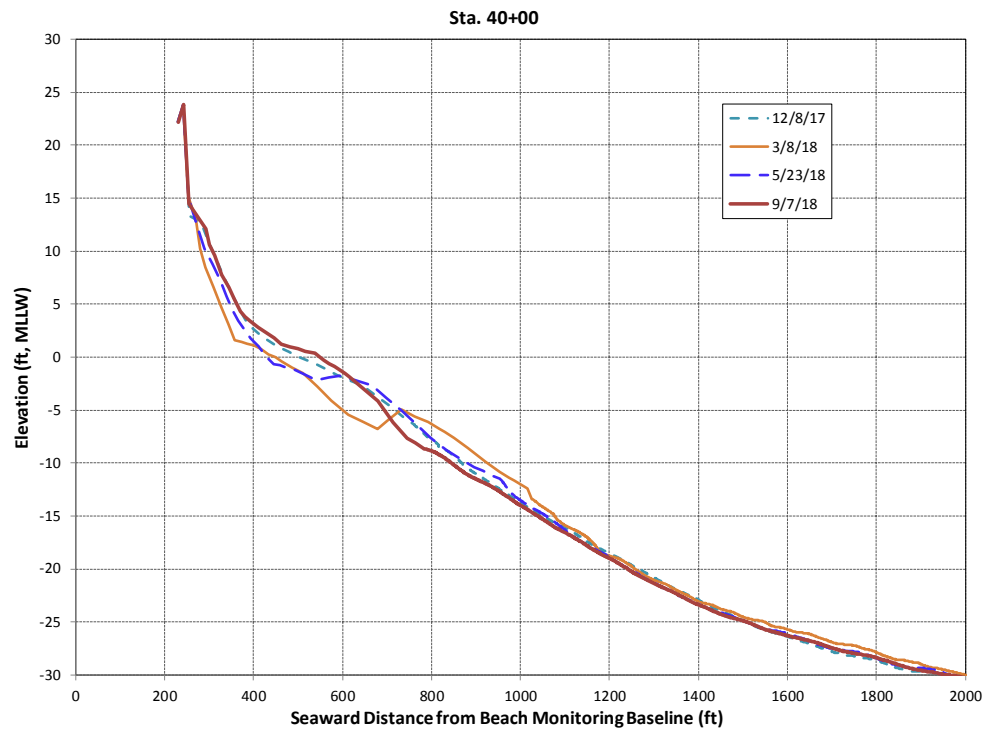


Figure 12. Surveyed Beach Profile at Station 40+00

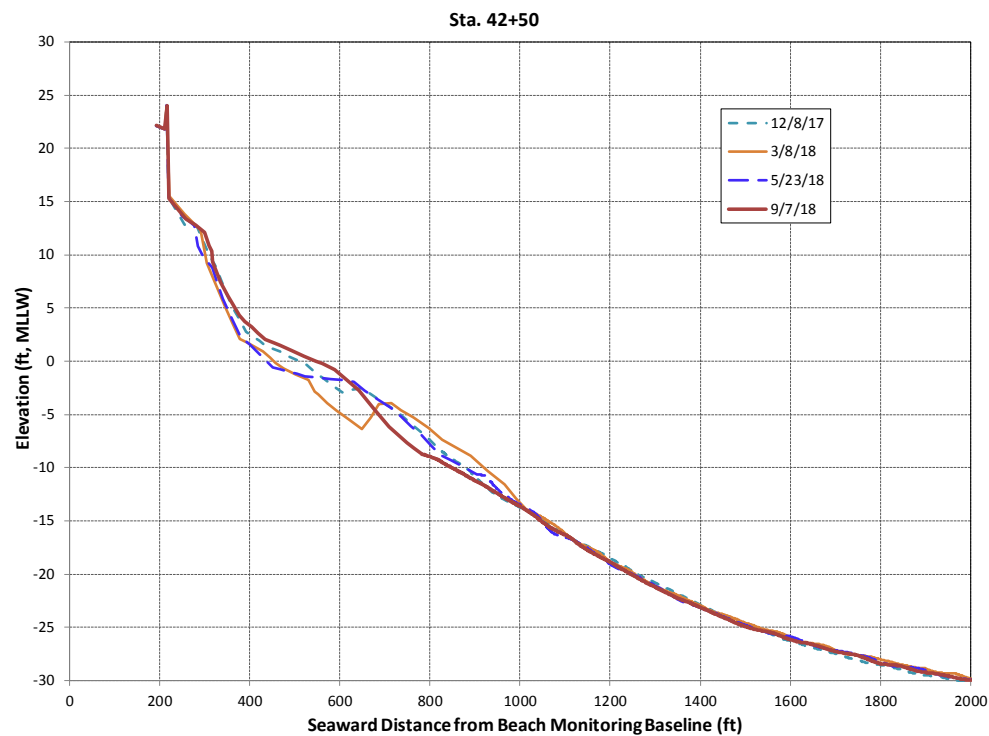


Figure 13. Surveyed Beach Profile at Station 42+50

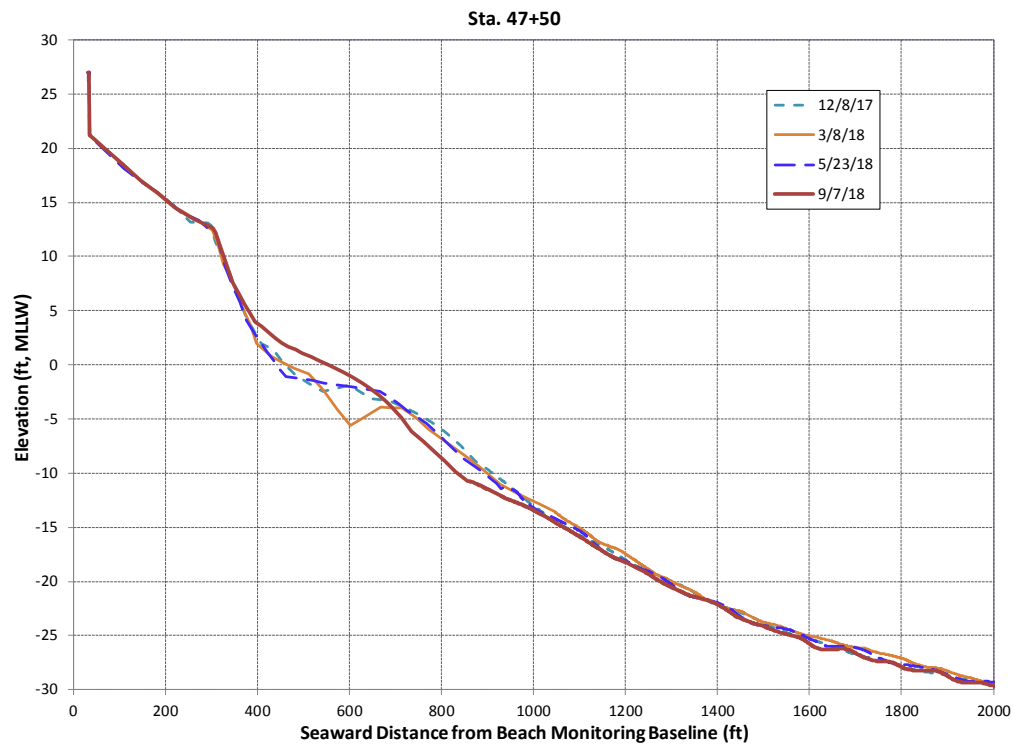


Figure 14. Surveyed Beach Profile at Station 47+50

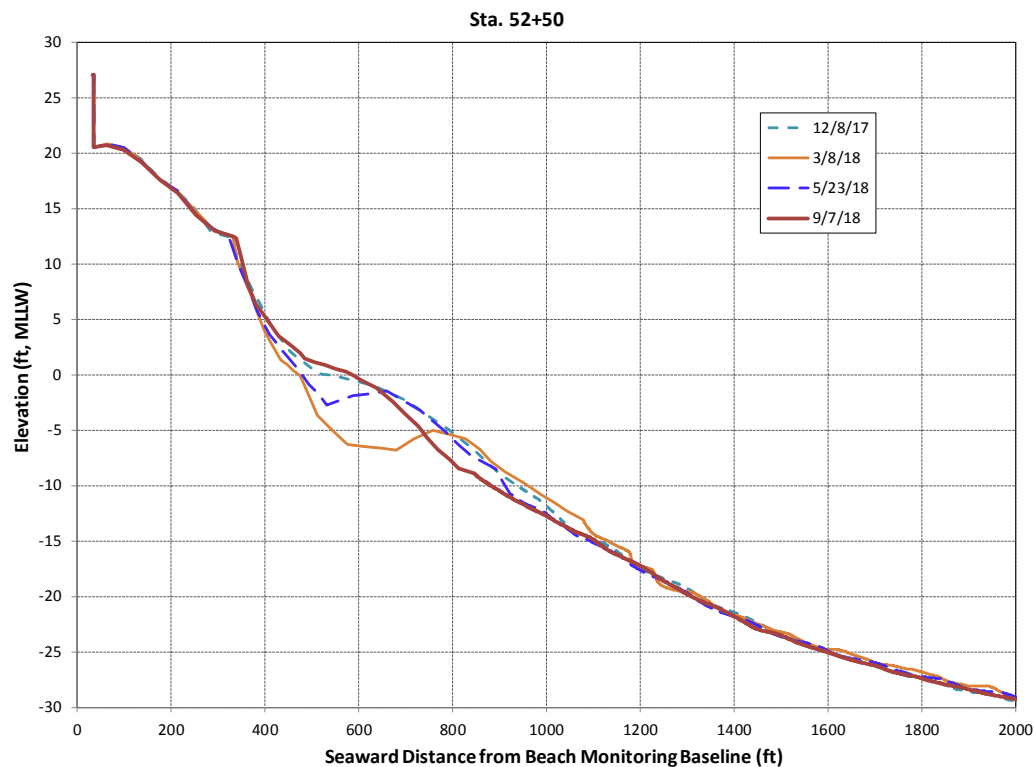


Figure 15. Surveyed Beach Profile at Station 52+50

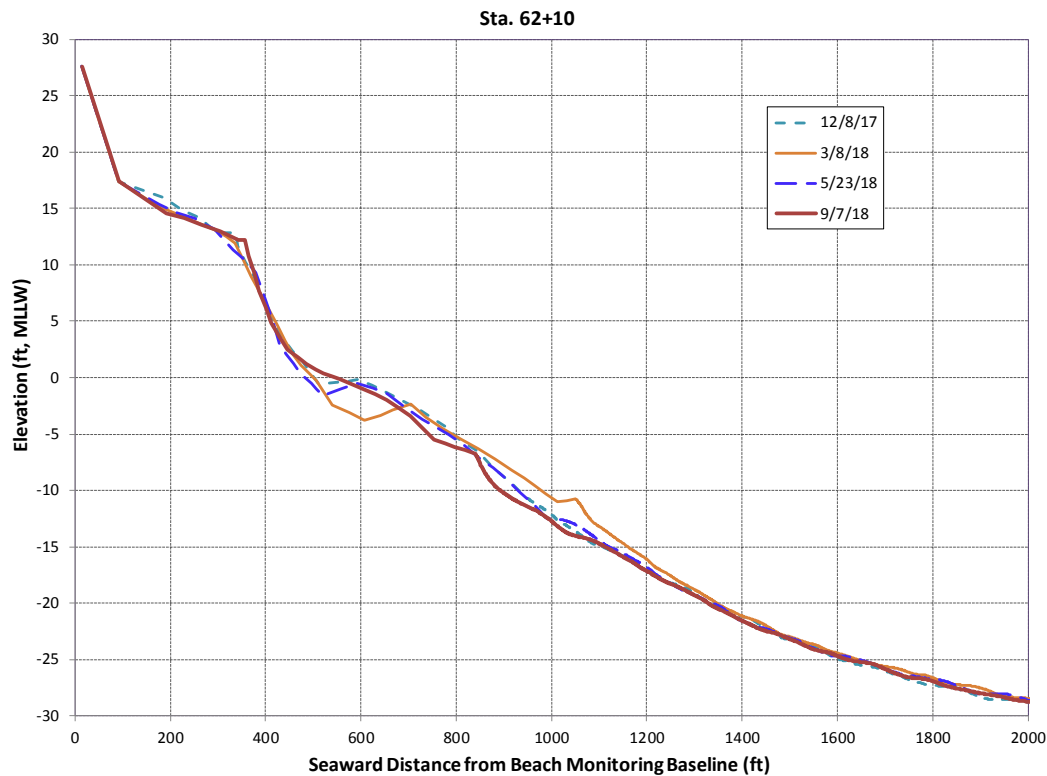


Figure 16. Surveyed Beach Profile at Station 62+10

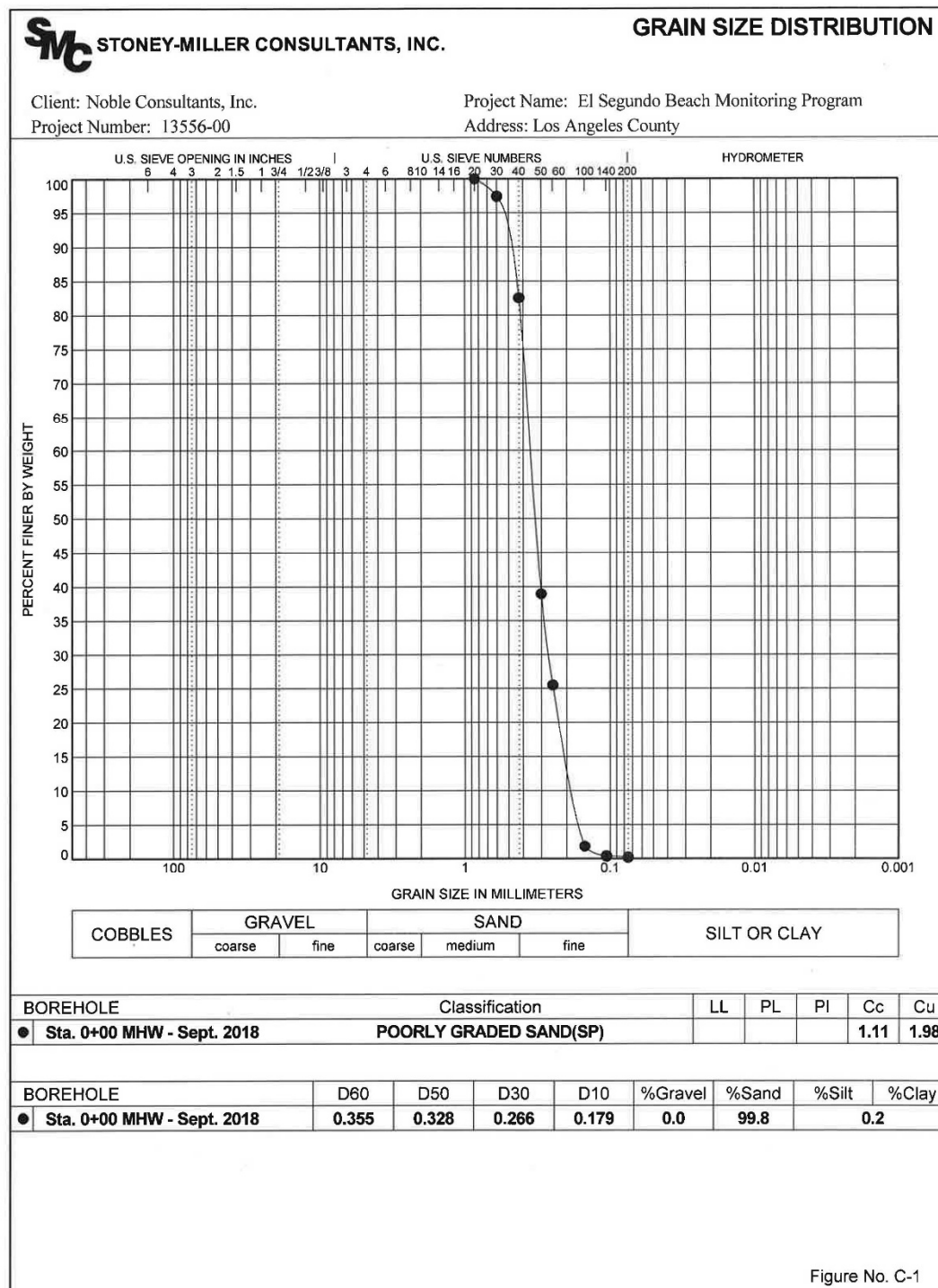


Figure 17. Grain Size Distribution at Sta. 0+00 MHW Line

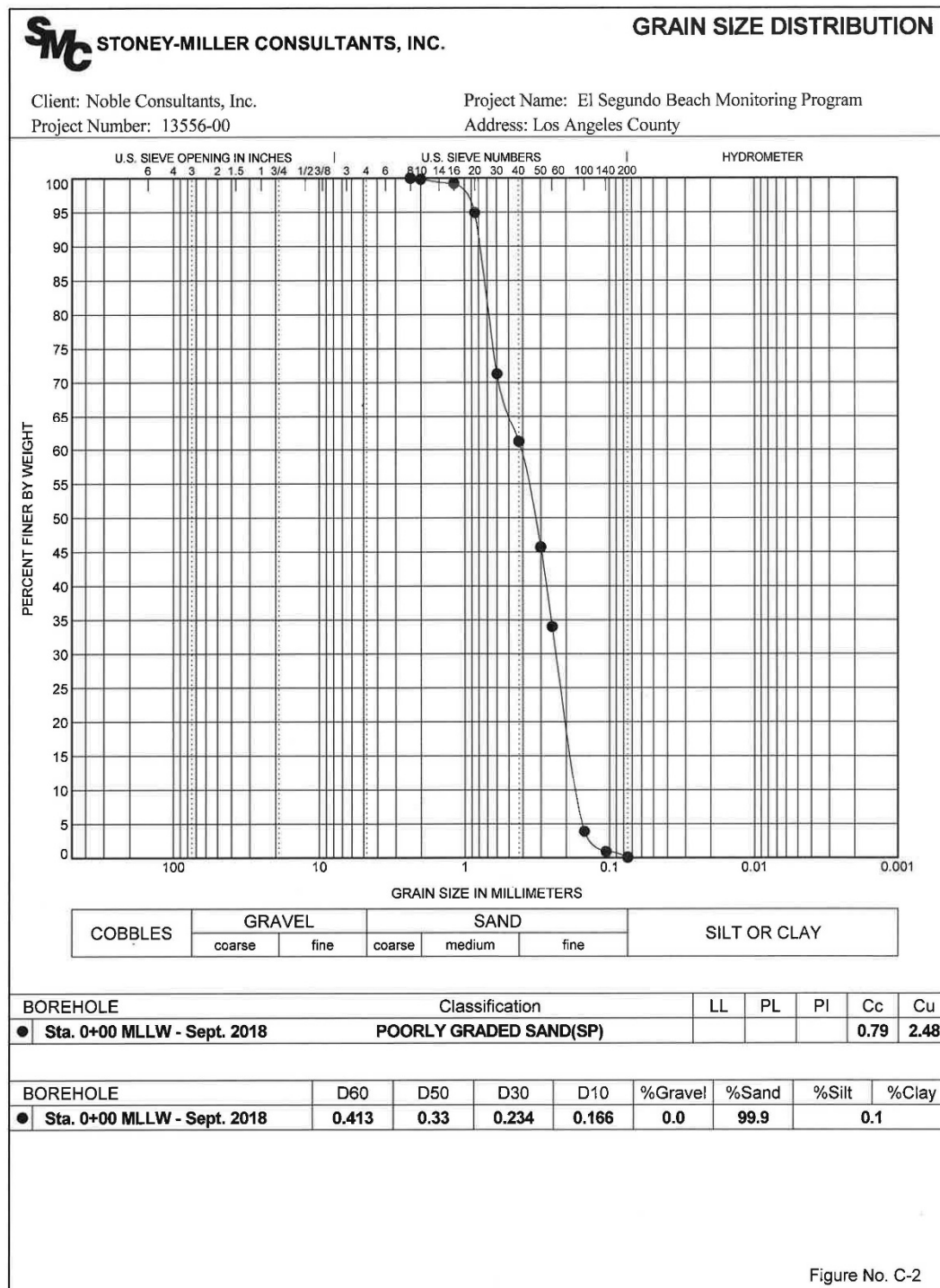


Figure 18. Grain Size Distribution at Sta. 0+00 MLLW Line

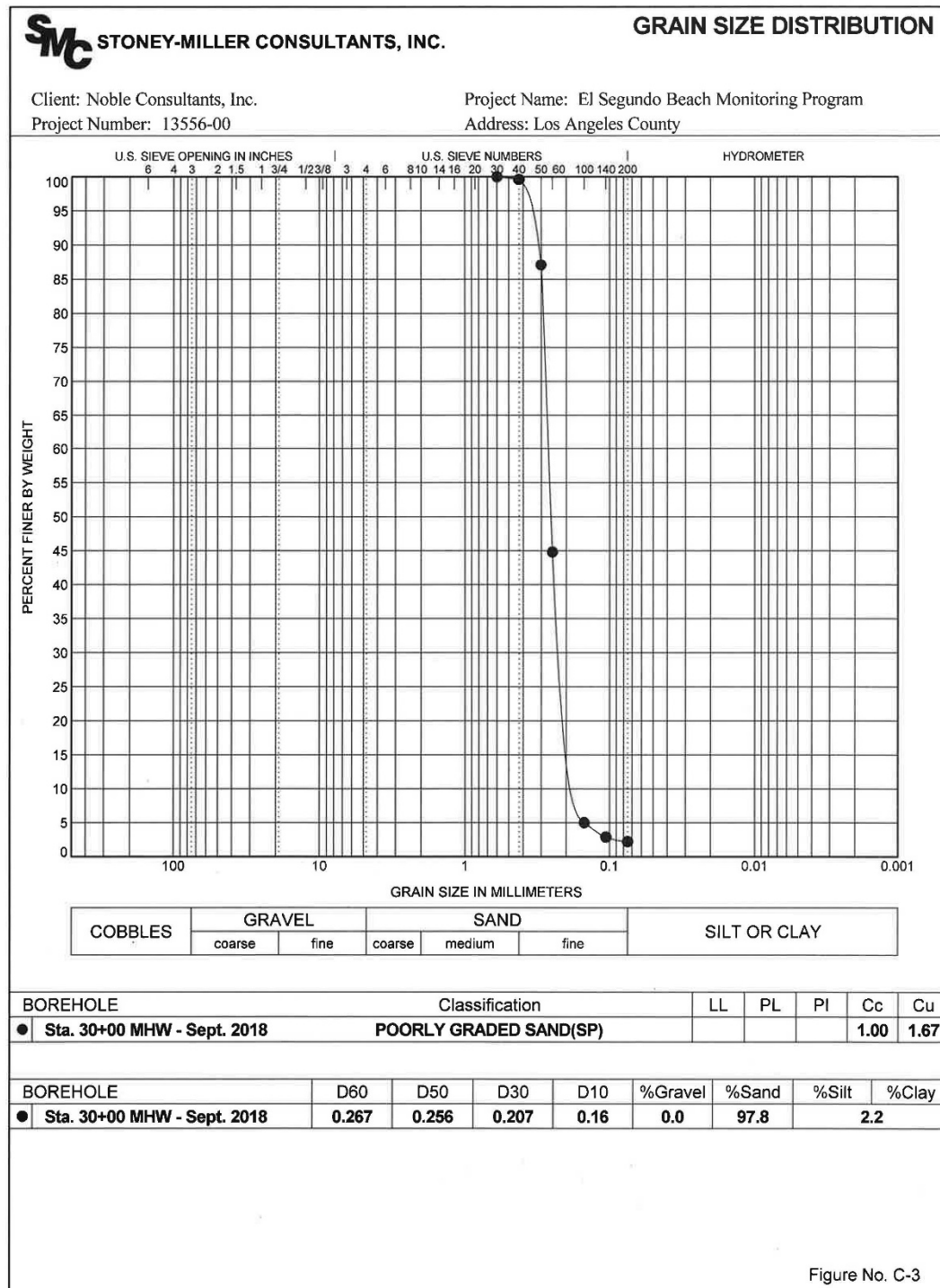


Figure 19. Grain Size Distribution at Sta. 30+00 MHW Line

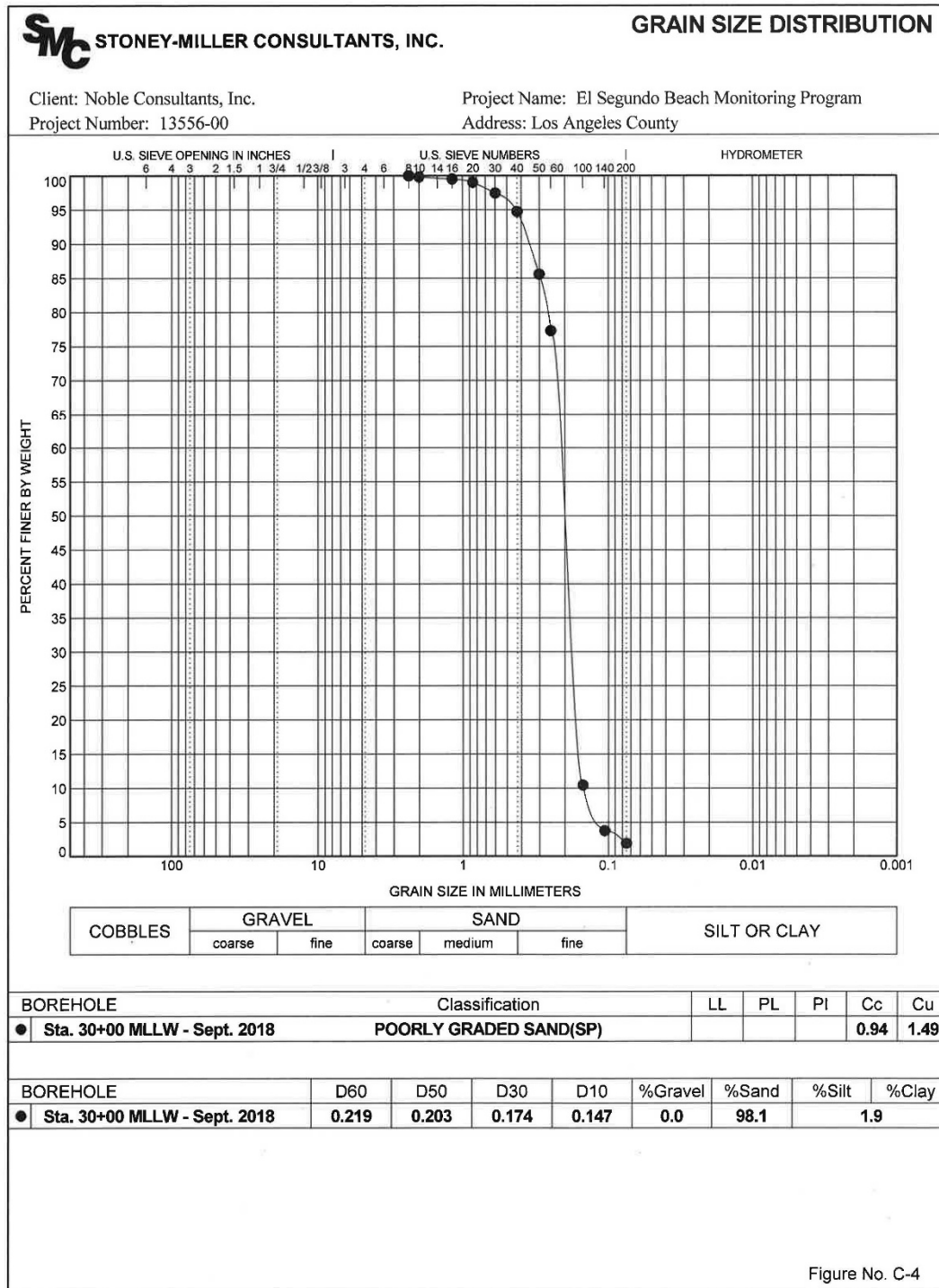


Figure 20. Grain Size Distribution at Sta. 30+00 MHW Line

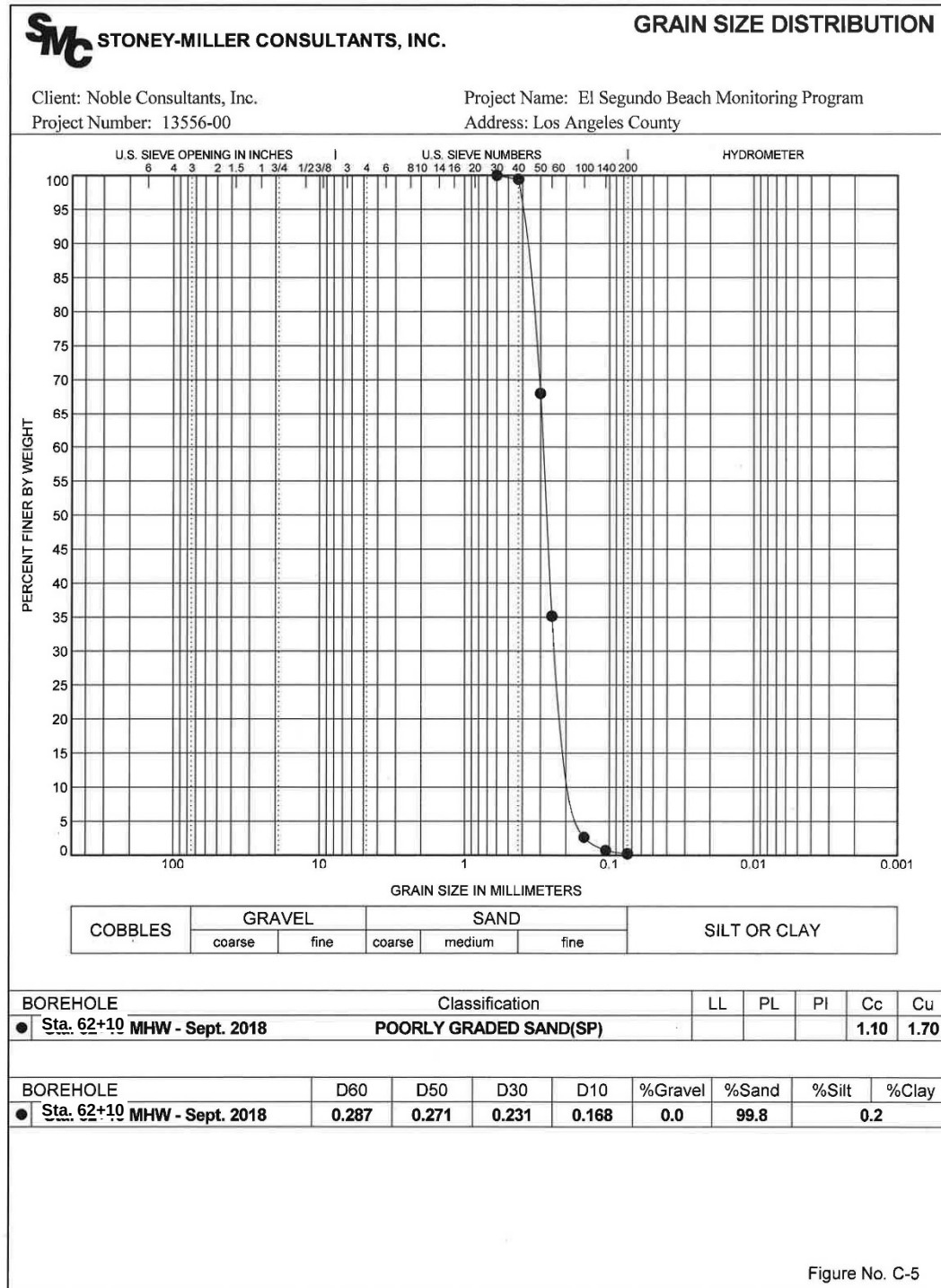


Figure 21. Grain Size Distribution at Sta. 62+10 MHW Line

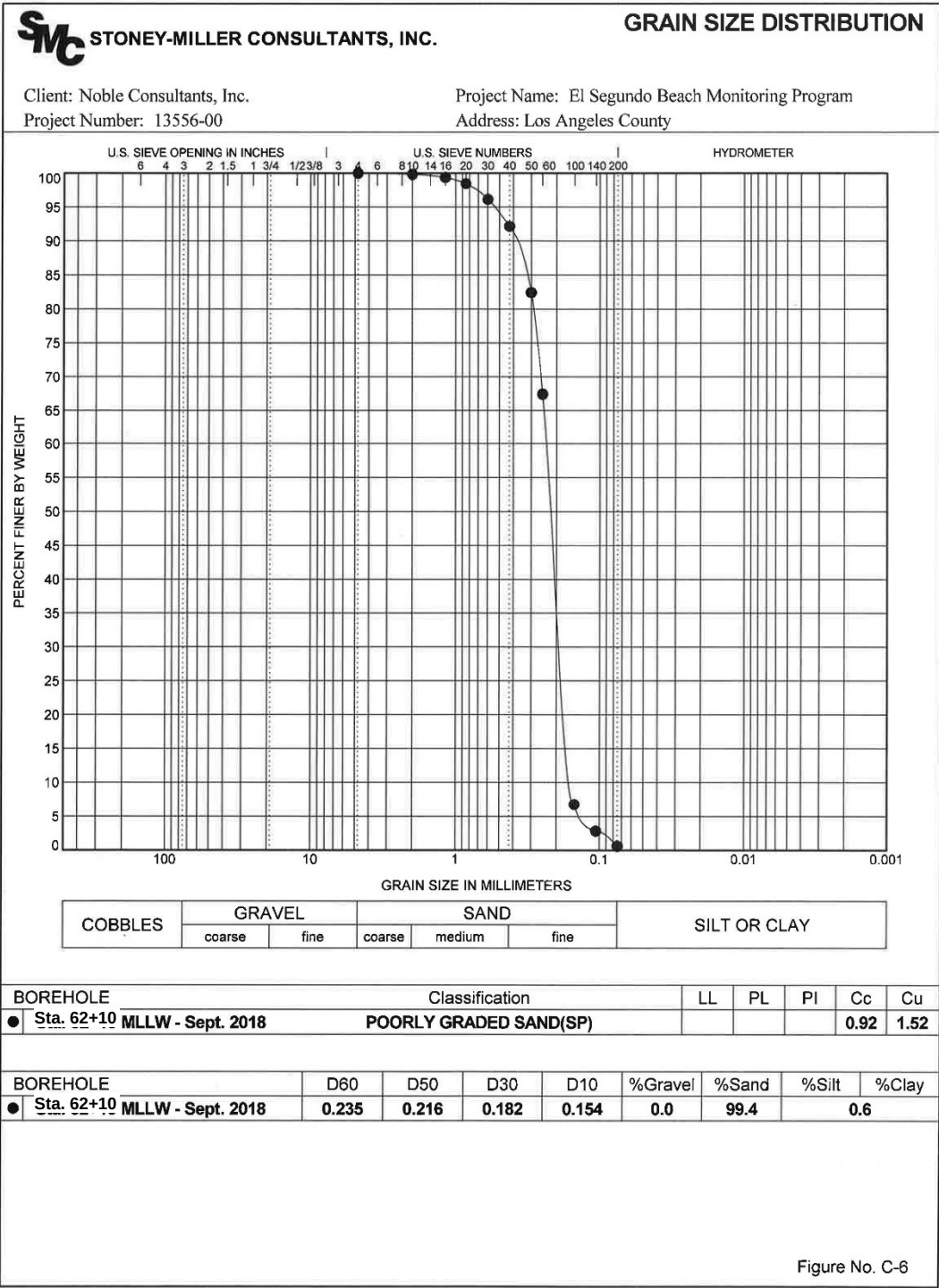


Figure 22. Grain Size Distribution at Sta. 62+10 MLLW Line

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 June 8, 2018

the March 2018 survey shows the recovery from winter/early spring eroded beach condition. Six sand samples (two sediment samples per location) were respectively collected at three different locations on May 23 & 25, 2018, as also identified in Figure 1. At each location, one sand sample was collected on the foreshore face at the approximate Mean High Water (MHW) position and the other in the surf zone near the Mean Lower Low Water (MLLW) elevation. The collected sand samples were forwarded to a soil-testing laboratory for analysis of the sediment grain size distribution. Table 1 summarizes the grain size characteristics of individually sampled sediments, while Figures 17 to 22 respectively illustrate the deduced grain size distributions for the collected sand samples.

Table 1. Summary of Sediment Characteristics for samples collected
 on May 23 & 25, 2018

Sampling Location	Reference Elevation	Soil Type	D50 (mm)
Sta. 0+00	MHW	Poorly Graded Sand	0.26
Sta. 0+00	MLLW	Poorly Graded Sand	0.33
Sta. 30+00	MHW	Poorly Graded Sand	0.22
Sta. 30+00	MLLW	Poorly Graded Sand	0.20
Sta. 62+10	MHW	Poorly Graded Sand	0.28
Sta. 62+10	MLLW	Poorly Graded Sand	0.20

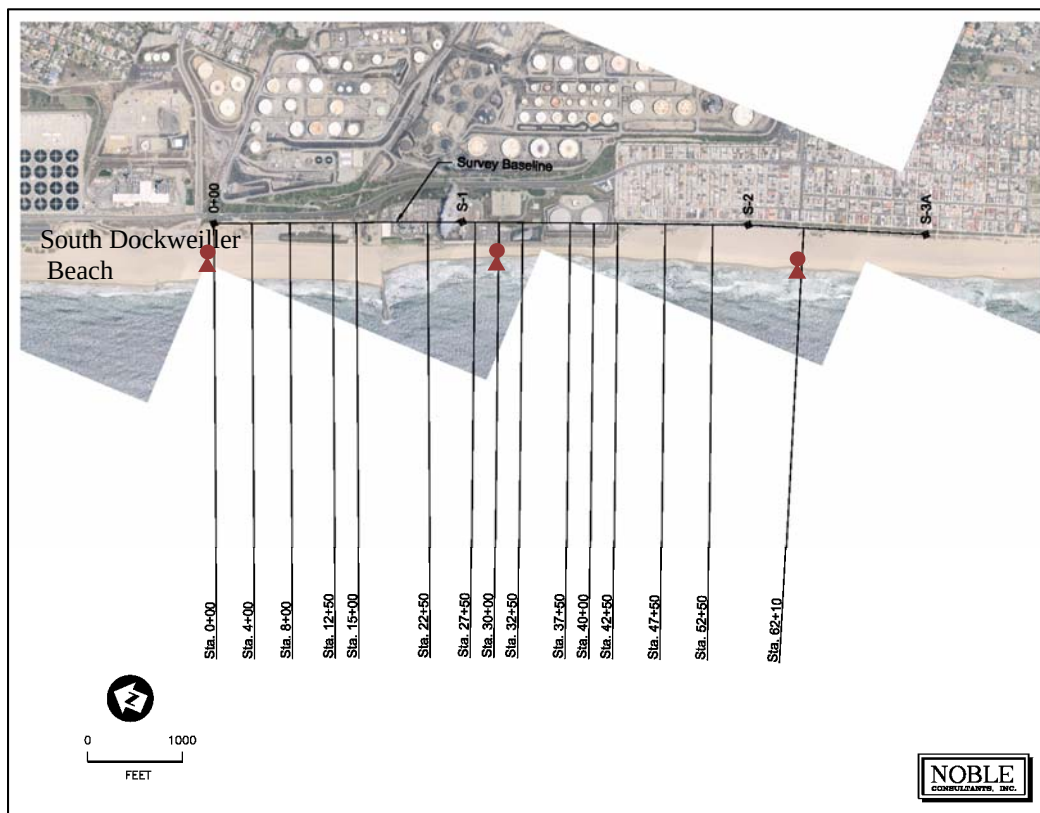
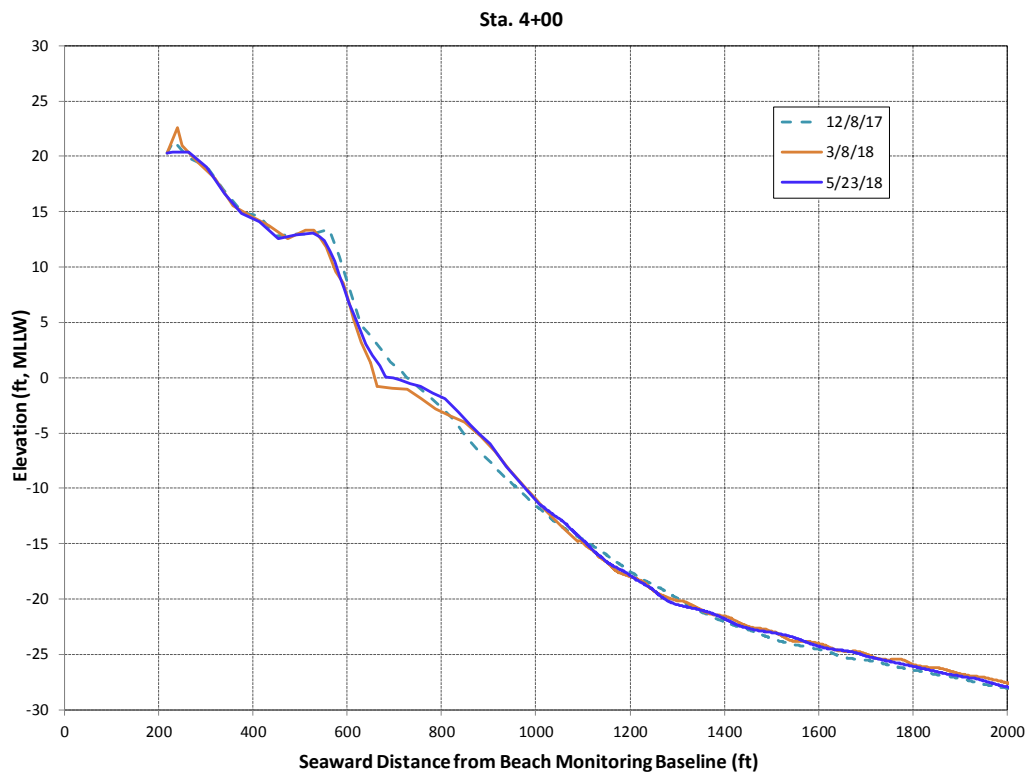
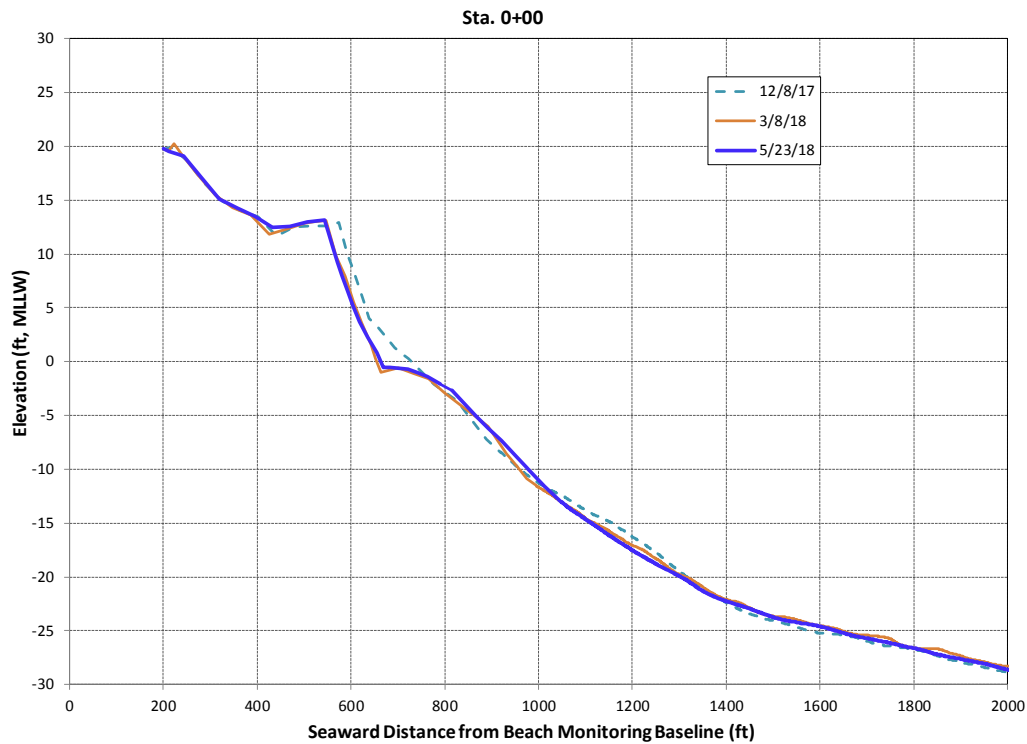
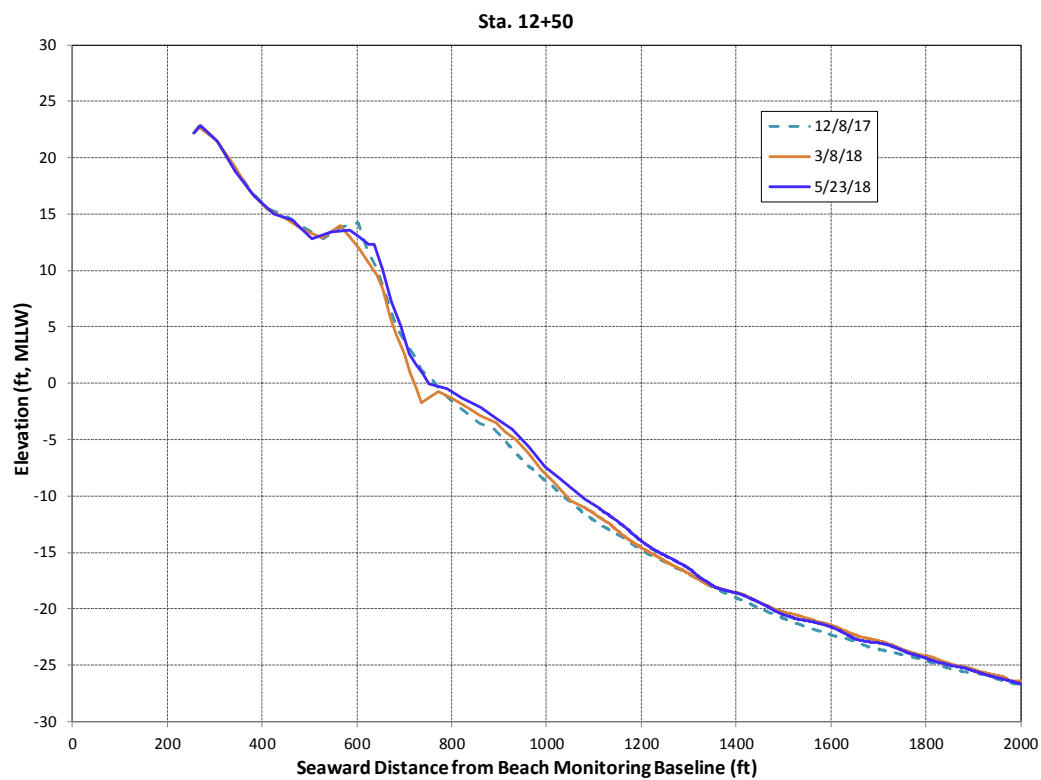
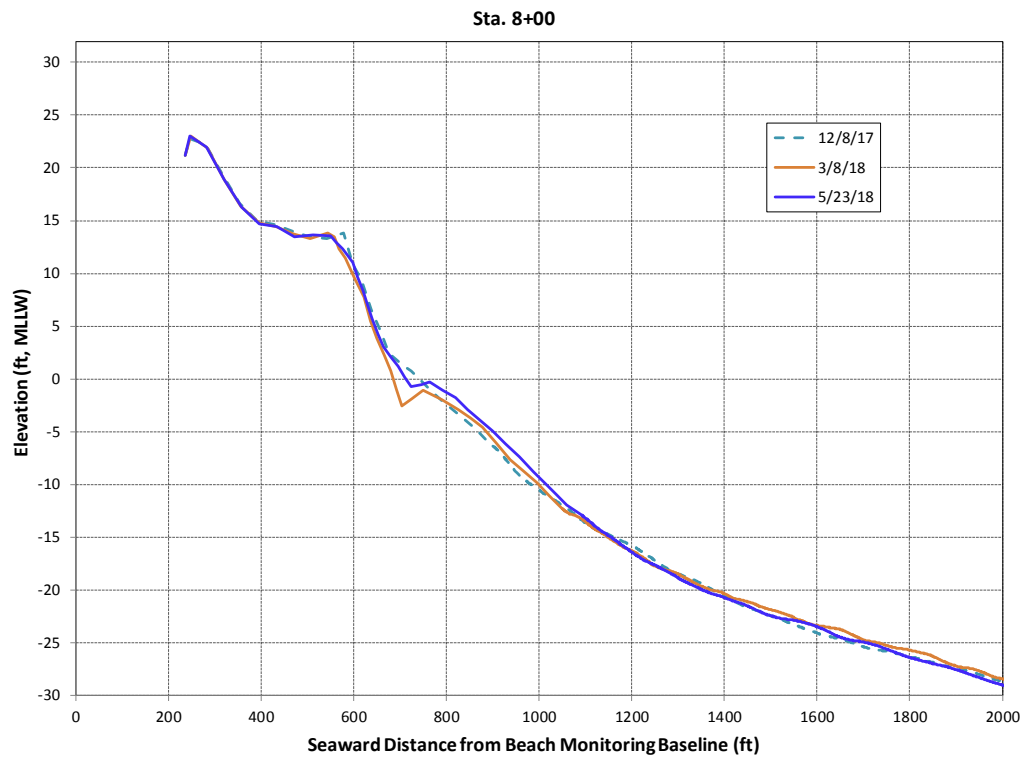


Figure 1. Surveyed Transect and Sediment Sampling Locations





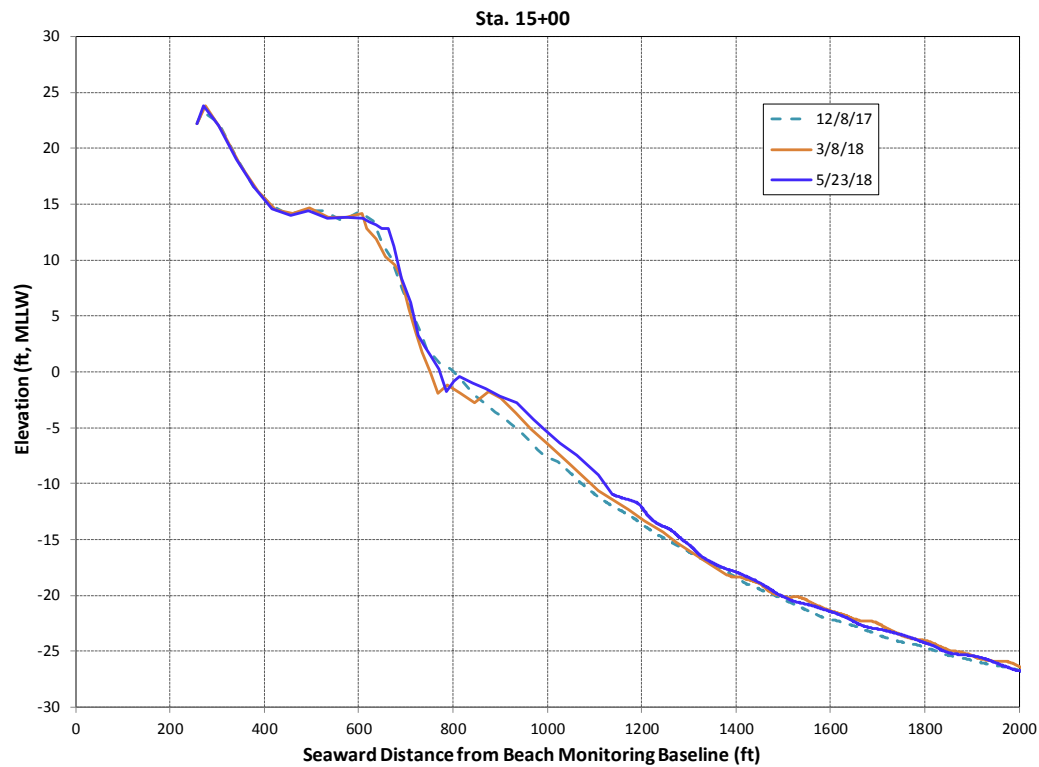


Figure 6. Surveyed Beach Profile at Station 15+00

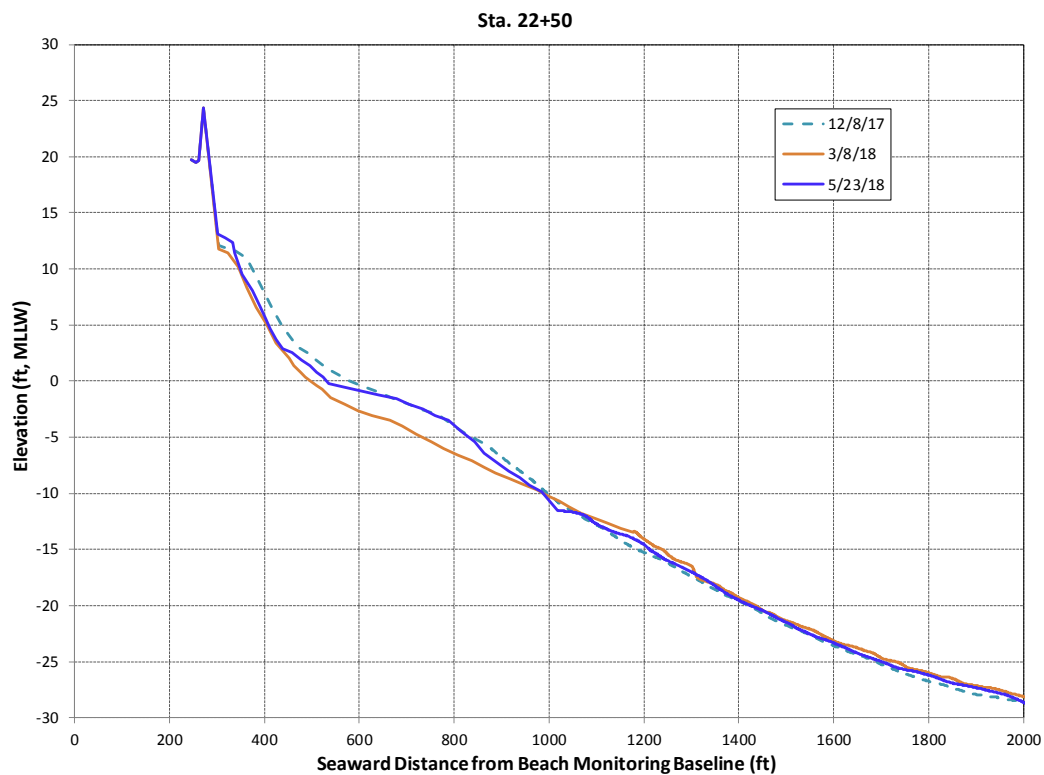


Figure 7. Surveyed Beach Profile at Station 22+50

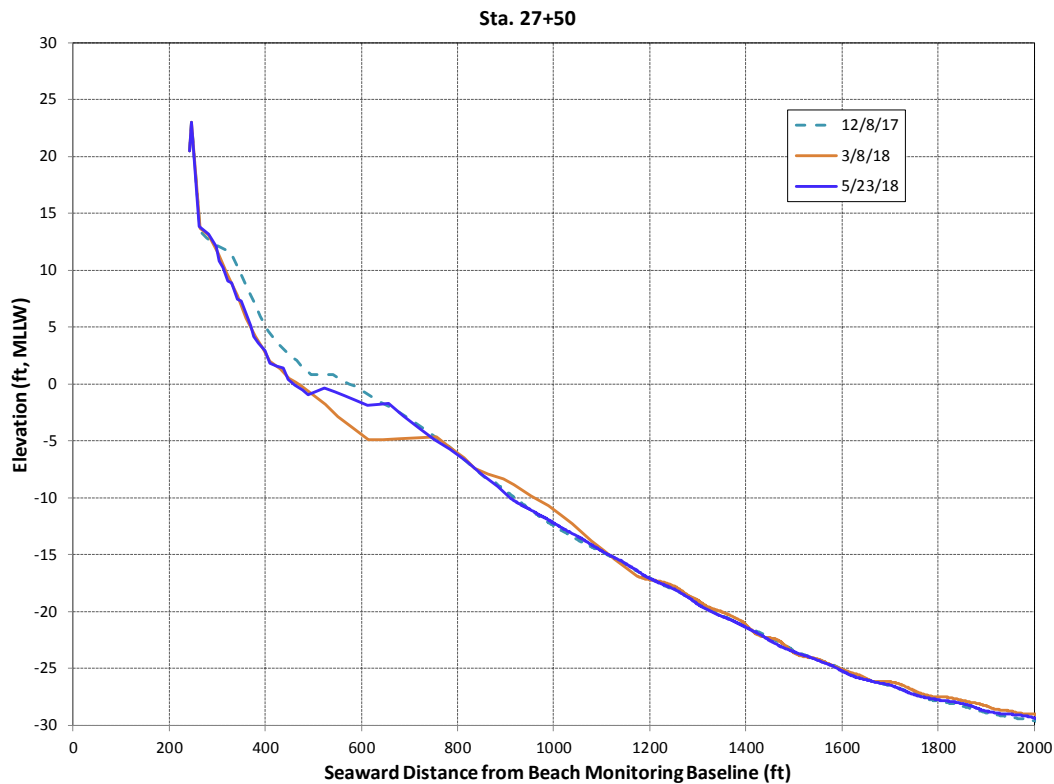


Figure 8. Surveyed Beach Profile at Station 27+50

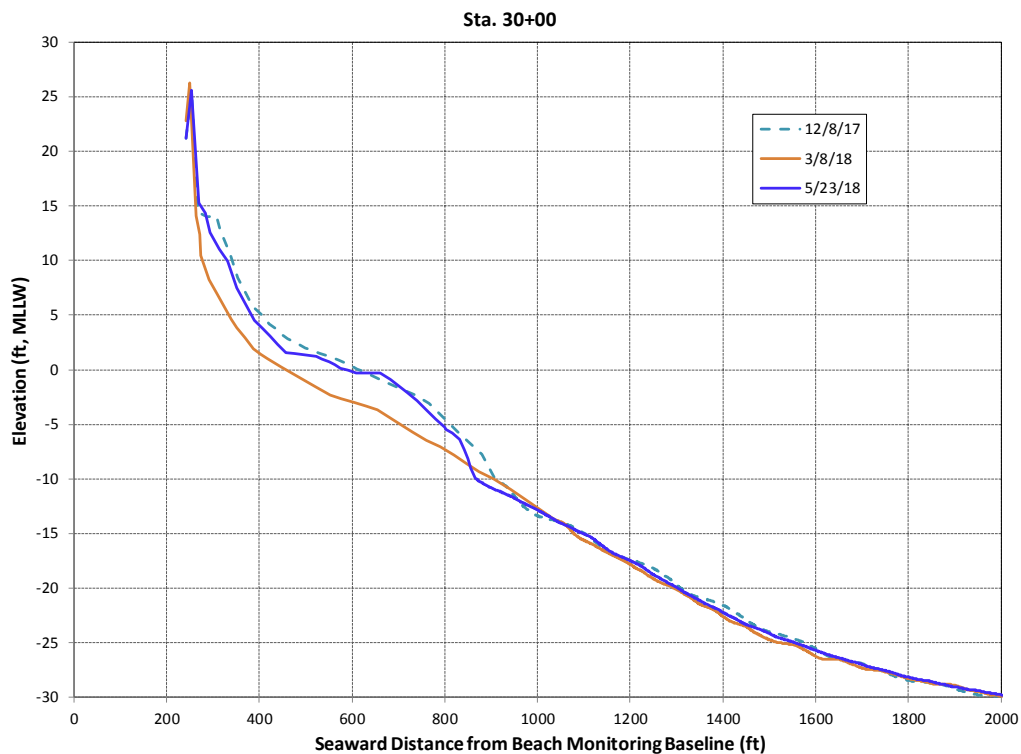


Figure 9. Surveyed Beach Profile at Station 30+00

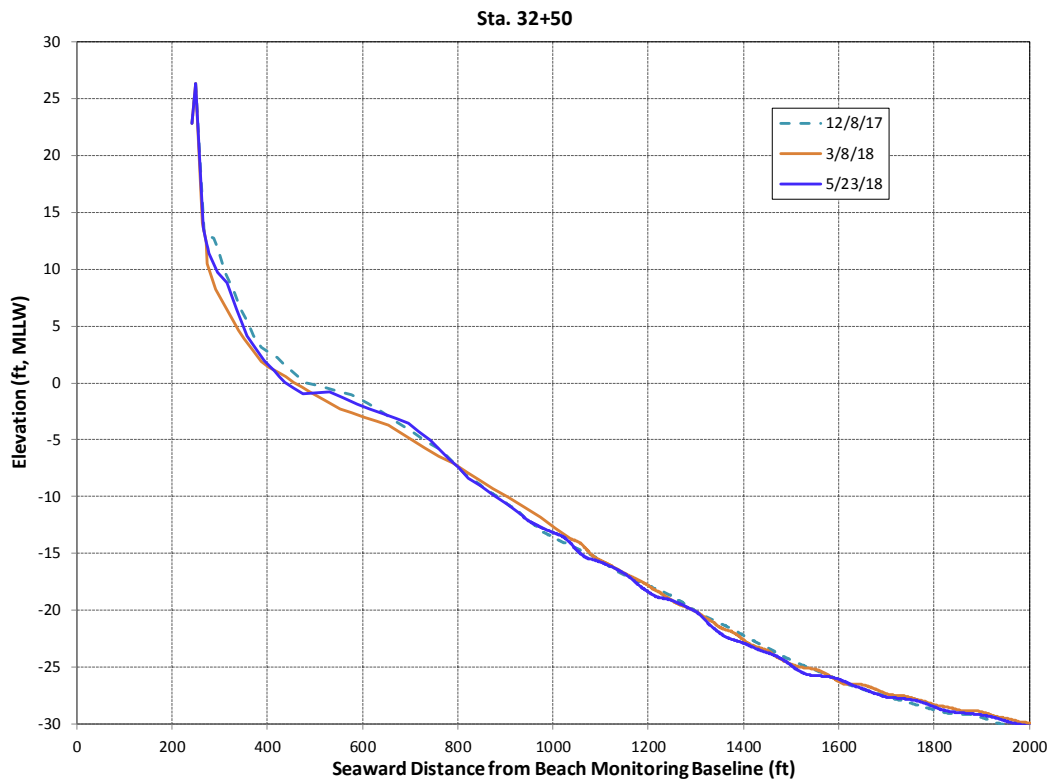


Figure 10. Surveyed Beach Profile at Station 32+50

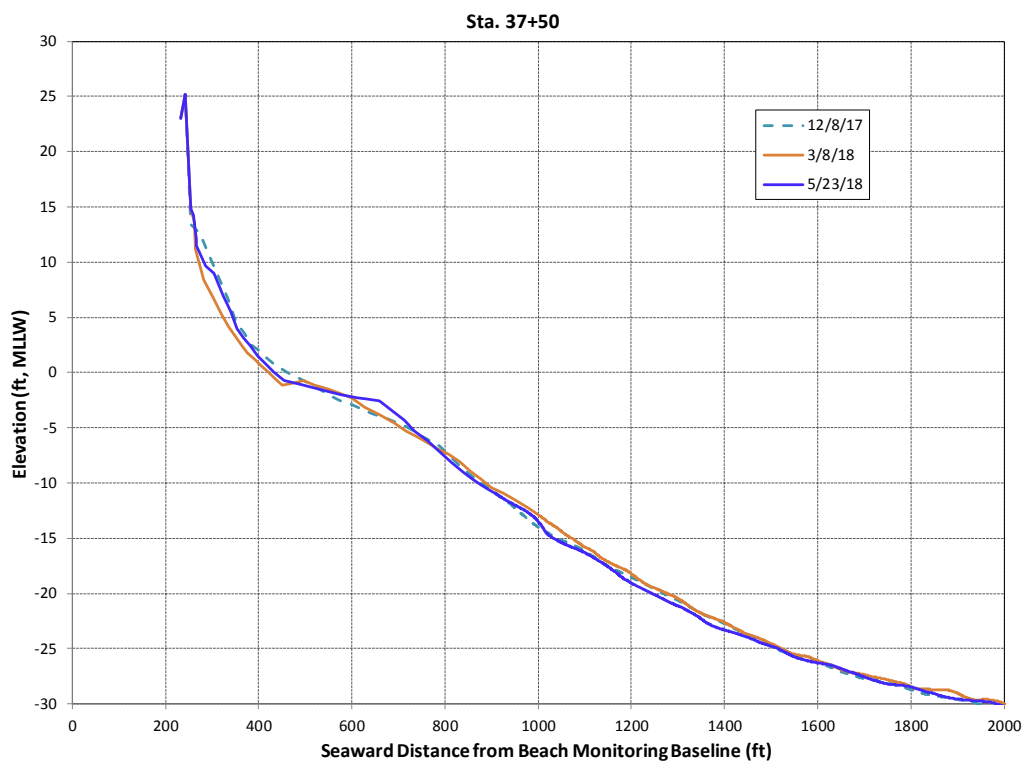


Figure 11. Surveyed Beach Profile at Station 37+50

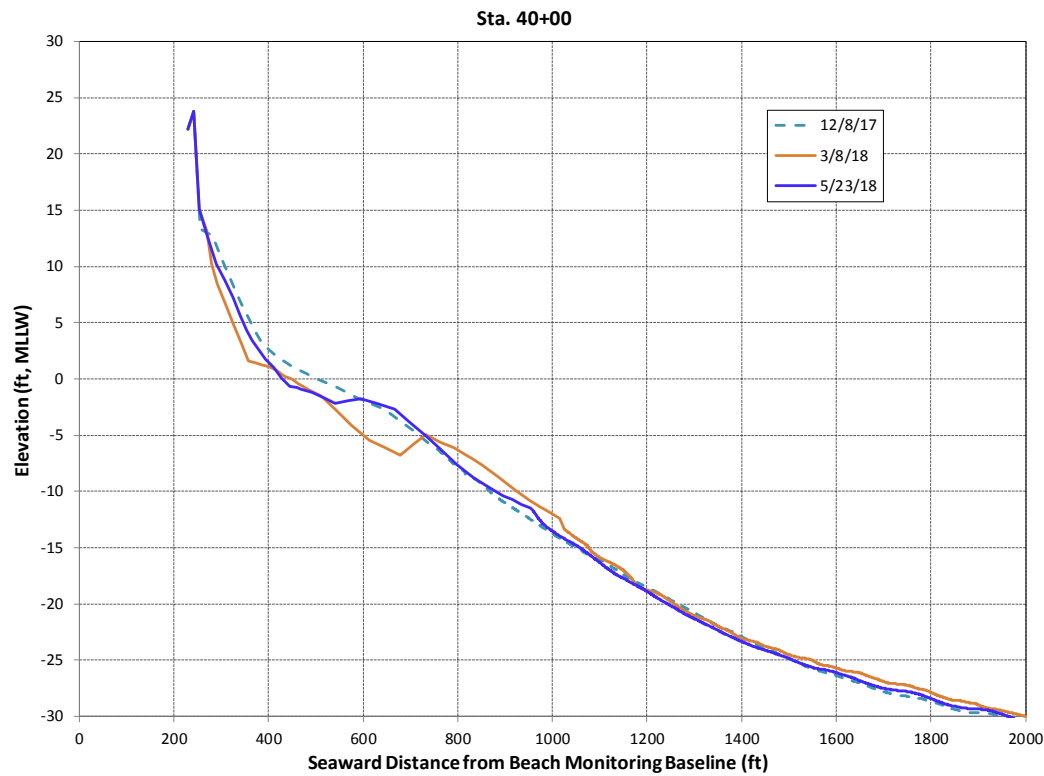


Figure 12. Surveyed Beach Profile at Station 40+00

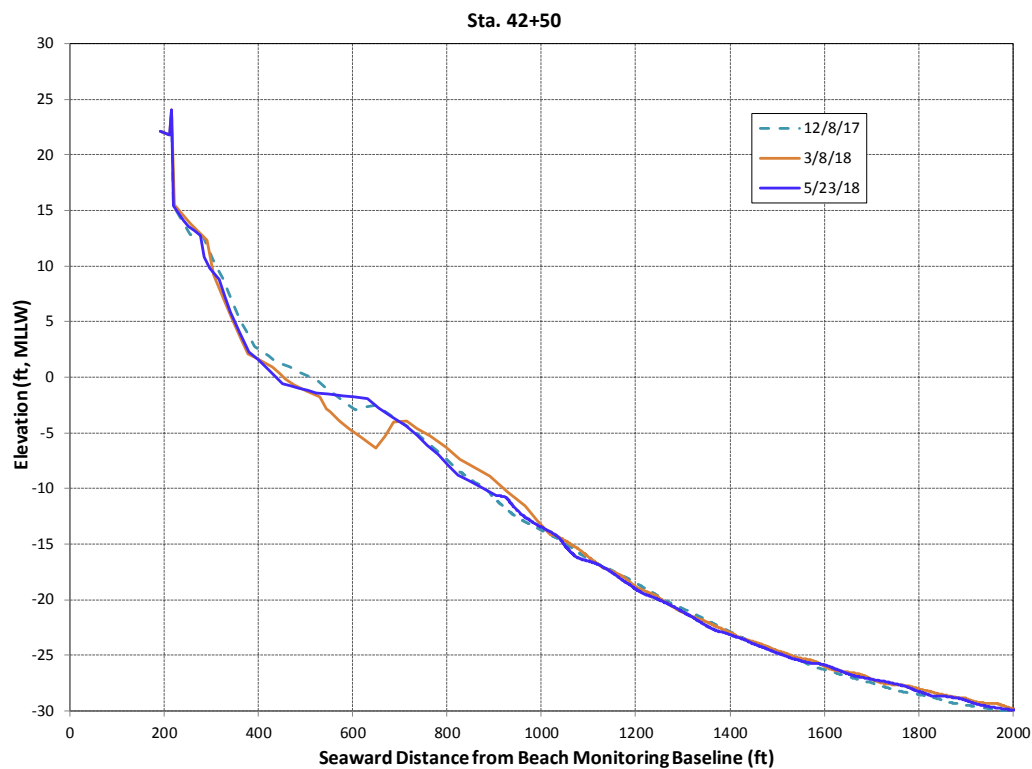


Figure 13. Surveyed Beach Profile at Station 42+50

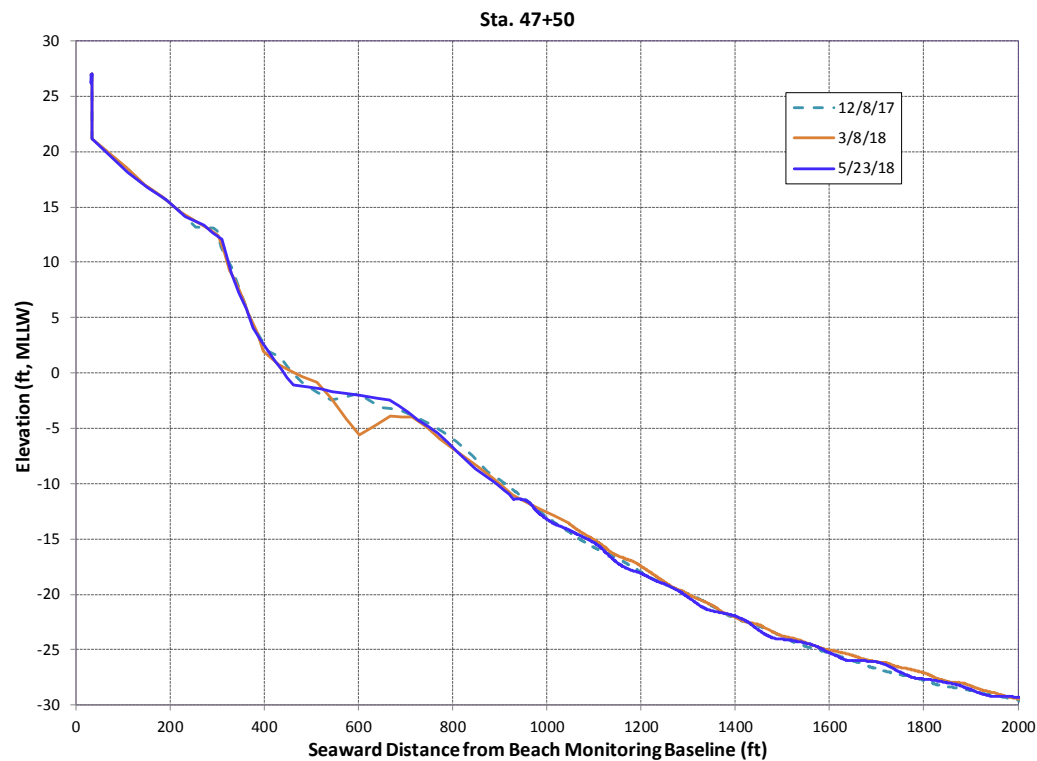


Figure 14. Surveyed Beach Profile at Station 47+50

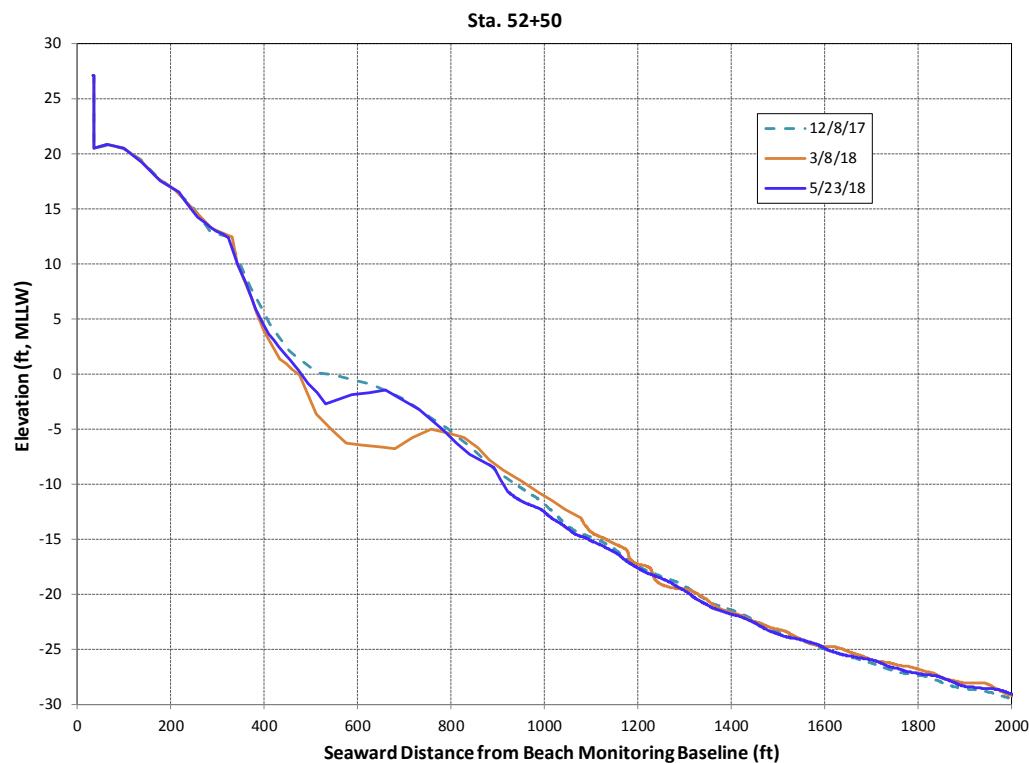


Figure 15. Surveyed Beach Profile at Station 52+50

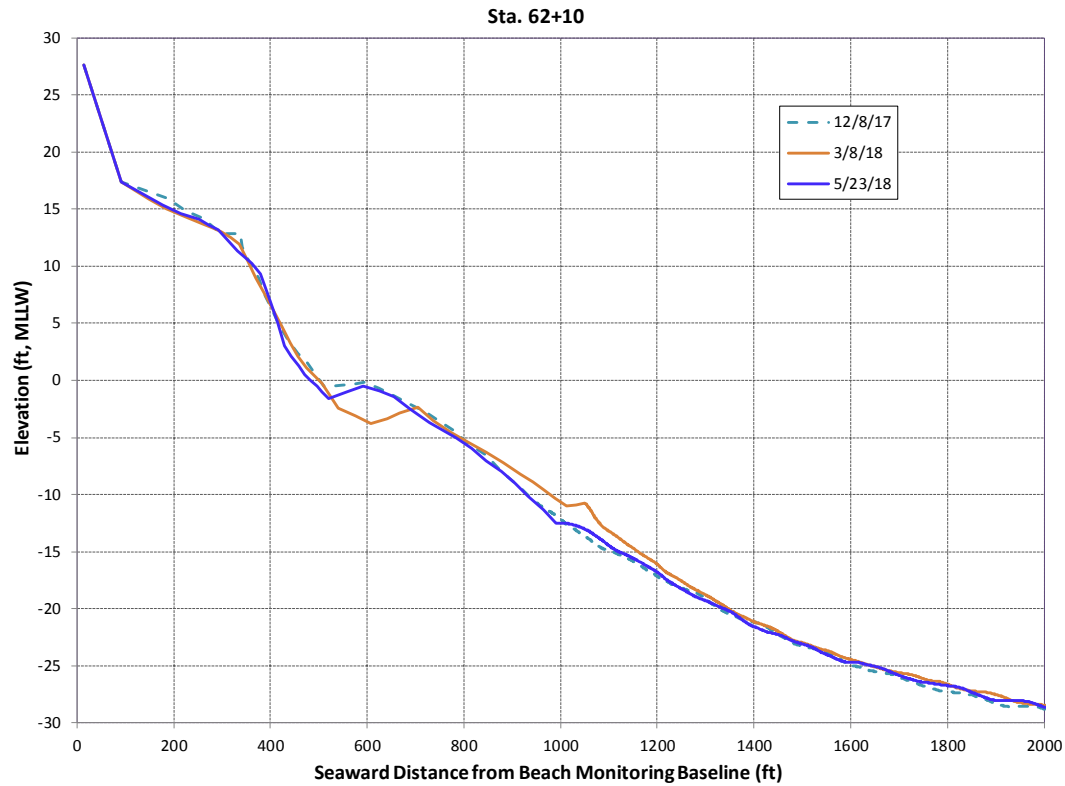


Figure 16. Surveyed Beach Profile at Station 62+10

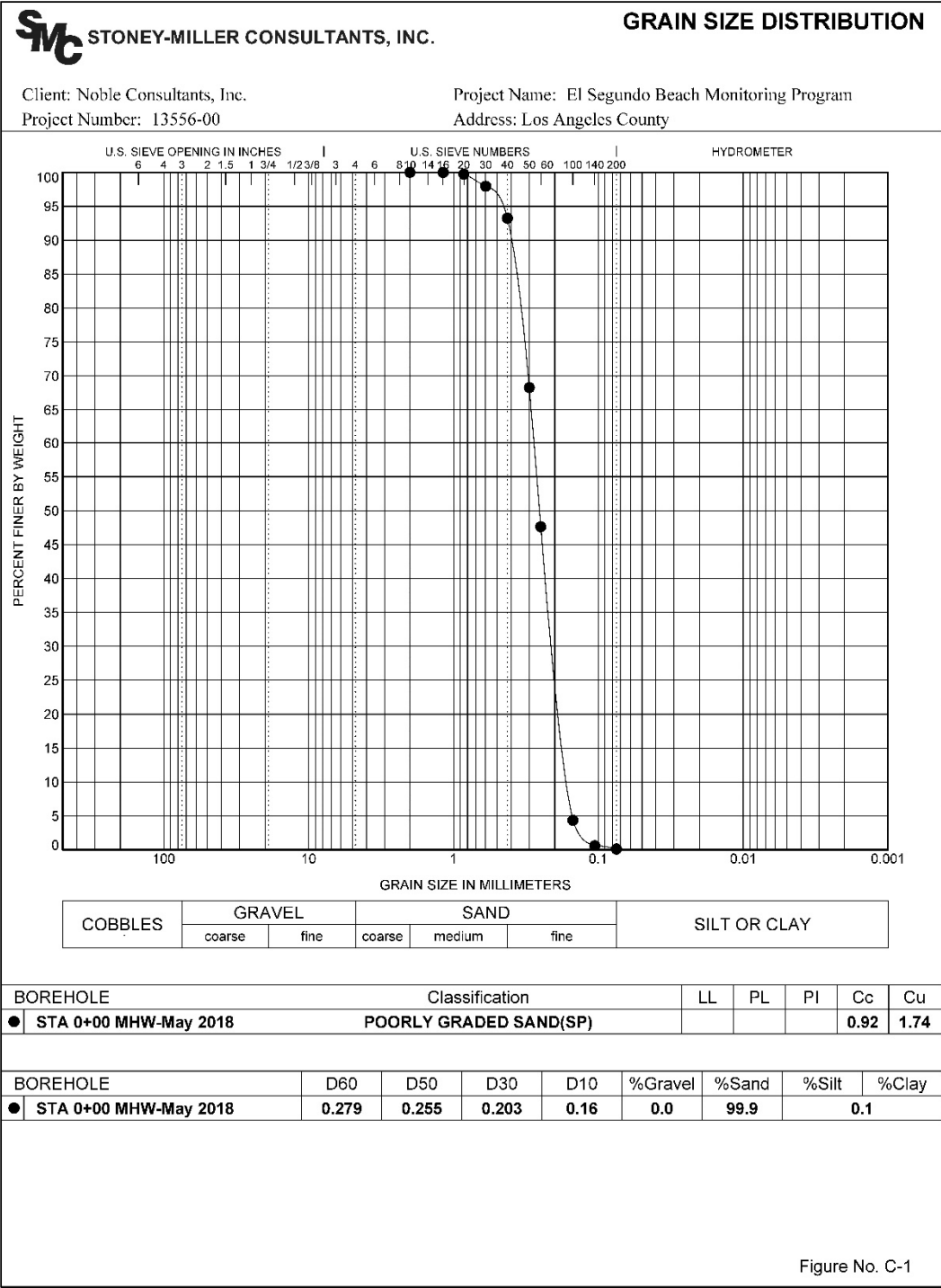


Figure 17. Grain Size Distribution at Sta. 0+00 MHW Line

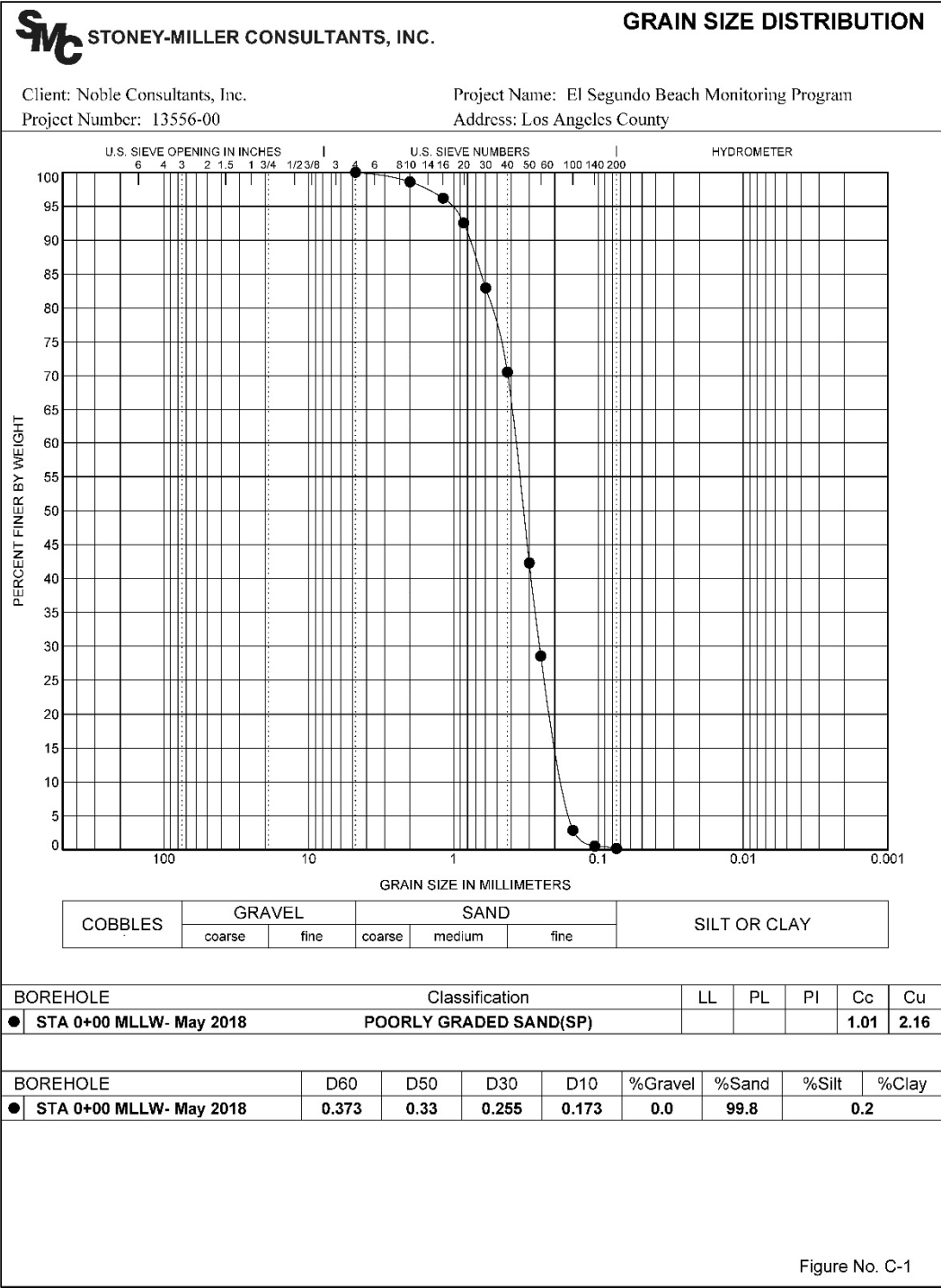


Figure No. C-1

Figure 18. Grain Size Distribution at Sta. 0+00 MLLW Line

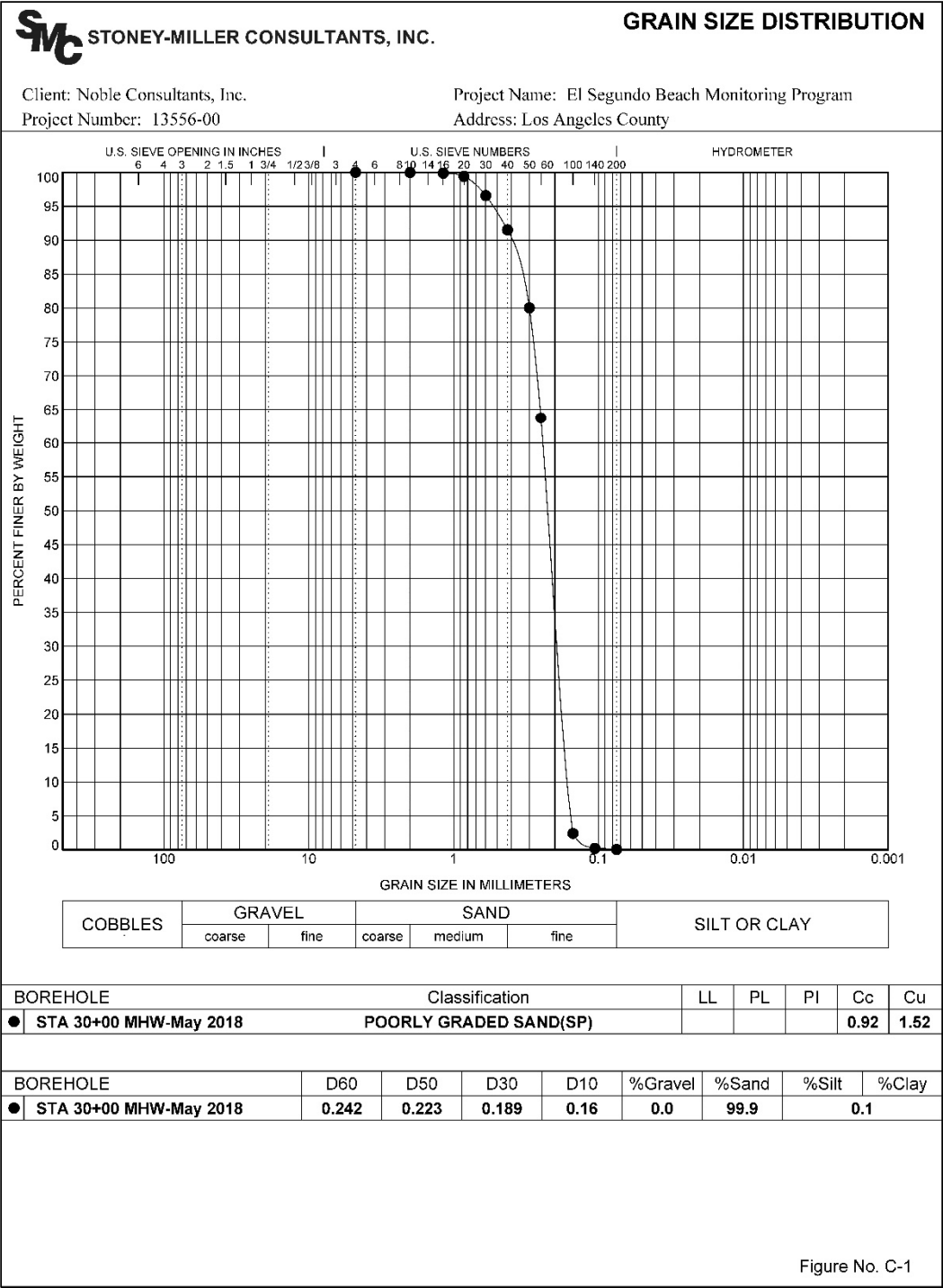


Figure 19. Grain Size Distribution at Sta. 30+00 MHW Line

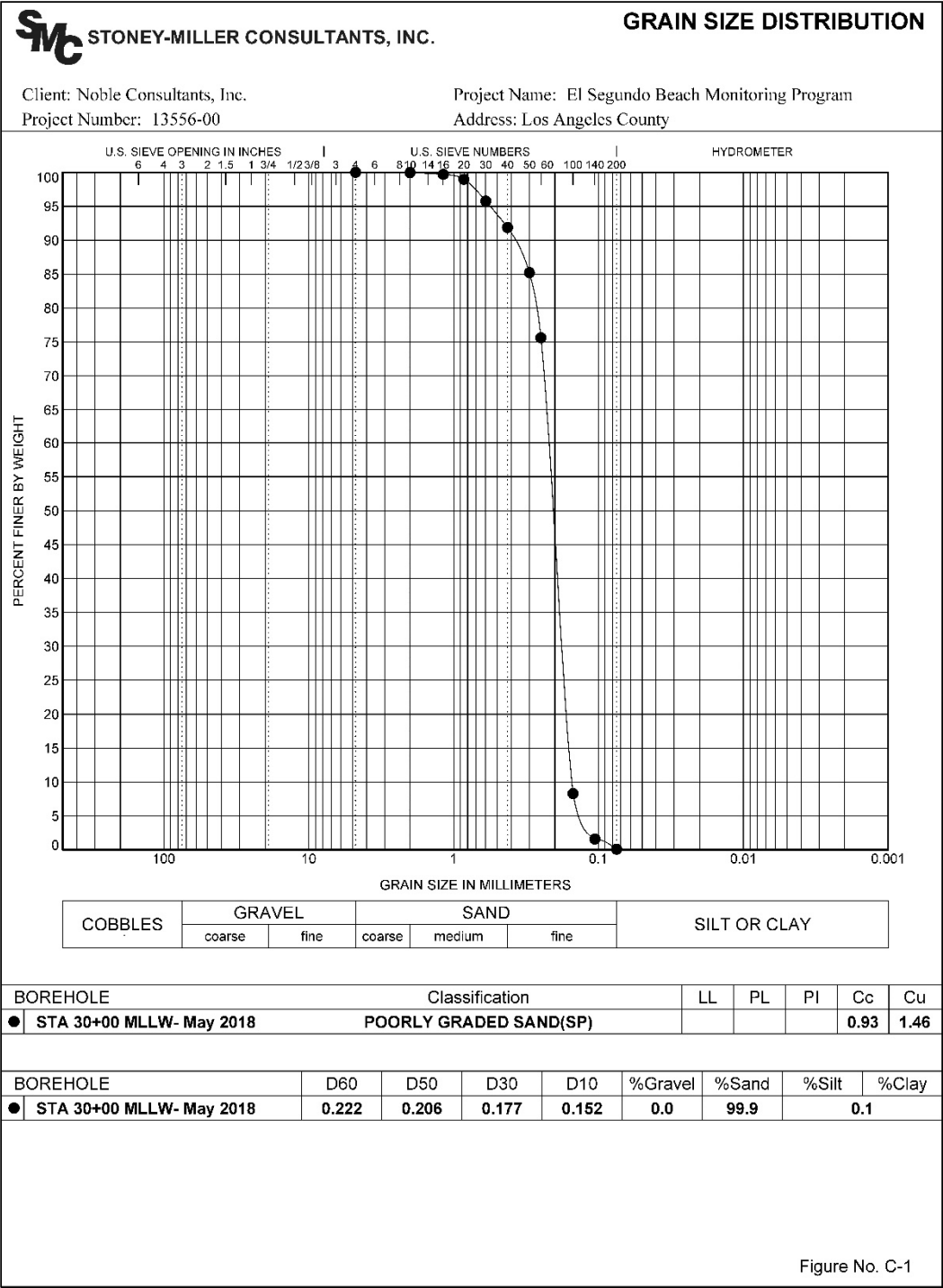


Figure 20. Grain Size Distribution at Sta. 30+00 MHW Line

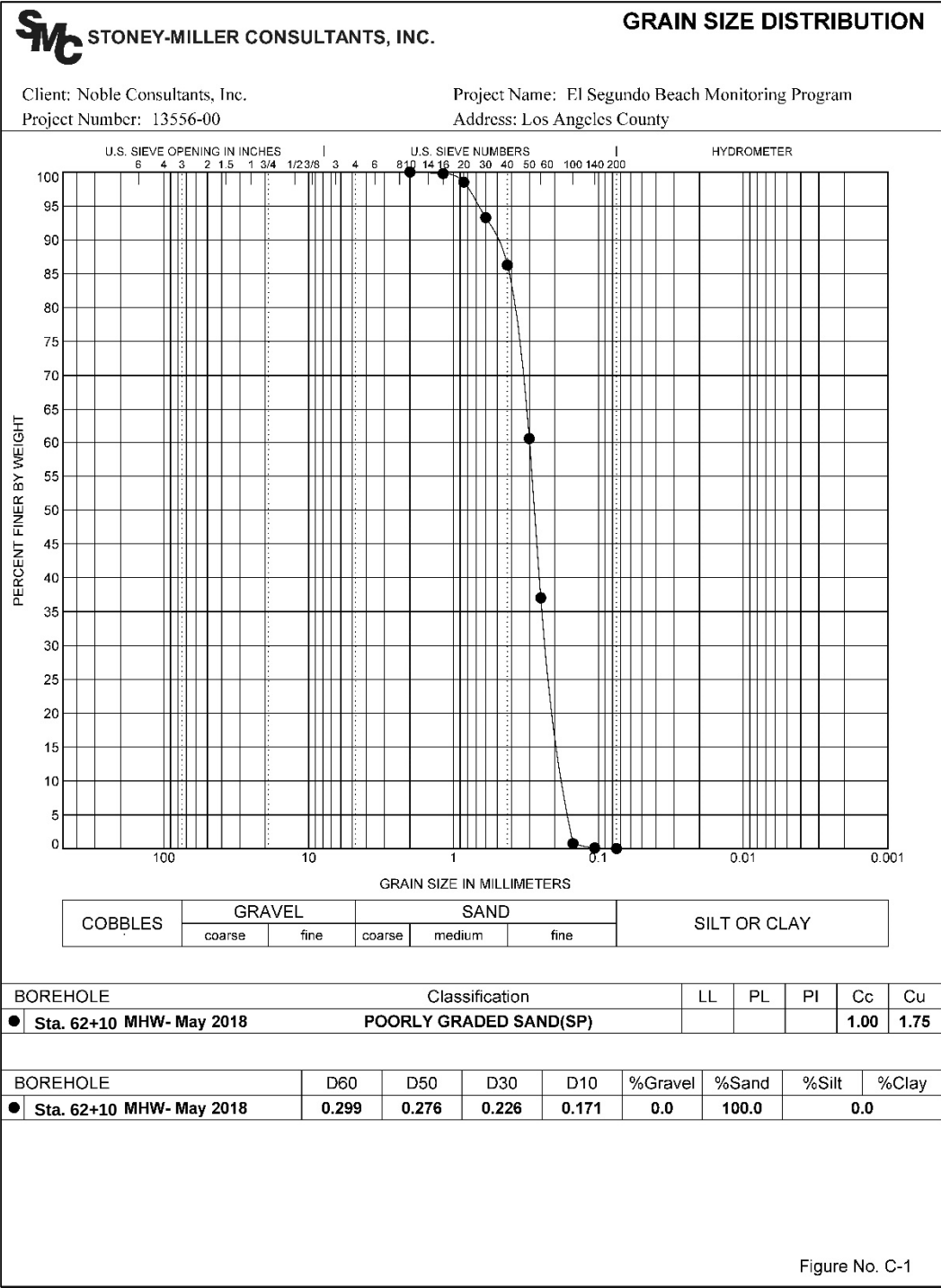


Figure 21. Grain Size Distribution at Sta. 62+10 MHW Line

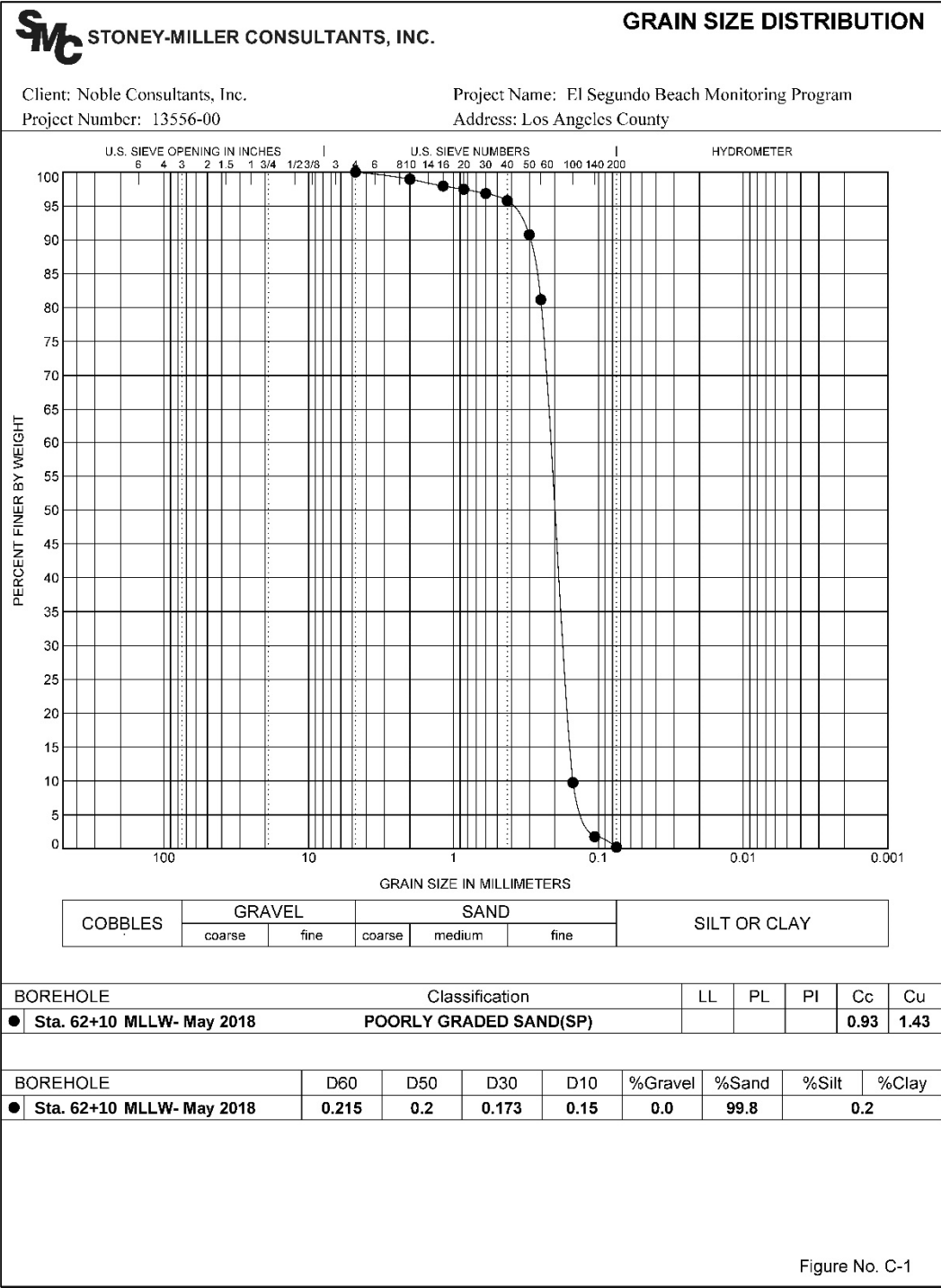


Figure 22. Grain Size Distribution at Sta. 62+10 MLLW Line

El Segundo Energy Center LLC
NRG Energy, Inc.
Quarterly Beach Survey for El Segundo Generating Station

To: Steven Odabashian and George Piantka
From: Chia-Chi Lu
Date: December 24, 2018
RE: Fourth Quarterly El Segundo Beach Monitoring Survey in 2018
CC: Scott Seipel and Srie Coustar

A beach monitoring program, as required by the California Energy Commission, was implemented to assess any potential impacts on the beach conditions at El Segundo Beach for the El Segundo Energy Center Project. The beach monitoring program primarily focuses on beach profile surveys of various onshore/offshore shore-normal transects every few hundred feet four (4) times per year. The program also includes the submittal of annual report documenting the conducted four surveys and variation of shoreline conditions at El Segundo Beach. This beach monitoring program that commenced in 2011 is in the eighth year.

The fourth quarterly survey of this beach monitoring program in 2018 was conducted on December 3 and 4, respectively. The December 2018 survey was based on the following procedures:

- Applied the previously established survey baseline and transect locations for the shore-normal beach profile survey. In total, 15 transect lines were selected from South Dockweiler Beach to El Porto, as illustrated in Figure 1. Transect locations spacing in several hundred feet are at historic transect lines that were previously used by the County of Los Angeles and the Corps of Engineers.
- Collected the offshore bathymetry soundings on December 3, 2018 extending from the surf zone that overlapped the wading survey limit to approximately 4,000 feet offshore. Horizontal positions and soundings were acquired using the Trimble GPS receiver and the Innerspace Depth Sounder, respectively.
- Conducted a wading survey on December 4, 2018 using a Leica TCR404 Total Station, extending from the bike path to the surf zone. In addition, six sediment samples were also collected along three transects at the MLLW and MHW positions, respectively.
- Performed data processing to merge the wading and hydrographic survey data and generated beach profiles for the 15 survey transects.

The four repetitive surveyed beach profiles at the selected 15 transects in 2018 along with the December 2017 survey are shown in Figures 2 to 16. The December 2018 survey shows the eroded beach condition directly resulting from the winter storm event in the end of November. Six sand

**Eighth Year Annual Report
El Segundo Shoreline Monitoring Program
At El Segundo, California**



**PREPARED FOR:
El Segundo Energy Center LLC
301 Vista Del Mar Boulevard
El Segundo, CA 90245**

**PREPARED BY:
Noble Consultants/G.E.C., Inc.
2201 Dupont Drive, Suite 830
Irvine, CA 92612**

January 2019

**EL SEGUNDO SHORELINE MONITORING PROGRAM
(ANNUAL REPORT – YEAR 8)**

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1.0 INTRODUCTION

El Segundo Beach is located in the Santa Monica Bay between Dockweiler Beach to the north and El Porto Beach to the south, as shown in Figure 1. El Segundo, which means “the second one” in Spanish, received its name after it became the site of the second Standard Oil refinery in 1911. At the present time, the shorefront facilities in the El Segundo shoreline segment include the Chevron Refinery and the El Segundo Generating Station (ESGS) that is presently owned by NRG Energy, Inc. To meet the projected consumer power demands in Los Angeles County, NRG has initiated the El Segundo Energy Center (ESEC) project to replace the power generating capacity with minimal environmental impacts at its existing facility (CEC, 2005 & 2010). Consequently, the California Energy Commission (CEC) requested a beach monitoring program to assess the potential shoreline evolution, if any, resulting from the completion of the redevelopment. The specific tasks required for this monitoring program include the following items:

- 1) Perform a historical data research including aerial photos, past beach nourishments and shoreline changes to document historical background at El Segundo Beach;
- 2) Conduct beach profile surveys of various onshore/offshore shore-normal transects every few hundred feet four times per year and submittal of an annual report documenting the findings during each one-year period;
- 3) Collect sand samples at various locations on beach for laboratory testing to characterize the physical property of the sand material;
- 4) Obtain ground and oblique photographs at set positions periodically to provide any visual observations of shoreline change; and
- 5) Document shoreline response of temporary erosion and subsequent recovery during and after a major storm, if occurs.

This prepared annual report summarizes the findings in Year 8 of the beach monitoring program, which covers the period between January 2018 and December 2018. A comprehensive report to summarize the findings over the entire 10-year period as well as any recommendations for further actions will be prepared and submitted after the completion of this ten-year beach monitoring program.

2.0 HISTORICAL BACKGROUND

2.1 Historical Beach Conditions

Beach conditions at El Segundo, and similarly along much of the Santa Monica coastline, have been altered by human intervention including various beach fills to widen the naturally narrow beaches, beach encroachment due to coastal development, and construction of harbors and other coastal structures, such as jetties and groins, for navigation and shore protection. Table 1 presents a summary of the documented historical beach activities that occurred in the El Segundo and the neighboring Dockweiler Beach areas in the past.

Prior to any significant human intervention in the 1930s, El Segundo Beach and its adjacent Dockweiler Beach that is located immediately upcoast were comprised of a narrow and continuous shoreline backed by coastal bluffs, as illustrated in Figure 2. Two oil piers that were built to support the oil pipelines for the operation of the Chevron Oil refinery were the only two major coastal structures located at El Segundo Beach (see Figure 2). Substantial beach alteration began in 1938 when the first beach nourishment activity commenced along Dockweiler Beach as a result of the construction of the Hyperion Treatment Facility (see in Figure 1). Dockweiler Beach was widened with 1.8 million cubic yards (mcy) of sand material dredged from the construction of the Hyperion facility (see the 1938 photo in Figure 2). However, El Segundo Beach, located immediately downdrift of Dockweiler Beach, was minimally impacted by the sand placement at Dockweiler Beach. The sand entrapment by a sheet pile groin located near the southeast end of Dockweiler Beach precluded the placed sand moving downcoast into El Segundo Beach.

In 1947, an additional fill associated with the Hyperion development occurred, during which approximately 7.5 mcy of sand was again placed on Dockweiler Beach (NCl, 2016). Development of the Scattergood Power Plant also contributed additional 2.6 mcy of sand to this littoral system in 1951 and 1956. The upcoast sheet-pile groin was also replaced by a rubble-mound groin as shown in Figure 3 (i.e., the 1954 aerial photo). As the nourished beach was continuously widened, the rubble-mound groin could only partially entrap the alongshore transported sand. Consequently, beach sand was able to bypass the groin, continued the alongshore movement, and entered into El Segundo Beach. Shoreline advance at El Segundo Beach thus occurred (see the 1954 and 1959 aerial photos in Figure 3). In 1960, additional 3.2 mcy of sand material were placed on Dockweiler Beach during the construction of Marina del Rey, which further widened Dockweiler Beach and also advanced shoreline at El Segundo Beach, as illustrated in Figure 4 (see the 1960 aerial photo).

Table 1. Historical Activities at El Segundo Beach and Dockweiler Beach

Date	Activity Description	Location
1887	Ballona Creek twin timber jetties	Ballona Creek
1938	1,800,000 cy fill from Hyperion facility	Dockweiler Beach
Prior 1930	Oil Pier Construction	El Segundo Beach
1938	Two 600-foot rubble mound jetties at Ballona Creek	Dockweiler Beach
1946	Two rubble mound jetties at Ballona Creek extended to 1,350 feet	Ballona Creek
1947	7,650,000 cy fill from Hyperion facility	Dockweiler Beach
1951	Construction of DWP Power Plant	Dockweiler Beach
1951	240,000 cy fill from DWP power plant	Dockweiler Beach
1951	Rubble mound groin at Deauville Street	Dockweiler Beach
1951	Rubble mound groin at Gillis Street	Dockweiler Beach
1956	2,400,000 cy from DWP power plant	Dockweiler Beach
1959	Ballona Creek north jetty extended to 2,000 feet	Ballona Creek
1960-62	3,200,000 cy fill from Marina del Rey	Dockweiler Beach
1965	2,330-foot detached rubble mound breakwater (at Marina del Rey entrance channel)	Marina del Rey
1969	390,000 cy bypass from Marina del Rey	Dockweiler Beach
1975	10,000 cy bypass from Marina del Rey	Dockweiler Beach
1981	217,000 cy bypass from Marina del Rey	Dockweiler Beach
1983-84	650-foot rubble mound Chevron Groin	El Segundo Beach
1984	620,000 cy fill from unknown source	Dockweiler Beach & El Segundo Beach
1987	35,000 cy bypass from Marina del Rey	Dockweiler Beach
1988	155,000 cy fill from Hyperion facility	Dockweiler Beach
1988	550,000 cy fill from Hyperion Facility	El Segundo Beach
1989	150,000 cy fill from Hyperion Facility	El Segundo Beach
Unknown	Rubble mound groin near RV Park	Dockweiler Beach
Unknown	Rubble mound groin near Scattergood facility	Dockweiler Beach
2012	150,000 cy from Marina del Rey Maintenance Dredging	Nearshore Region at Dockweiler Beach
2012	Nearshore and on-beach sand placement from Marina del Rey (83,000 & 75,000 cy, respectively in volume)	Redondo Beach
2016-2017	Nearshore placement of 388,000 cy	Dockweiler Beach

Source: Noble Consultants, Inc., 2016 & Ryan. 2017.

As years went by without any additional beach replenishment activity and the alongshore transported sand was continuously entrapped by the presence of the groin, less sand was moved into El Segundo Beach than sand being moved downcoast from wave impingement. The artificially advanced beach at El Segundo began to gradually retreat. Aerial photos taken in 1965 and 1970, shown in Figure 4, demonstrate this gradual retreating trend at El Segundo Beach. Eventually, the beach at El Segundo reached a narrow-width state in the early 1980s as illustrated in Figure 5.

Historical meteorological records indicate that southern California experienced a period of severe winter storms in the late 1970s and 1980s. These winter storms that respectively occurred in 1978, during the 1982-83 El Nino season, and in 1988 resulted in extensive damage to public infrastructures and private coastal development. Specifically, the 1983 extreme storm waves destroyed the marine terminal pier and damaged the oil pipelines. A 650-foot rubble mound groin (i.e. the Chevron Groin) was consequently constructed in 1983-84 at the destroyed oil pier location to protect the repaired Chevron pipeline facility. In addition, a riprap revetment was built downcoast of the newly constructed groin along the backshore of the entire El Segundo Beach to protect the landward infrastructure. Approximately 0.62 mcy of sand were dredged from an offshore source to replenish the depleted beach and to supplement the anticipated sand deficiency due to the sand entrapping effect induced by the newly constructed groin.

However, the Chevron Groin continued to have an eroding impact on the downdrift beach and El Segundo Beach remained in a beach-depleted state, as illustrated in Figure 5 (see aerial photo taken in 1988). In 1988-1989, El Segundo Beach received two separate beach fills with a combined sand volume of 0.7 mcy from the additional Hyperion development. Figure 5 also shows the pre-fill beach conditions in 1988 as well as the post-fill beach conditions two years later in 1991. Nevertheless, the beach returned to its narrow state within a couple of years. Figure 6 illustrates the once-again depleted beach condition in 1994.

2.2 Present-Day Beach Conditions

Seasonal changes in the wave climate and the occurrence of strong El Nino winter storms are the primary causes for fluctuations in beach width. The shoreline within the project site, even in a sand-limited state, still experiences seasonal changes in beach width as winter sand profiles are typically more depleted than summer profiles. Although El Segundo Beach exhibits typical seasonal changes, the sand-limited beach conditions remain relatively invariant since the early 1990s after the last beach replenishment was conducted in 1989. Figures 6 to 11 show the site conditions that were observed in different periods between 1994 and 2018. The Chevron Groin essentially entraps the majority of the downdrift-transported sand and limits the updrift sand supply to El Segundo Beach. Therefore, the narrow beach conditions persist within El Segundo Beach although the shoreline exhibits a repetitive pattern of seasonal retreat in the winter and subsequent recovery in the summer. Even during the summer months, the width from the revetment to the water line is only approximately 100 feet within the narrowest sub-segment.

3.0 REGIONAL OCEANOGRAPHIC CONDITIONS

3.1 Water Levels

Water levels at El Segundo Beach are primarily affected by four oceanographic factors: 1) astronomical tides, 2) El Nino Southern Oscillation (ENSO) events, 3) long-term changes in sea level, and 4) storm-induced surge during individual storm events. Astronomical tides in the Southern California Bight are of the mixed, semi-diurnal type, with two highs and two lows of unequal height occurring each lunar day (the duration of which averages 24.4 hours). The largest water level excursion typically occurs as the tide falls from higher high to lower low water, a process that generally requires 7 to 8 hours. Table 2 summarizes the tidal datums that were derived from the measurements at the Santa Monica Pier during the epoch period from 1983 to 2001 (NOAA, 2016). The extreme high and low water levels that were historically recorded are also presented in the table.

El Nino-Southern Oscillation (ENSO) events represent global-scale climatic variations with a duration of two to several years. These are characterized by a decrease in atmospheric pressure in the eastern tropical Pacific Ocean, a decrease in the easterly trade winds, and an increase in sea level on the west coast of North and South America. It is expected that elevated water levels that result from ENSO events may be expected every four to seven years, with four or five strong events each century (Flick and Badan-Dangon, 1989).

Table 2. Tidal Characteristics

Datum or Level	Elevation (ft, MLLW)
Maximum Measured Water Level	+8.5
Mean Higher High Water (MHHW)	+5.4
Mean High Water (MHW)	+4.7
Mean Tide Level (MTL)	+2.8
Mean Sea Level (MSL)	+2.8
Mean Low Water (MLW)	+0.9
North America Vertical Datum–1988 (NAVD)	+0.2
Mean Lower Low Water (MLLW)	0.0
Minimum Measured Water Level	-2.8

Note: tidal gage at Santa Monica Pier

Long-term changes in the elevation of sea level relative to the land can be engendered by two independent factors: 1) global or eustatic changes in sea level, which might result from influences such as global warming, and 2) local changes in the elevation of the land, which might result from subsidence or uplift. A trendline analysis of yearly Mean Sea Level (MSL) data recorded at the Santa

Monica Pier from 1933 to 2017 indicates that the MSL upward trend is approximately 0.00501 ft/yr (NOAA, 2018), as illustrated in Figure 12.

Storm surge is the super-elevation of the water level that results from the reduced barometric pressure (the so-called “inverted barometer effect”) and wind stress during storm events. Unlike the Atlantic and Gulf Coasts where storm surges can attain high amplitudes on the relatively wide, shallow, and gentle slopes of the Continental Shelf, surges on the Southern Pacific Coast are comparatively small.

The added probability of experiencing more severe winter storms during the El Nino periods increases the likelihood of coincident storm waves and higher storm surge. The record water level of +8.5 feet, MLLW, observed at the Santa Monica Pier in November 1982 includes storm surge and seasonal sea level rise (Flick and Cayan, 1984).

3.2 Regional Wave Climate

Local seas and swell incidents at the El Segundo shoreline are produced primarily by six basic meteorological patterns: 1) extratropical storm swells in the northern hemisphere (northwest or west swells); 2) wind swells generated by northwest winds in the outer coastal waters (wind swells); 3) westerly local seas (west seas); 4) southeasterly local seas (southeast sea); 5) storm swells of tropical storms or hurricanes off the Mexican coast; and 6) southerly swells originating in the southern hemisphere (southerly swells).

Northwest or West Swells: Low pressure centers, which develop along the polar front, are the source of the predominant wave action along the entire coast during the winter half of the year. Storm swells are generated at some distance from the El Segundo coastline in the North Pacific. In general, the modal deep water approach direction of these waves to Southern California is between 275° and 285°. The wave period typical ranges between 12 to 18 seconds. This swell pattern has been responsible for causing most of the coastal damage along the Southern California shoreline in the past, including the coastal infrastructure located at El Segundo Beach.

Wind Swells: The predominant wave actions along the El Segundo coast during the spring and summer months are due to the prevailing northwest winds north and west of the Southern California coastal waters. Waves traveling at a variance to the mean wind direction reach El Segundo Beach with periods on the order of 6 to 10 seconds. Moderate northwesterners will produce breaker heights of 4 to 6 feet while stronger events can generate 6 to 9 foot waves along the shoreline.

West Seas: Westerly winds exhibit a pronounced seasonal and diurnal variation. The summer sea breezes, which average about 15 knots, usually set in during

the late morning and peak in the mid-afternoon. In winter months, sea breeze conditions are limited to a few hours during early afternoon with wind speed on the order of 10 knots.

Southeast Seas: The El Segundo coastline may be vulnerable under storm conditions prior to frontal passage winds blowing in a counterclockwise rotation from the southeast to southwest along the coast, but turning toward the south-southeast to south a short distance offshore. Local seas generally have a peak energy between 6 and 8 seconds with wave heights of 4 to 8 feet.

Tropical Storm Swells: Tropical cyclones form regularly along the inter-tropical convergence zone west of Mexico from early July to late October. On the average, about 15 to 20 hurricanes can be expected each year, and most take a westerly track. Swells generated by these storms will have little or no effect on Southern California; however, those that take a northwest track lengthen the effective fetch over which the generated swells travel toward Southern California. As a result, larger waves may be experienced at El Segundo Beach.

Southerly Swells: From the months of April through October, and to a lesser extent the remainder of the year, large South Pacific storm systems traversing the ocean between south latitude 40° and 60° from Australia to South America send swells northward to the west coast of Central and North America. The approach directions to Southern California range from about 215° for storms near New Zealand to 170° for South American storm systems. Wave heights in deep water are usually low on the order of one to three feet. The periods range from 18 to 22 seconds. Since this wave pattern occurs mostly during the summer months when the El Segundo Beach is seasonal wide, the impact from these distant wave swells is generally insignificant.

3.3 Local Wave Climate in The 2018 Monitoring Year

Monthly plots of wave rose, which characterize wave conditions that occurred during this monitoring period from January 2018 to December 2018, are presented in Figures 13 to 15. Wave data were obtained from the Coastal Data Information Program (CDIP) buoy (#028) located in the Santa Monica Bay (CDIP, 2018). The deepwater buoy is located at 33° 51.27' N (Latitude) and 118° 37.97' W (Longitude) in a water depth of approximately 1,191 feet. These figures show the gradual shift of the prevailing wave pattern from westerly to southerly swells as the season transitions from the winter (e.g., March) to summer (e.g., June) months. The reverse trend of shifting back to the prevailing west swells occurs as November arrives (see Figure 15). Figures 16 to 19 graphically present the recorded significant wave heights for the entire year of 2018. The wave climate pattern observed during the Year 8 monitoring period is relatively similar to the previous seven years.

4.0 BEACH MONITORING PROGRAM

A beach monitoring program, as required by the California Energy Commission, was implemented to assess any potential changes of the beach conditions at El Segundo Beach as a consequence of the El Segundo Energy Center (ESEC) project. This beach monitoring program primarily focuses on beach profile surveys of various onshore/offshore shore-normal transects every few hundred feet four (4) times per year and submittal of an annual report documenting the conducted surveys and variation of shoreline conditions at El Segundo Beach. In addition, the program includes sand sampling and testing on a semi-yearly basis at three designated locations within the upcoast, downcoast, and project beach areas. It is noted that the sediment samples were collected on a quarterly basis in the eighth year. The annual report also includes photographs taken from pre-selected positions along El Segundo Beach, and shoreline response during and after a major storm, if observed.

In total, 15 transect lines were selected from South Dockweiler Beach to El Porto, as illustrated in Figure 20. Transect locations spacing in several hundred feet are at historic transect lines that were previously used by the County of Los Angeles and the US Army Corps of Engineers-Los Angeles District (USACE-LAD). These transects will be used for all subsequent monitoring surveys.

4.1 Survey Methods

4.1.1 Establishment of Baseline

Individual survey markers were located or reestablished for the 15 transects to be monitored for this program, as these transect locations were previously selected by USACE-LAD and County of Los Angeles for their beach profiles surveys. Previously established markers at individual transects were utilized wherever identified in the field. Otherwise, new markers were reestablished so that one marker exists for each individual transect. The location of each historical or newly established marker was determined using the Sokkia Locus GPS receiver that was referenced to the US Coast and Geodetic Survey Monument T767. The Sokkia GPS receiver is capable of accurately determining the coordinates and elevation of a given point. It is noted that the historical baseline within this shoreline segment was originally established in the 1930s when the first comprehensive beach profile survey was conducted. The historical baseline is much further landward of the existing bicycle path along the South Dockweiler Beach and El Segundo Beach, where the presently selected survey markers are located. The cross-shore distance between the historical baseline and the survey marker at each individual transect is presented in Table 3.

4.1.2 Wading Surveys

The beach and foreshore were surveyed using an electronic Leica TRC404 Total Station and a survey rodman. The Total Station was used to determine the position and elevation at each location occupied by the rodman. The wading

survey extended from the back beach, through the foreshore, and to the surf zone. The instrument was set up over a given survey marker and oriented using a nearby marker. The transect orientation was marked with temporary range stakes. The rodman walked across the beach stopping incrementally as required to document the beach profile. A 6-foot prism rod was held vertically and the location of the rod was determined and logged using the Total Station. A 14-foot extendable prism rod was used within the surf zone to ensure the overlap of data collection between the wading and nearshore hydrographic surveys.

Table 3. Surveyed Beach Profile Stations

Beach	Survey Transect	Cross-shore Distance (ft)*
South Dockweiler Beach	0+00	191.9
	4+00	219.0
	8+00	224.2
	12+50	256.8
	15+00	257.4
El Segundo Beach	22+50	247.0
	27+50	242.4
	30+00	242.0
	32+50	240.9
	37+50	232.4
	40+00	230.5
	42+50	192.7
El Porto Beach	47+50	32.9
	52+50	33.1
	62+10	14.3

*. Cross-shore distance between historical baseline (landward) and survey markers along the bicycle path

4.1.1 Nearshore Bathymetric Surveys

Nearshore bathymetry was acquired with a digital acoustic echo sounder operated from a 16-foot shallow-draft inflatable survey vessel. The data collection extended from the surf zone seaward to a point approximately 4,000 feet from the baseline. Position data was obtained using the Trimble GPS receiver; raw sounding data was collected using the Inner-space Depth Sounder. The position and sounding data was merged and logged onto a laptop computer running the Hypack Hydrographic Survey Software. The Hypack software with the instant navigation data was used by the helmsman to steer the vessel along each transect. A dynamic motion sensor, which provides real-time corrections to the echo sounder for wave-induced vessel heave, also was utilized. This tool improves the resolution of the sonar system, particularly in areas of localized vertical relief.

At each transect, the survey vessel was maneuvered to the offshore end using the Hypack navigation data. Data logging began when the vessels reached the starting location of each transect and soundings were logged on a near-continuous basis until the vessel reached the surf zone. At the conclusion of data collection, the transducer draft and speed of sound was confirmed with a bar check and sound velocity profiler.

4.2 Surveyed Beach Profiles

Four (4) beach profile surveys are to be annually performed during this 10-year monitoring program. The repetitive surveys were conducted on a quarterly basis. The dates of individual surveys conducted so far for this beach monitoring program are provided in Table 4. The 34 surveyed beach profiles for the first 8 years of this beach monitoring program are shown in Figures 21 to 35, while the four surveyed profiles that were conducted in 2018 are illustrated in Figures 36 to 43. These figures also show the December 2017 survey for the comparison purpose.

Table 4. Survey Dates in Years 1 to 8 (2011 to 2018)

Survey No.	Survey Dates	Survey No.	Survey Dates
1	February 8 & 9, 2011	18	February 2 & 5, 2015
2	April 27 & 28, 2011	19	May 21 & 22, 2015
3	July 26 & 27, 2011	20	July 23 & 24, 2015
4	October 26 & 27, 2011	21	November 5 & 6, 2015
5	February 22 & 23, 2012	22	December 28 & 29, 2015
6	April 23 & 24, 2012	23	March 17 & 21, 2016
7	July 18 & 19, 2012	24	May 25 & 26, 2016
8	October 30 & 31, 2012	25	August 29 & 31, 2016
9	January 30 & 31, 2013	26	November 29 & December 2, 2016
10	April 25 & 26, 2013	27	March 7 & 8, 2017
11	July 23 & 25, 2013	28	May 23 & 29, 2017
12	November 1 & 6, 2013	29	August 14 & 17, 2017
13	February 26 & 27, 2014	30	December 7 & 8, 2017
14	March 13, & 14, 2014	31	March 8 & 9, 2018
15	April 18 & 25, 2014	32	May 23 ~ 25, 2018
16	July 21 & 23, 2014	33	September 5 & 7, 2018
17	Oct. 30 & Nov. 3, 2014	34	December 3 & 4, 2018

4.3 Sediment Sampling

Six sand samples (two sediment samples per location) were respectively collected at three different locations for each quarterly survey in 2018, as identified in Figure 20. At each location, one sand sample was collected on the foreshore face at the approximate Mean High Water (MHW) position and the other in the surf zone near the Mean Lower Low Water (MLLW) elevation. The collected sand samples were sent to a soil-testing laboratory for analysis of the sediment grain size distribution. Table 5 summarizes the median grain size (D50) characteristics of individually sampled sediments, while Figures A-1 to A-24 graphically illustrate the deduced grain size distributions for the collected sand samples.

4.4 Ground and Oblique Photographs

Ground and oblique photographs at El Segundo Beach were also taken periodically during the Year 8 beach monitoring period. Ground photographs were taken at two designated locations, one in the upcoast sub-segment and the other in the downcoast area, as identified in Figure 20. Figures 44 to 47 show ground photographs taken at these two locations on four different dates. In addition, oblique photographs of El Segundo Beach were periodically taken from the upper level of the plant facility. Figures 48 to 53 present the monthly snapshots of shoreline conditions towards both the upcoast and downcoast directions at El Segundo Beach from January 2018 to December 2018.

Table 5. Median Grain Sizes (D₅₀) of Collected Sand Samples in 2018

Sampling Location	Sampling Location	Soil Type	D ₅₀ (mm)			
			Mar.	May	Sep.	Dec.
Sta. 0+00	MHW	Poorly Graded Sand	0.33	0.26	0.33	0.53*
	MLLW	Poorly Graded Sand	0.32	0.33	0.33	0.26
Sta. 30+00	MHW	Poorly Graded Sand	0.24	0.22	0.26	0.31
	MLLW	Poorly Graded Sand	0.24	0.20	0.20	0.24
Sta. 62+10	MHW	Poorly Graded Sand	0.21	0.28	0.27	0.34
	MLLW	Poorly Graded Sand	0.23	0.20	0.22	0.37

*: with a significant portion of gravel

5.0 INTERPRETIVE ANALYSIS

Beaches within the project site experience long-term shoreline evolution resulting from the sand balance within its littoral system as well as seasonal changes in beach width due to variant wave climate in the summer and winter seasons. The surveyed beach profiles shown in Figures 36 to 43 typify the seasonal variation of beach conditions at South Dockweiler Beach, El Segundo Beach, and El Porto. Winter sand profiles are typically more depleted than summer profiles, as sands

are carried offshore beyond the surf zone during the winter months and stored in a bar formation. During the summer months, the beach widens and reforms as sands from the offshore bar return. This phenomenon is the consequence of seasonal wave climate. The offshore sand movement is induced by the stormy high waves in the winter, while the reverse trend occurs due to the low-height longer-period swells that are commonly observed in the summer months.

The results of the sediment sampling analysis also indicate the seasonal cross-shore sand movement, as seen in Table 5. The coarse sediments were identified during the December sampling as compared to the finer sands collected at the same locations in May. As the fine materials are moved seaward during the winter months, the remaining sands on beach tend to be coarse. Conversely, nearshore fine sands that are moved back to the beach during the summer months result in a finer sand grain size distribution.

Figure 54 shows the distance from the bicycle path (South Dockweiler Beach & El Segundo Beach) or the parking lot (El Porto) seaward to the MSL position at three respective beaches. The widest beach that was observed in the period between the summer and fall season typifies the summer profiles. The beach profiles surveyed in December 2018 are the narrowest for the 2018 monitoring year. The most depleted beach condition directly results from a major storm arriving the southern California prior to the survey conducted in early December (see Figure 19). The figure of the MSL position illustrates a slightly retreating trend at South Dockweiler Beach and El Porto in the past eight years, but a relatively stable condition at El Segundo Beach. Figure 55 delineates seasonal variation at the MSL position between the winter and summer surveys.

6.0 REFERENCE

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Ryan, J., 2017. Personal Communications, Corps of Engineers- Los Angeles District.



Source: Google Earth (November 2011)

Site Map



Figure 1



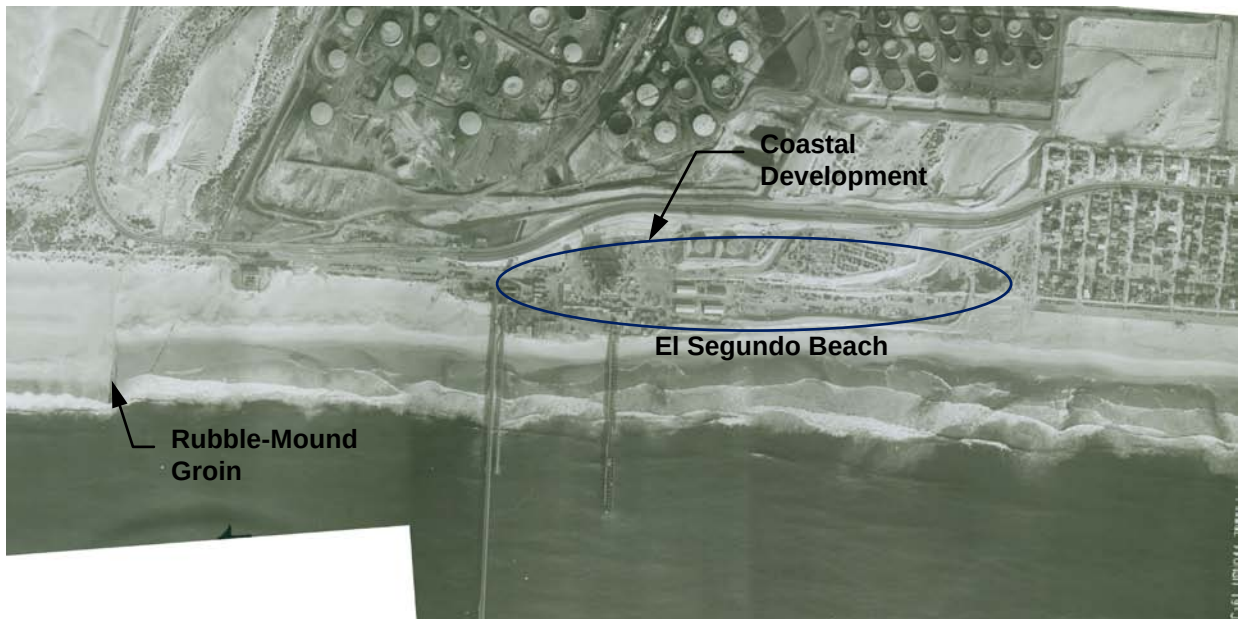
Oblique Photo Taken in 1930



Aerial Photo Taken in 1938

Source: USACE-LAD

Beach Conditions at Dockweiler /El Segundo Beaches in 1930s



Aerial Photo Taken in 1954



Aerial Photo Taken in 1959

Source: USACE-LAD

Beach Conditions at El Segundo in 1954 & 1959



Aerial Photo Taken in 1960



Aerial Photo Taken in 1965



Aerial Photo Taken in 1970

Source: USACE-LAD

Beach Conditions at El Segundo in 1960, 1965 & 1970



Aerial Photo Taken in 1984



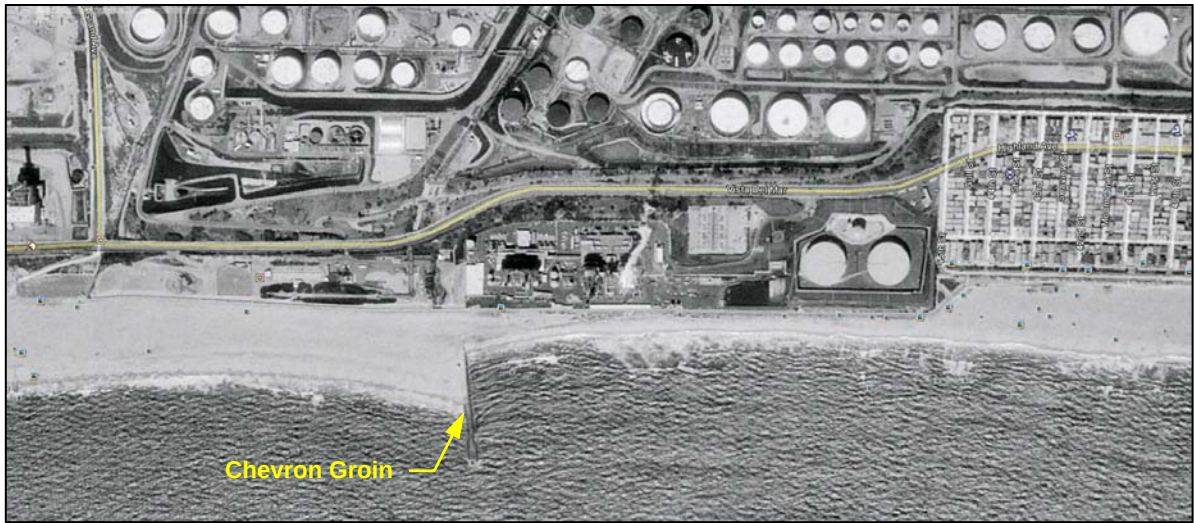
Aerial Photo Taken in 1988



Aerial Photo Taken in 1991

Source: USACE-LAD

Beach Conditions at El Segundo in 1984, 1988 & 1991



Aerial Photo Taken on May 30, 1994



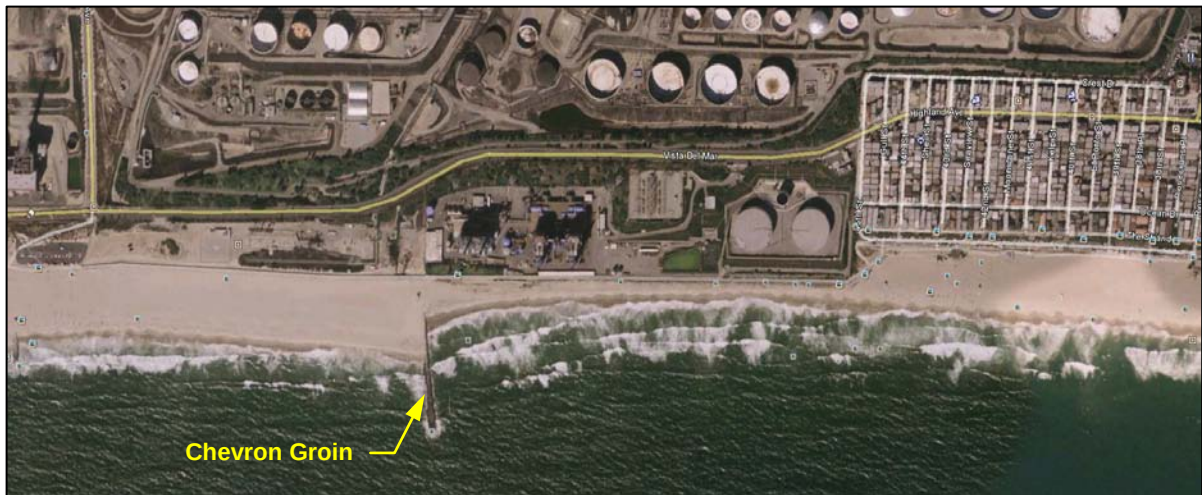
Aerial Photo Taken on Mar. 5, 2002



Aerial Photo Taken on Nov. 30, 2003

Source: Google Earth

Beach Conditions at El Segundo in 1994, 2002 & 2003



Aerial Photo Taken on Dec. 31, 2004



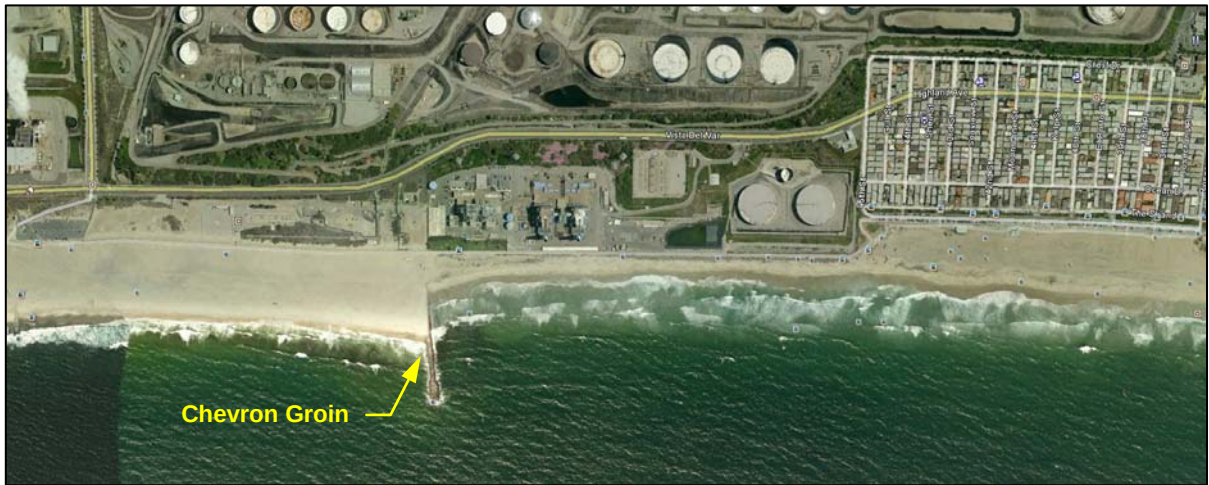
Aerial Photo Taken on Nov. 2, 2005



Aerial Photo Taken on Jul. 30, 2007

Source: Google Earth

Beach Conditions at El Segundo in 2004, 2005 & 2007



Aerial Photo Taken on Jan. 8, 2008



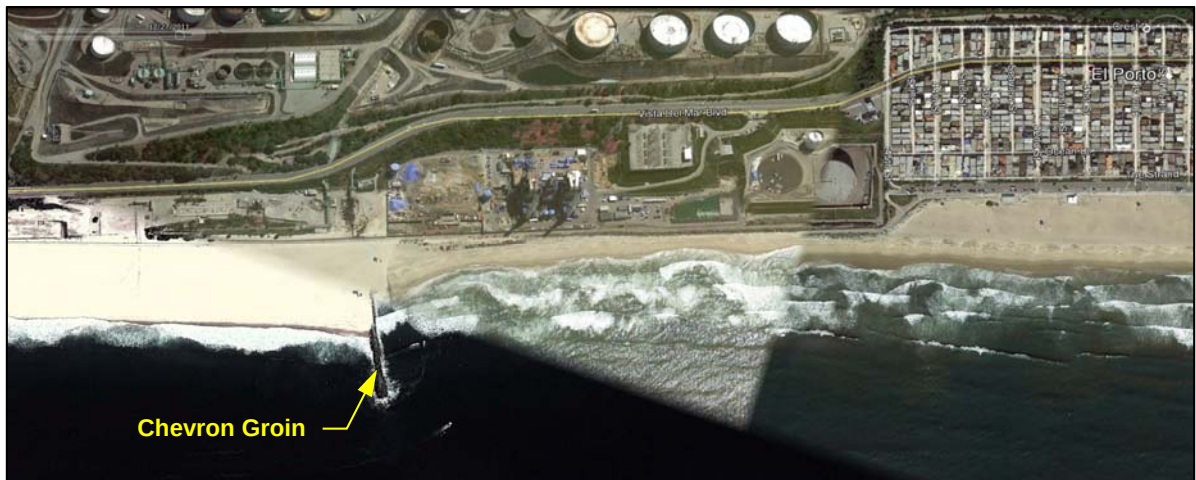
Aerial Photo Taken on May 24, 2009



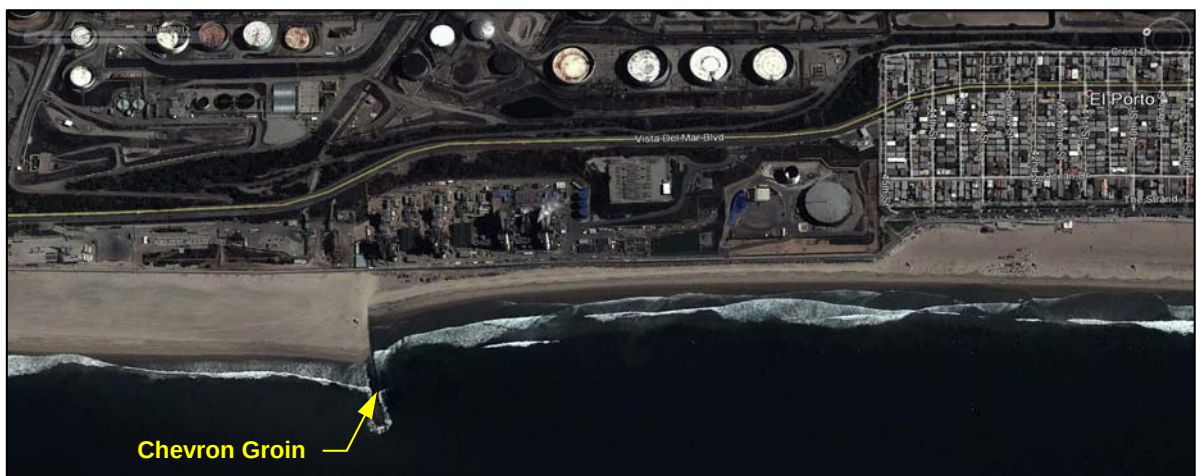
Aerial Photo Taken on Mar. 7, 2011

Source: Google Earth

Beach Conditions at El Segundo in 2008, 2009 & 2011



Aerial Photo Taken on December 27, 2011



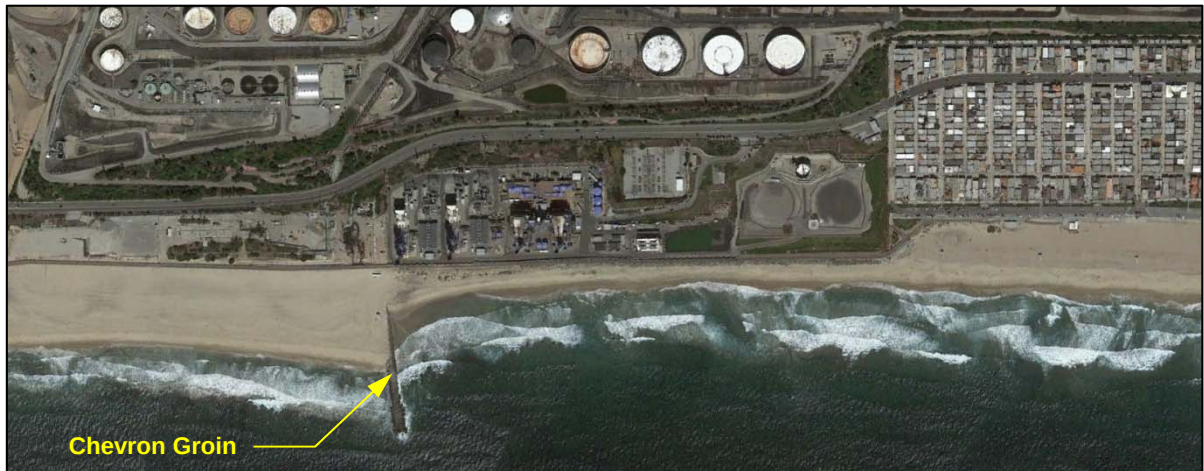
Aerial Photo Taken on October 13, 2012



Aerial Photo Taken on April 16, 2013

Source: Google Earth

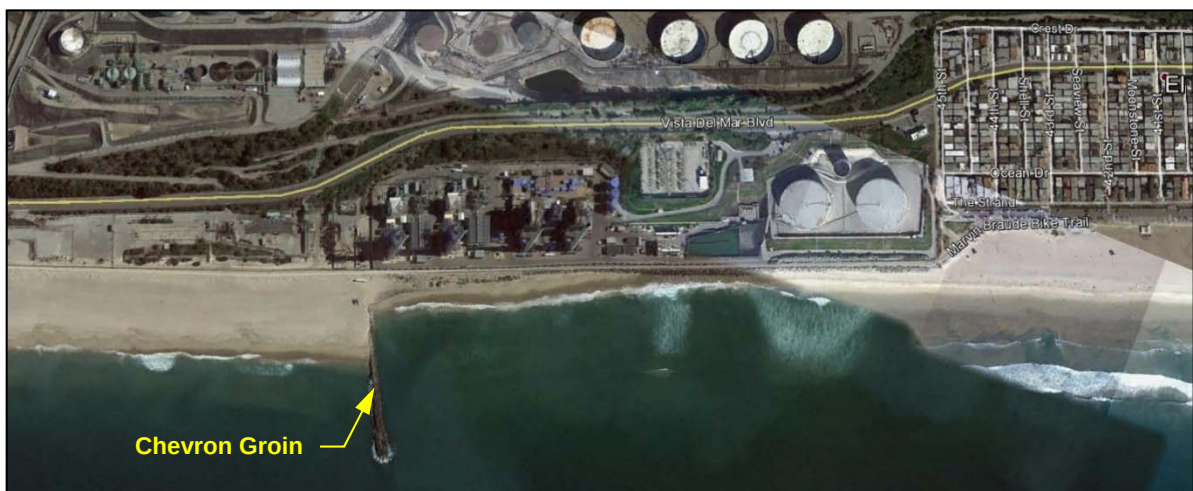
Beach Conditions at El Segundo in 2011, 2012 & 2013



Aerial Photo Taken on April 23, 2014



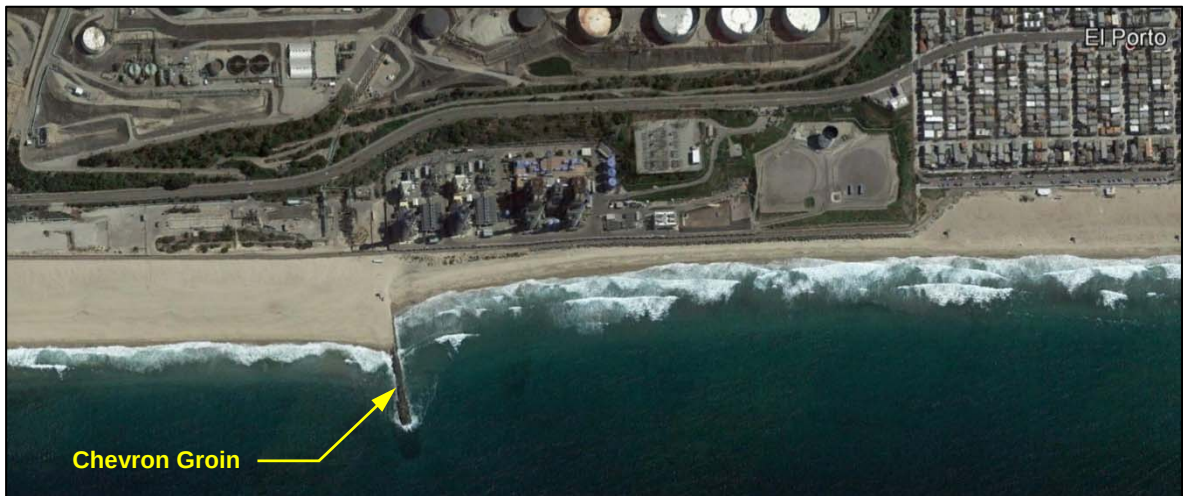
Aerial Photo Taken on May 1, 2015



Aerial Photo Taken on February 8, 2016

Source: Google Earth

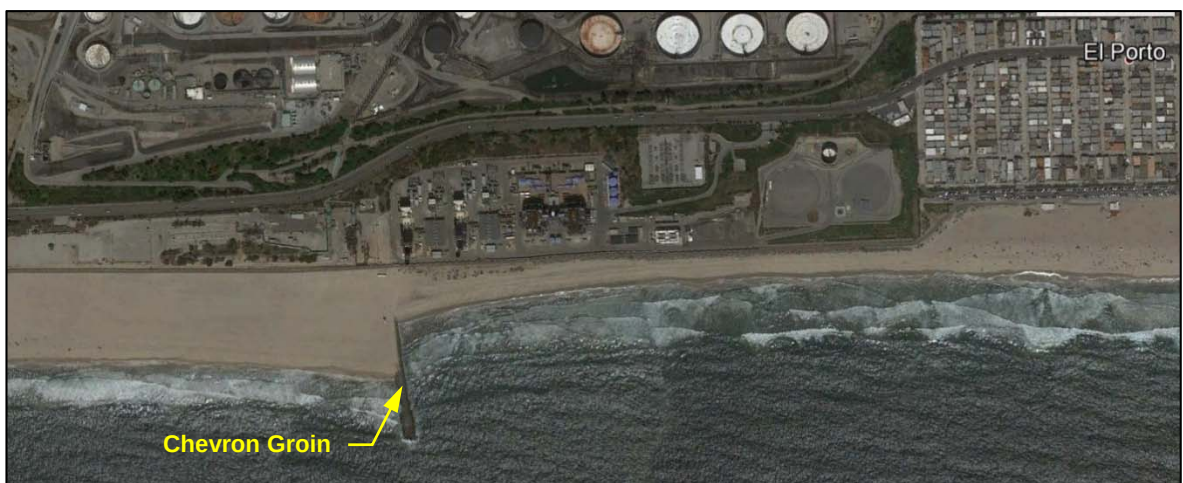
Beach Conditions at El Segundo in 2014 to 2016



Aerial Photo Taken on October 2, 2016



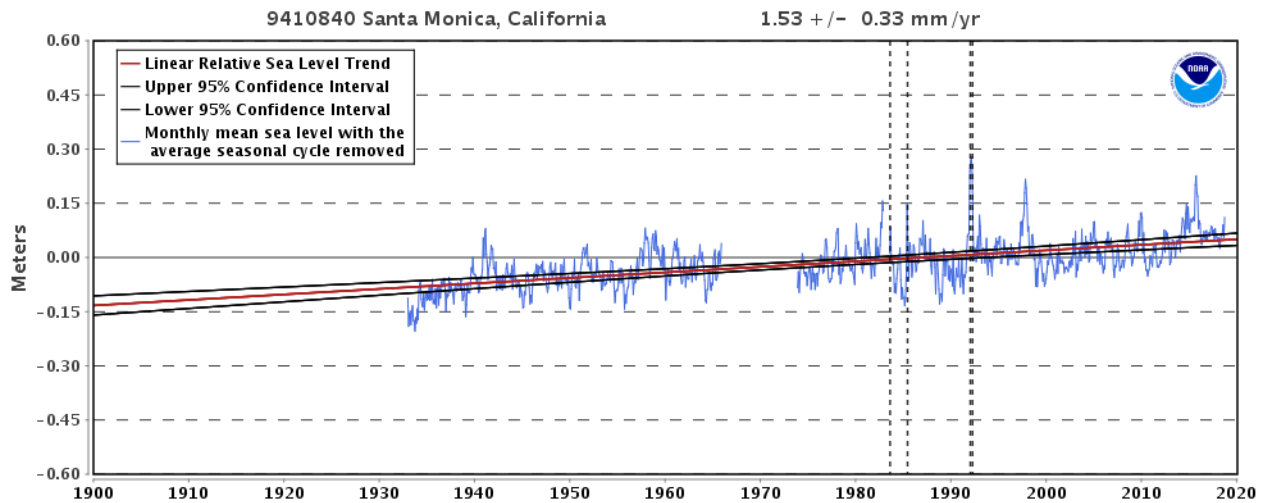
Aerial Photo Taken on December 31, 2017



Aerial Photo Taken on June 8, 2018

Source: Google Earth

Beach Conditions at El Segundo in 2016 to 2018

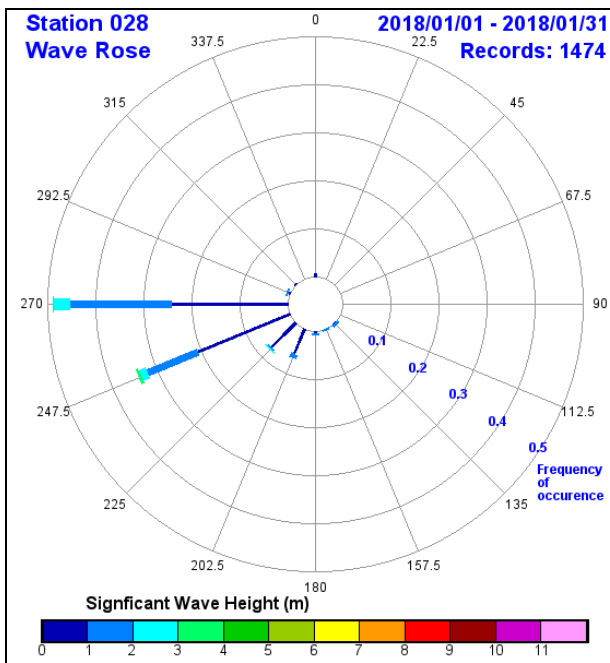


Note: Sea level data from 1933 to 2017

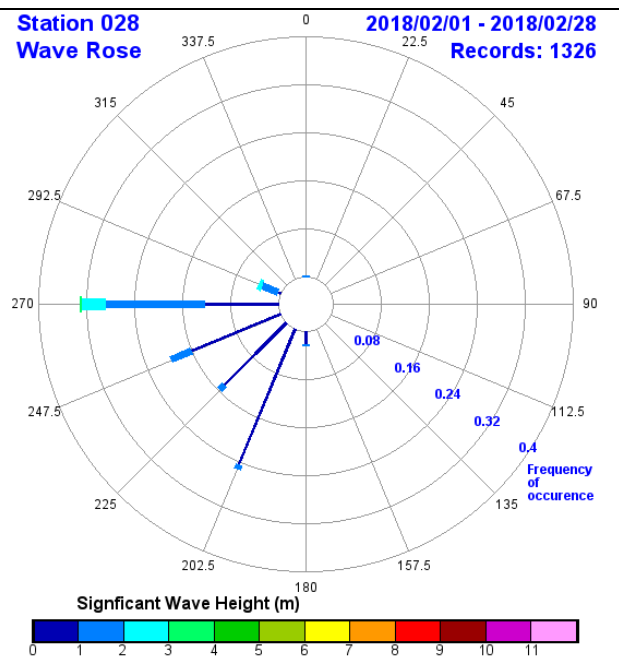
Source:

http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=9410840

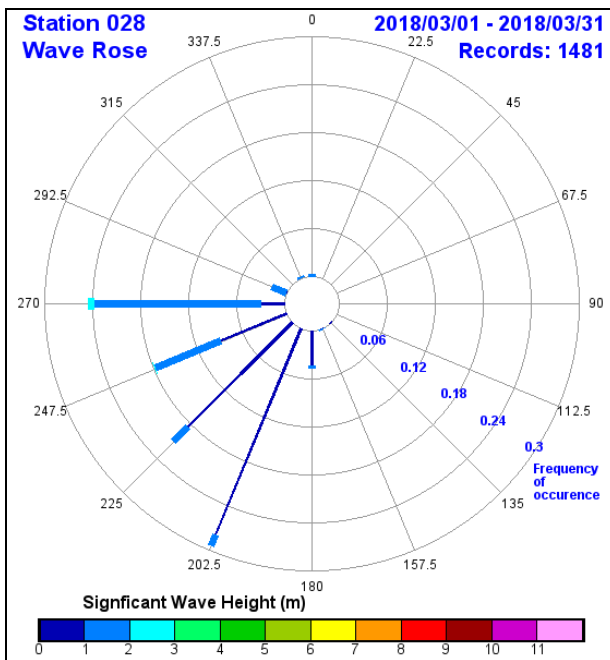
Mean Sea Level Trend at Santa Monica Pier



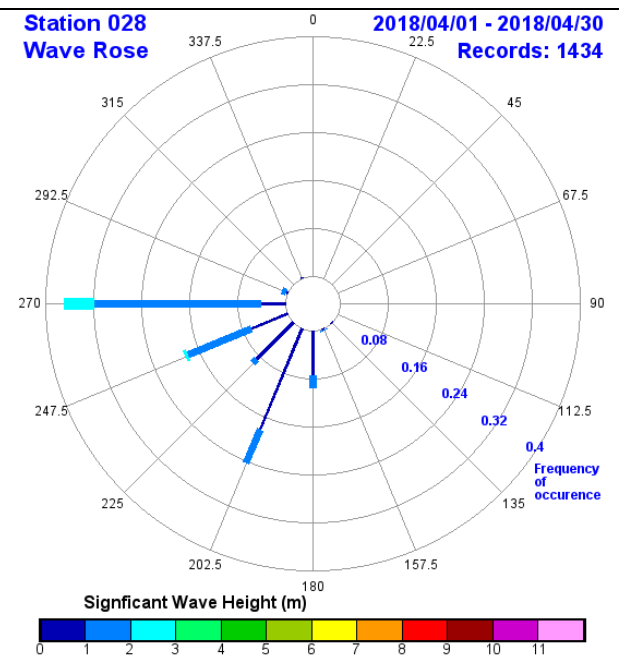
January 2018



February 2018



March 2018



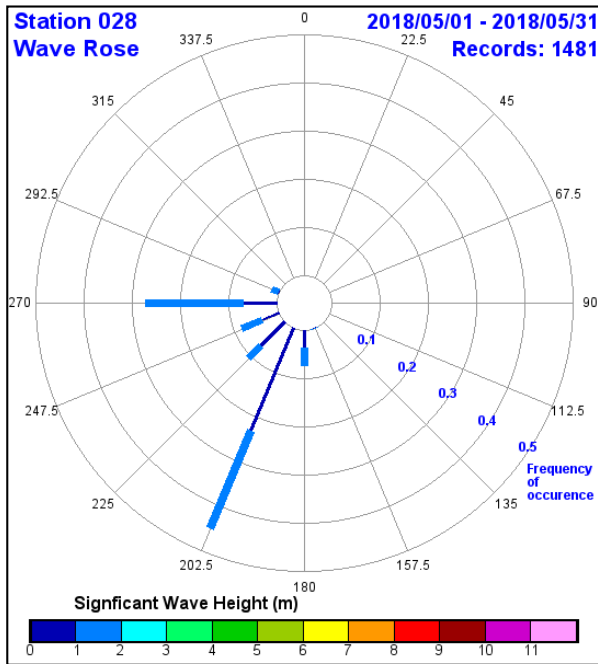
April 2018

Note: Wave roses generated from Santa Monica Bay (#028) buoy operated by CDIP

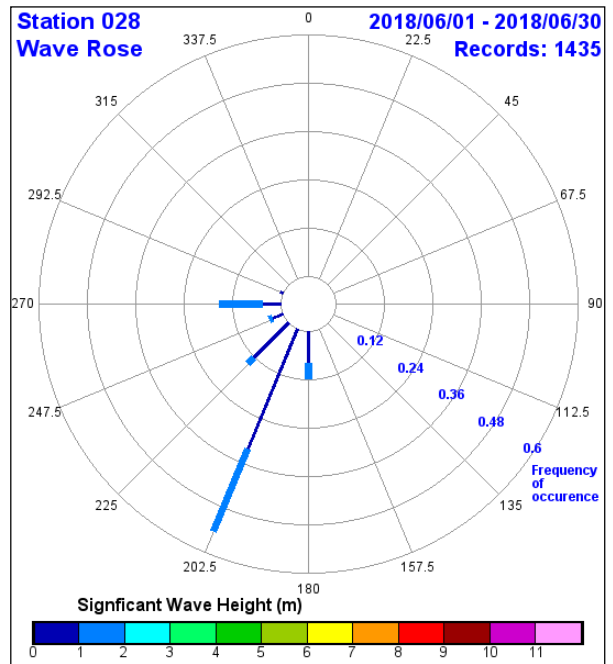
Wave Conditions from January to April in 2018

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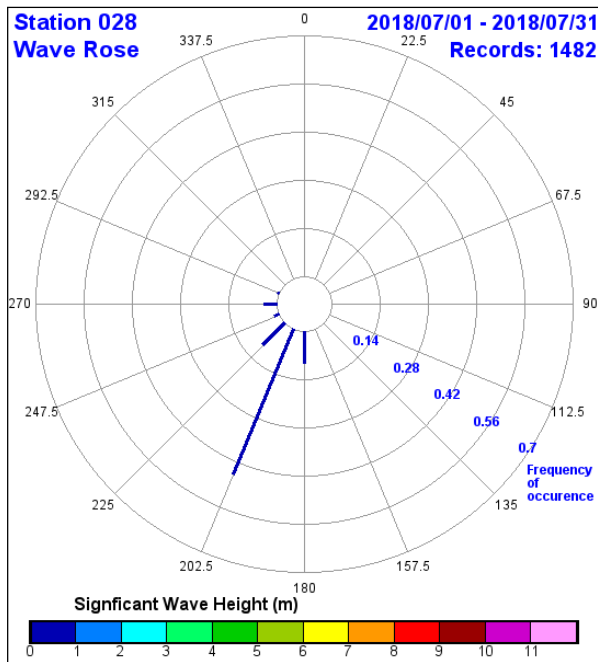
Figure 13



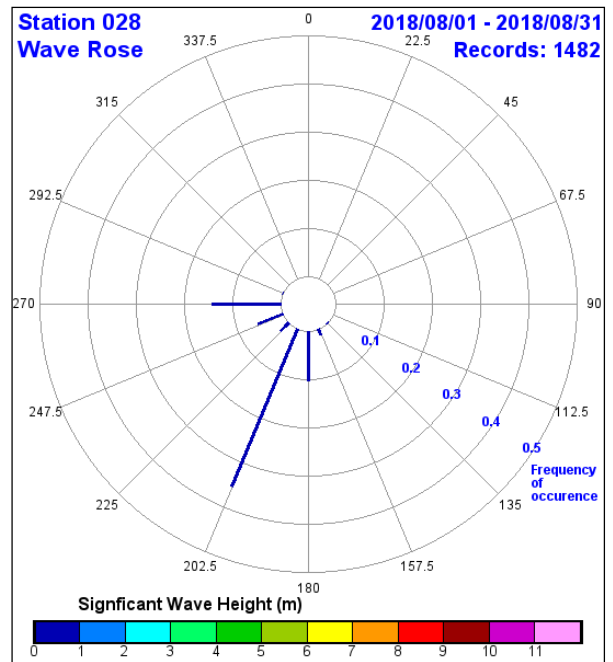
May 2018



June 2018



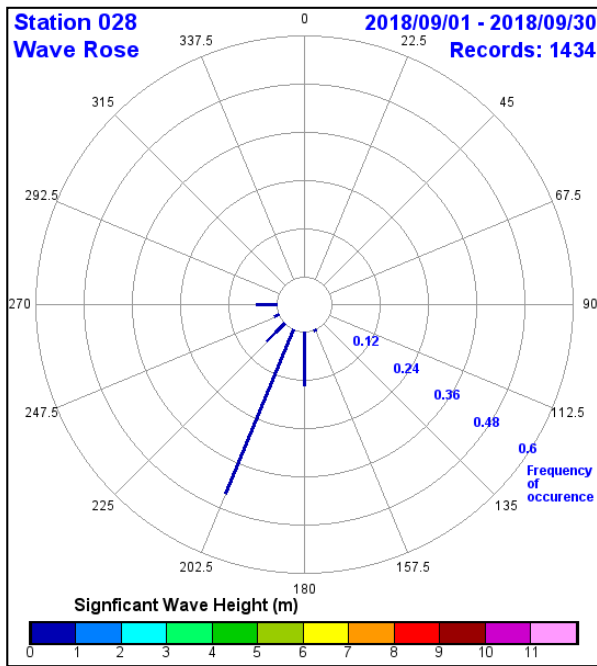
July 2018



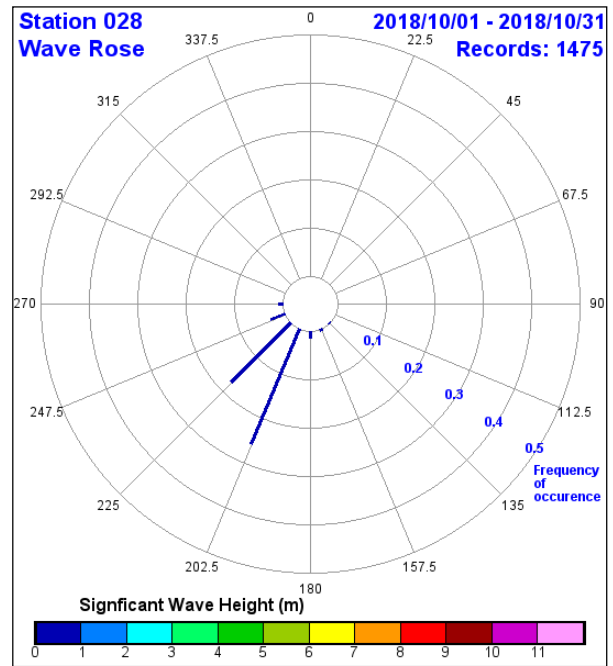
August 2018

Note: Wave roses generated from Santa Monica Bay (#028) buoy operated by CDIP

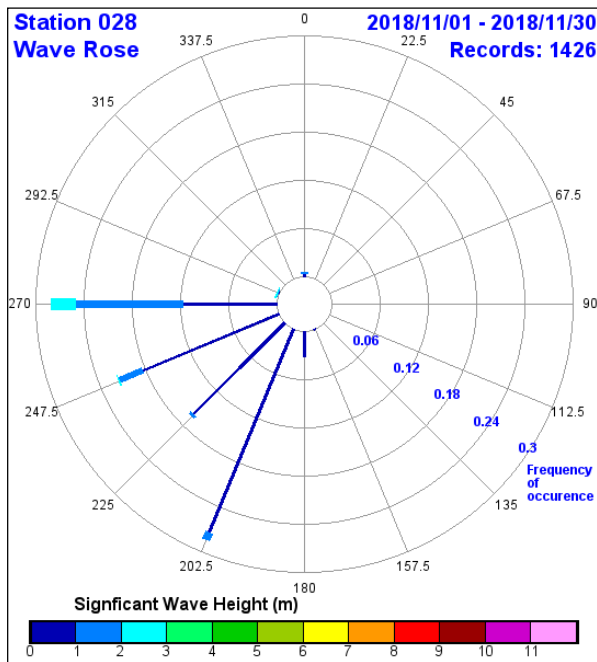
Wave Conditions from May to August in 2018



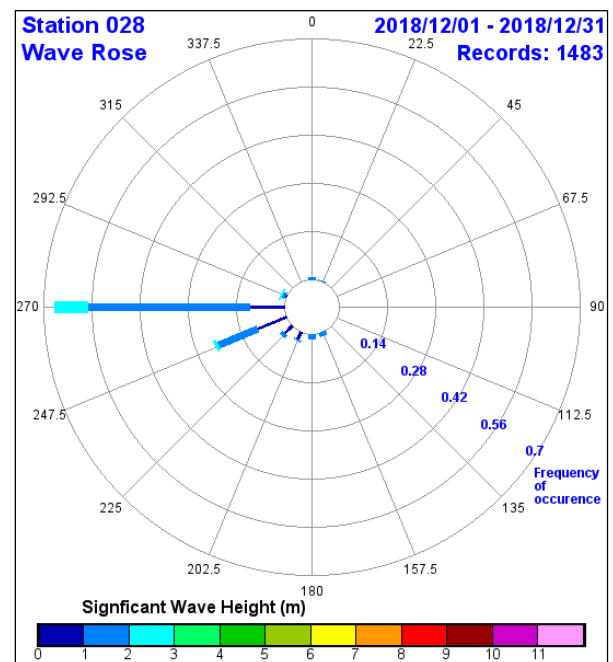
September 2018



October 2018



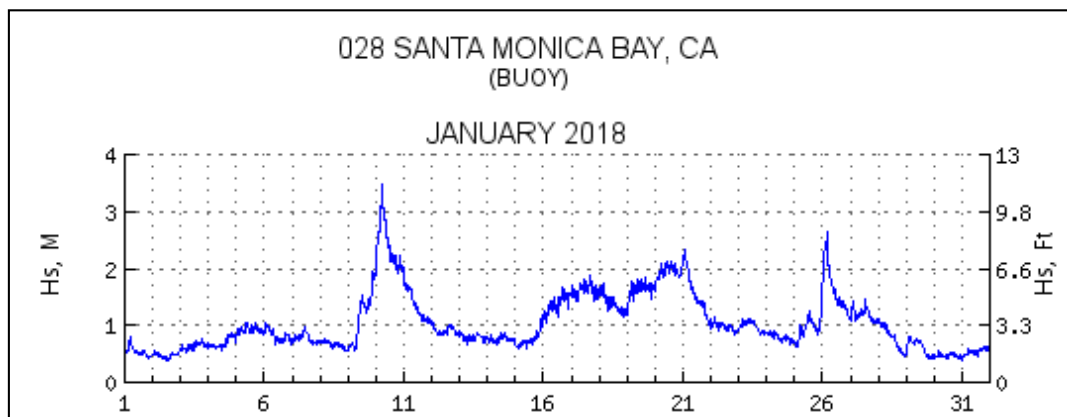
November 2018



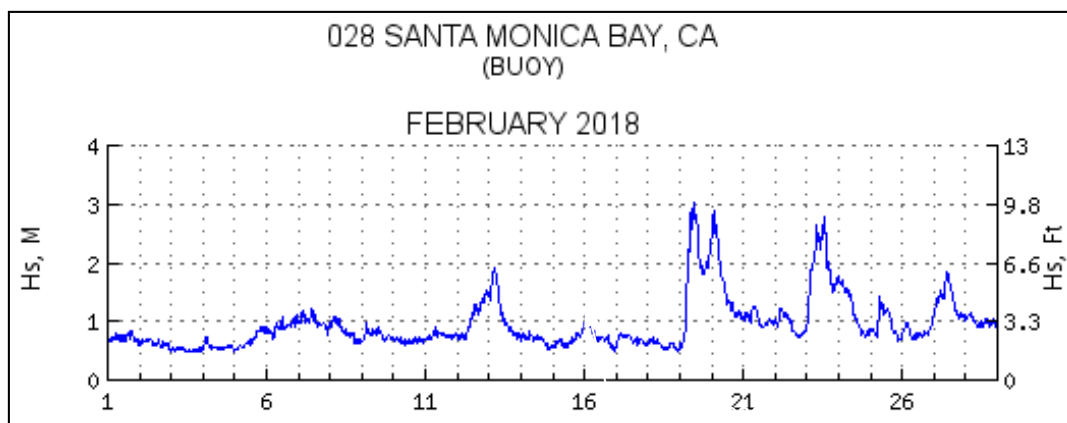
December 2018

Note: Wave roses generated from Santa Monica Bay (#028) buoy operated by CDIP

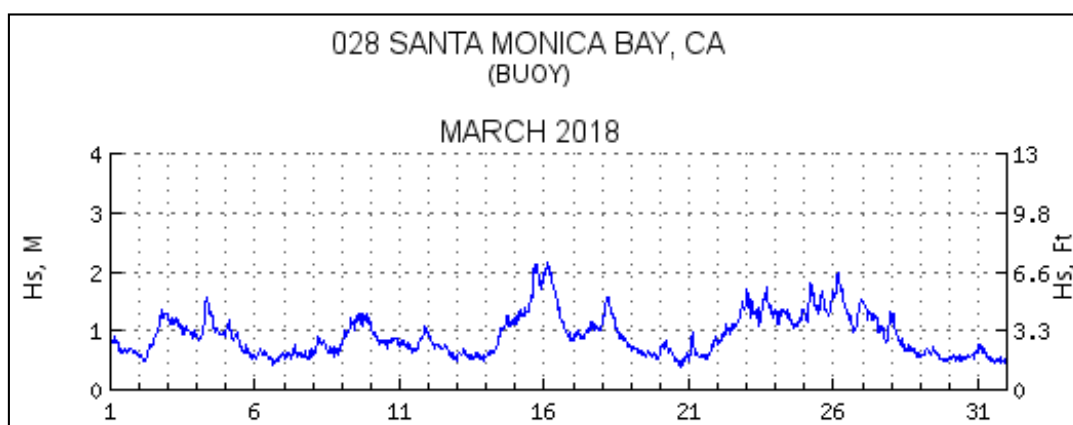
Wave Conditions from September to December in 2018



January 2018



February 2018



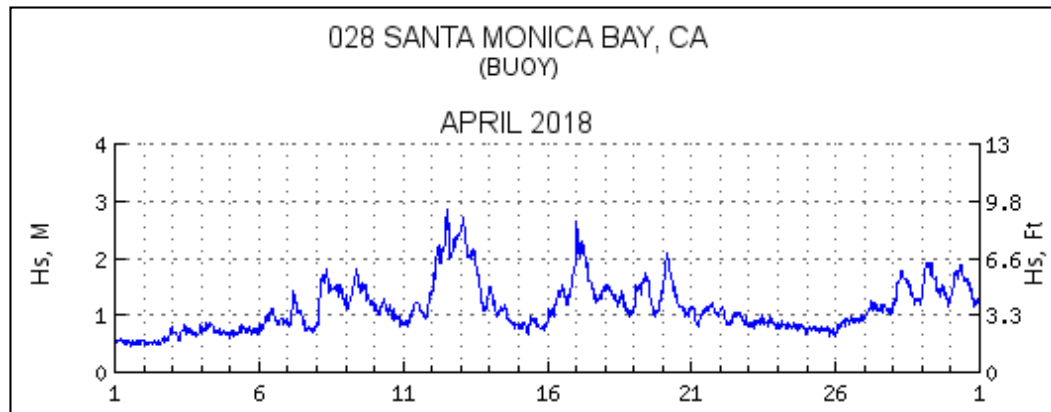
March 2018

Note: Wave roses generated from
Santa Monica Bay (#028) buoy
operated by CDIP

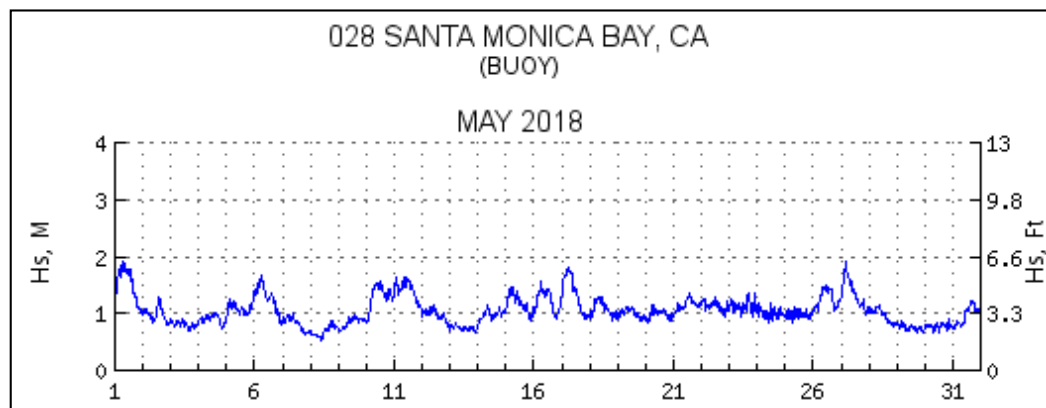
Wave Conditions from January to
March in 2018

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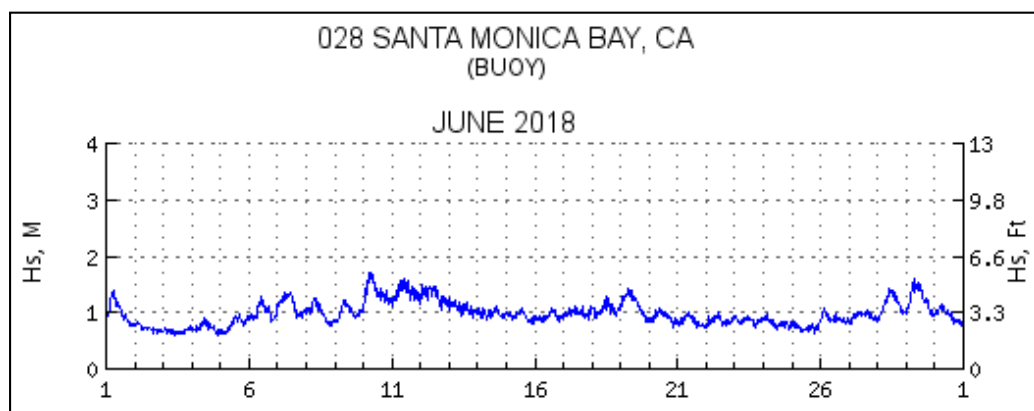
Figure 16



April 2018



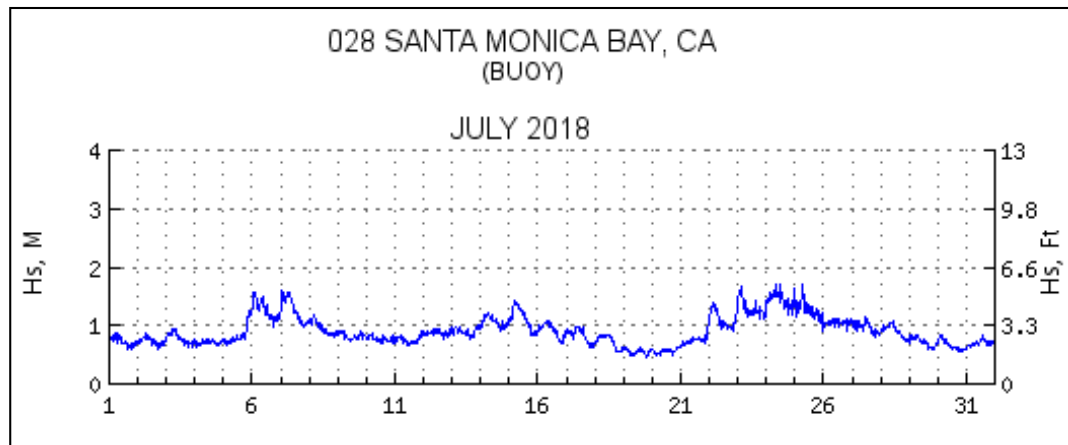
May 2018



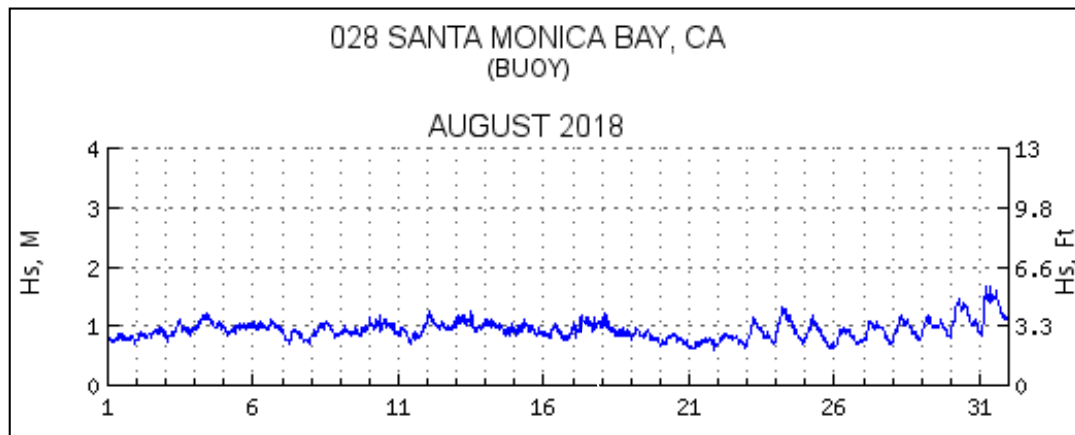
June 2018

Note: Wave roses generated from
Santa Monica Bay (#028) buoy
operated by CDIP

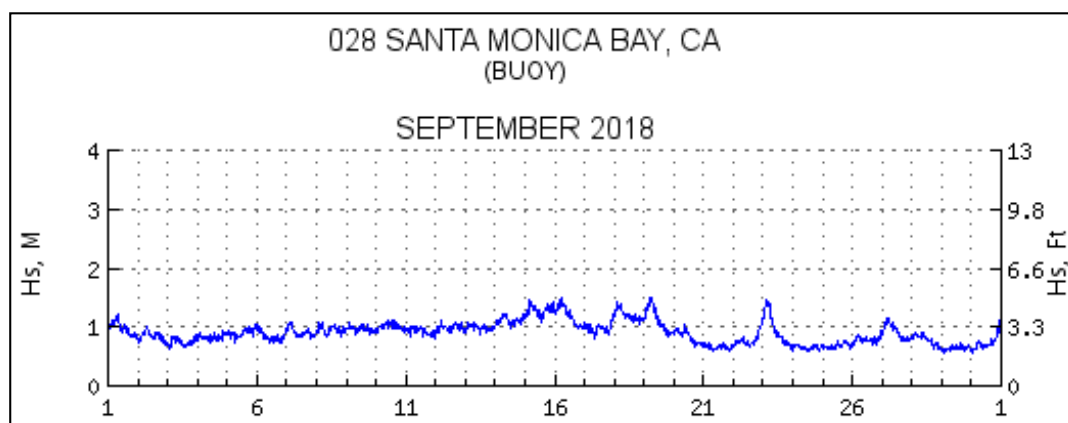
Wave Conditions from April to
June in 2018



July 2018



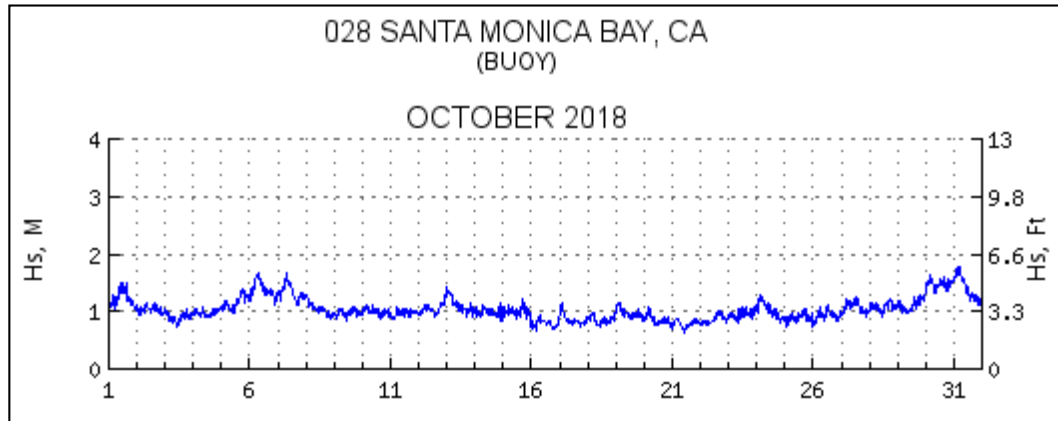
August 2018



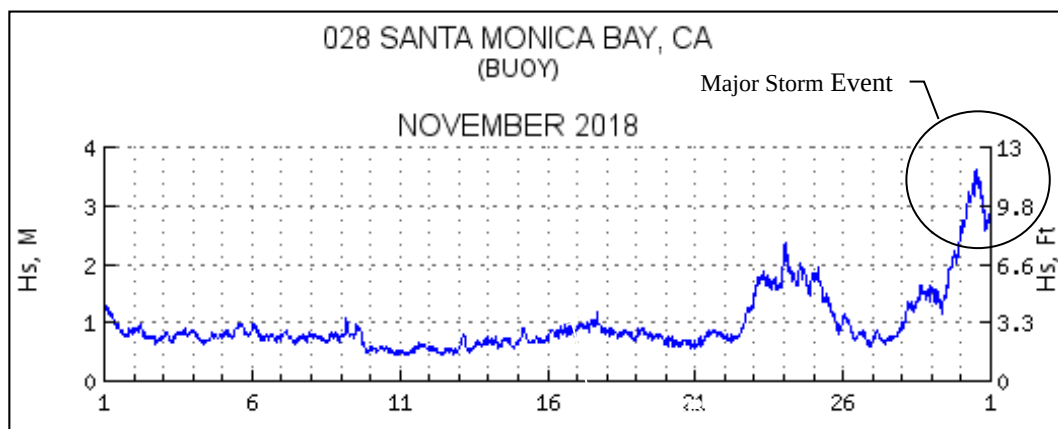
September 2018

Note: Wave roses generated from
Santa Monica Bay (#028) buoy
operated by CDIP

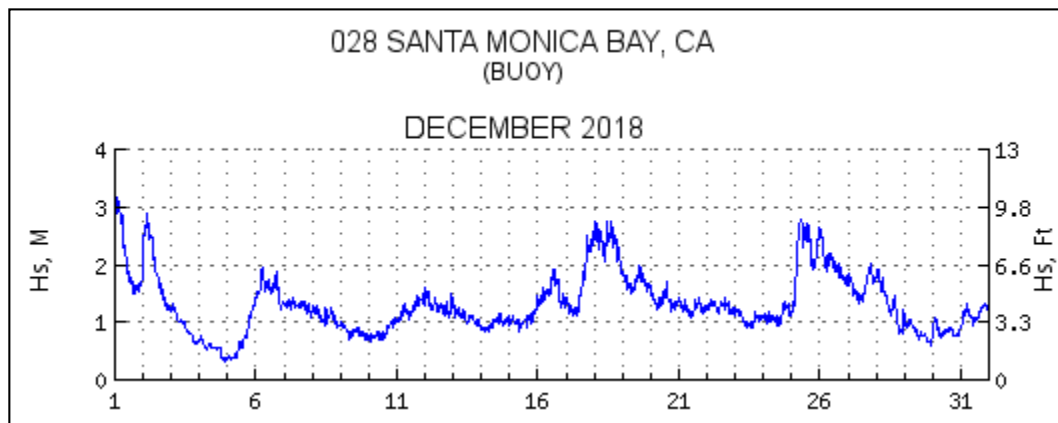
Wave Conditions from July to
September in 2018



October 2018



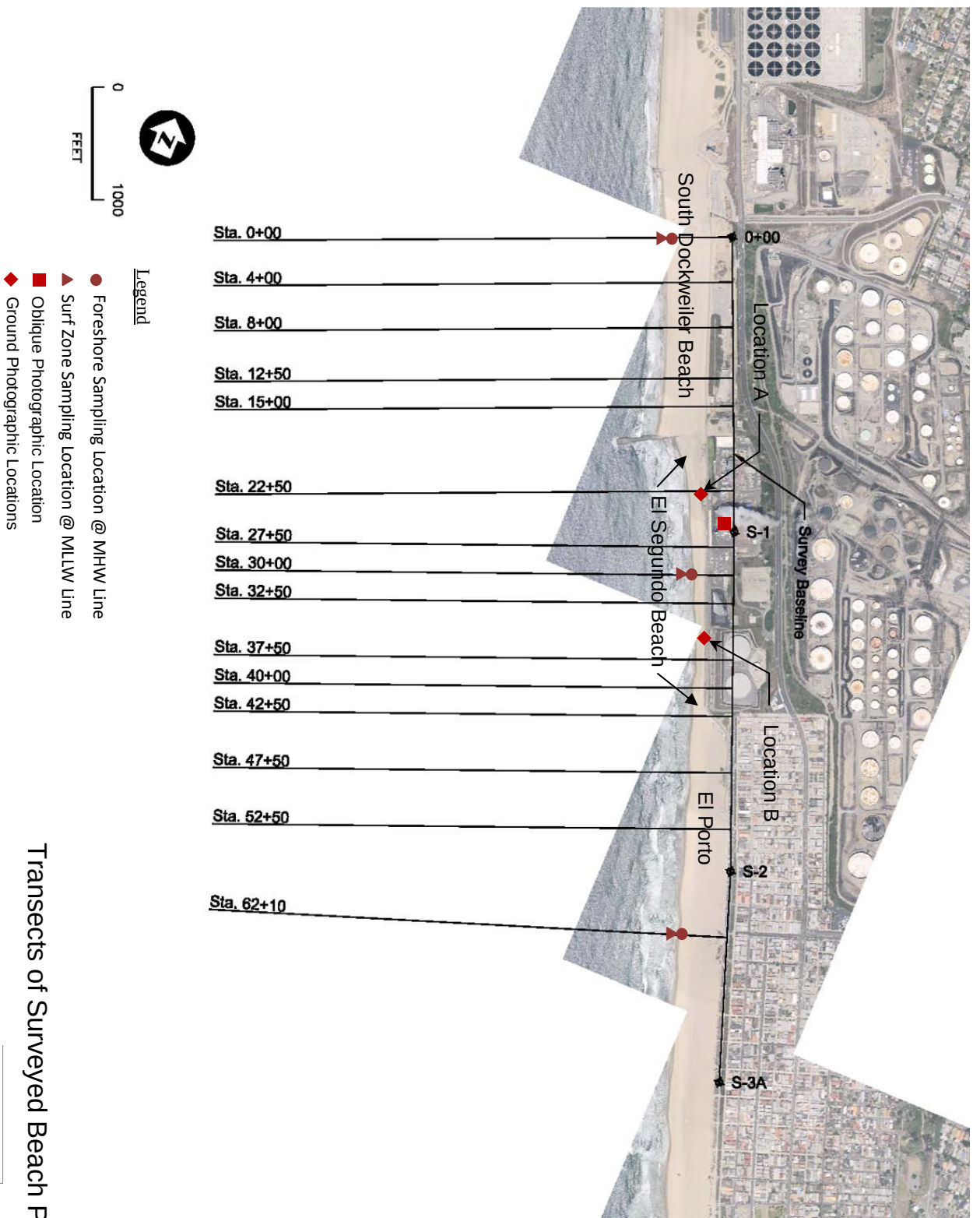
November 2018



December 2018

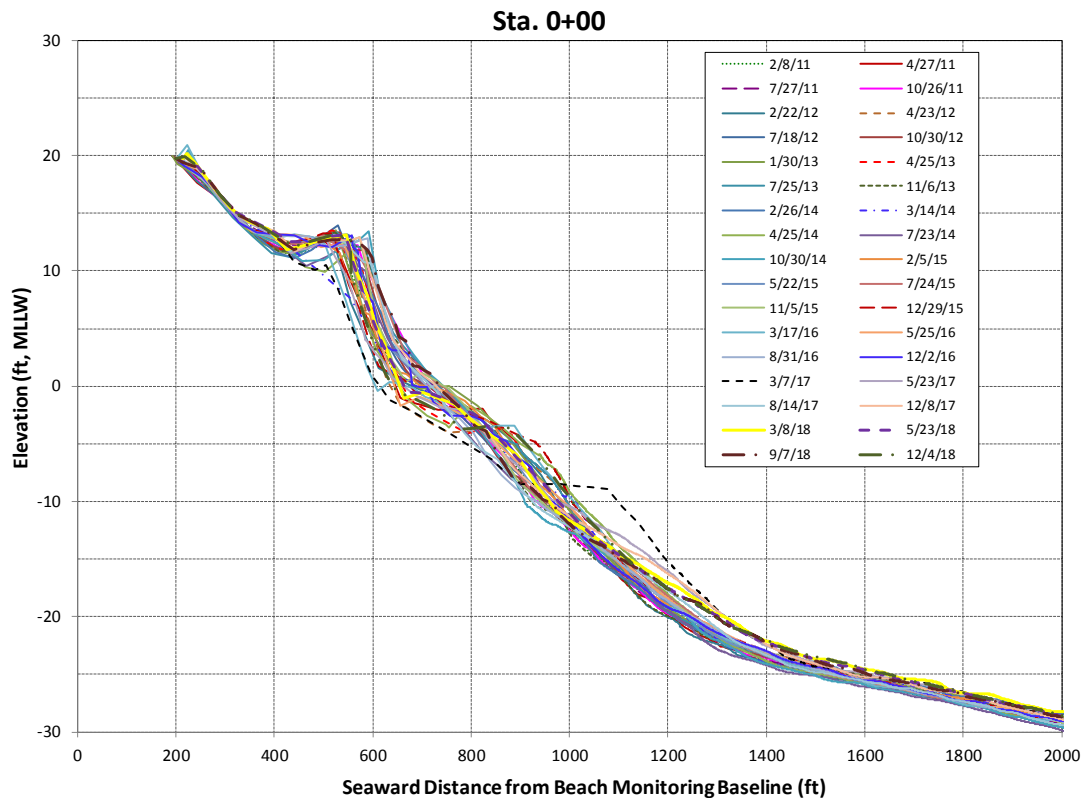
Note: Wave roses generated from
Santa Monica Bay (#028) buoy
operated by CDIP

Wave Conditions from October to
December in 2018

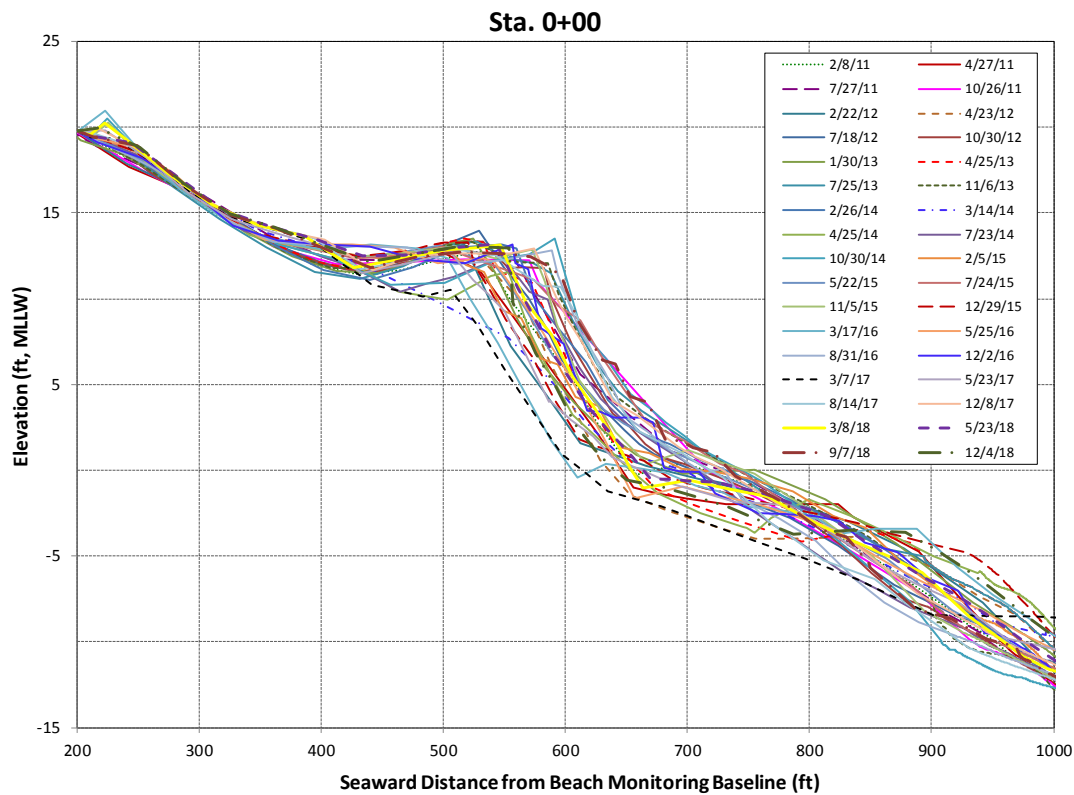


Transects of Surveyed Beach Profiles

Entire Set of Beach Profiles



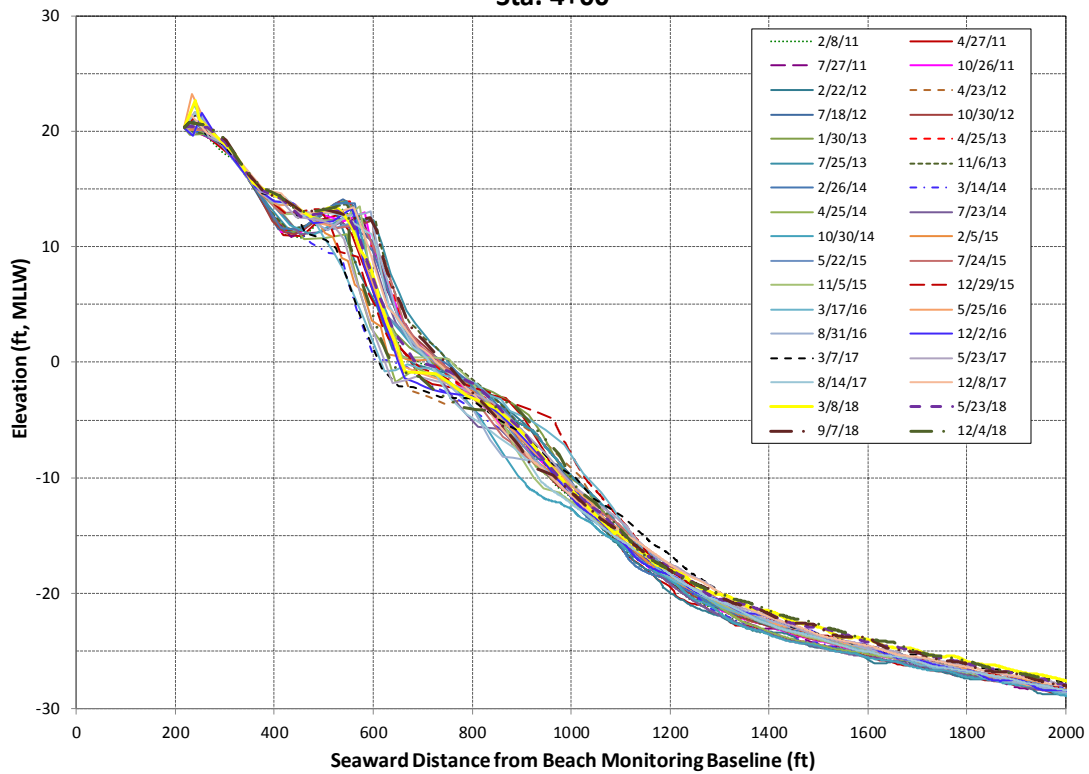
Enlarged Partial Beach Profiles



Surveyed Beach Profiles at Station 0+00

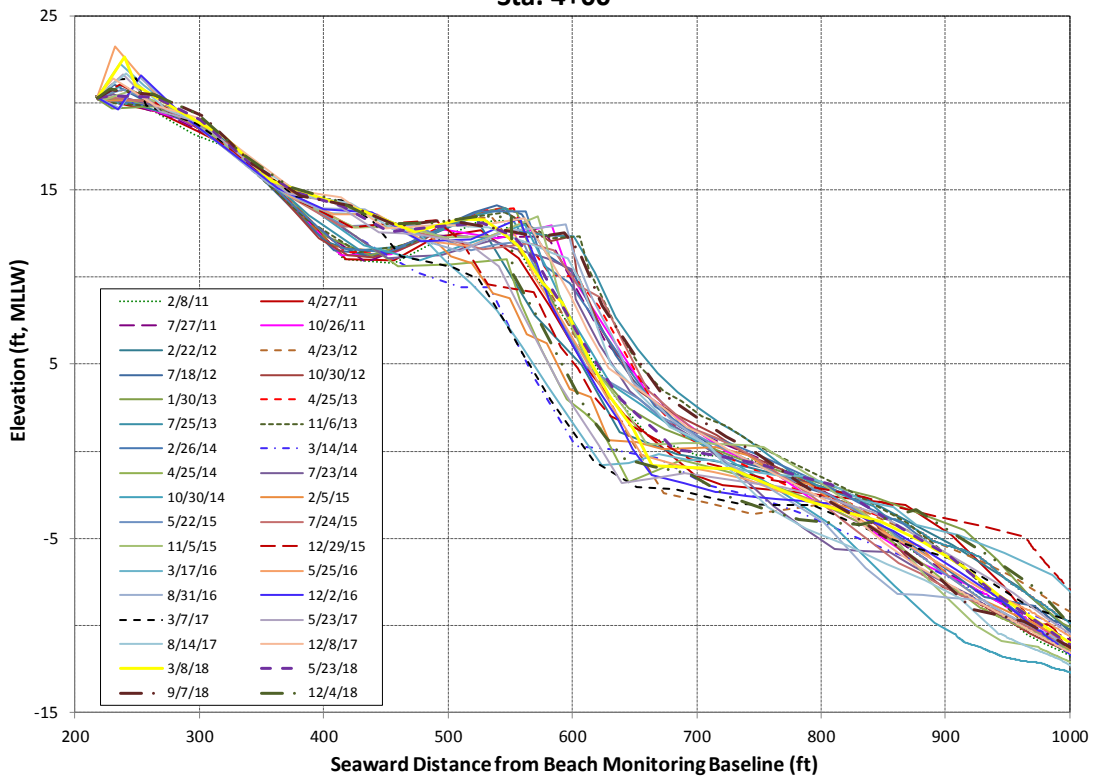
Entire Set of Beach Profiles

Sta. 4+00



Enlarged Partial Beach Profiles

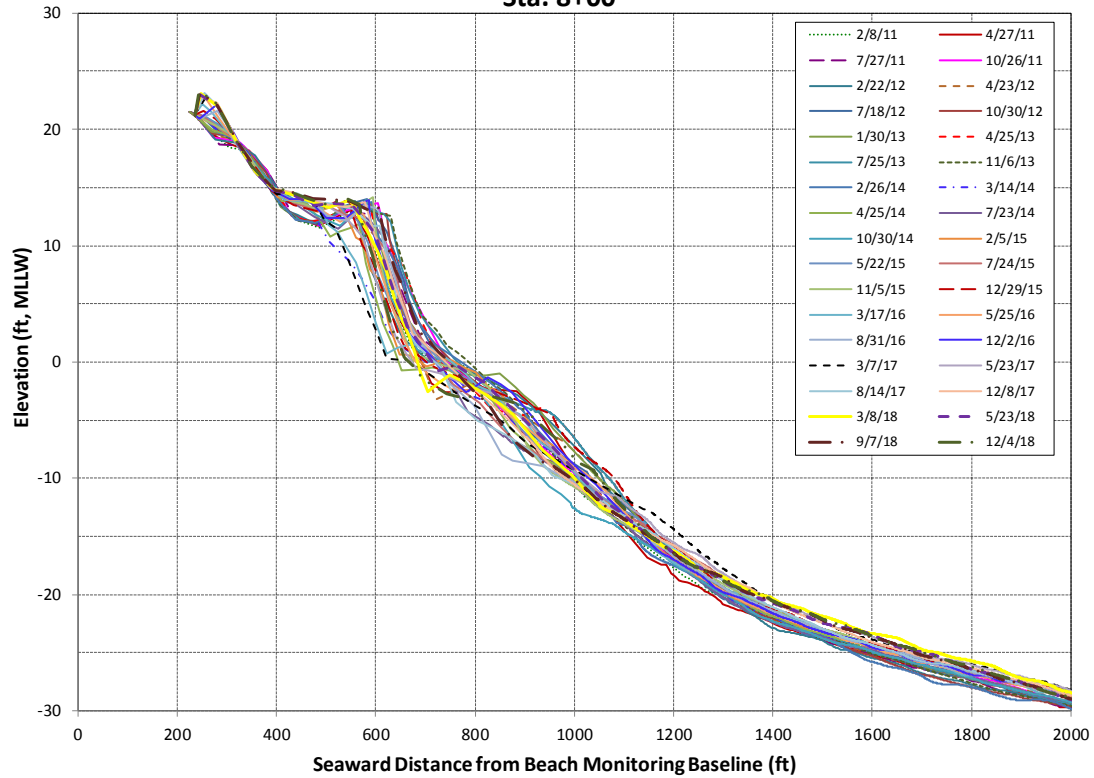
Sta. 4+00



Surveyed Beach Profiles at Station 4+00

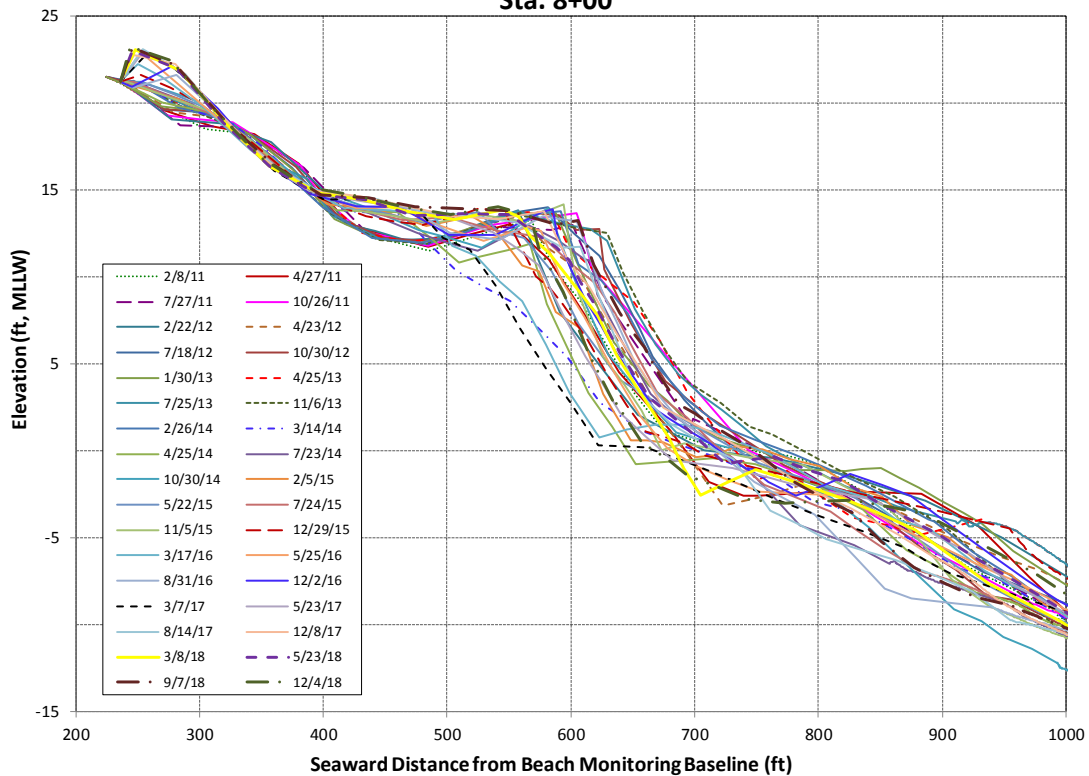
Entire Set of Beach Profiles

Sta. 8+00



Enlarged Partial Beach Profiles

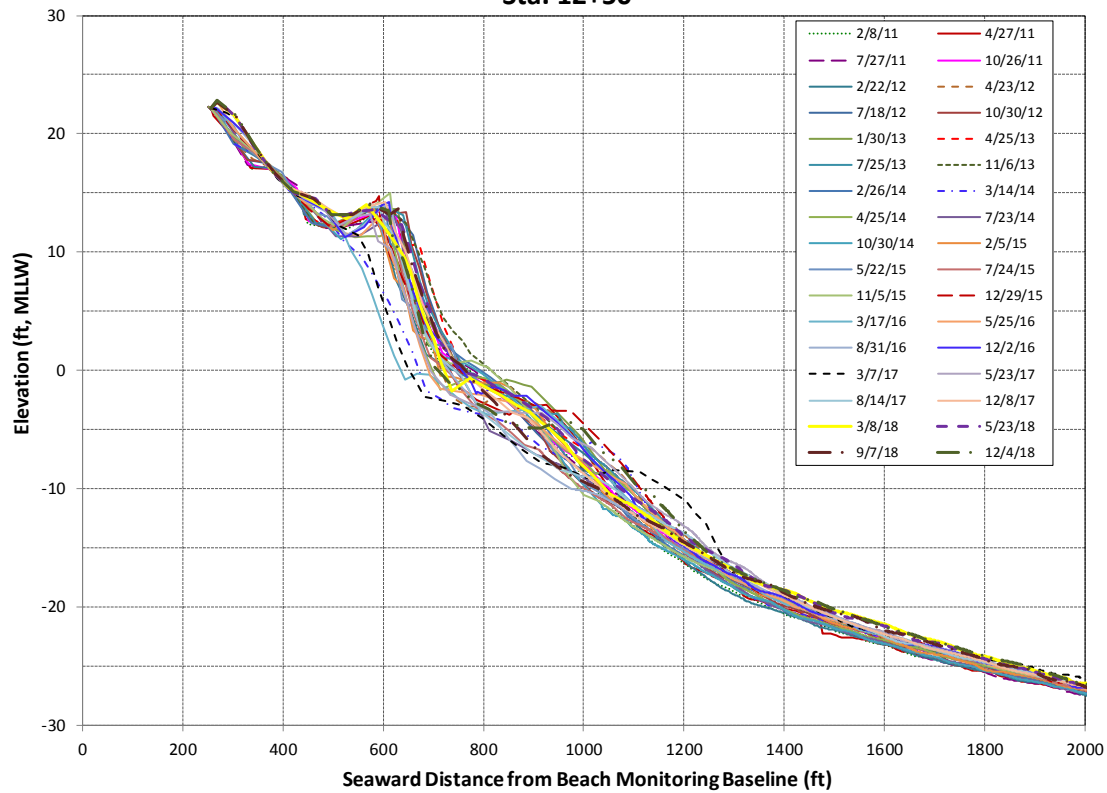
Sta. 8+00



Surveyed Beach Profiles at Station 8+00

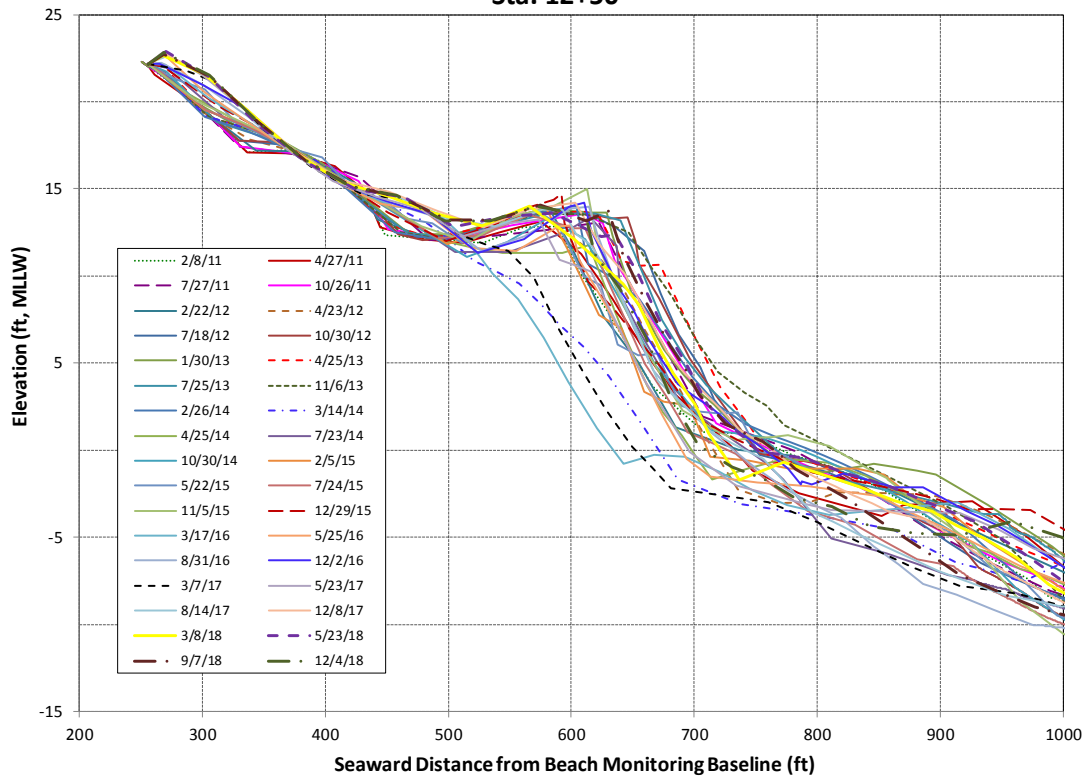
Entire Set of Beach Profiles

Sta. 12+50



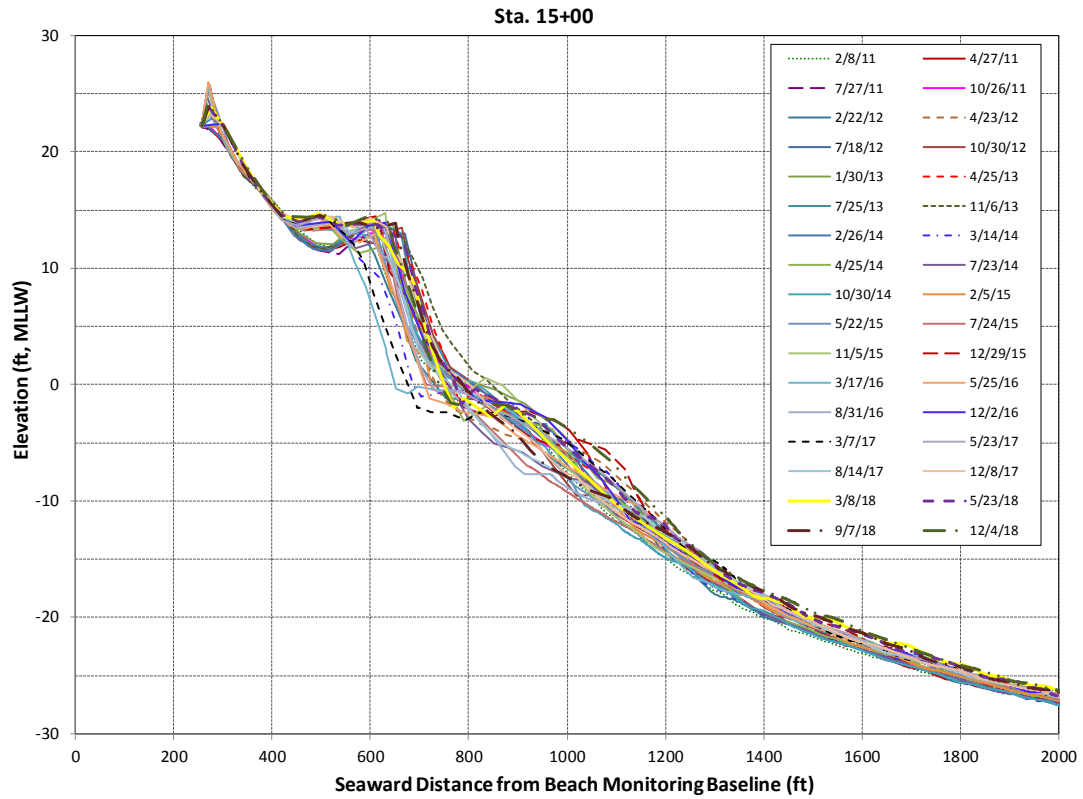
Enlarged Partial Beach Profiles

Sta. 12+50

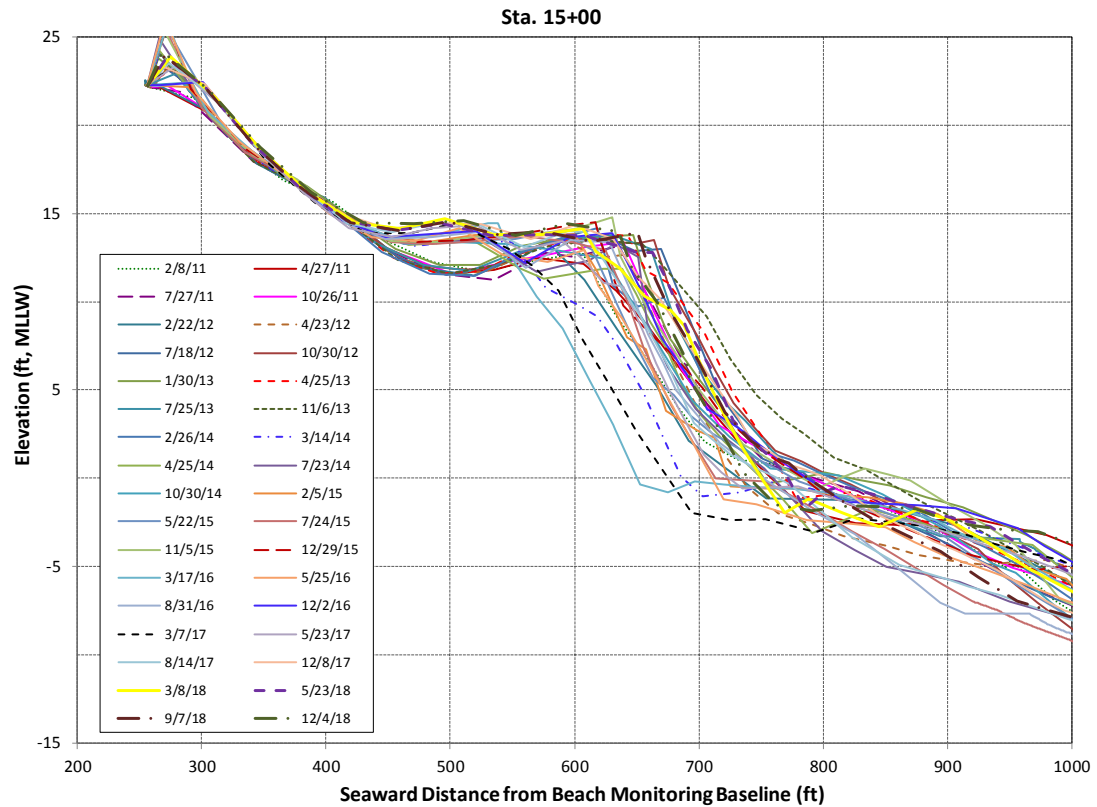


Surveyed Beach Profiles at Station 12+50

Entire Set of Beach Profiles



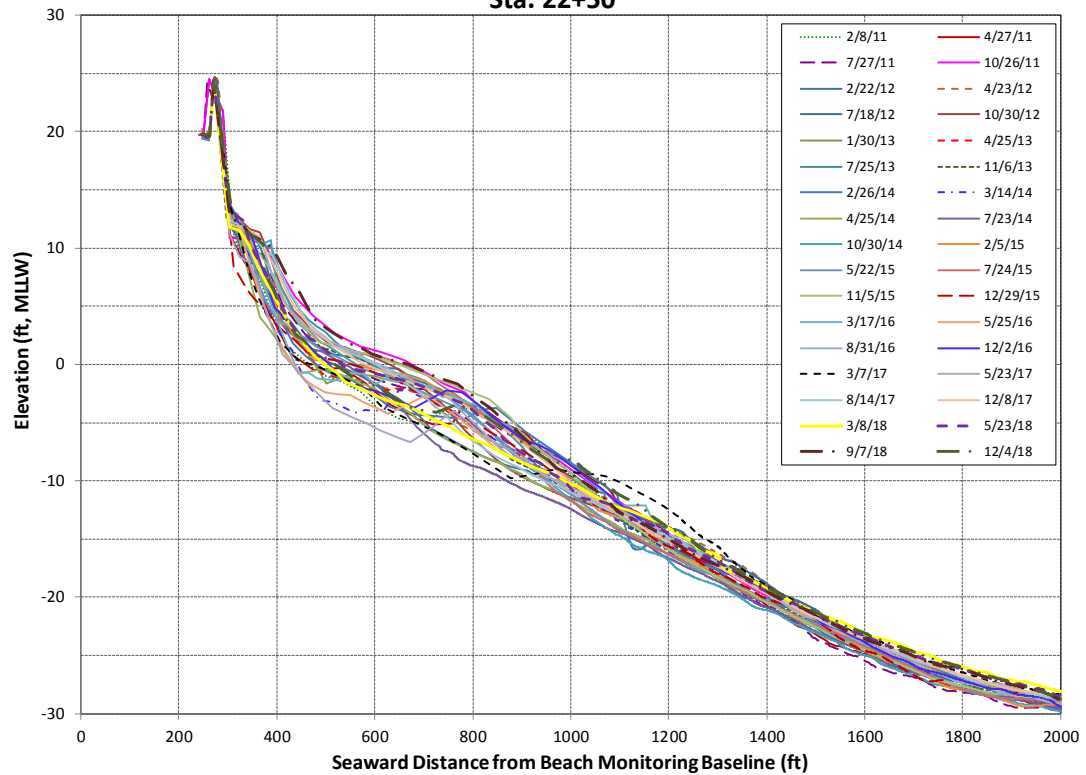
Enlarged Partial Beach Profiles



Surveyed Beach Profiles at Station 15+00

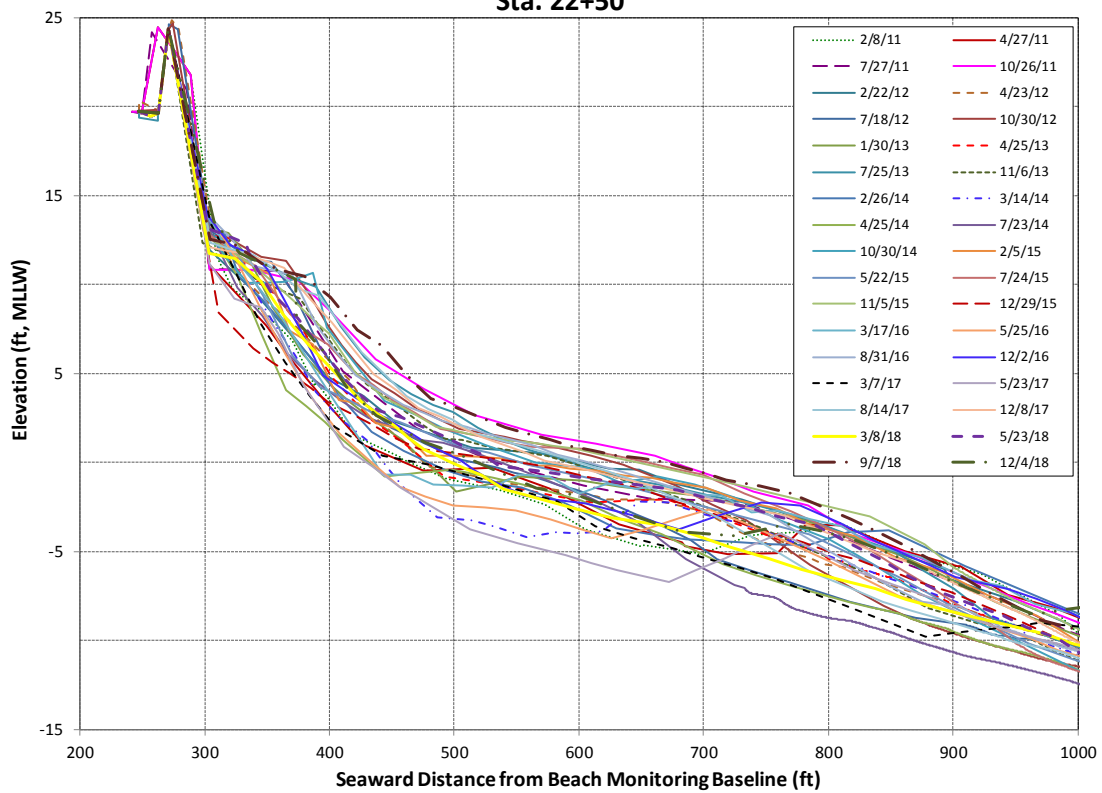
Entire Set of Beach Profiles

Sta. 22+50



Enlarged Partial Beach Profiles

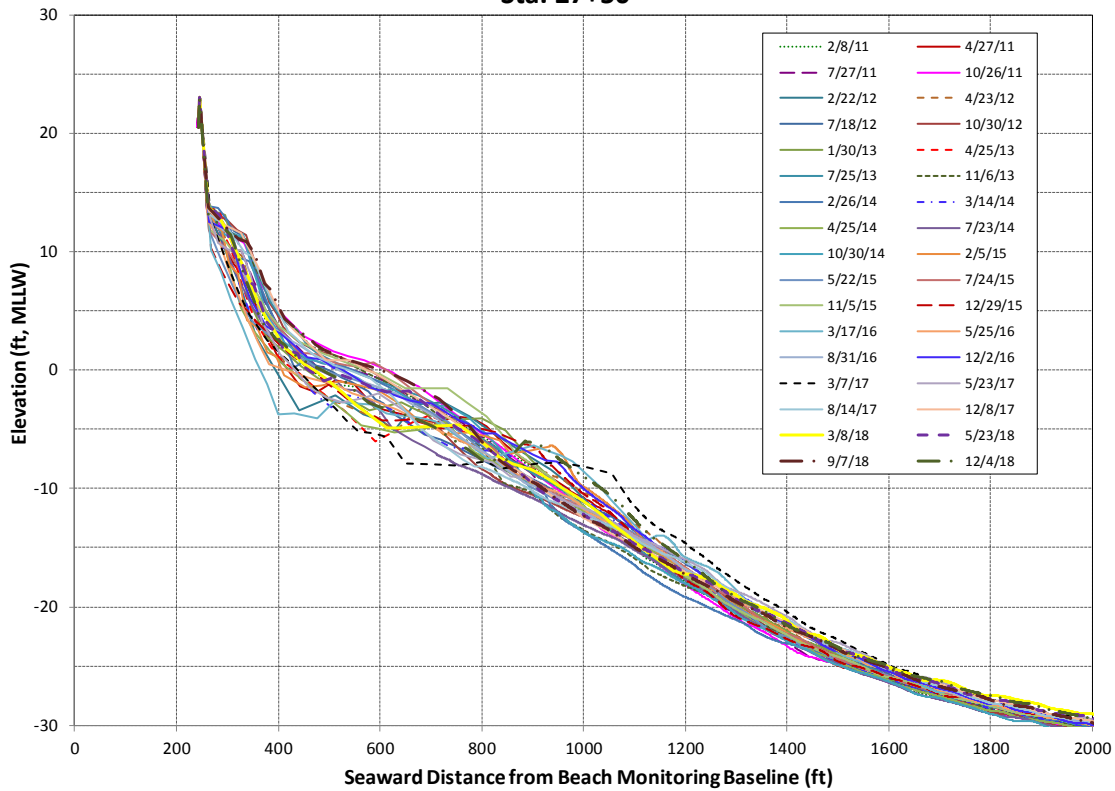
Sta. 22+50



Surveyed Beach Profiles at Station 22+50

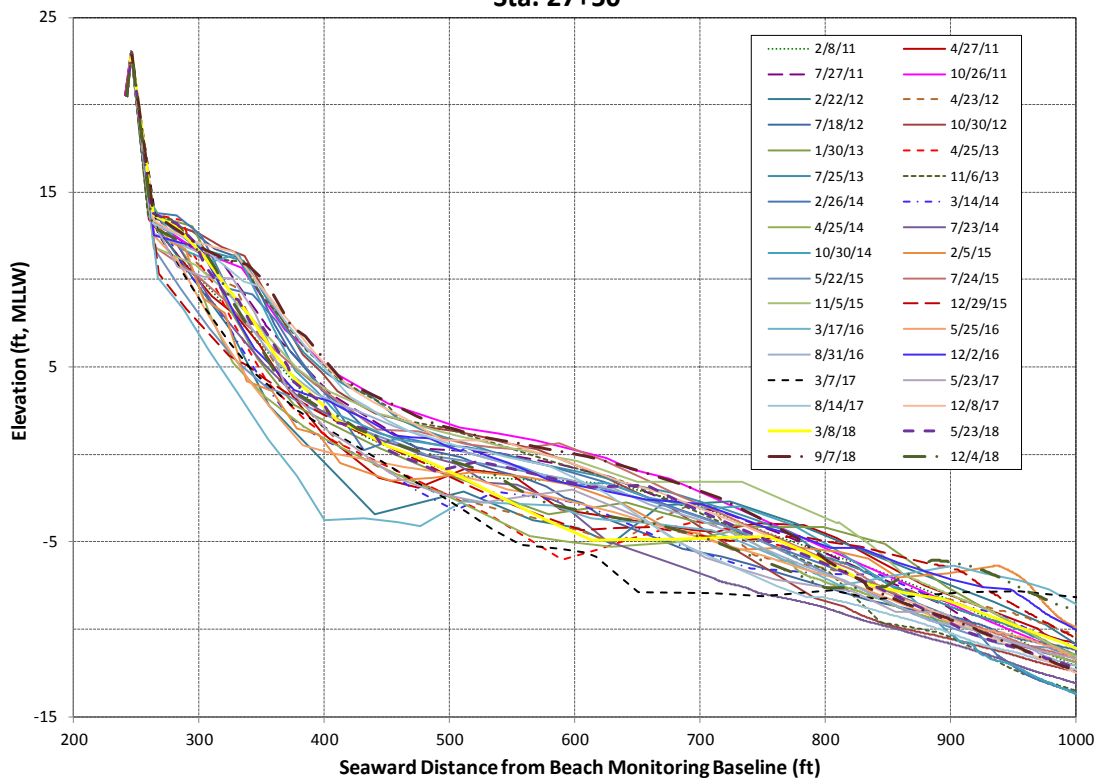
Entire Set of Beach Profiles

Sta. 27+50



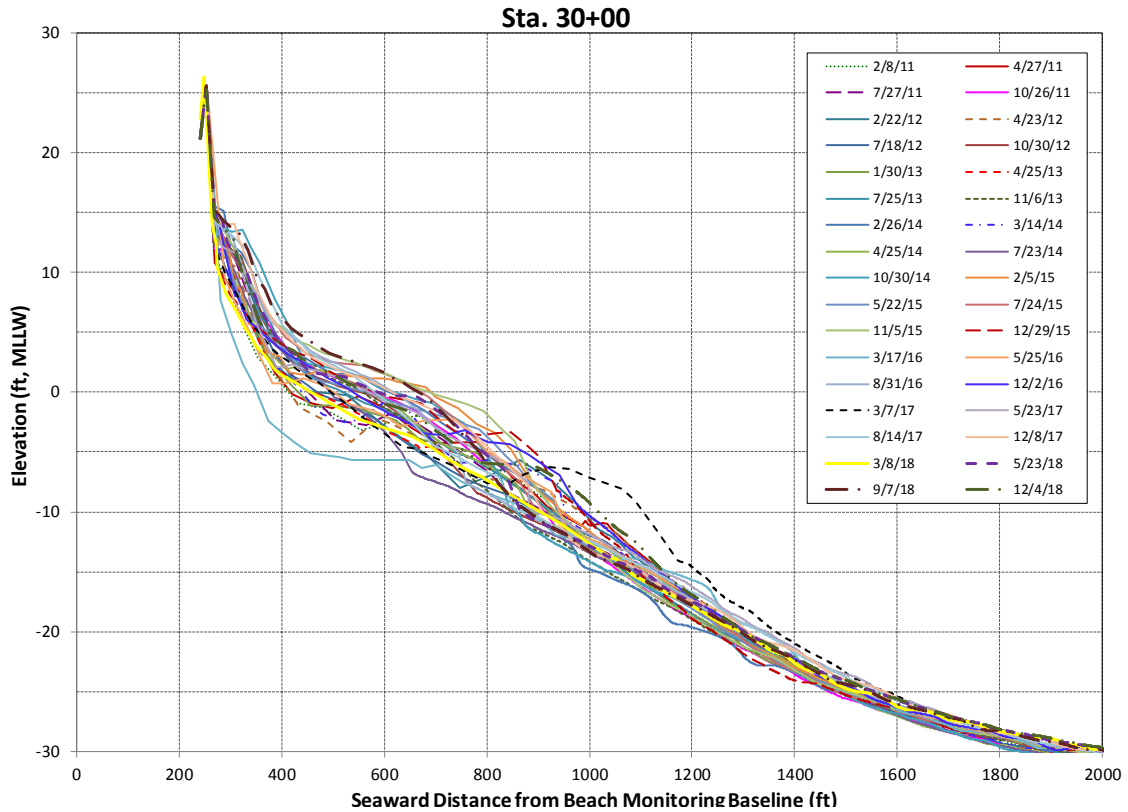
Enlarged Partial Beach Profiles

Sta. 27+50

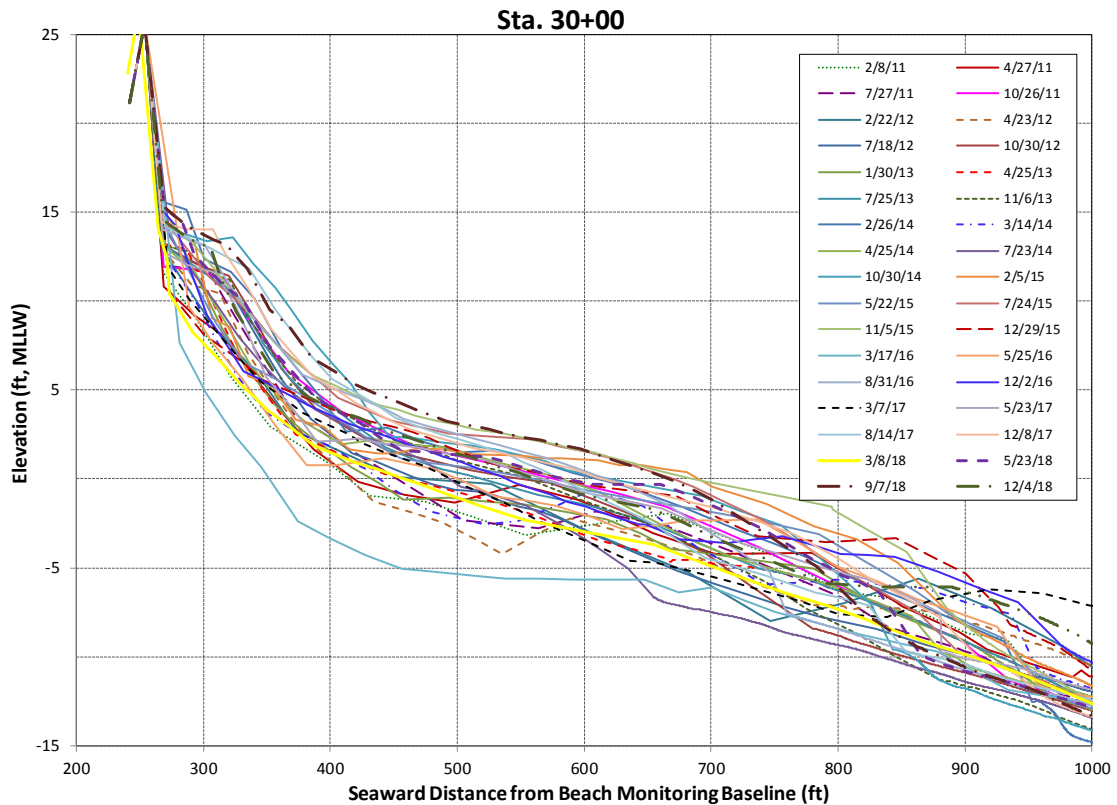


Surveyed Beach Profiles at Station 27+50

Entire Set of Beach Profiles



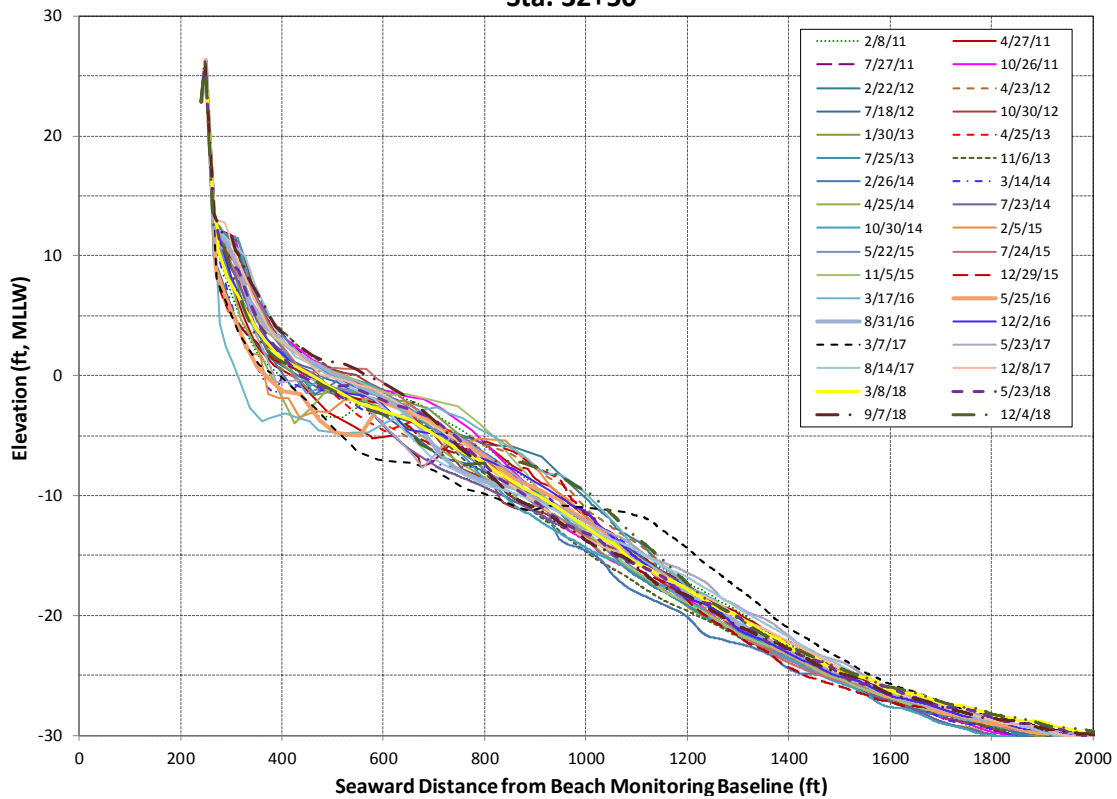
Partially Listed Beach Profiles



Surveyed Beach Profiles at Station 30+00

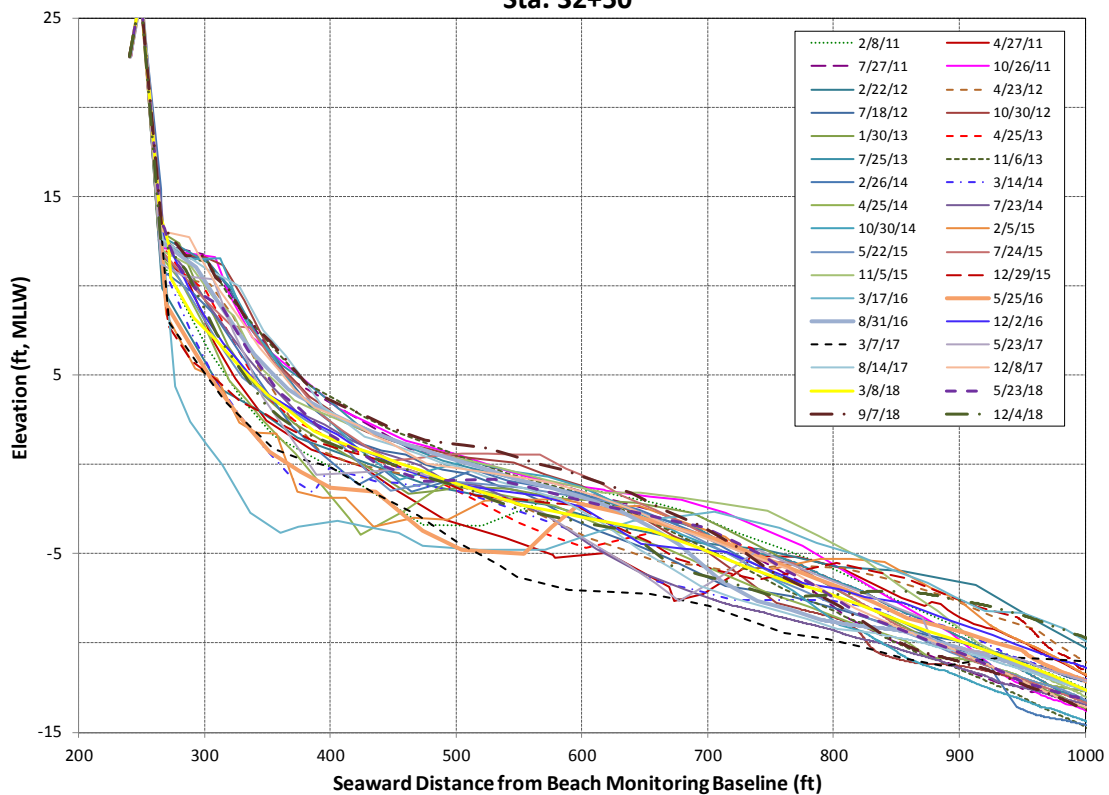
Entire Set of Beach Profiles

Sta. 32+50



Enlarged Partial Beach Profiles

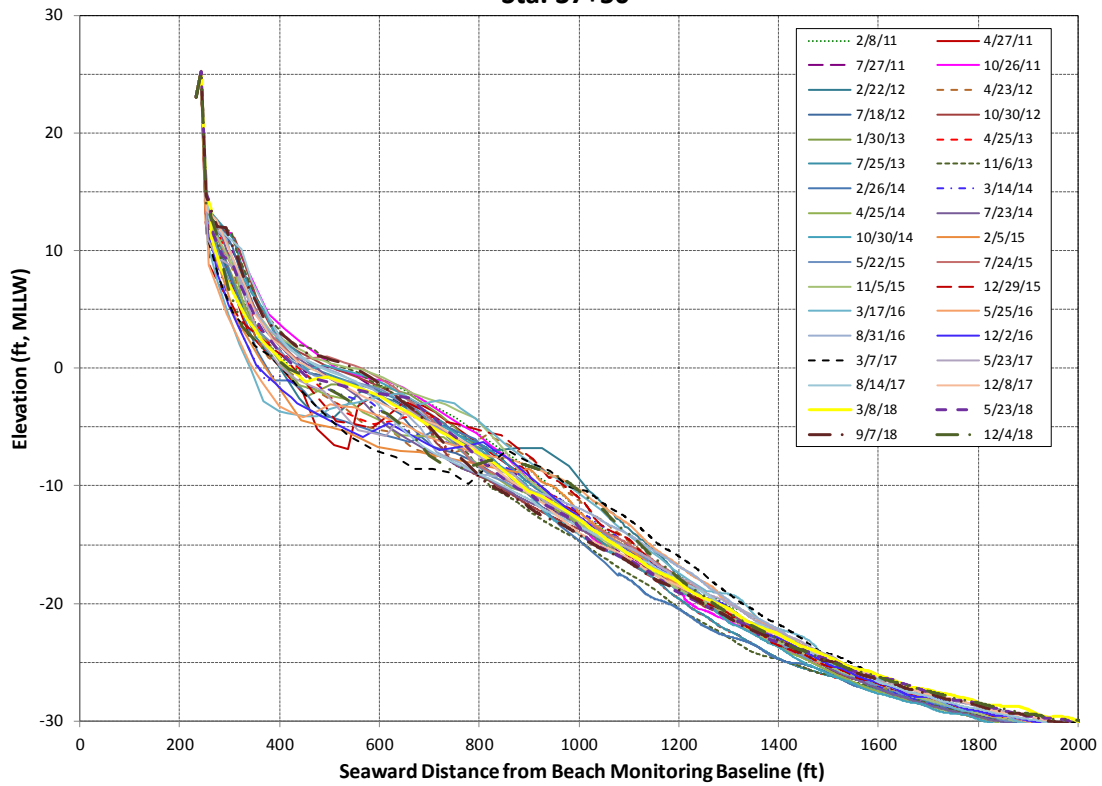
Sta. 32+50



Surveyed Beach Profiles at Station 32+50

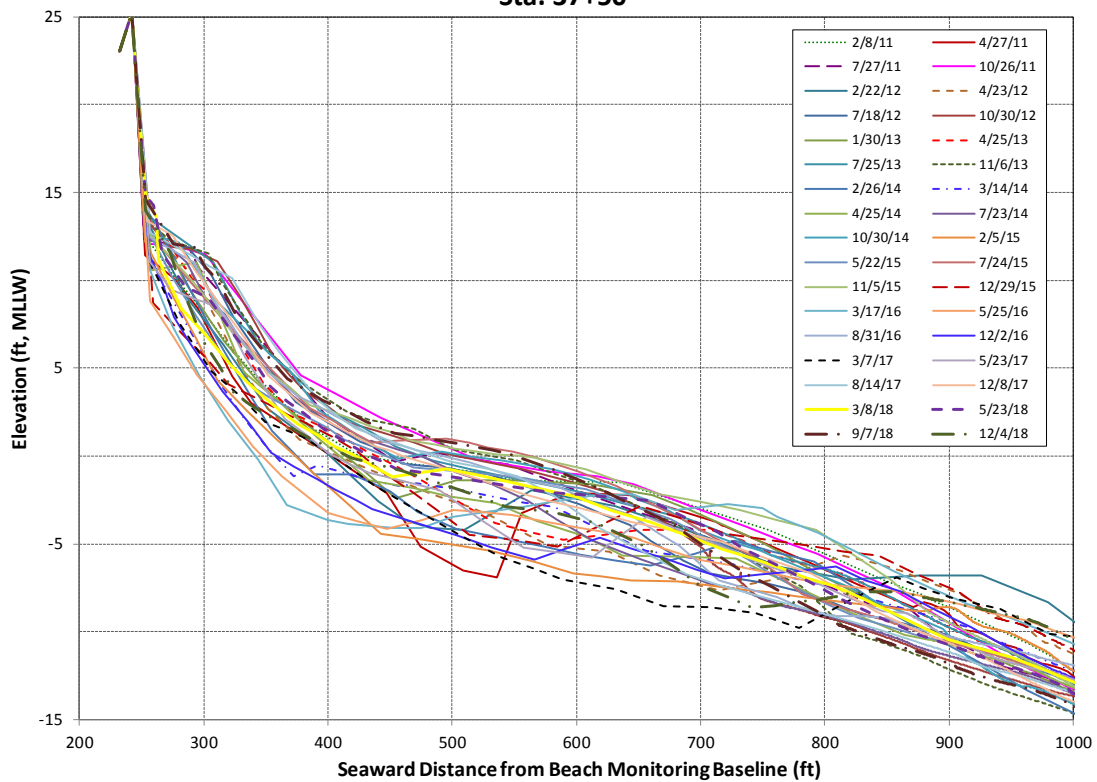
Entire Set of Beach Profiles

Sta. 37+50



Enlarged Partial Beach Profiles

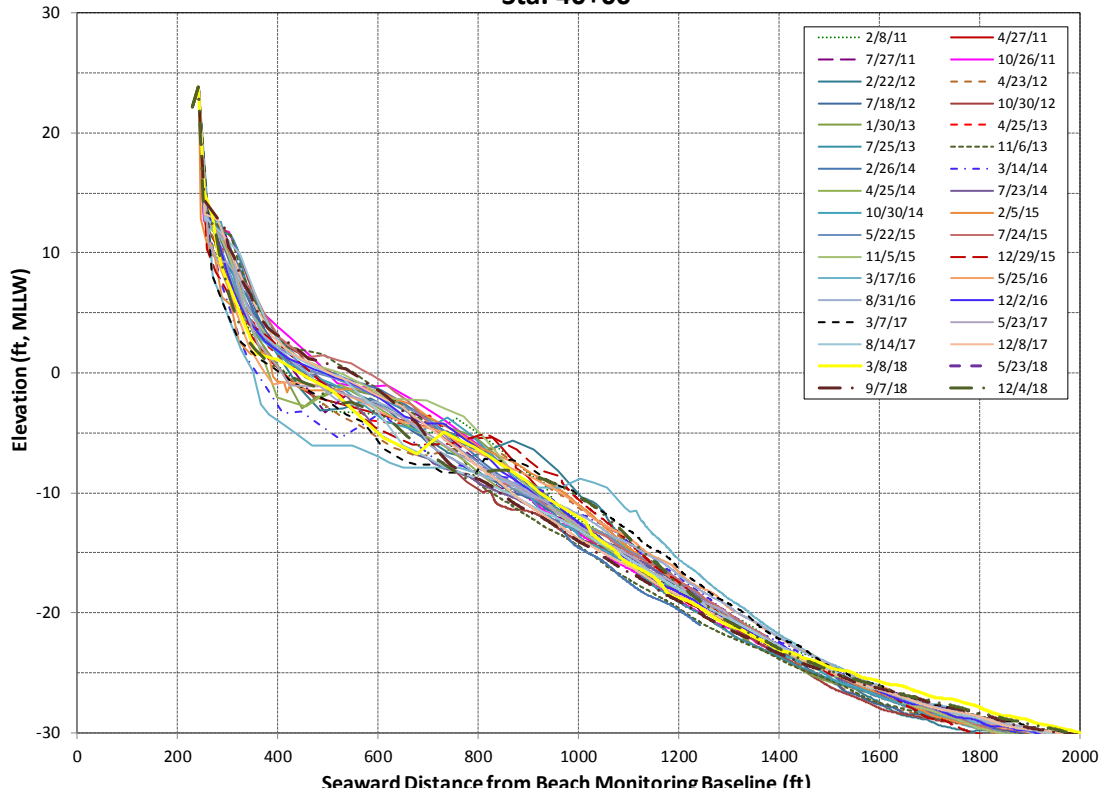
Sta. 37+50



Surveyed Beach Profiles at Station 37+50

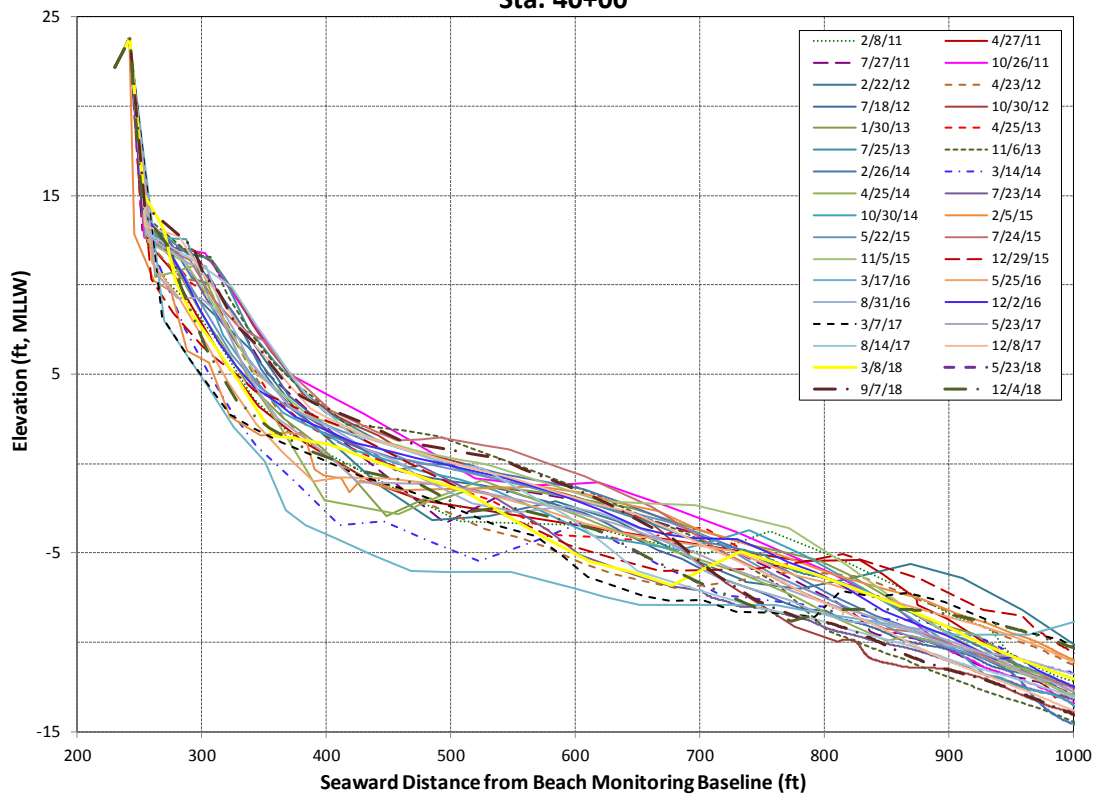
Entire Set of Beach Profiles

Sta. 40+00



Enlarged Partial Beach Profiles

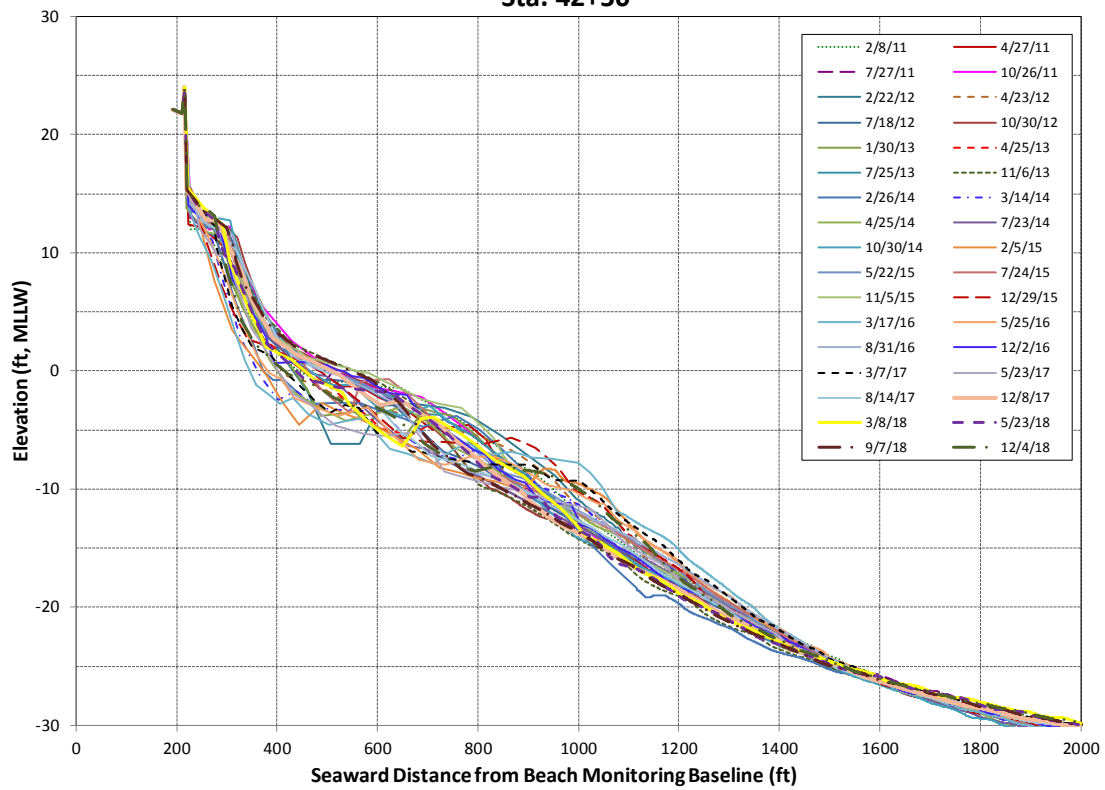
Sta. 40+00



Surveyed Beach Profiles at Station 40+00

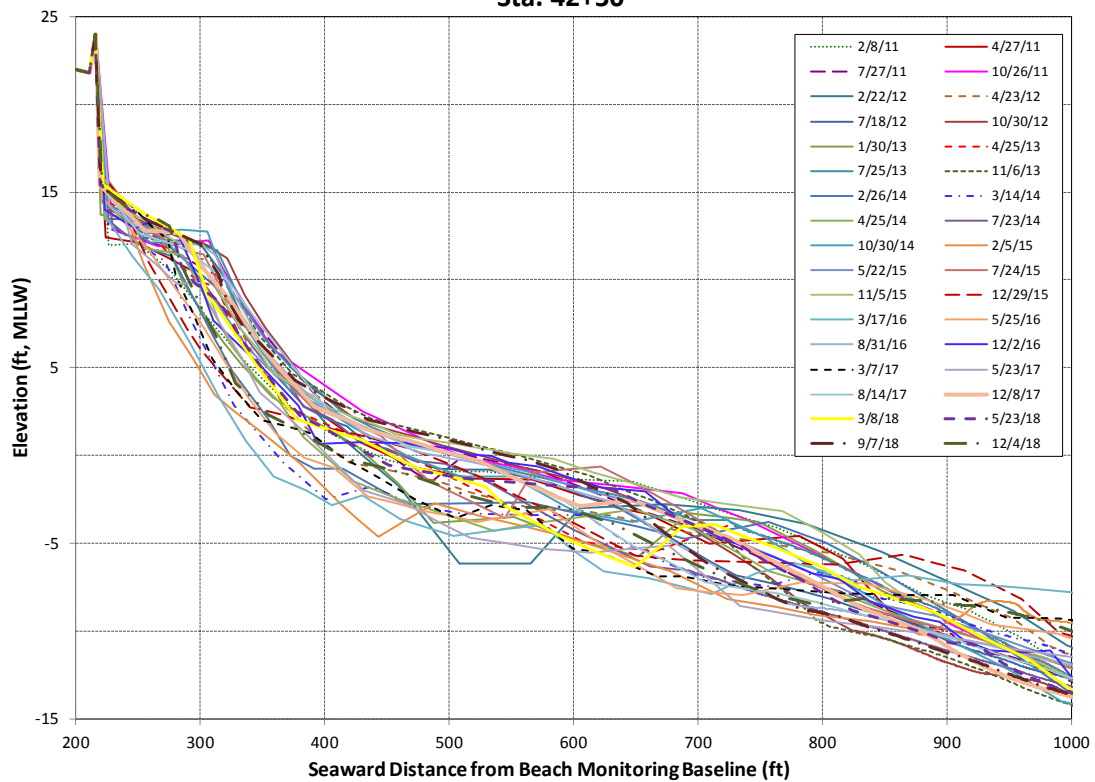
Entire Set of Beach Profiles

Sta. 42+50



Enlarged Partial Beach Profiles

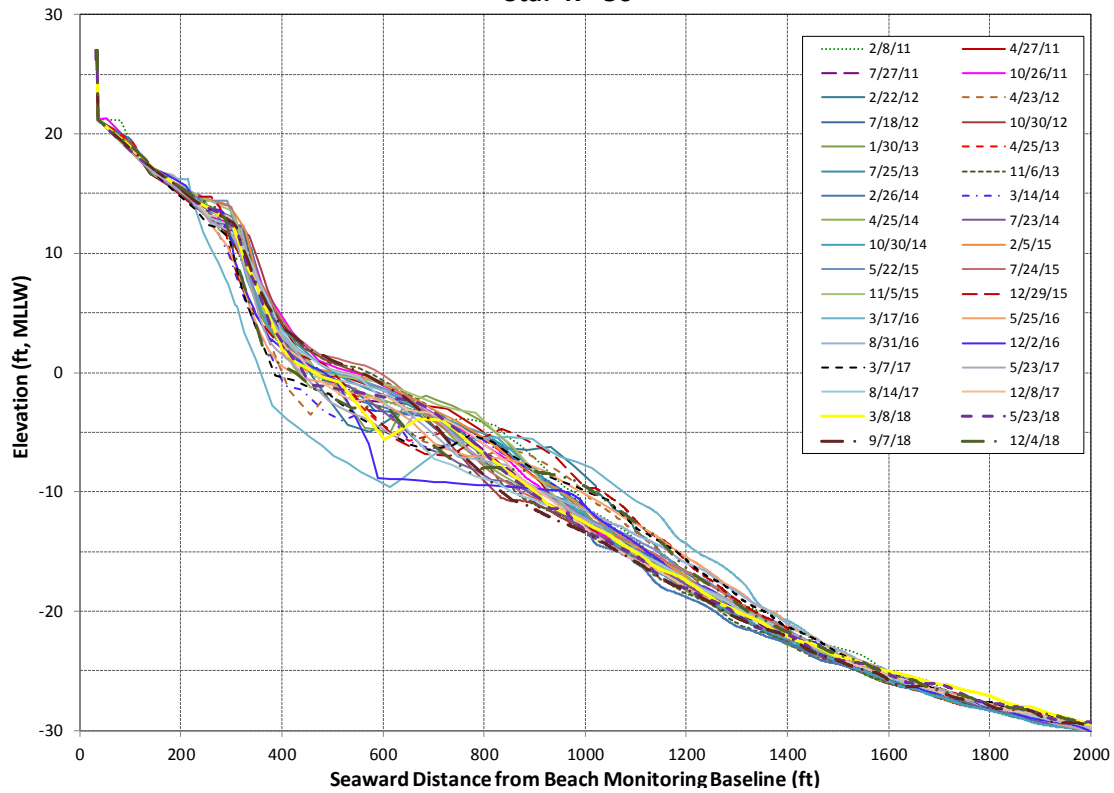
Sta. 42+50



Surveyed Beach Profiles at Station 42+50

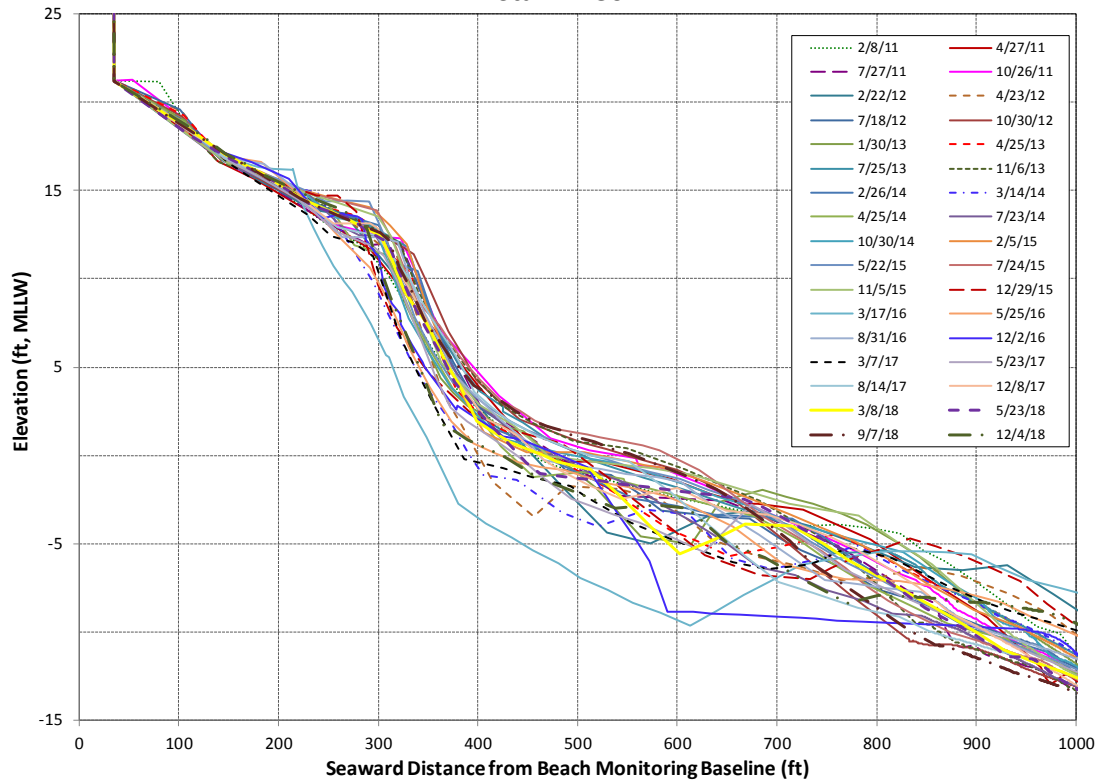
Entire Set of Beach Profiles

Sta. 47+50



Enlarged Partial Beach Profiles

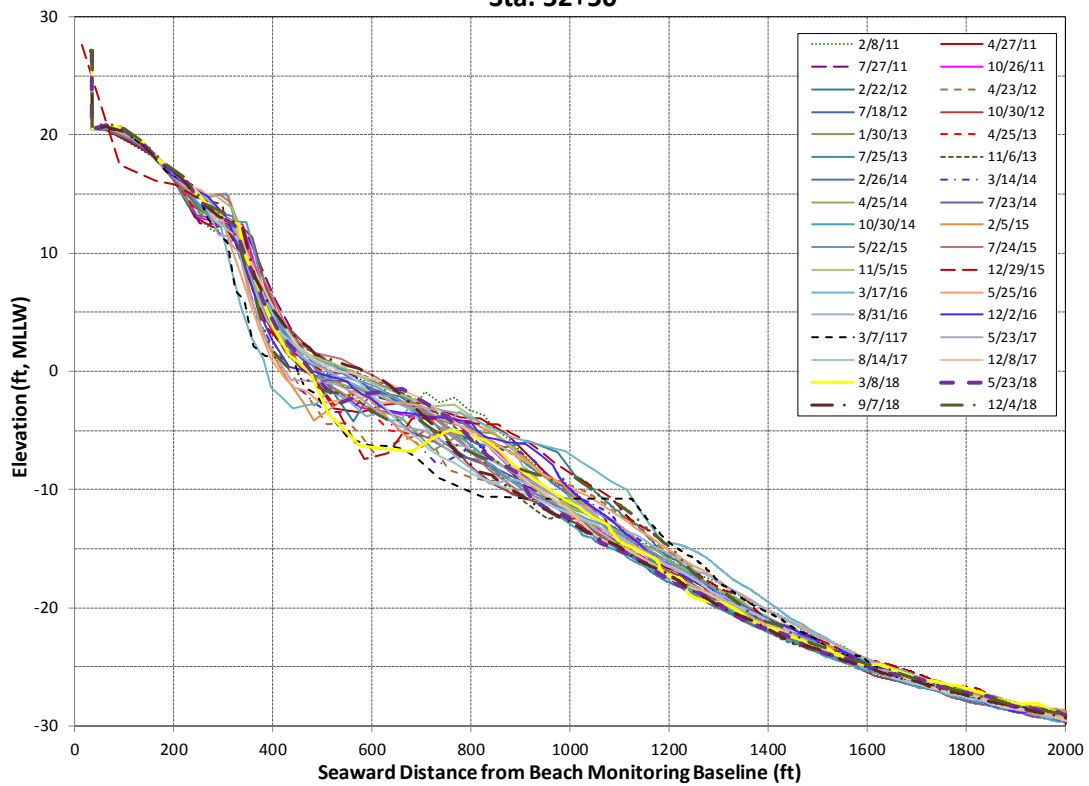
Sta. 47+50



Surveyed Beach Profiles at Station 47+50

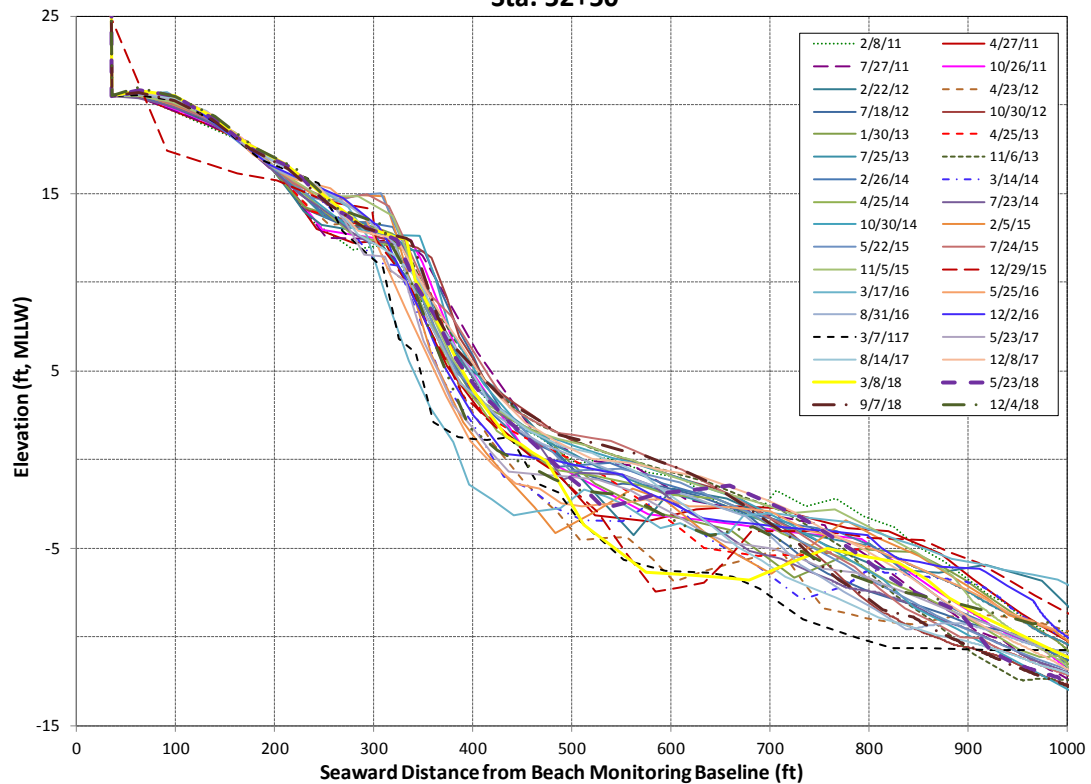
Entire Set of Beach Profiles

Sta. 52+50



Enlarged Beach Profiles

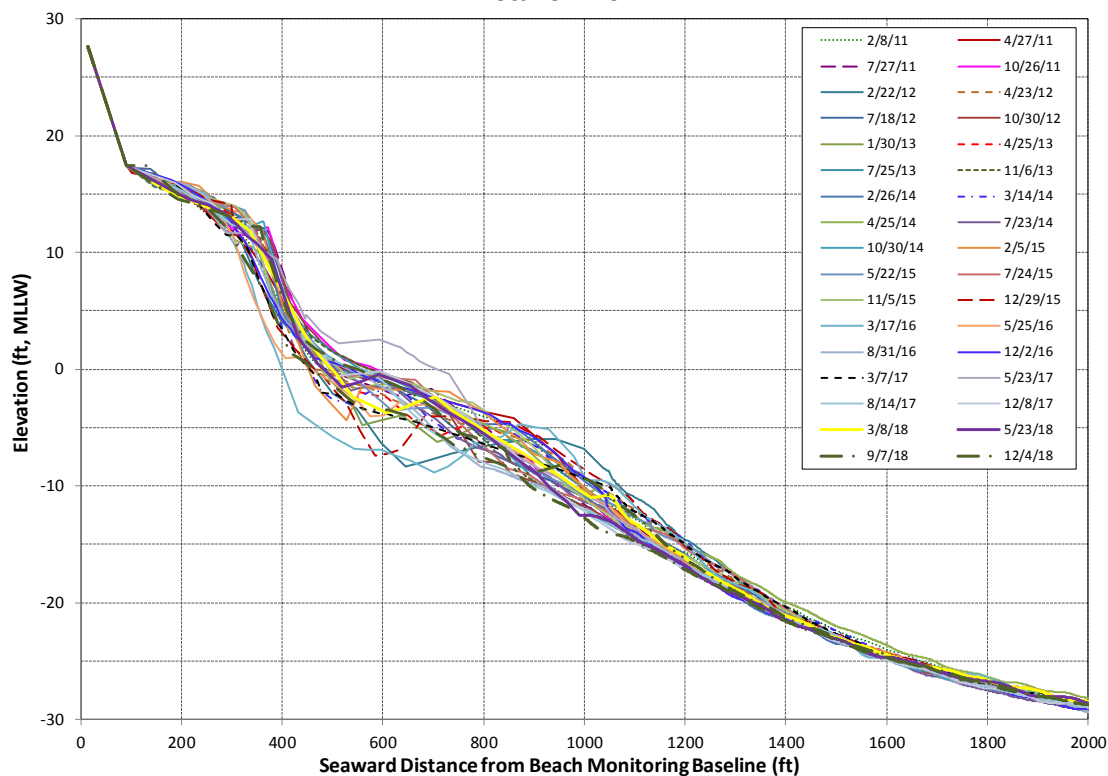
Sta. 52+50



Surveyed Beach Profiles at Station 52+50

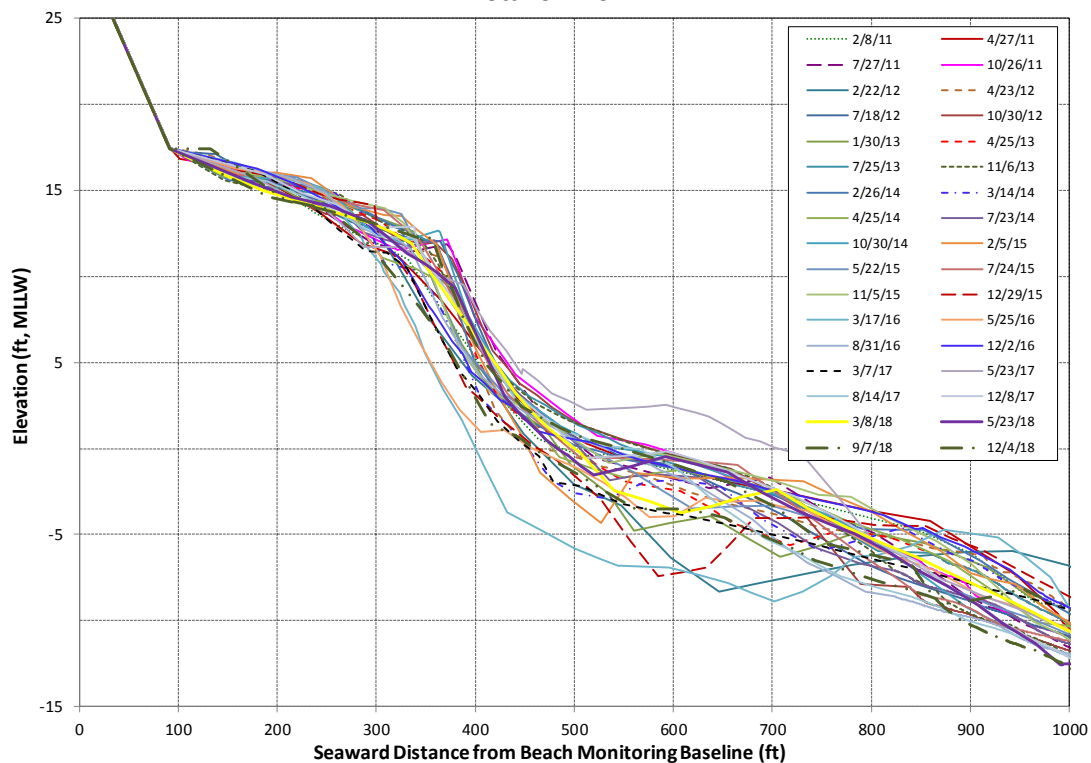
Entire Set of Beach Profiles

Sta. 62+10

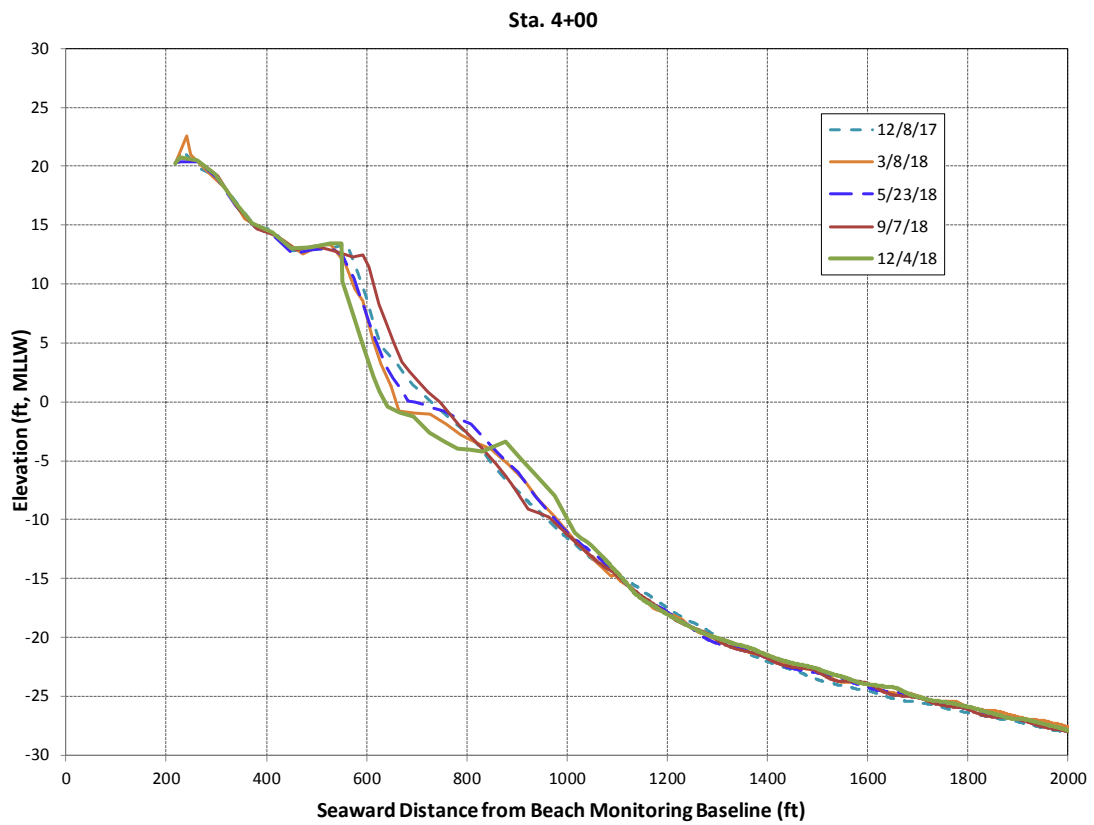
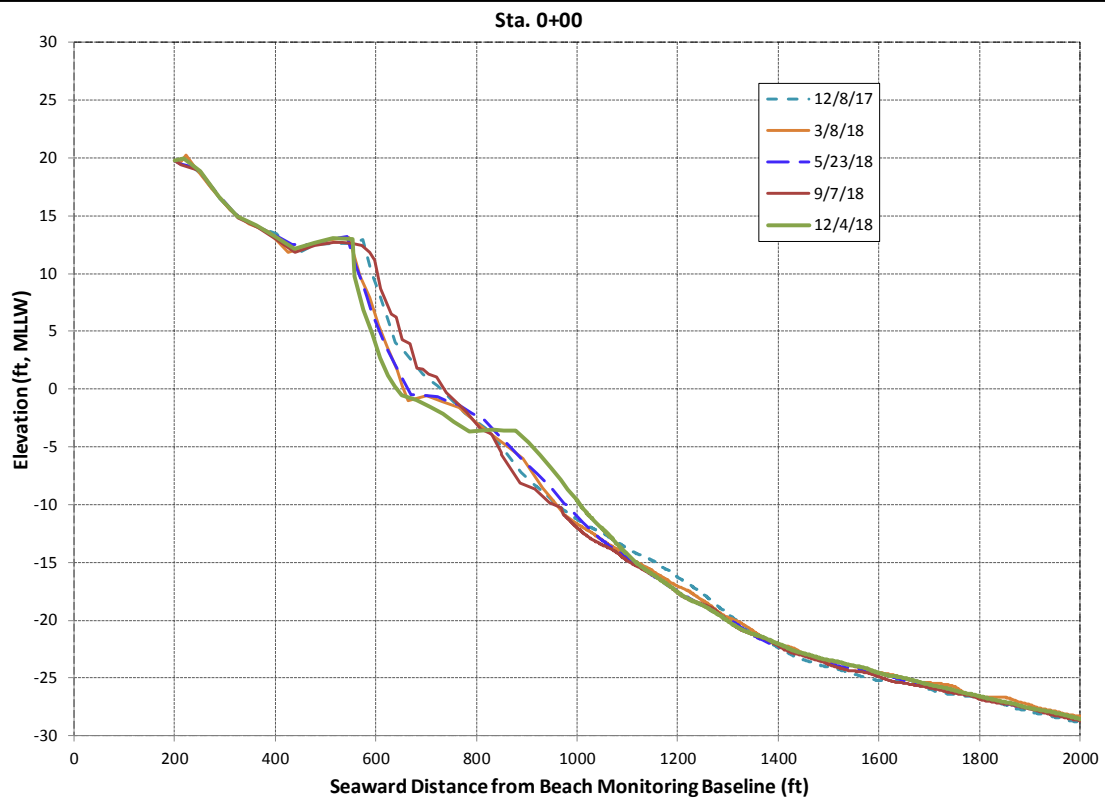


Enlarged Beach Profiles

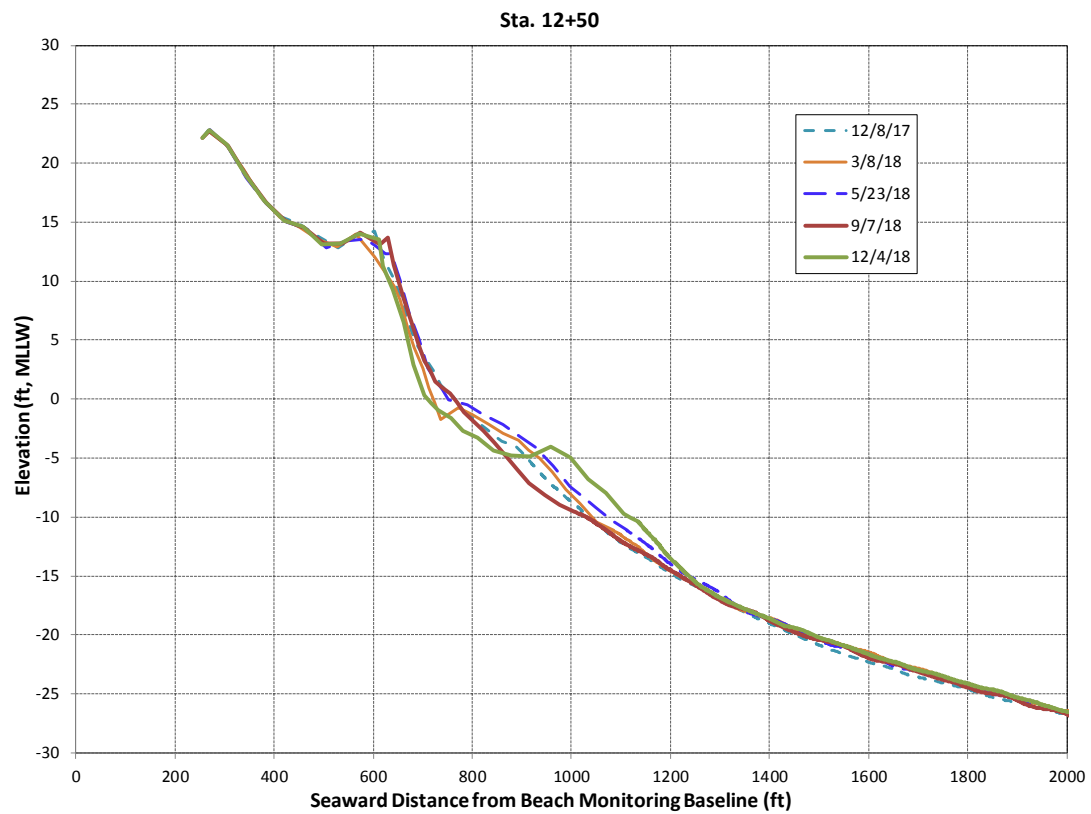
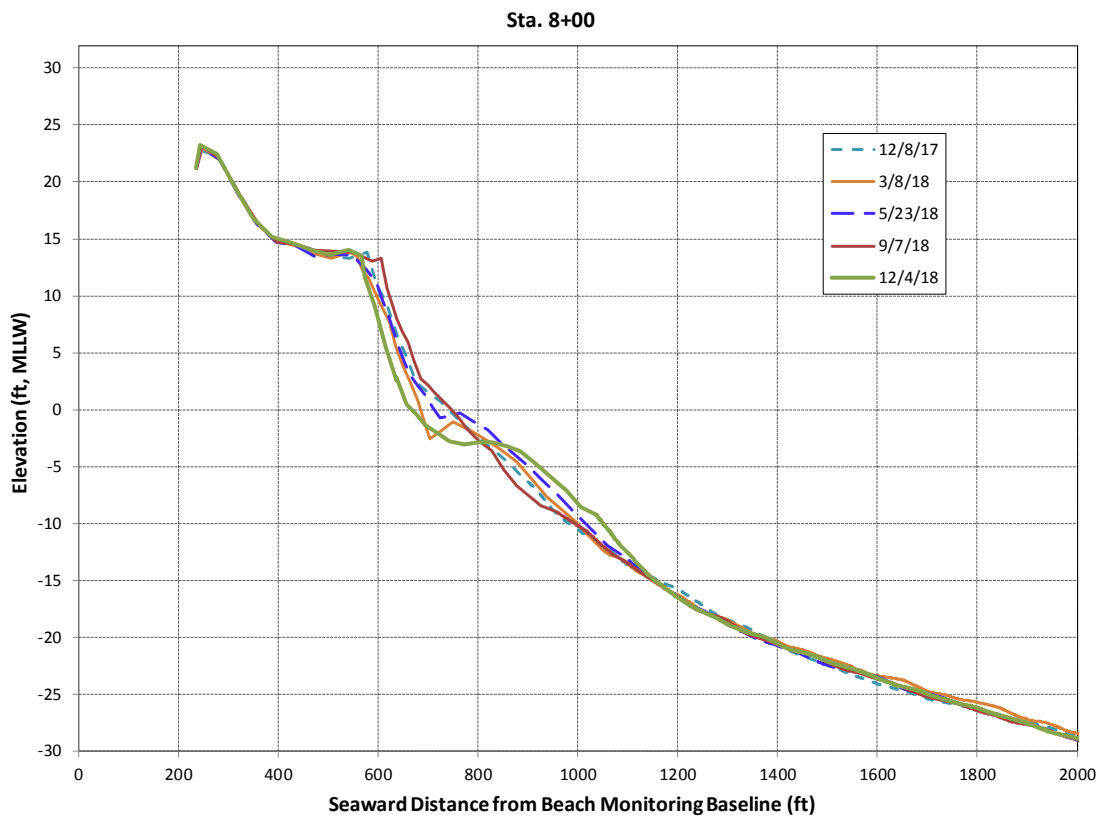
Sta. 62+10



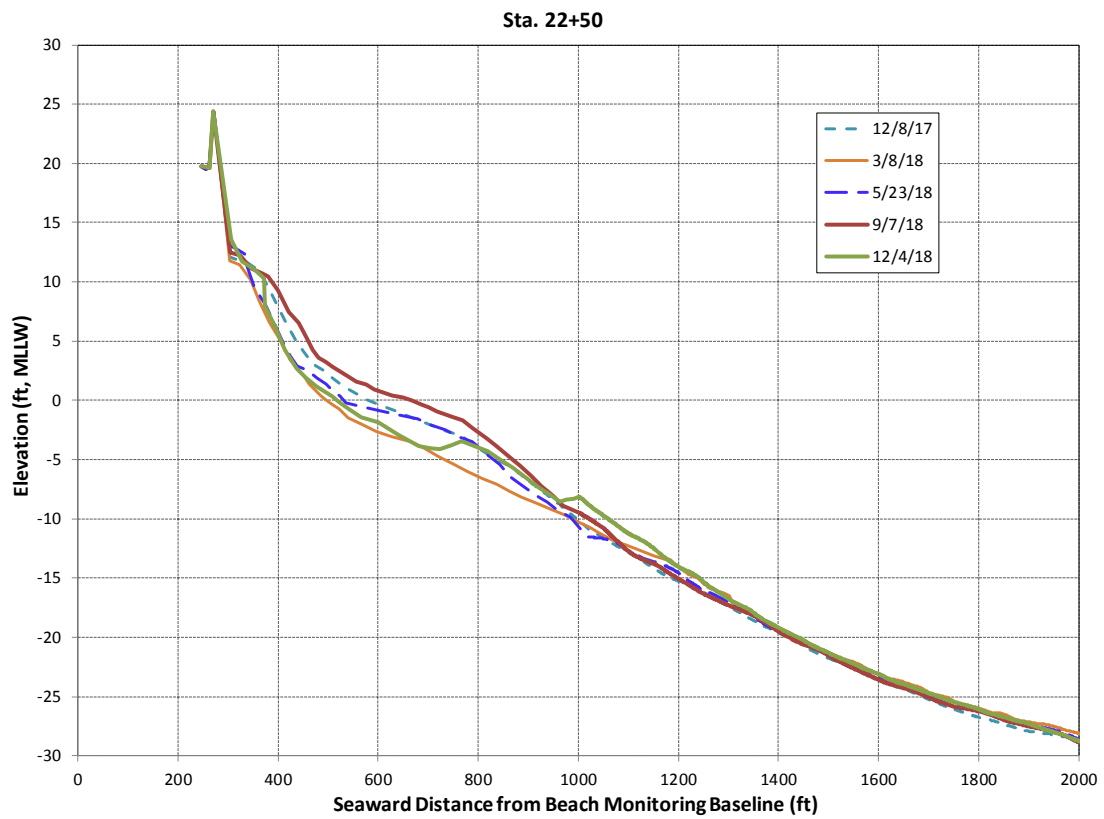
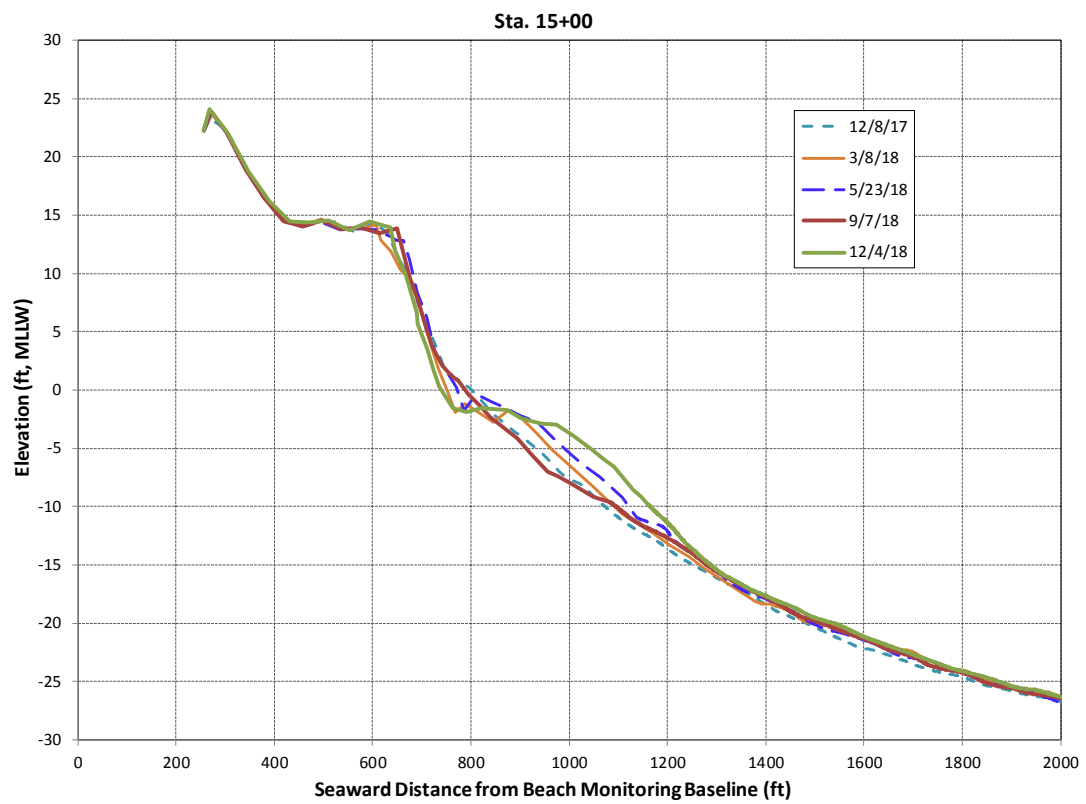
Surveyed Beach Profiles at Station 62+10



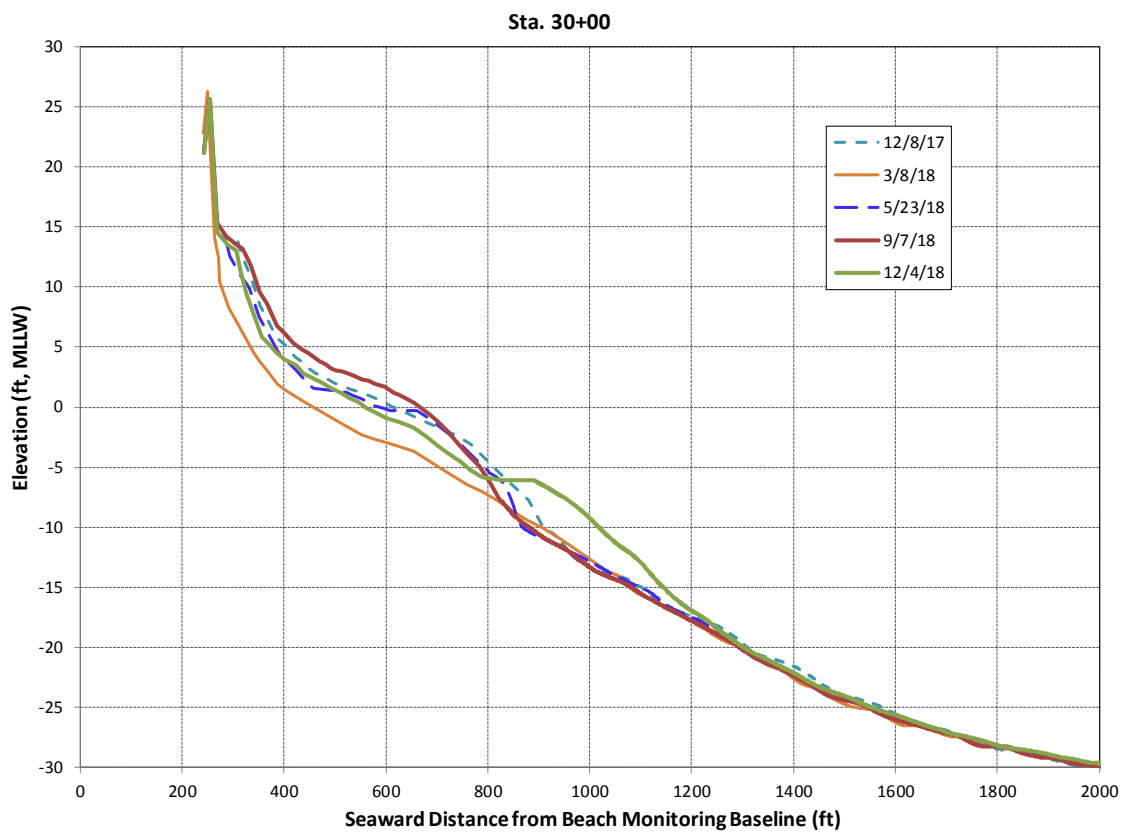
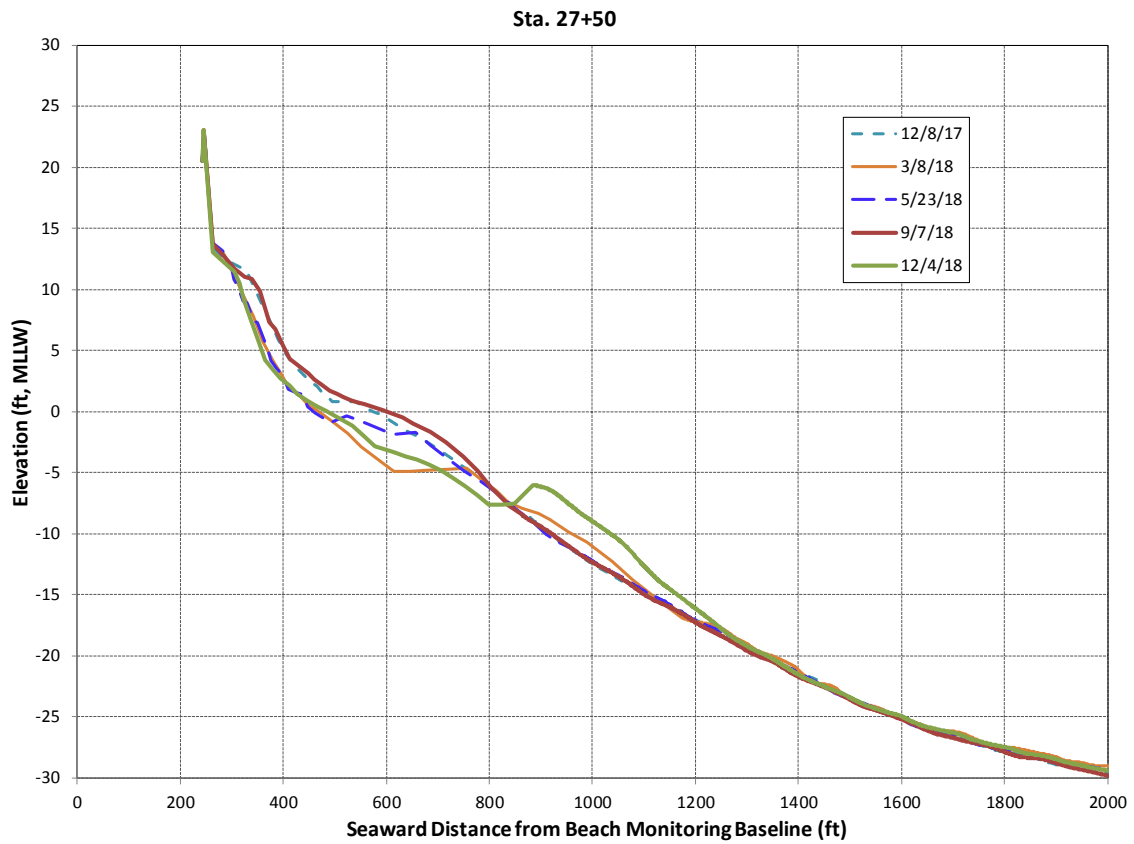
Surveyed Beach Profiles at Stations 0+00 & 4+00 in 2018



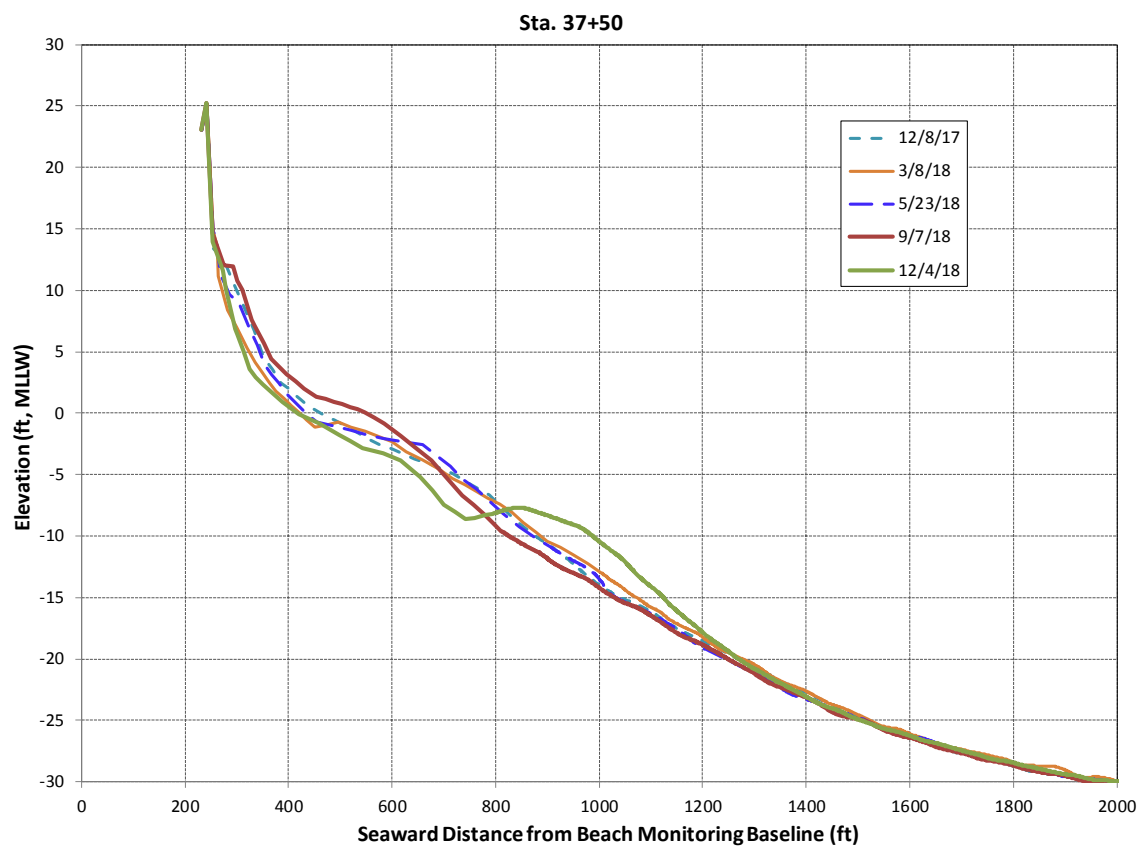
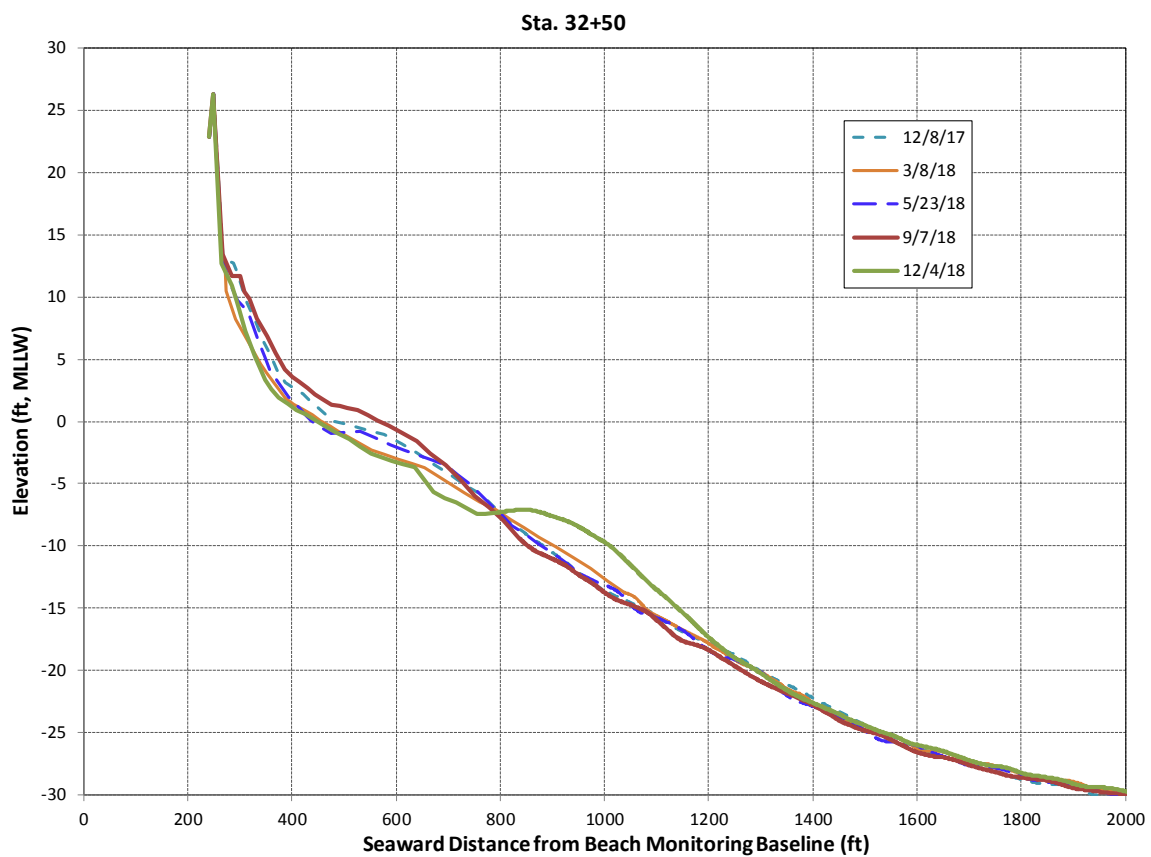
Surveyed Beach Profiles at Stations 8+00 & 12+50 in 2018



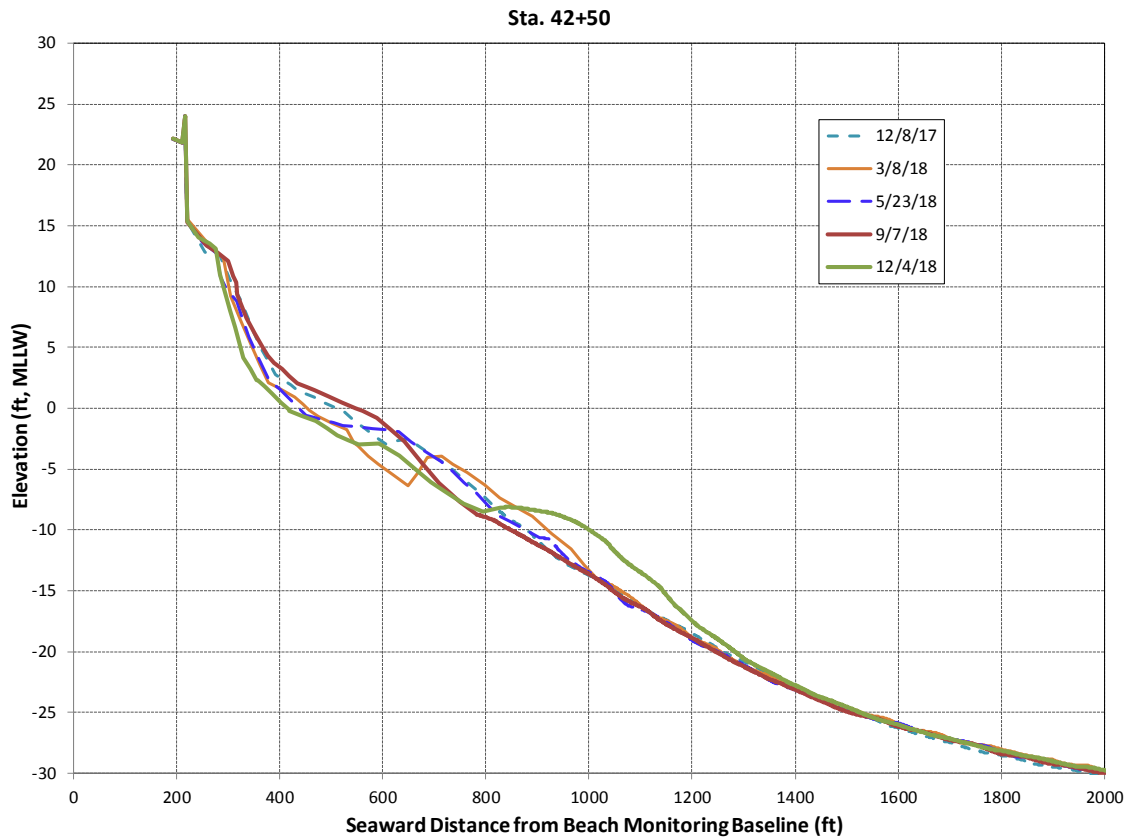
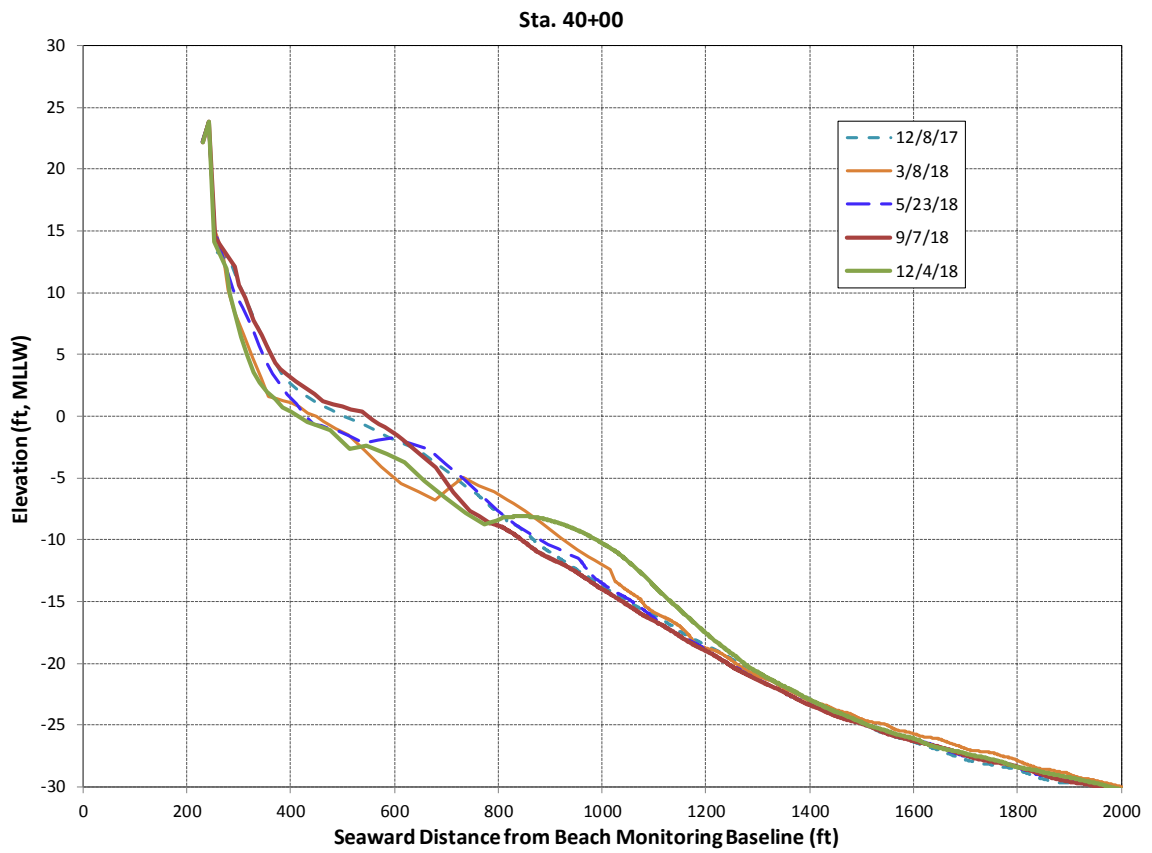
Surveyed Beach Profiles at Stations 15+00 & 22+50 in 2018



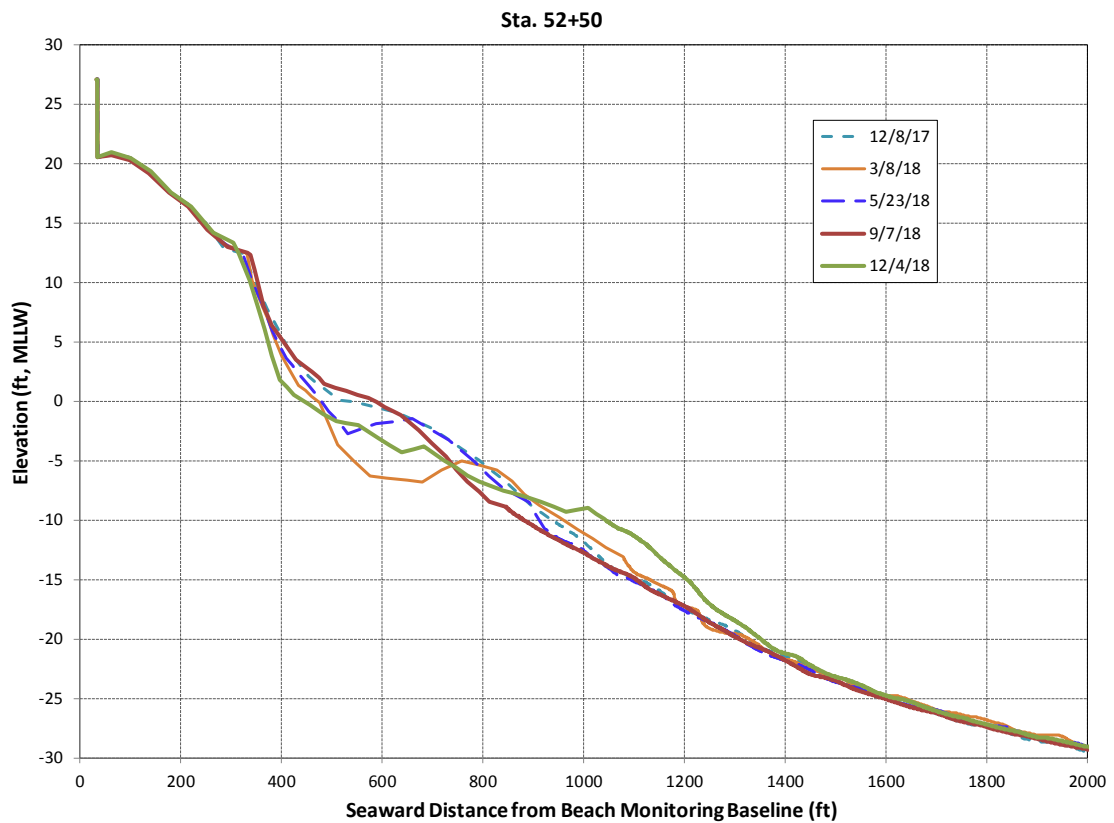
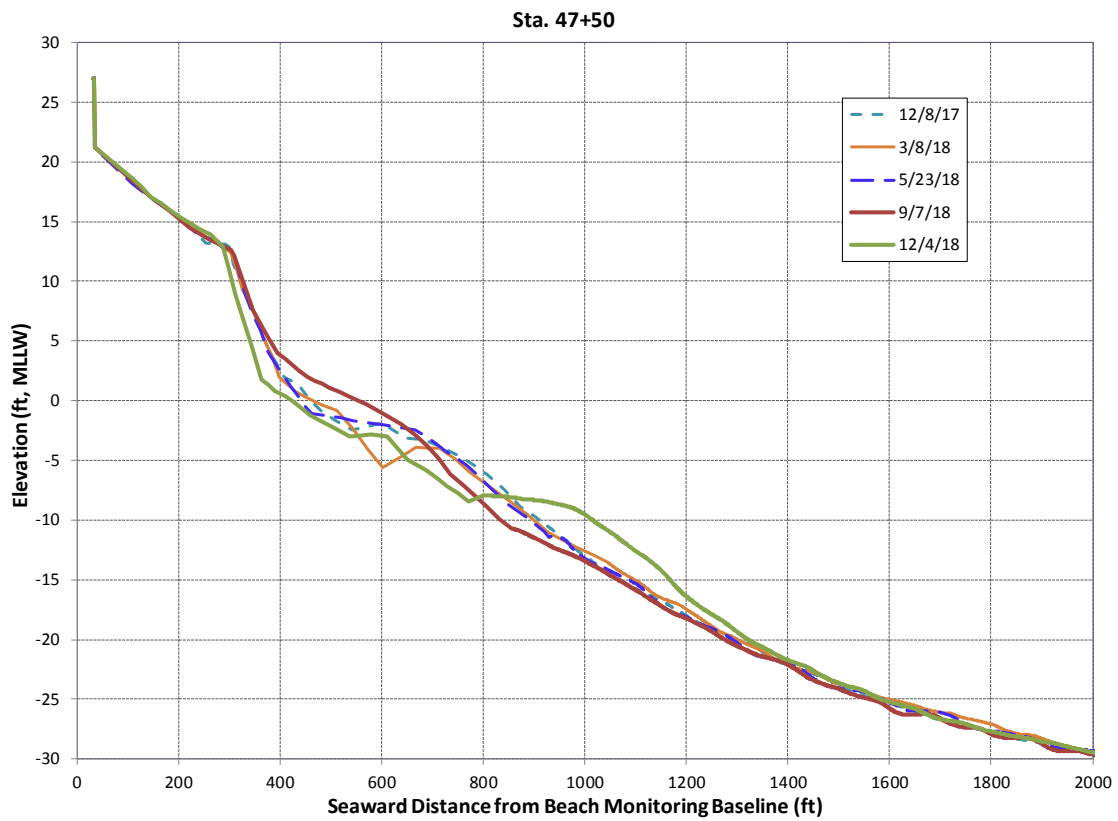
Surveyed Beach Profiles at Stations 27+50 & 30+00 in 2018



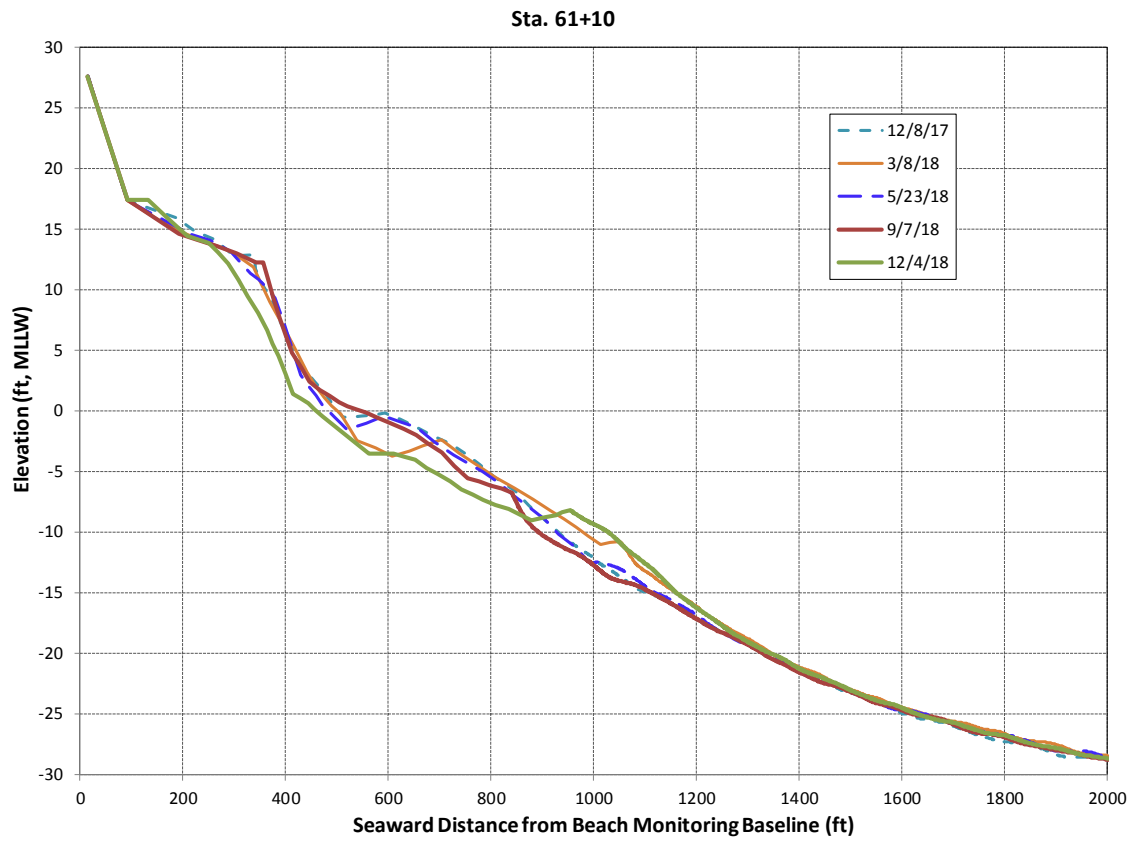
Surveyed Beach Profiles at Stations 32+50 & 37+50 in 2018



Surveyed Beach Profiles at Stations 40+00 & 42+50 in 2018



Surveyed Beach Profiles at Stations 47+50 & 52+50 in 2018



Surveyed Beach Profiles at Station 62+10 in 2018



Photo taken on 2/8/18



Photo taken on 5/25/18



Photo taken on 9/7/18

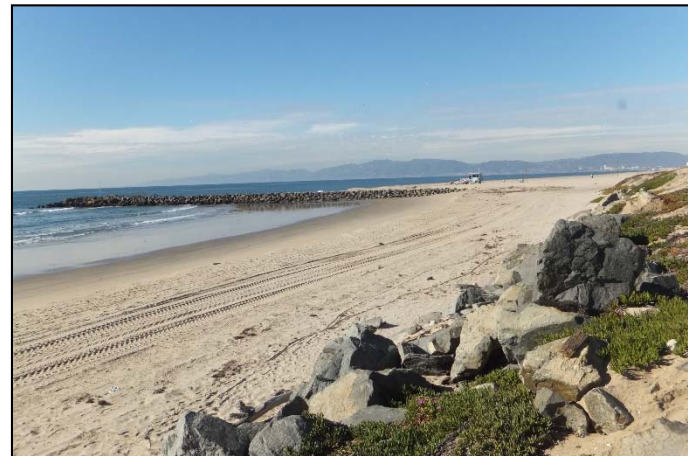


Photo taken on 12/4/18

Ground Photos at Location A (Looking Upcoast)



Photo taken on 3/8/18



Photo taken on 5/25/18



Photo taken on 9/7/18



Photo taken on 12/4/18

Ground Photos at Location A (Looking Downcoast)



Photo taken on 3/8/18



Photo taken on 5/25/18



Photo taken on 9/7/18



Photo taken on 12/4/18

Ground Photos at Location B (Looking Upcoast)



Photo taken on 3/8/18



Photo taken on 5/25/18



Photo taken on 9/7/18



Photo taken on 12/4/18

Ground Photos at Location B (Looking Downcoast)



Photo taken on 1/22/18



Photo taken on 2/12/18



Photo taken on 3/19/18



Photo taken on 4/16/18

El Segundo Beach Conditions (Looking Upcoast)



Photo taken on 5/14/18



Photo taken on 6/18/18



Photo taken on 7/23/18



Photo taken on 8/14/18

El Segundo Beach Conditions (Looking Upcoast)



Photo taken on 9/24/18



Photo taken on 10/18/18



Photo taken on 11/14/18



Photo taken on 12/31/18

El Segundo Beach Conditions (Looking Upcoast)



Photo taken on 1/22/18



Photo taken on 2/12/18



Photo taken on 3/19/18



Photo taken on 4/16/18

El Segundo Beach Conditions (Looking Downcoast)



Photo taken on 5/14/18



Photo taken on 6/18/18



Photo taken on 7/23/18



Photo taken on 8/14/18

El Segundo Beach Conditions (Looking Downcoast)



Photo taken on 9/24/18



Photo taken on 10/18/18

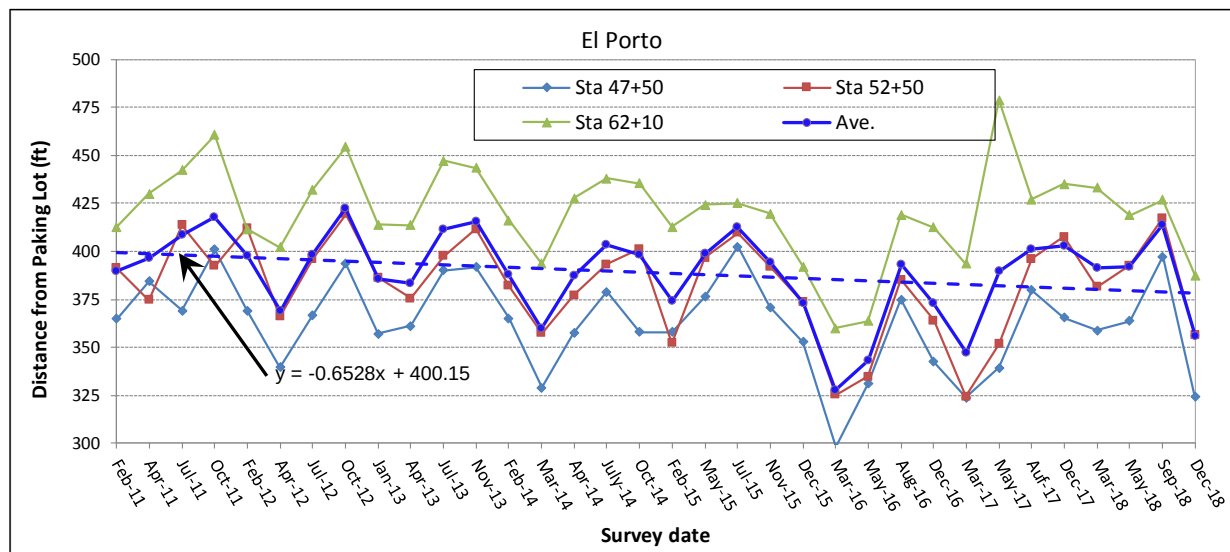
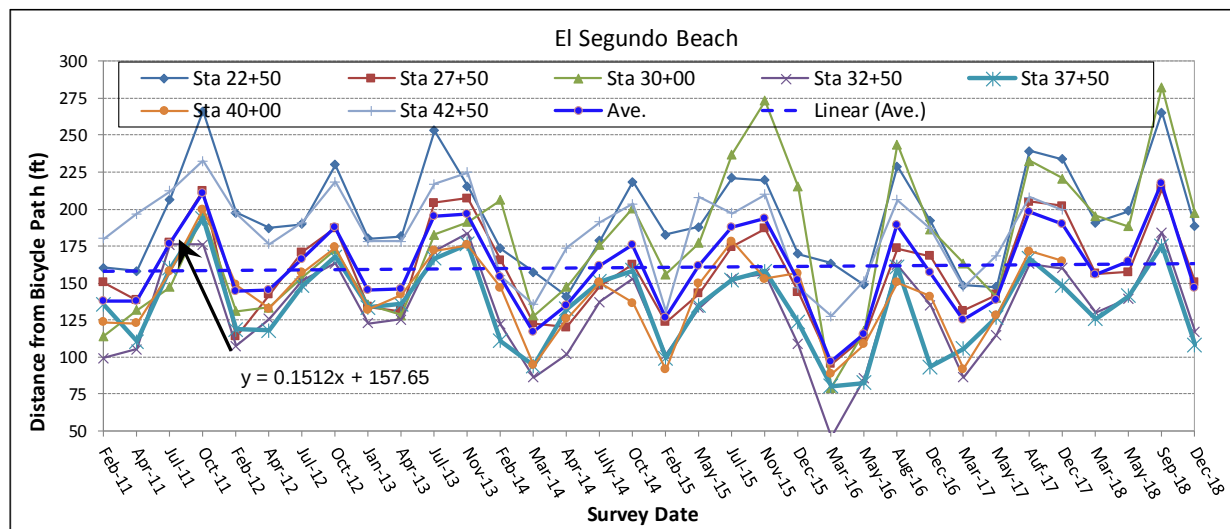
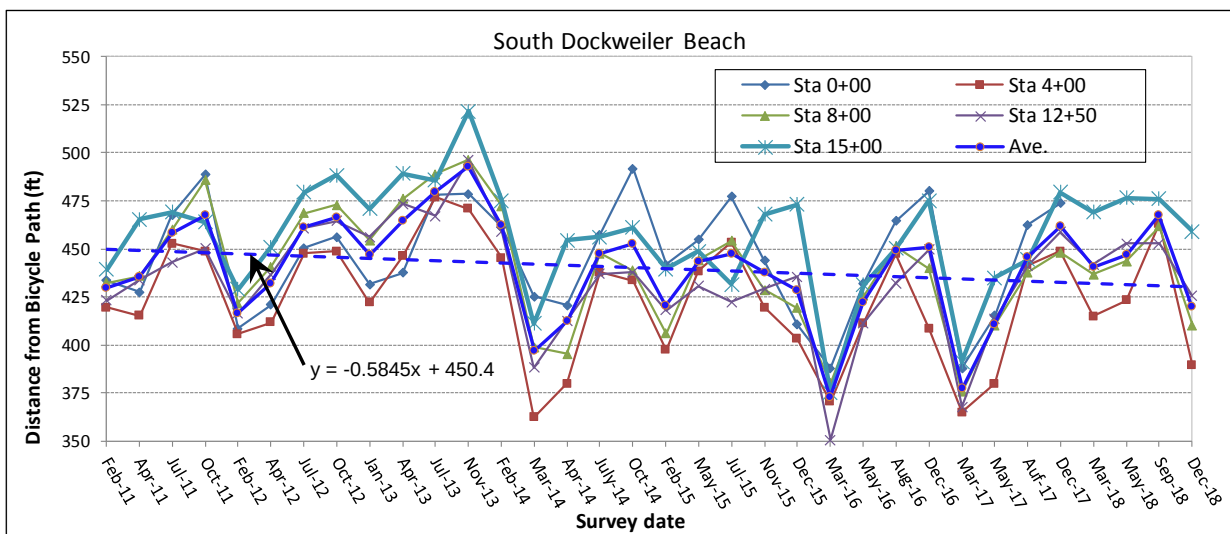


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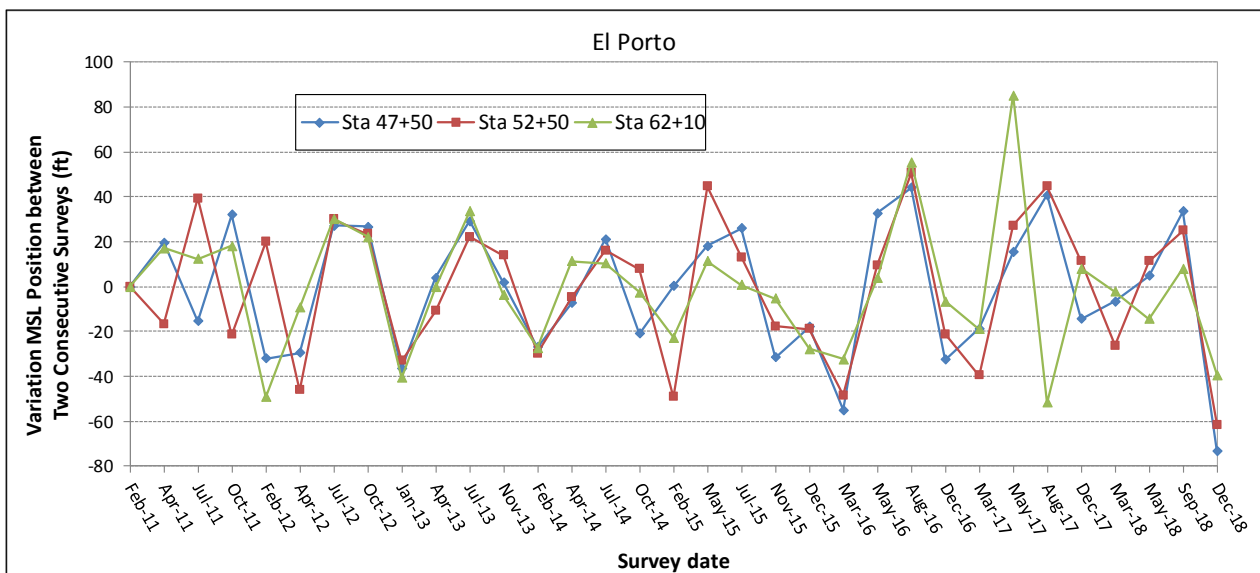
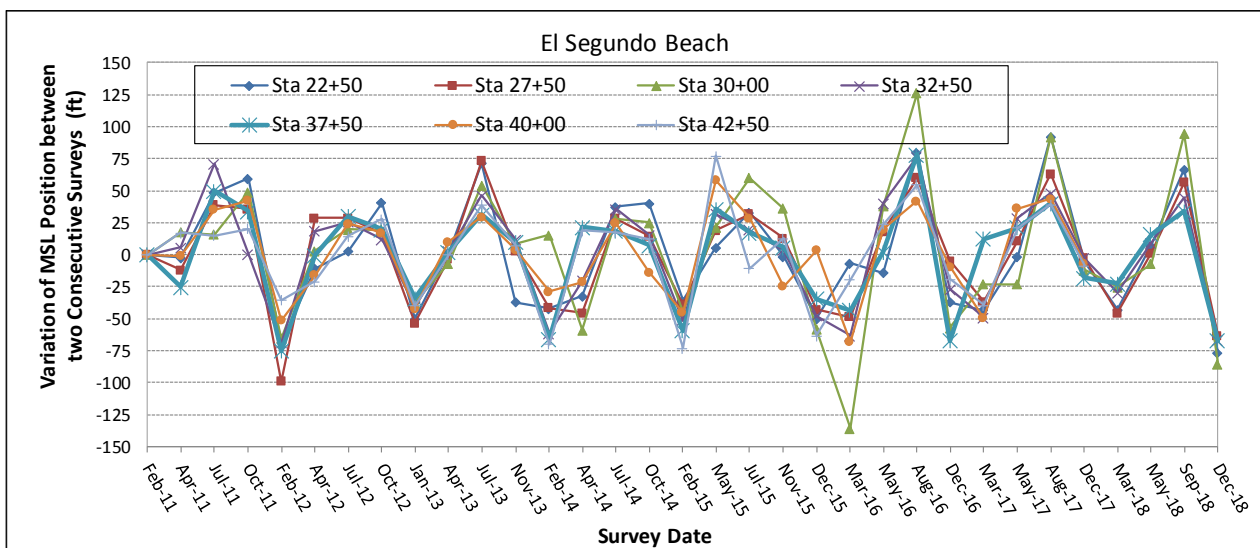
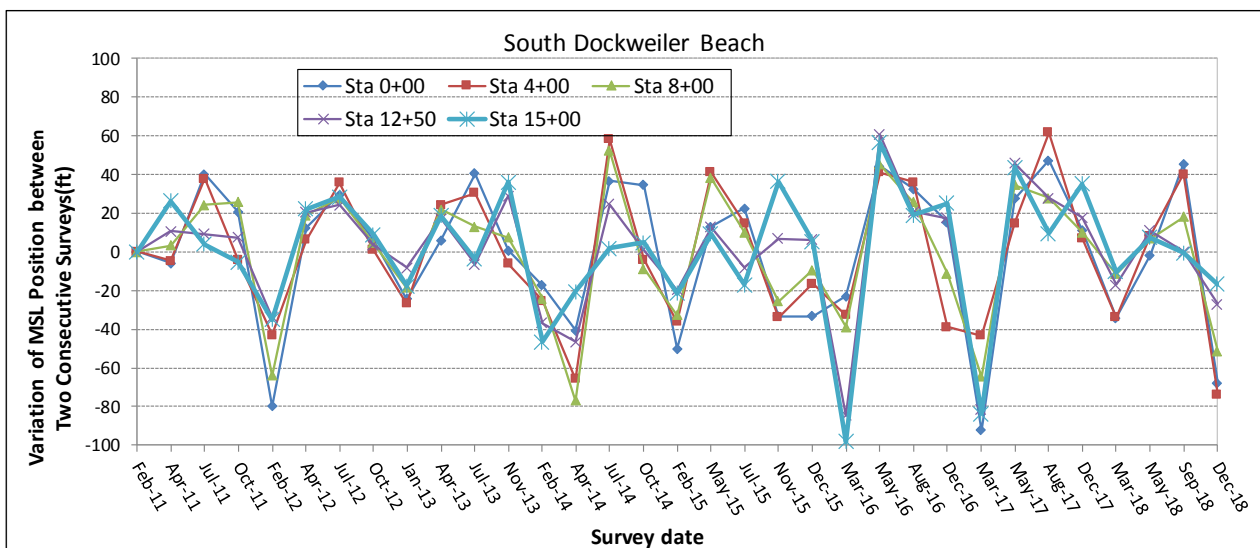


Photo taken on 12/31/18

El Segundo Beach Conditions (Looking Downcoast)



Mean Sea Level Positions



Seasonal Variation of Mean Sea Level Positions

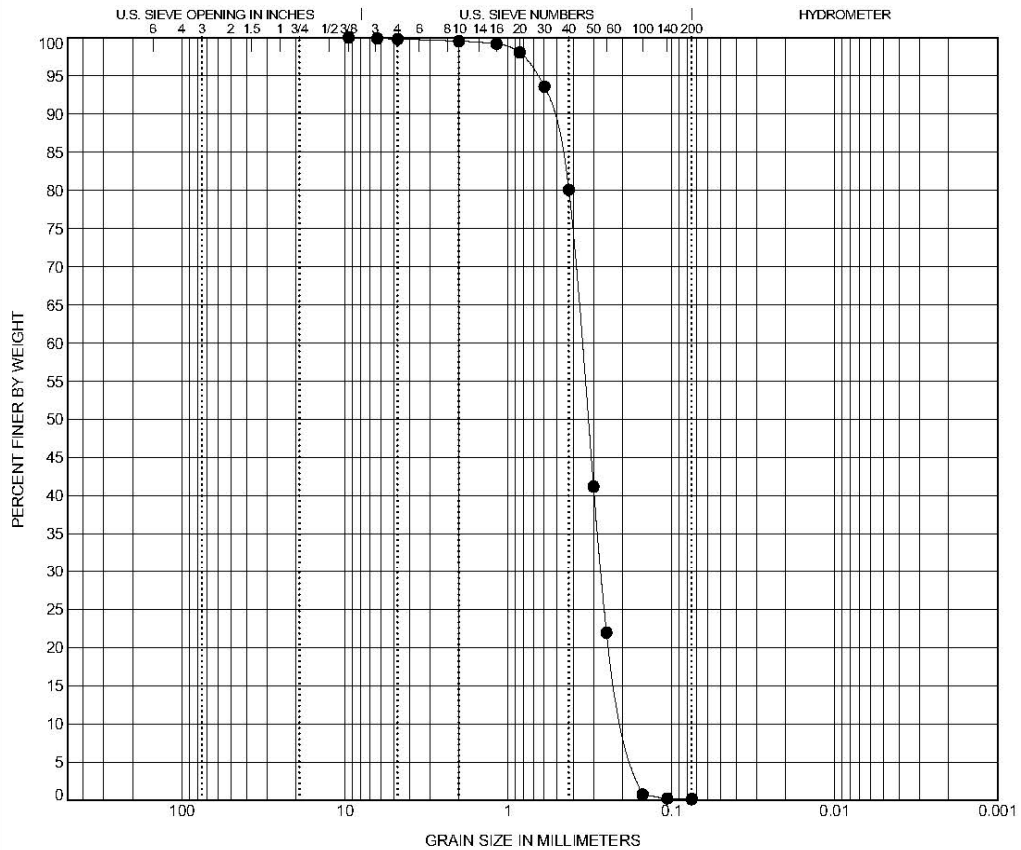


STONEY-MILLER CONSULTANTS, INC.

GRAIN SIZE DISTRIBUTION

Client: Noble Consultants, Inc.
Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 0+00 MHW- March 2018	POORLY GRADED SAND(SP)				1.09	1.89

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 0+00 MHW- March 2018	0.355	0.325	0.27	0.187	0.2	99.6		0.2

Figure No. C-1

Sand Grain Size Distribution at Sta. 0+00 MHW Line (March 2018)

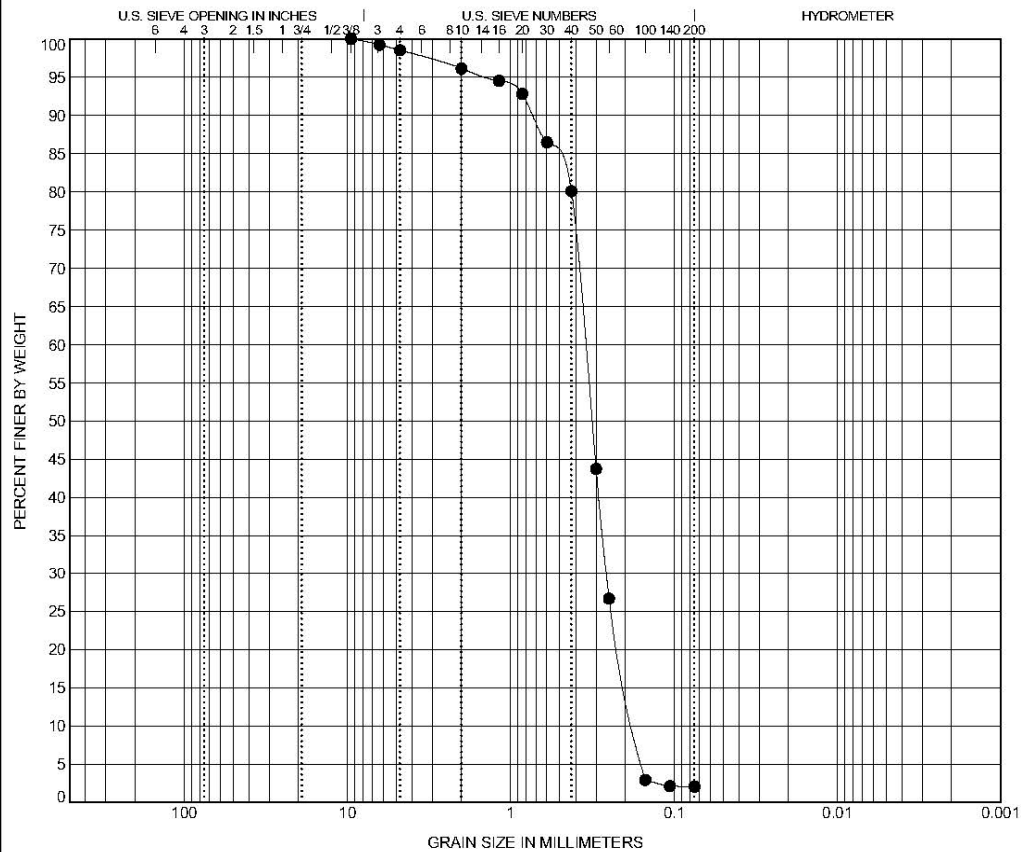


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 0+00 MLLW- March 2018	POORLY GRADED SAND(SP)				1.10	2.01

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 0+00 MLLW- March 2018	0.351	0.319	0.259	0.175	1.5	96.5		2.0

Figure No. C-2

Sand Grain Size Distribution at Sta. 0+00 MLLW Line (March 2018)



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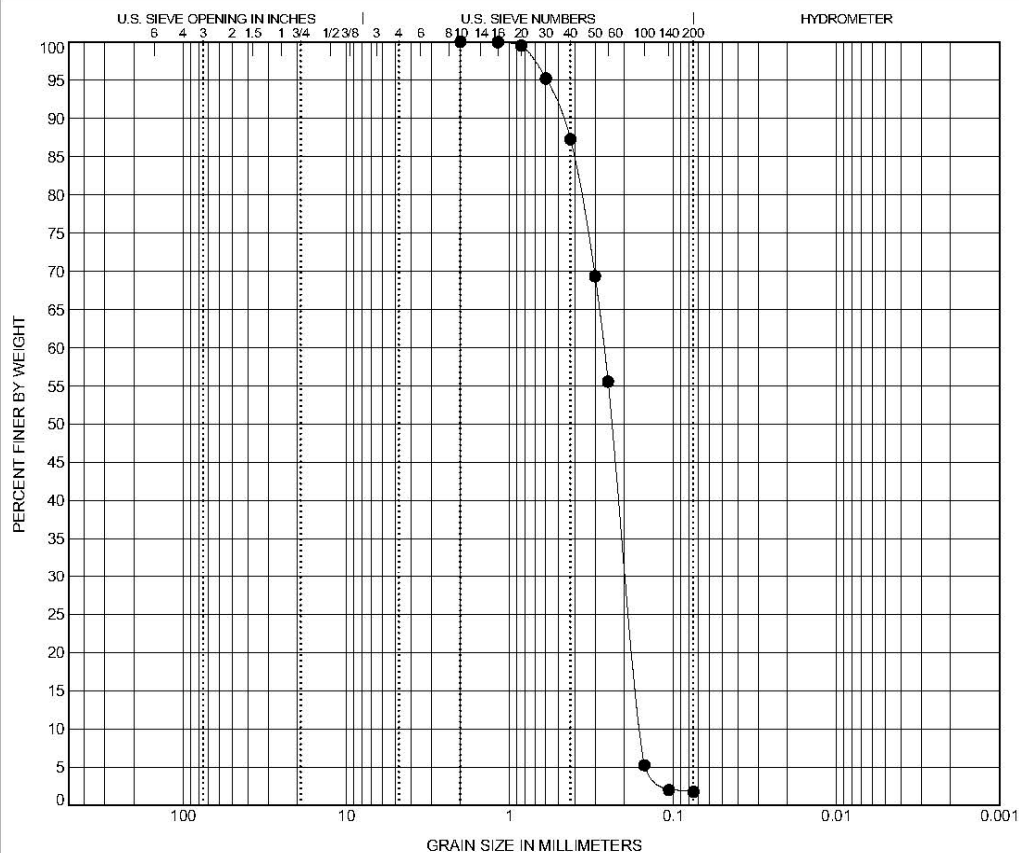
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Project Number: 13556-00

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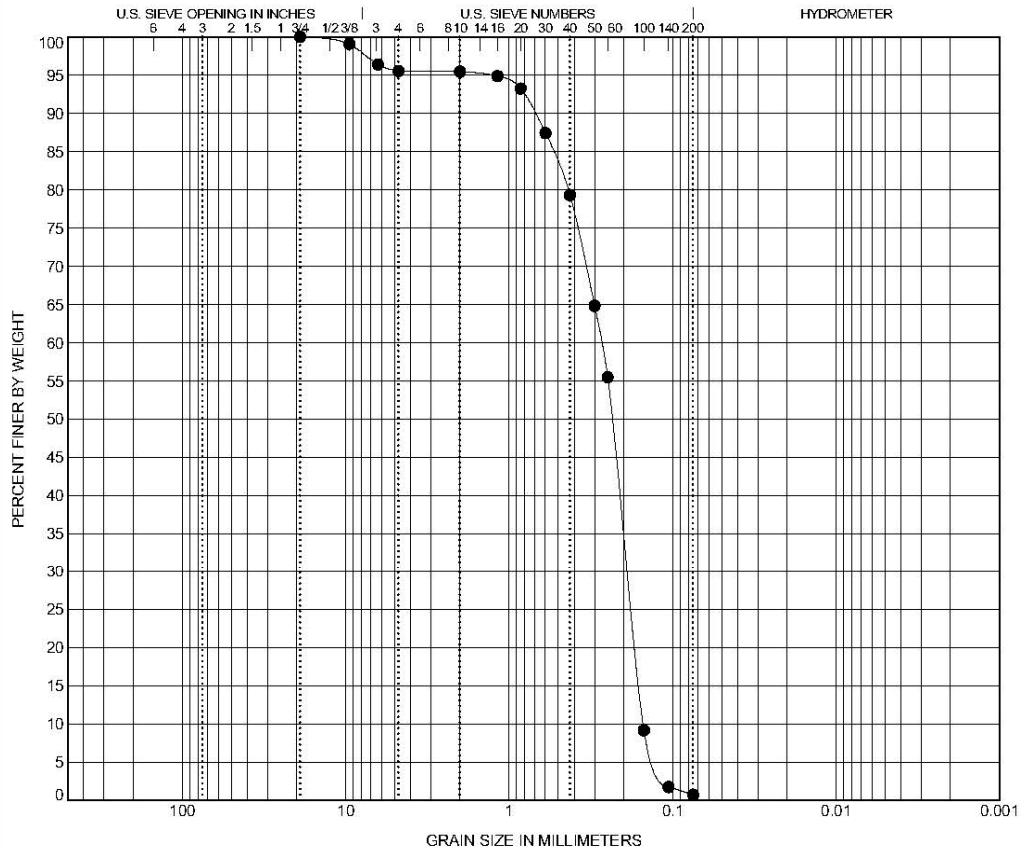


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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 30+00 MLLW- March 2018	POORLY GRADED SAND(SP)				0.86	1.80

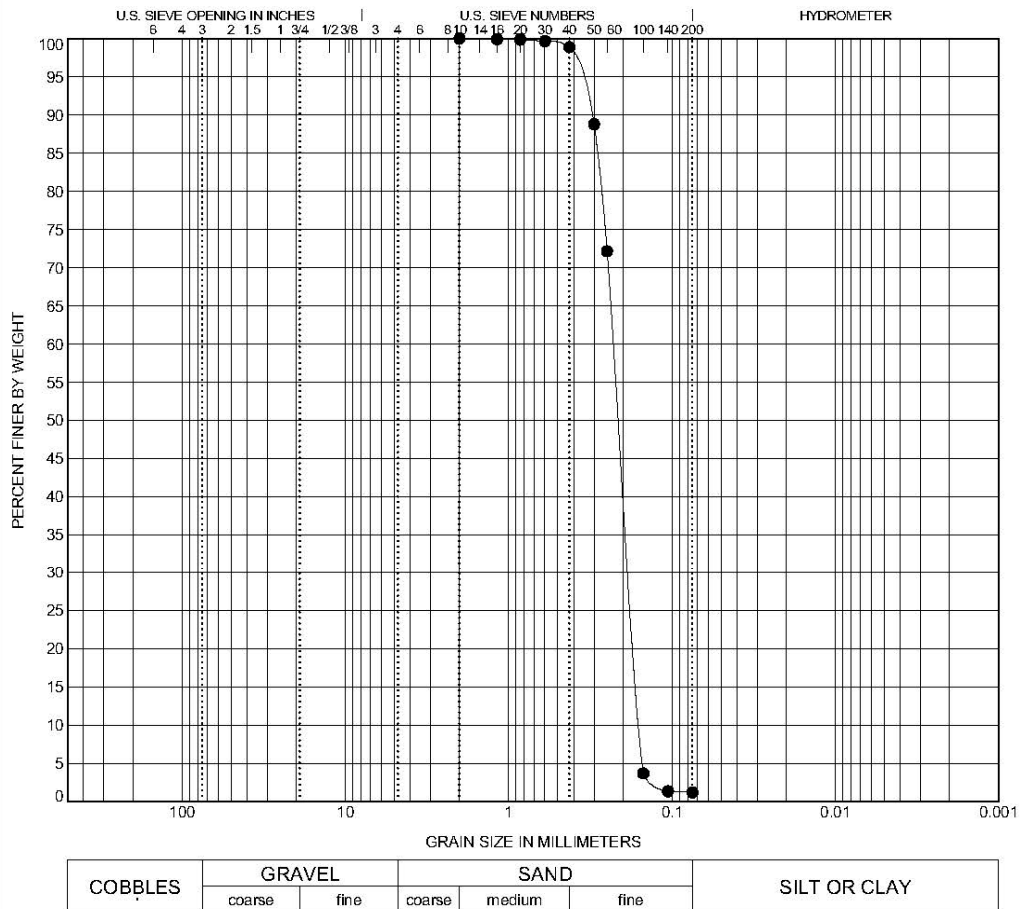
BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 30+00 MLLW- March 2018	0.273	0.235	0.189	0.151	4.5	94.8	0.7	

Figure No. C-4

Sand Grain Size Distribution at Sta. 30+00 MLLW Line (March 2018)

Client: Noble Consultants, Inc.
Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



BOREHOLE		Classification				LL	PL	PI	Cc	Cu
●	Sta. 62+10 MHW- March 2018	POORLY GRADED SAND(SP)							0.93	1.45
BOREHOLE		D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	Sta. 62+10 MHW- March 2018	0.228	0.212	0.183	0.157	0.0	98.8	1.2		

Figure No. C-5

Sand Grain Size Distribution at Sta. 62+10 MHW Line (March 2018)

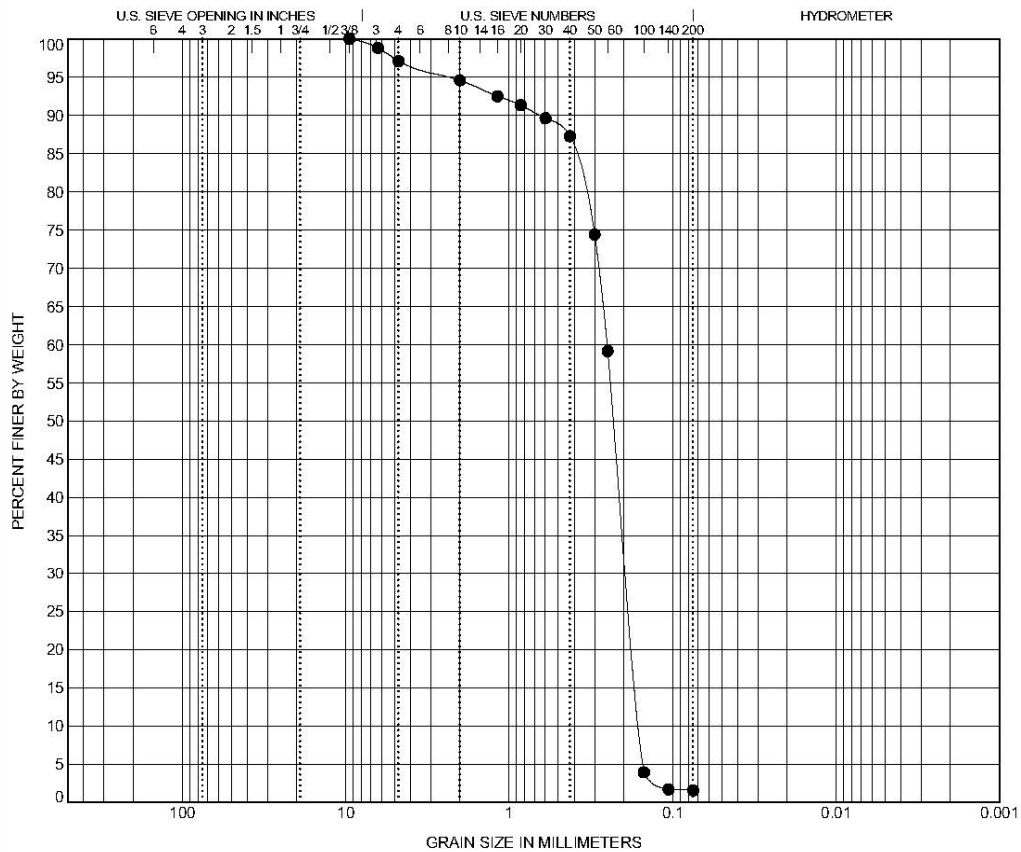


STONE-MILLER CONSULTANTS, INC.

GRAIN SIZE DISTRIBUTION

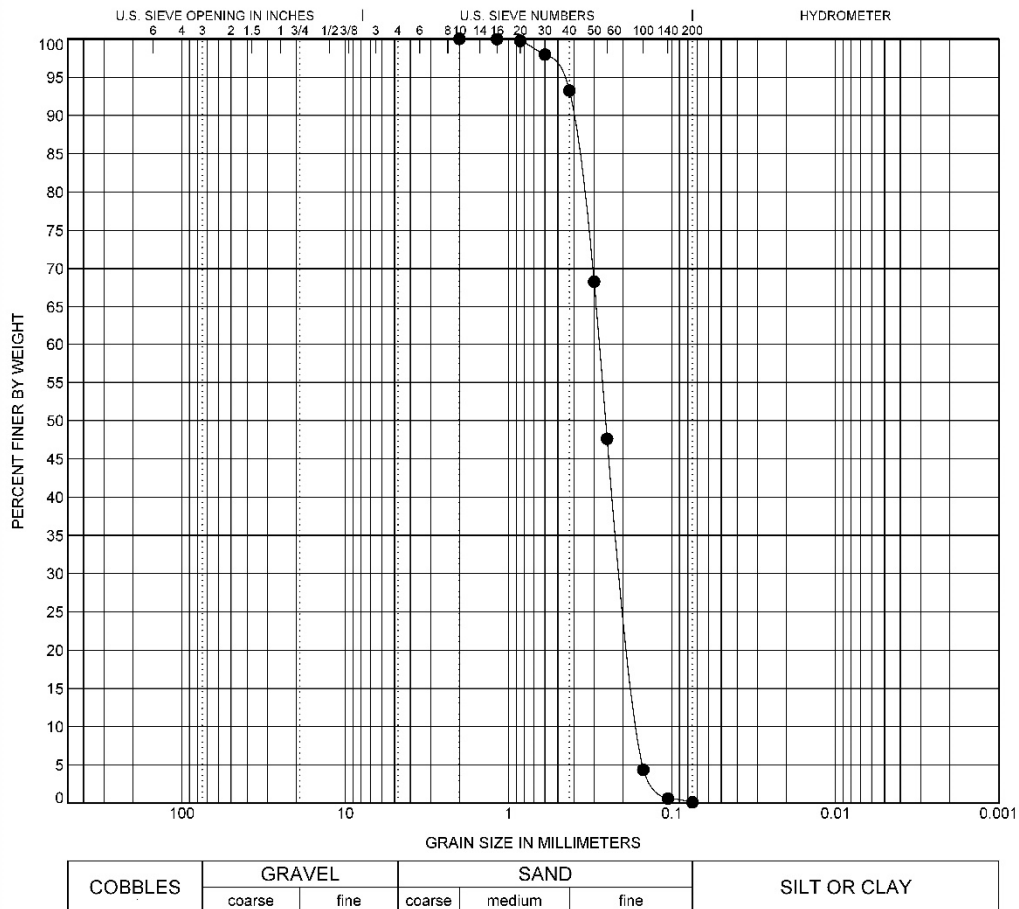
Client: Noble Consultants, Inc.
Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



Client: Noble Consultants, Inc.
Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



BOREHOLE		Classification				LL	PL	PI	Cc	Cu
●	STA 0+00 MHW-May 2018	POORLY GRADED SAND(SP)							0.92	1.74
BOREHOLE		D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	STA 0+00 MHW-May 2018	0.279	0.255	0.203	0.16	0.0	99.9	0.1		

Figure No. C-1

Sand Grain Size Distribution at Sta. 0+00 MHW Line (May 2018)

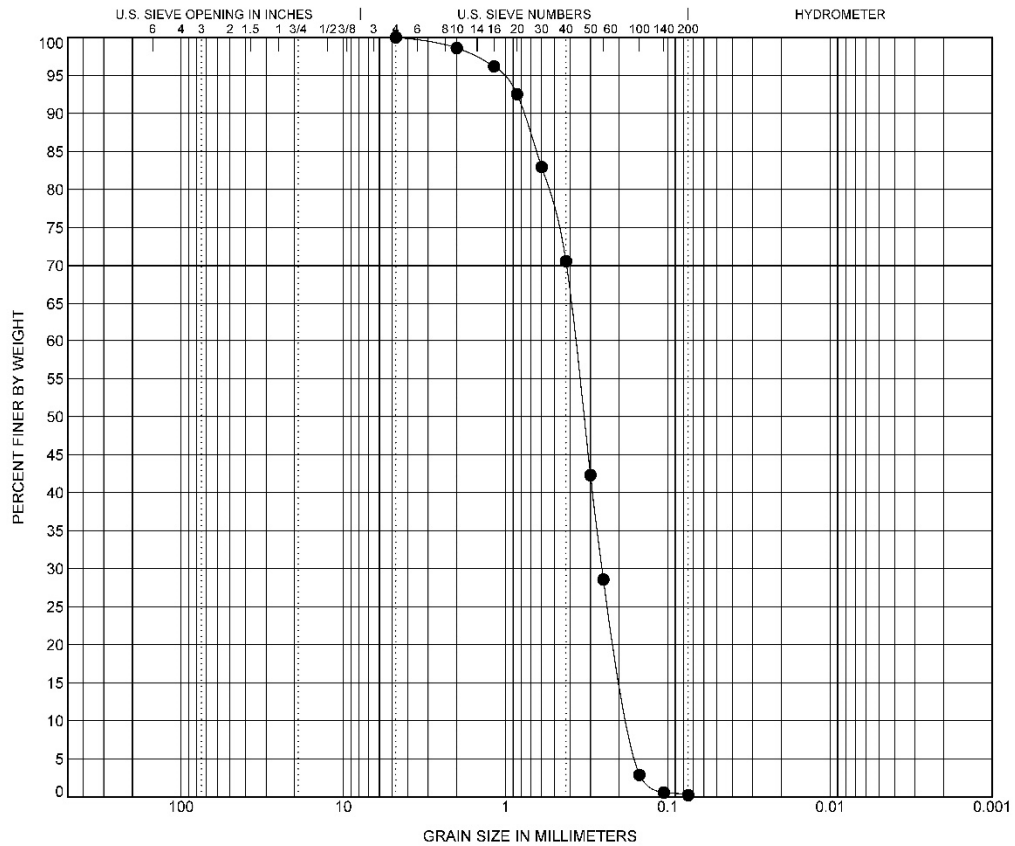


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GRAIN SIZE DISTRIBUTION

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Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE		Classification		LL	PL	PI	Cc	Cu
● STA 0+00 MLLW- May 2018		POORLY GRADED SAND(SP)					1.01	2.16

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● STA 0+00 MLLW- May 2018	0.373	0.33	0.255	0.173	0.0	99.8	0.2	

Figure No. C-1

Sand Grain Size Distribution at Sta. 0+00 MLLW Line (May 2018)



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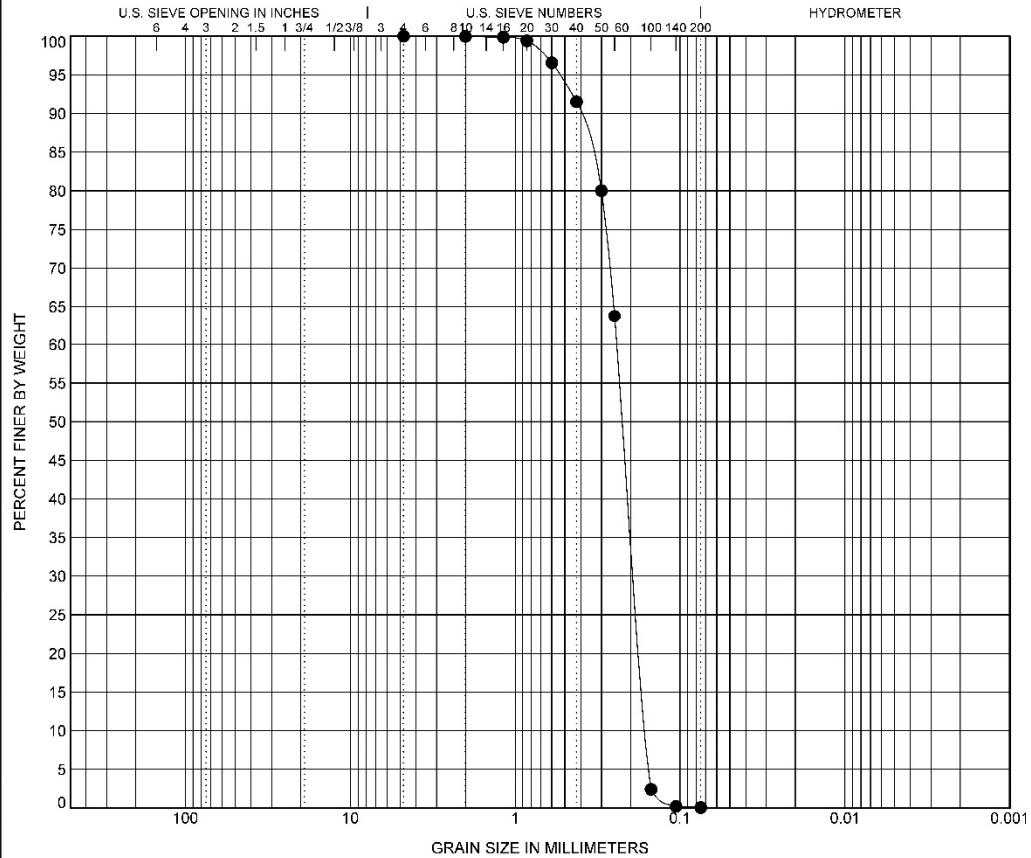
GRAIN SIZE DISTRIBUTION

Client: Noble Consultants, Inc.

Project Name: El Segundo Beach Monitoring Program

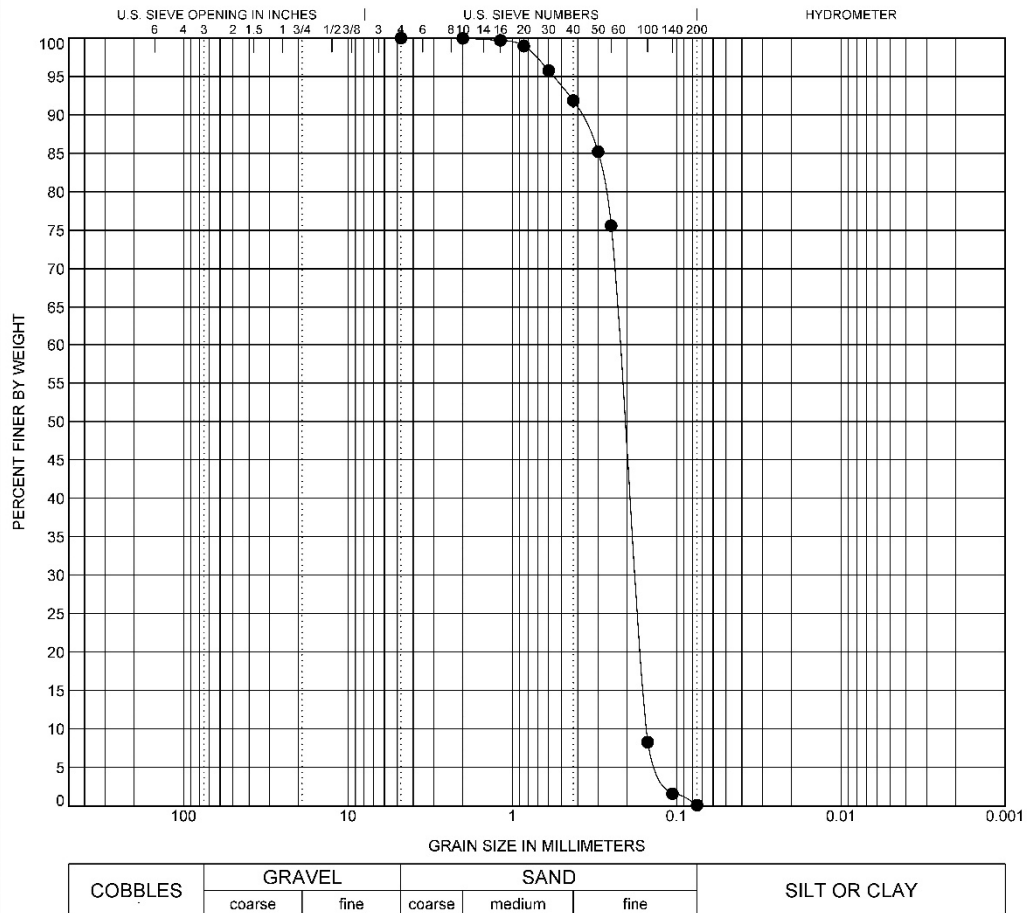
Project Number: 13556-00

Address: Los Angeles County



Client: Noble Consultants, Inc.
Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County

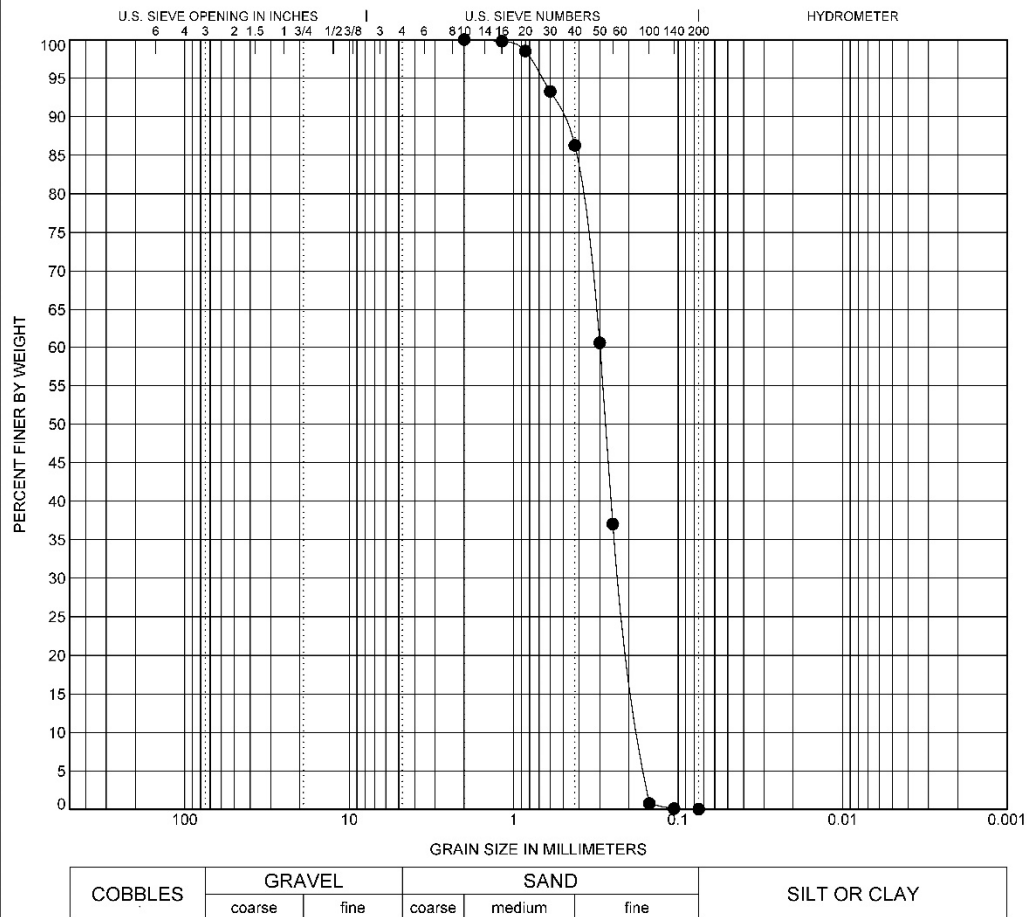


Client: Noble Consultants, Inc.

Project Name: El Segundo Beach Monitoring Program

Project Number: 13556-00

Address: Los Angeles County



BOREHOLE		Classification				LL	PL	PI	Cc	Cu
●	STA 62+10 MHW- May 2018	POORLY GRADED SAND(SP)							1.00	1.75
BOREHOLE		D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	STA 62+10 MHW- May 2018	0.299	0.276	0.226	0.171	0.0	100.0	0.0		

Figure No. C-1

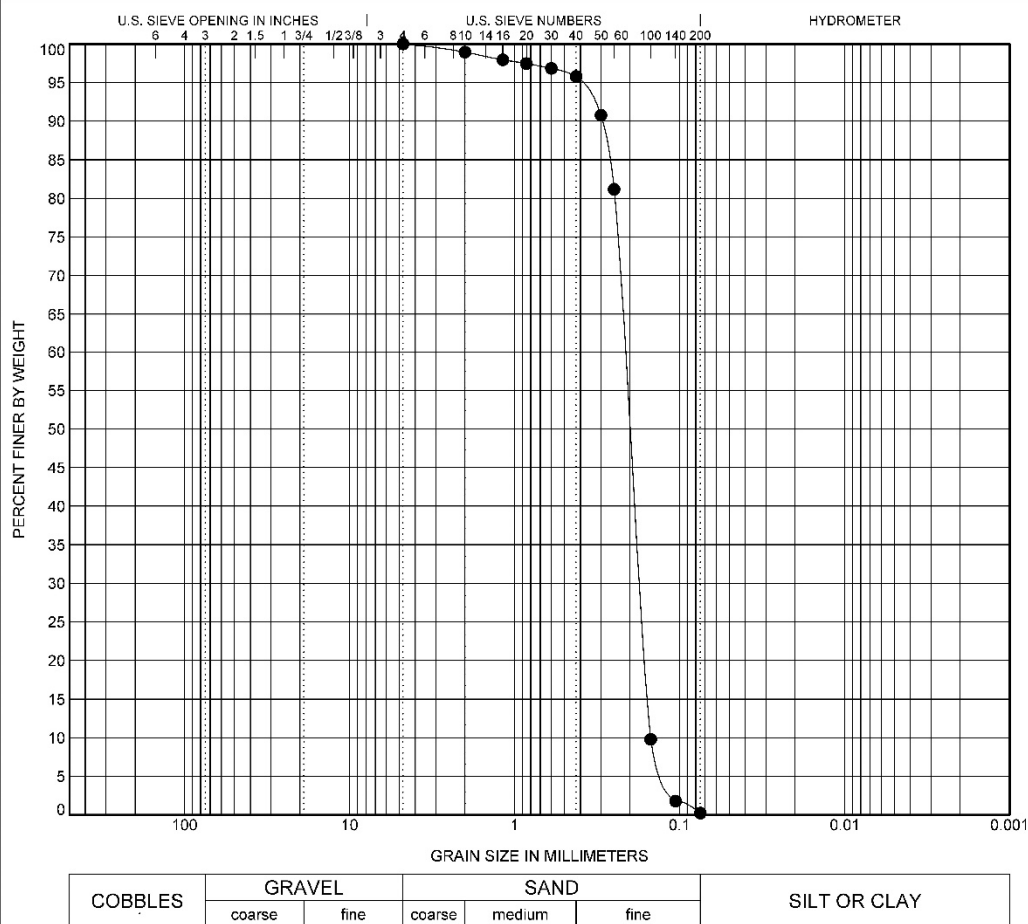
Sand Grain Size Distribution at Sta. 62+10 MHW Line (May 2018)

Client: Noble Consultants, Inc.

Project Name: El Segundo Beach Monitoring Program

Project Number: 13556-00

Address: Los Angeles County



BOREHOLE		Classification	LL	PL	PI	Cc	Cu
●	STA 62+10 MLLW- May 2018	POORLY GRADED SAND(SP)				0.93	1.43

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● STA 62+10 MLLW- May 2018	0.215	0.2	0.173	0.15	0.0	99.8	0.2	

Figure No. C-1

Sand Grain Size Distribution at Sta. 62+10 MLLW Line (May 2018)

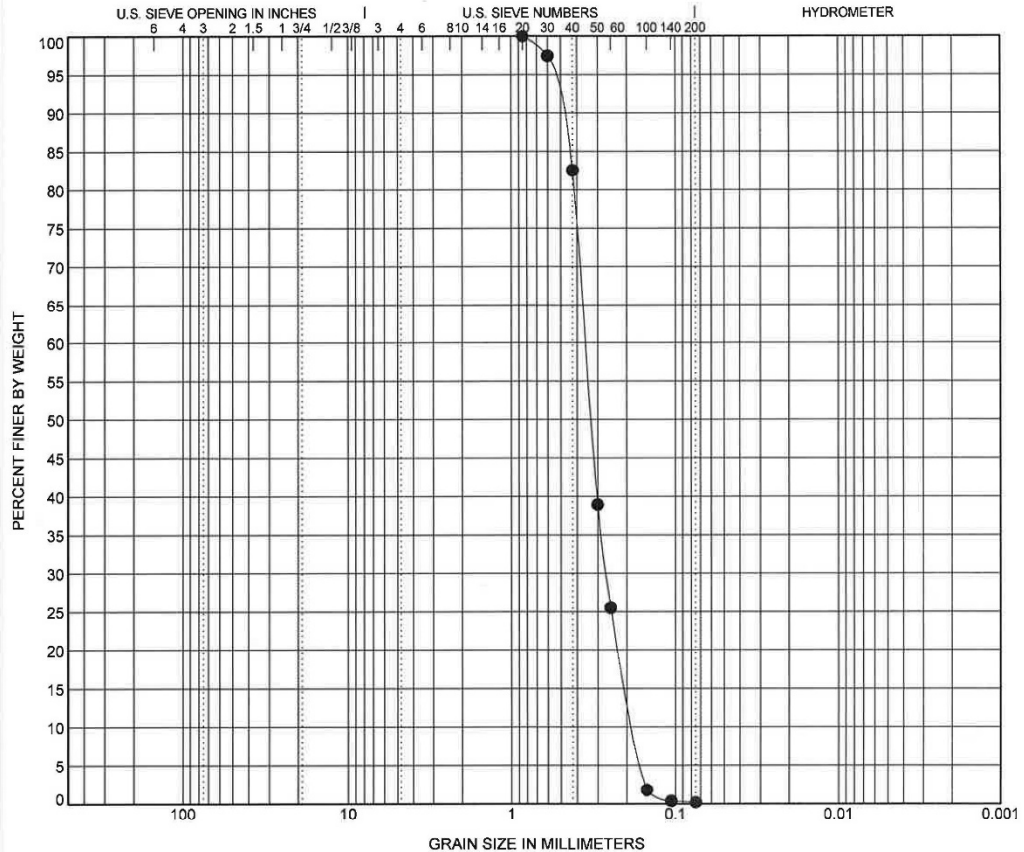


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Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 0+00 MHW - Sept. 2018	POORLY GRADED SAND(SP)				1.11	1.98

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 0+00 MHW - Sept. 2018	0.355	0.328	0.266	0.179	0.0	99.8	0.2	

Figure No. C-1

Sand Grain Size Distribution at Sta. 0+00 MHW Line (September 2018)

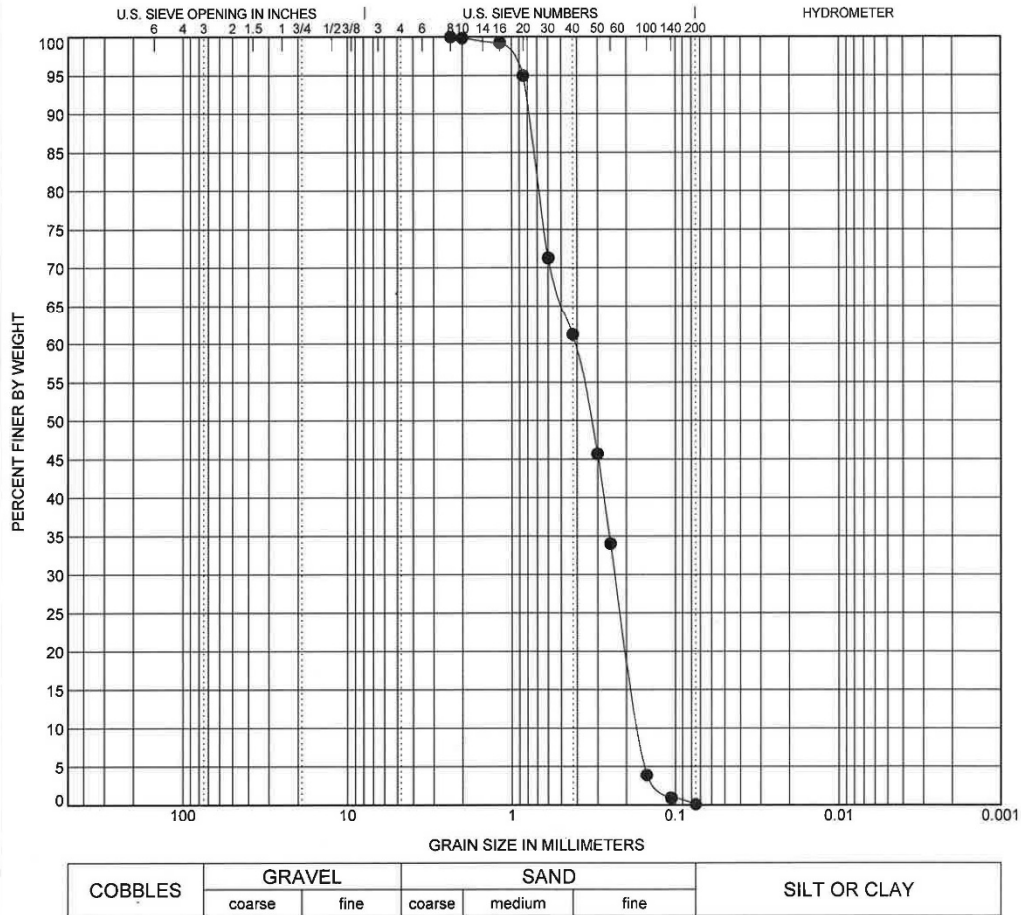


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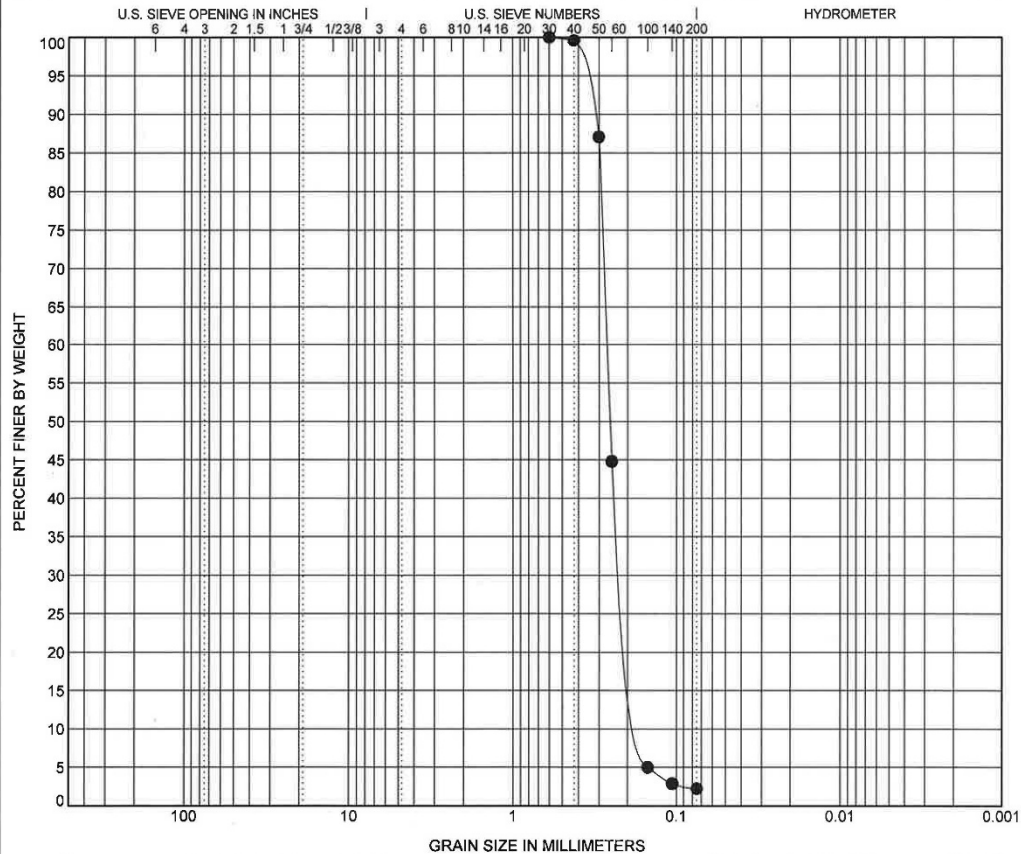
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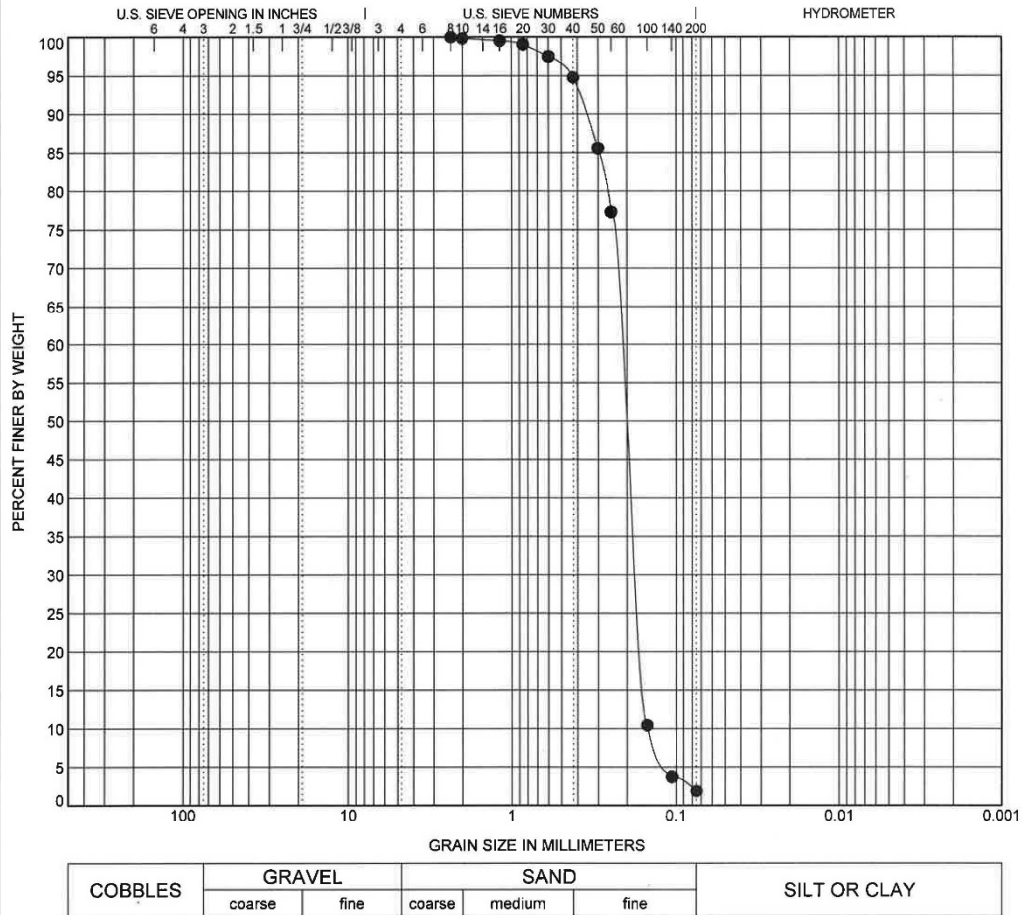
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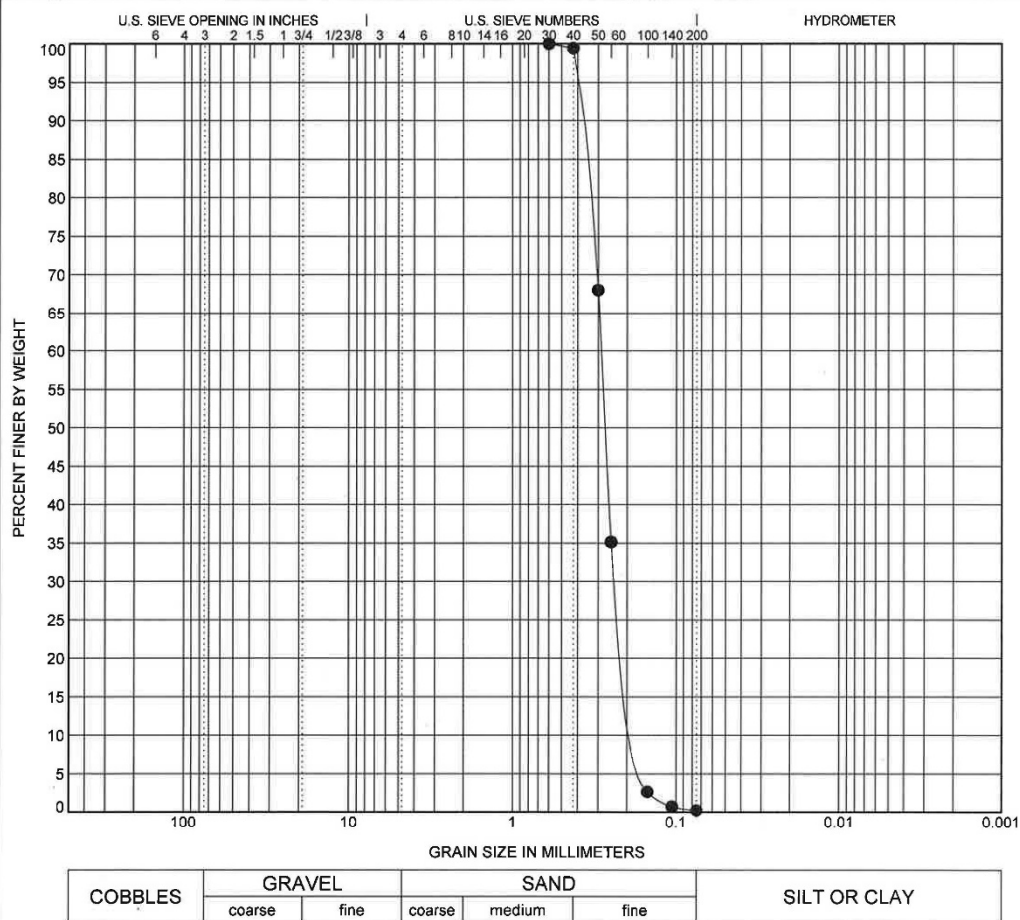


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Project Number: 13556-00

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BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 62+10 MHW - Sept. 2018	POORLY GRADED SAND(SP)				1.10	1.70

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 62+10 MHW - Sept. 2018	0.287	0.271	0.231	0.168	0.0	99.8	0.2	

Figure No. C-5

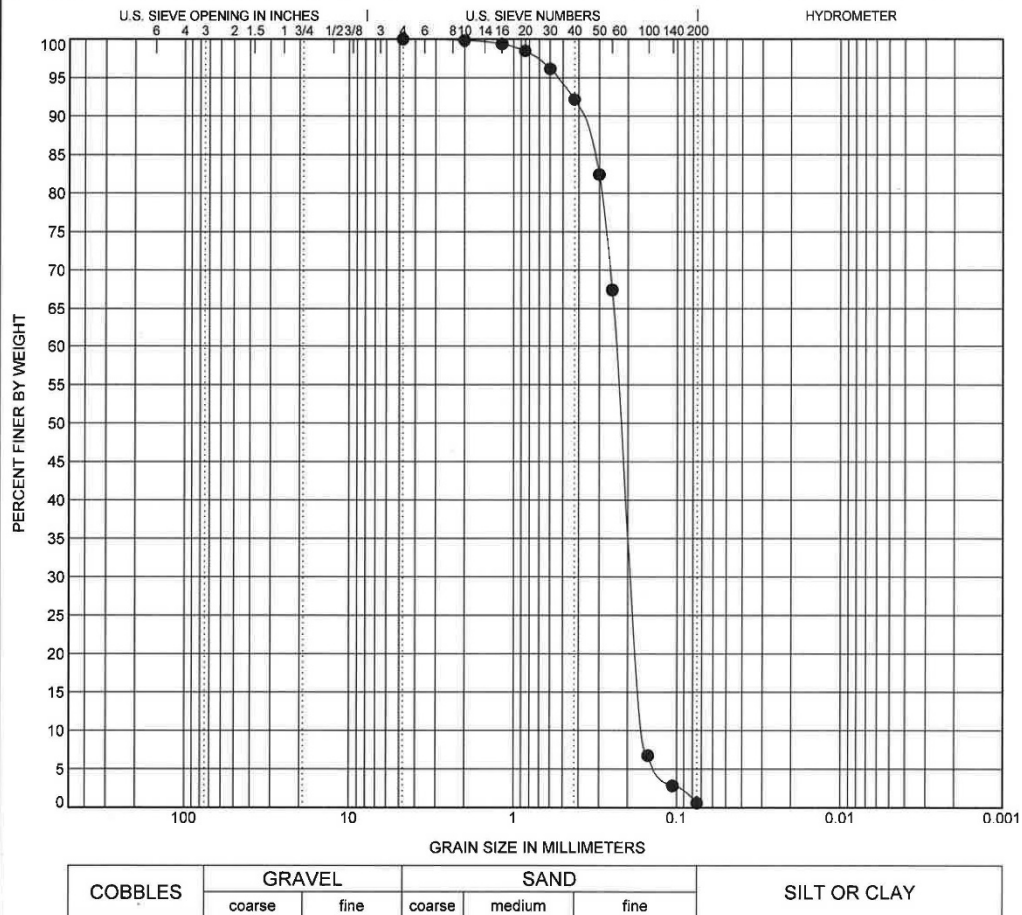
Grain Size Distribution at Sta. 62+10 MHW Line (September 2018)

Client: Noble Consultants, Inc.

Project Name: El Segundo Beach Monitoring Program

Project Number: 13556-00

Address: Los Angeles County



BOREHOLE		Classification				LL	PL	PI	Cc	Cu
●	Sta. 62+10 MLLW - Sept. 2018	POORLY GRADED SAND(SP)							0.92	1.52
BOREHOLE		D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	Sta. 62+10 MLLW - Sept. 2018	0.235	0.216	0.182	0.154	0.0	99.4	0.6		

Figure No. C-6

Sand Grain Size Distribution at Sta. 62+10 MLLW Line (September 2018)



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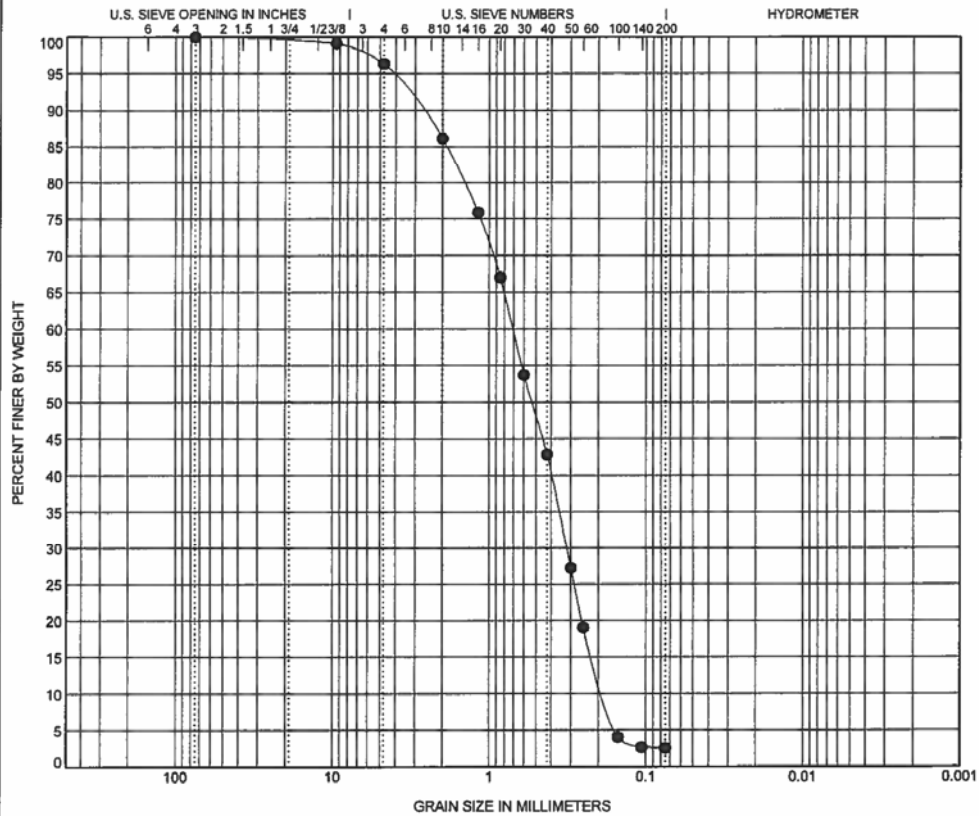
GRAIN SIZE DISTRIBUTION

Client: Noble Consultants, Inc.

Project Name: El Segundo Beach Monitoring Program

Project Number: 13556-00

Address: Los Angeles County



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 0+00 MHW-December 2018	POORLY GRADED SAND(SP)				0.78	3.85

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 0+00 MHW-December 2018	0.707	0.533	0.319	0.184	3.7	93.8		2.5

Figure No. C-1

Sand Grain Size Distribution at Sta. 0+00 MHW Line (December 2018)

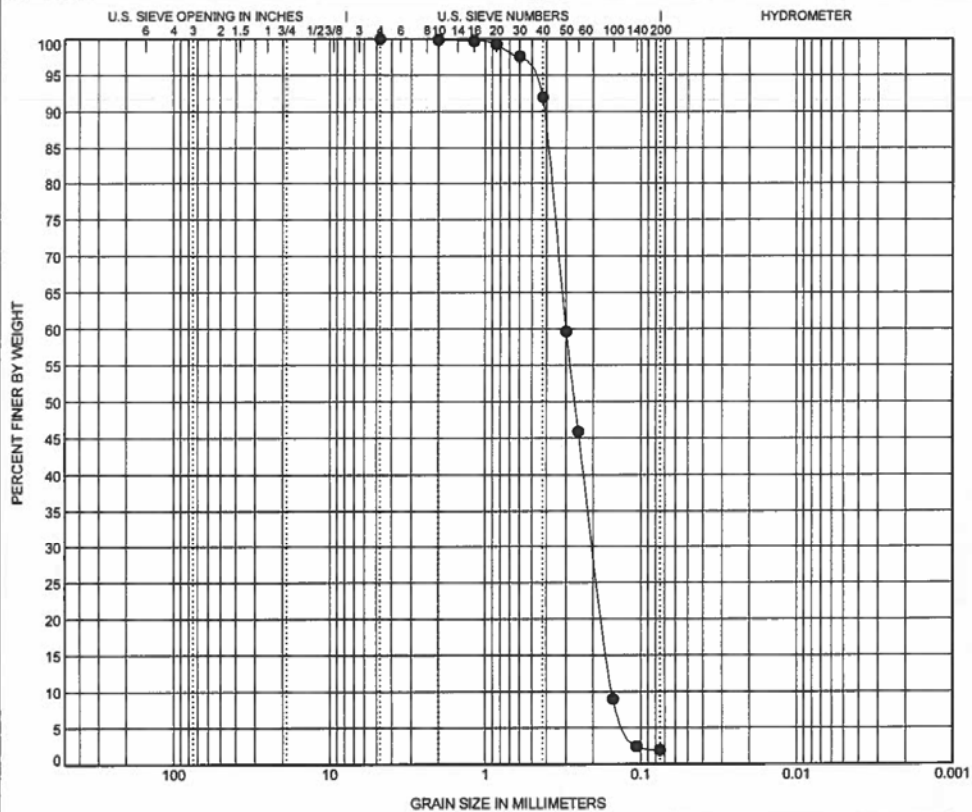


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Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 0+00 MLLW-December 2018	POORLY GRADED SAND(SP)				0.88	1.98

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 0+00 MLLW-December 2018	0.301	0.264	0.201	0.152		98.1		1.9

Figure No. C-2

Sand Grain Size Distribution at Sta. 0+00 MLLW Line (December 2018)



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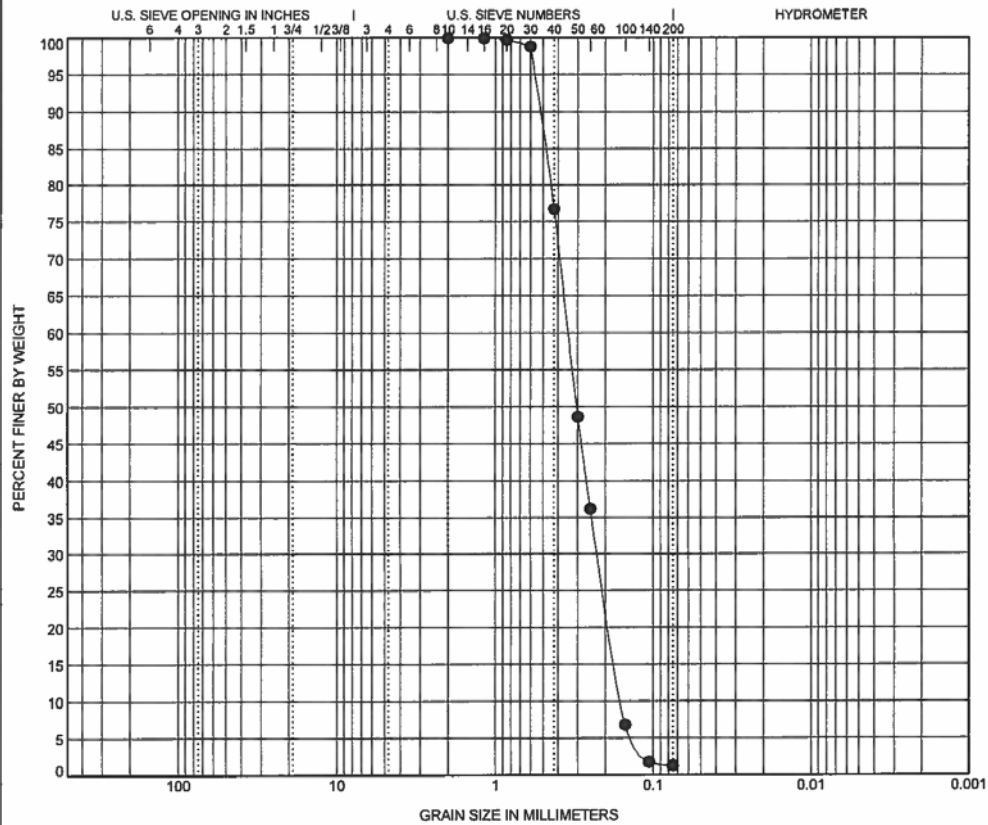
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Project Name: El Segundo Beach Monitoring Program

Project Number: 13556-00

Address: Los Angeles County





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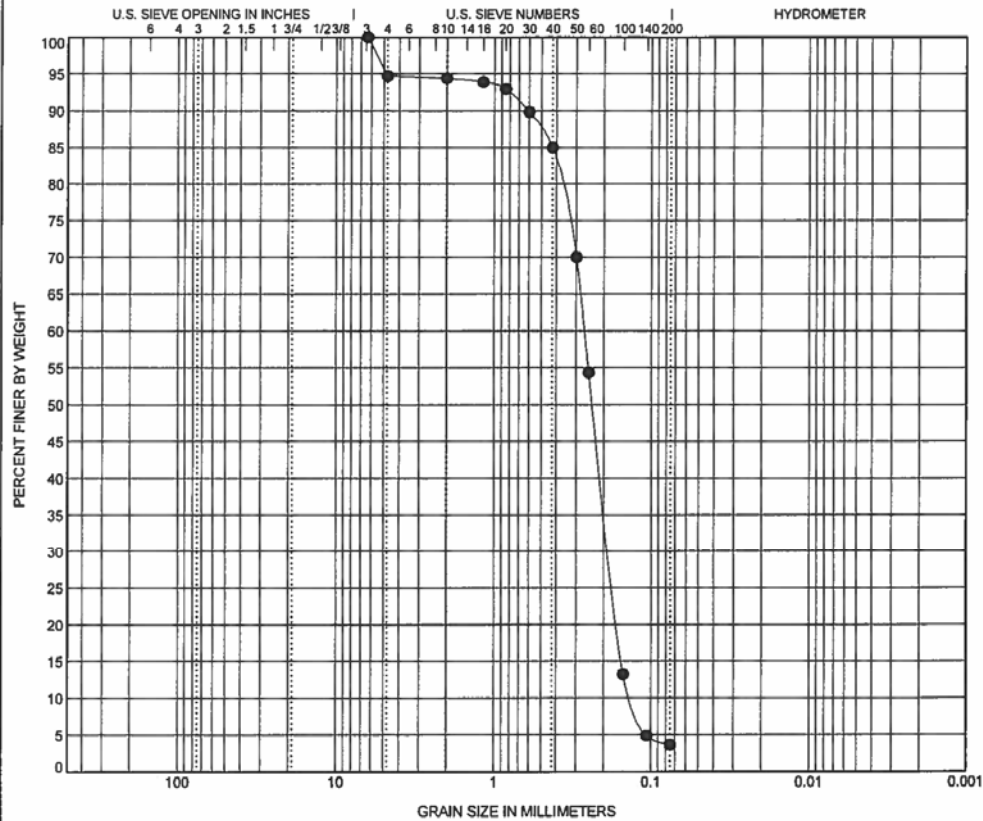
GRAIN SIZE DISTRIBUTION

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Project Name: El Segundo Beach Monitoring Program

Project Number: 13556-00

Address: Los Angeles County



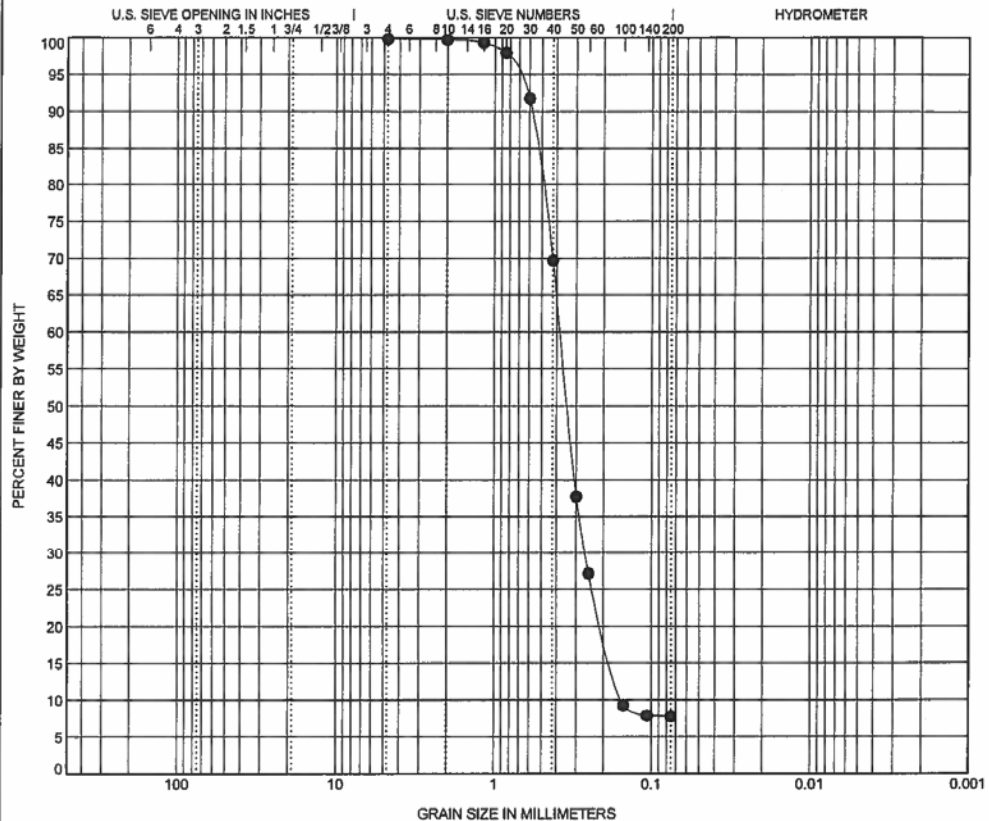


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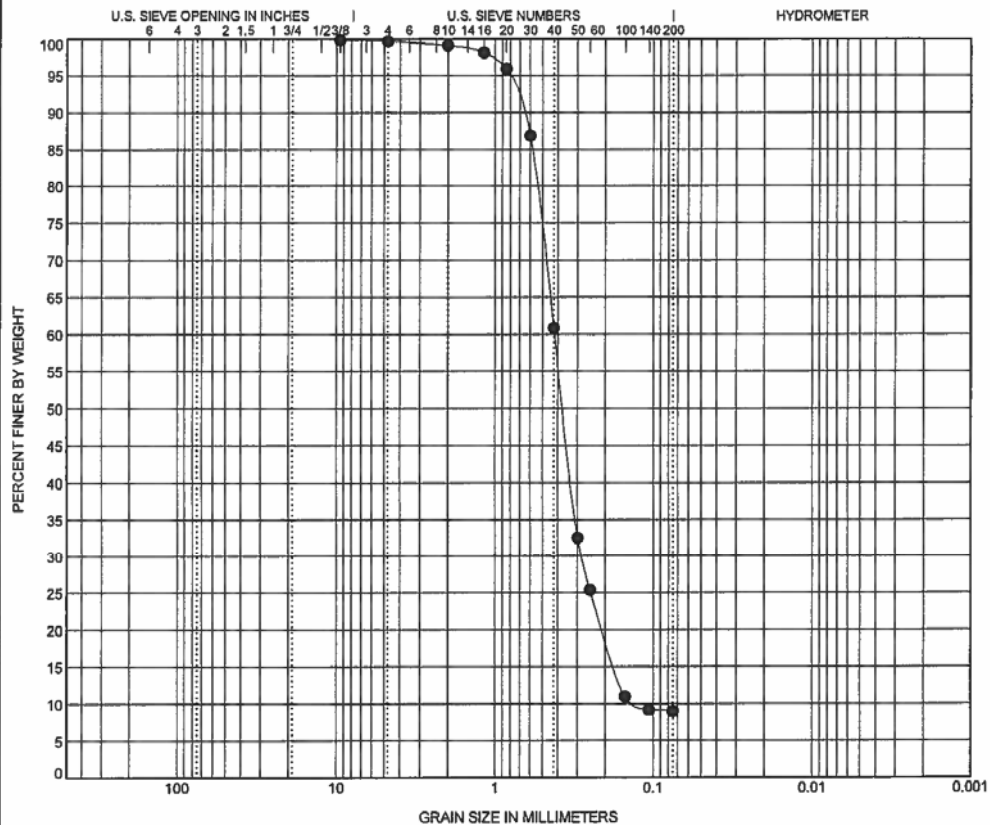


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Project Number: 13556-00

Project Name: El Segundo Beach Monitoring Program
Address: Los Angeles County



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	Classification	LL	PL	PI	Cc	Cu
● Sta. 62+10 MLLW-December 2018					1.52	3.40

BOREHOLE	D60	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sta. 62+10 MLLW-December 2018	0.421	0.372	0.281	0.124	0.1	90.7	9.0	

Figure No. C-6

Sand Grain Size Distribution at Sta. 62+10 MLLW Line (December 2018)

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 December 24, 2018

samples (two sediment samples per location) were respectively collected at three different locations on December 4, 2018, as also identified in Figure 1. At each location, one sand sample was collected on the foreshore face at the approximate Mean High Water (MHW) position and the other in the surf zone near the Mean Lower Low Water (MLLW) elevation. The collected sand samples were forwarded to a soil-testing laboratory for analysis of the sediment grain size distribution. Table 1 summarizes the grain size characteristics of individually sampled sediments, while Figures 17 to 22 respectively illustrate the deduced grain size distributions for the collected sand samples.

Table 1. Summary of Sediment Characteristics for samples collected on December 4, 2018

Sampling Location	Reference Elevation	Soil Type	D50 (mm)
Sta. 0+00	MHW	Poorly Graded Sand	0.53
Sta. 0+00	MLLW	Poorly Graded Sand	0.26
Sta. 30+00	MHW	Poorly Graded Sand	0.31
Sta. 30+00	MLLW	Poorly Graded Sand	0.24
Sta. 62+10	MHW	Poorly Graded Sand	0.34
Sta. 62+10	MLLW	Poorly Graded Sand	0.37

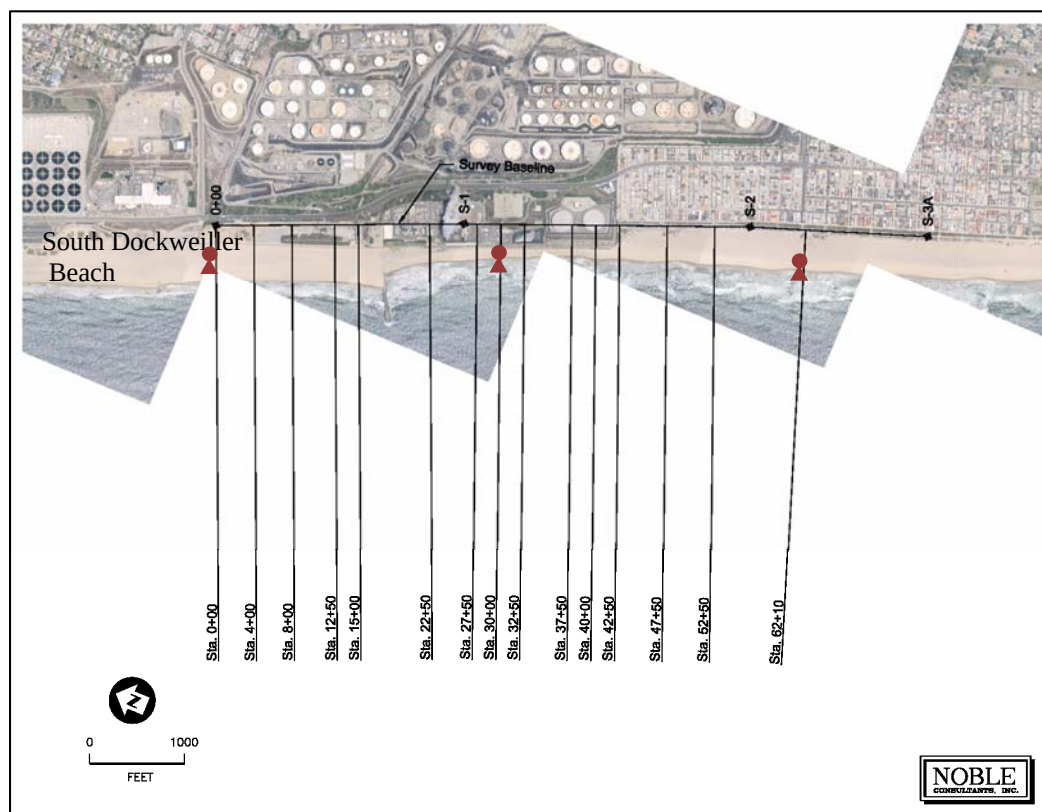


Figure 1. Surveyed Transect and Sediment Sampling Locations

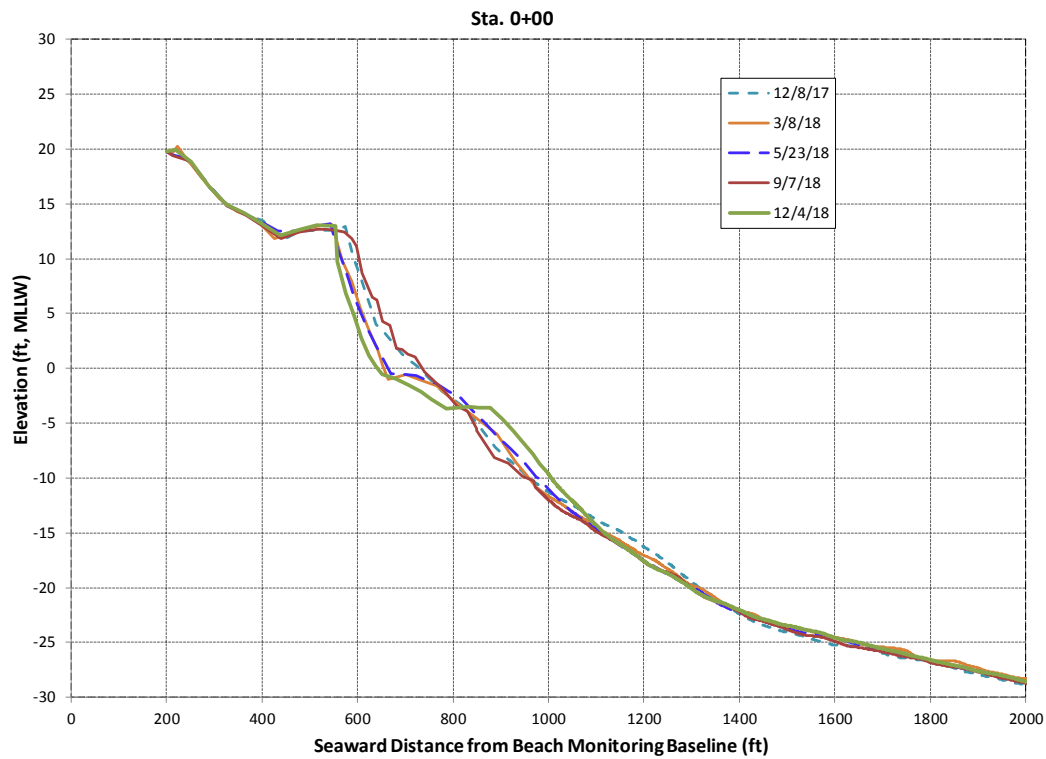


Figure 2. Surveyed Beach Profile at Station 0+00

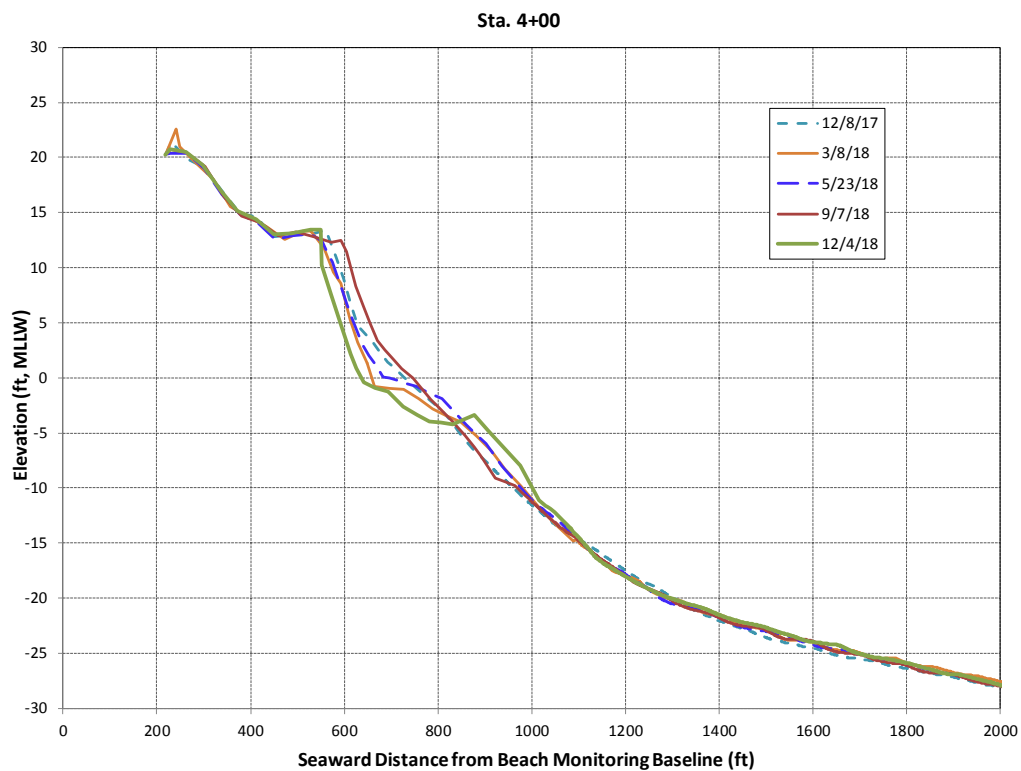


Figure 3. Surveyed Beach Profile at Station 4+00

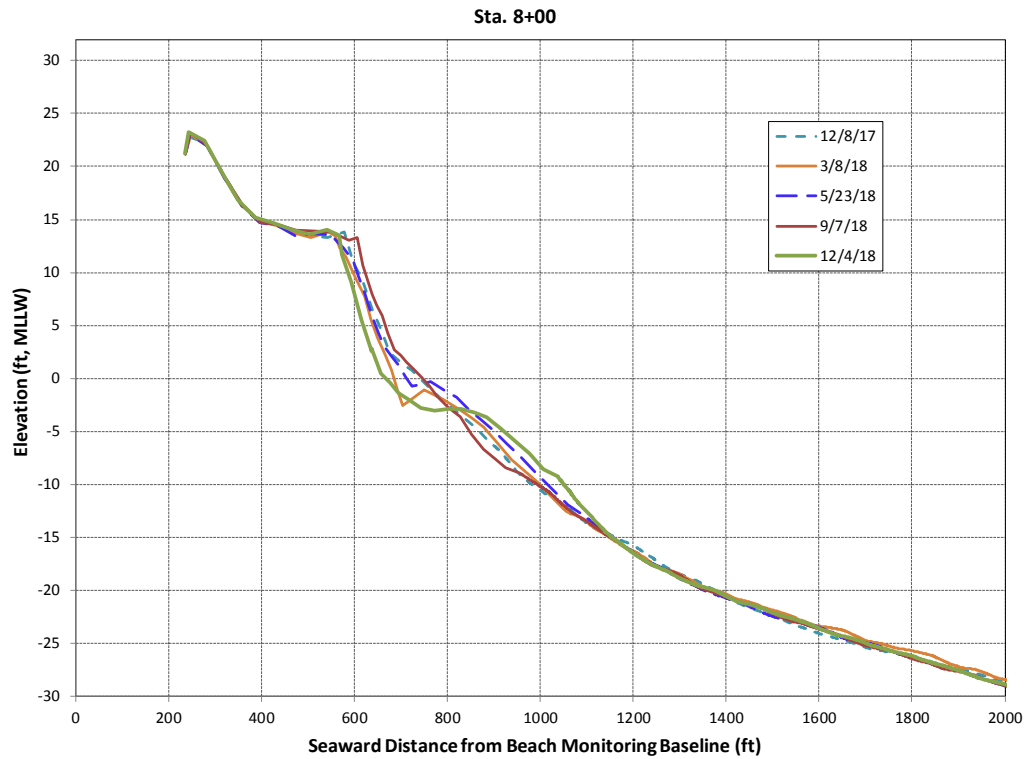


Figure 4. Surveyed Beach Profile at Station 8+00

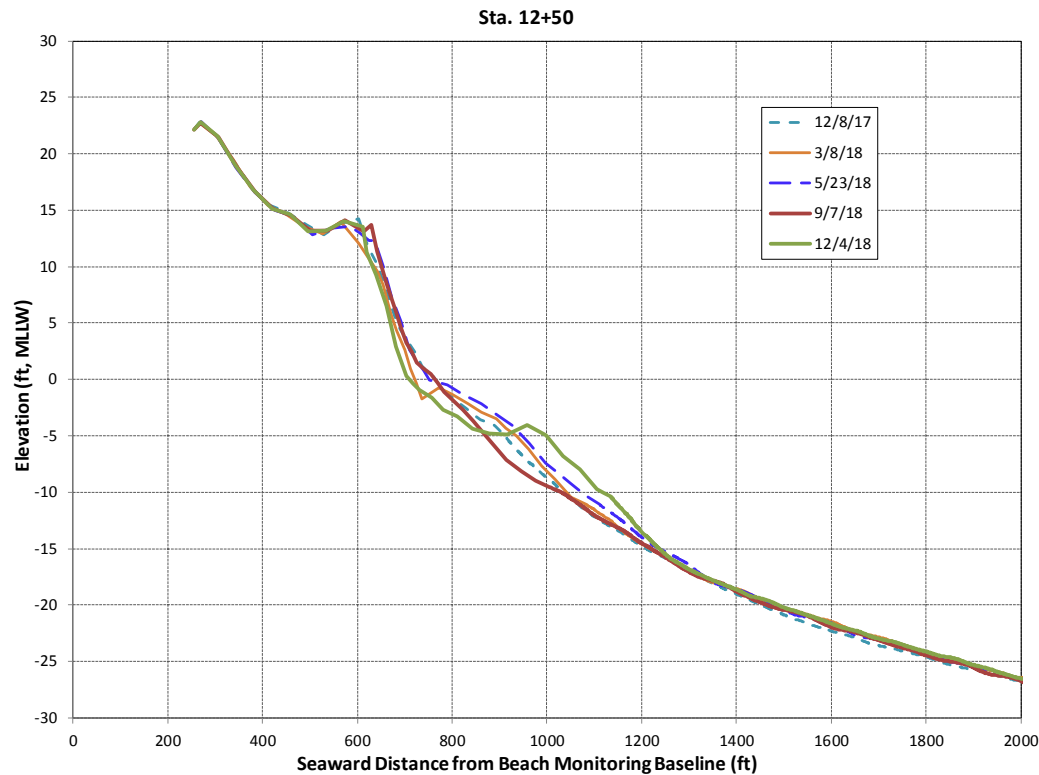
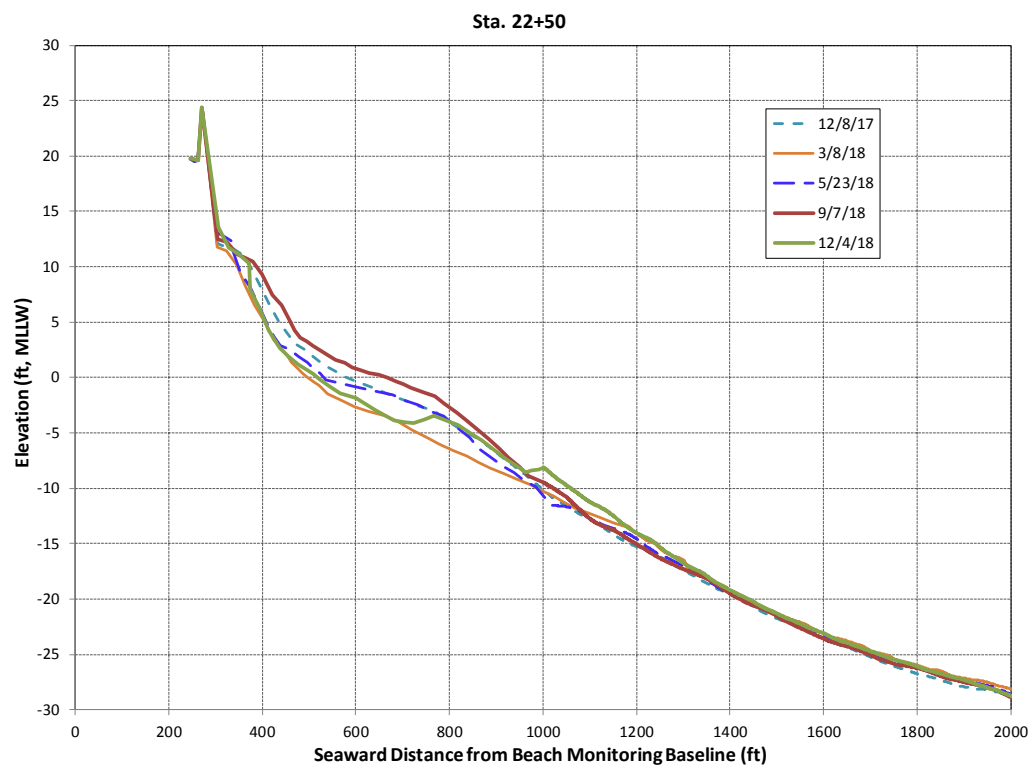
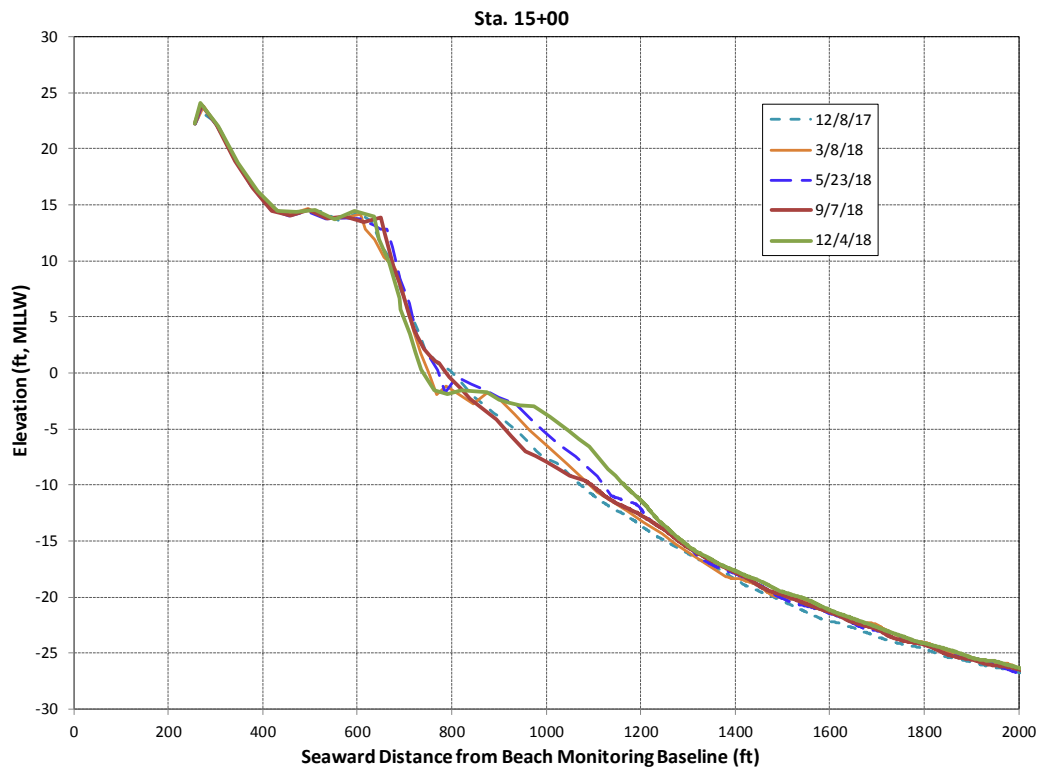


Figure 5. Surveyed Beach Profile at Station 12+50



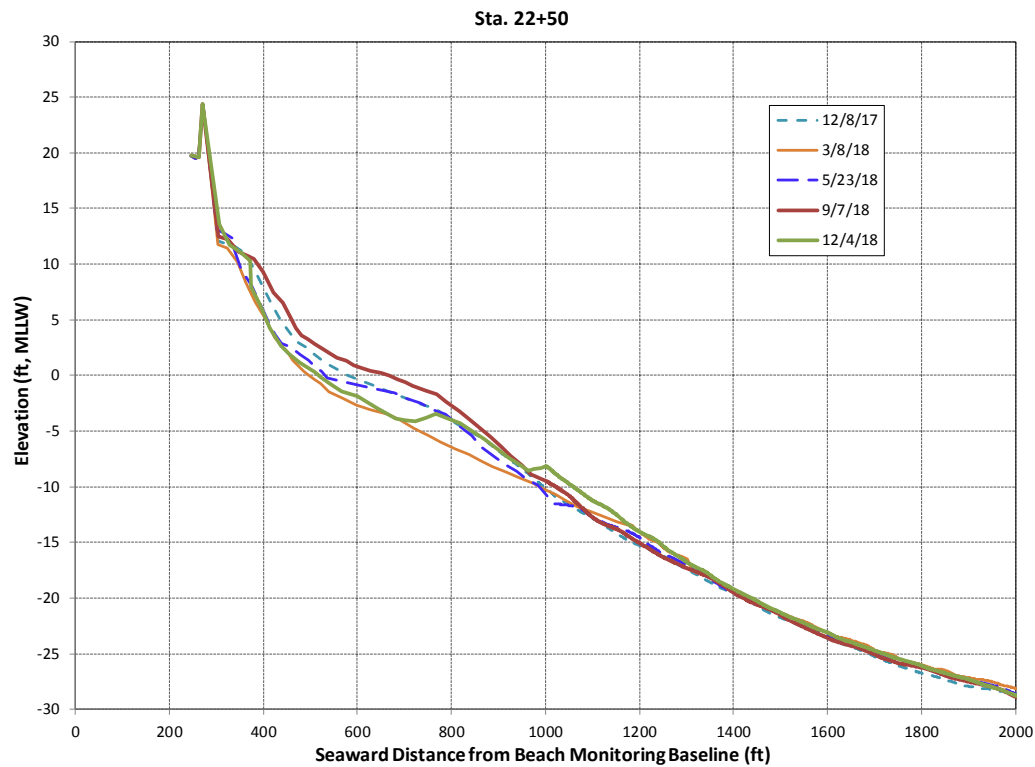


Figure 8. Surveyed Beach Profile at Station 27+50

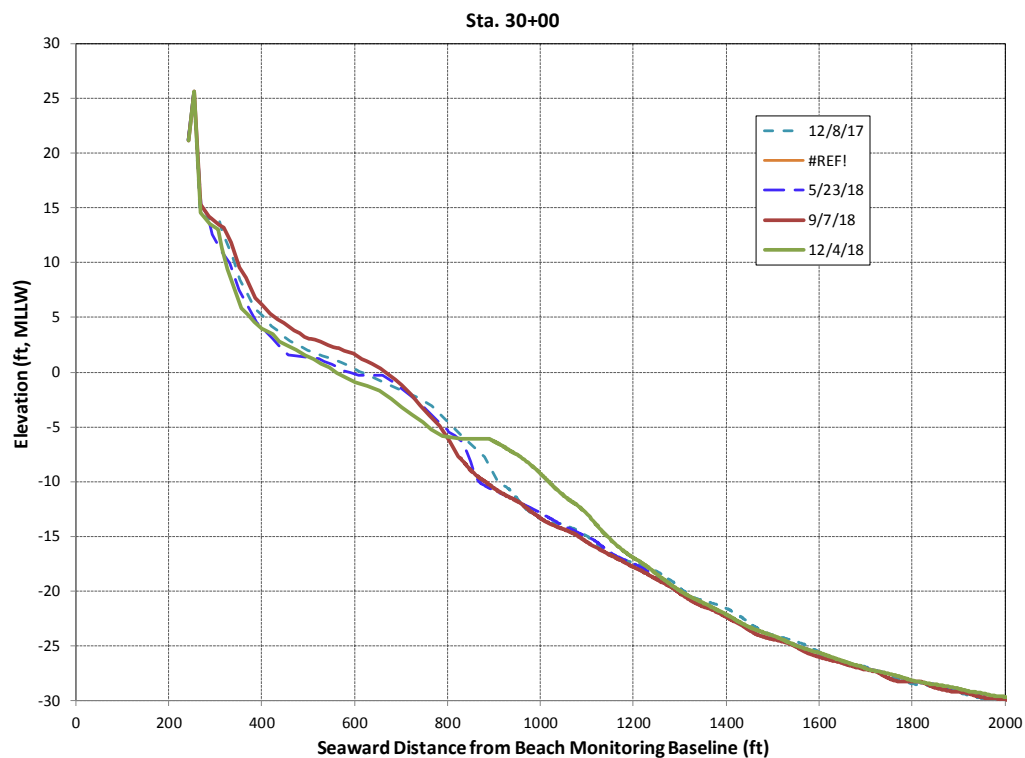


Figure 9. Surveyed Beach Profile at Station 30+00

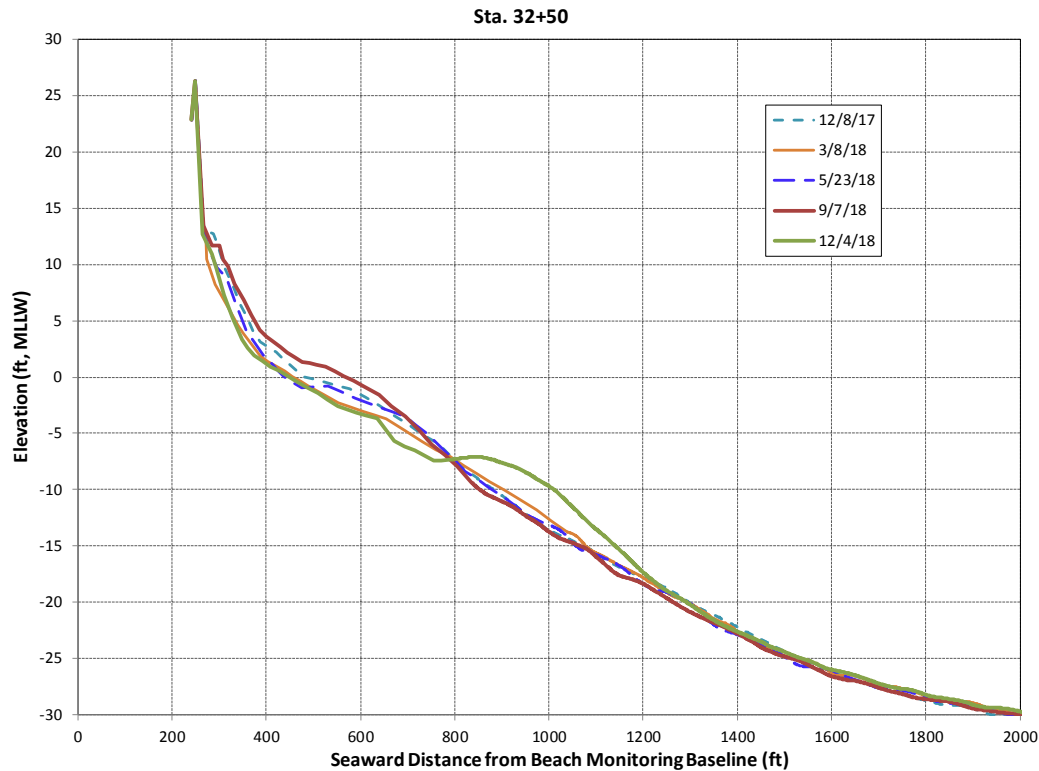


Figure 10. Surveyed Beach Profile at Station 32+50

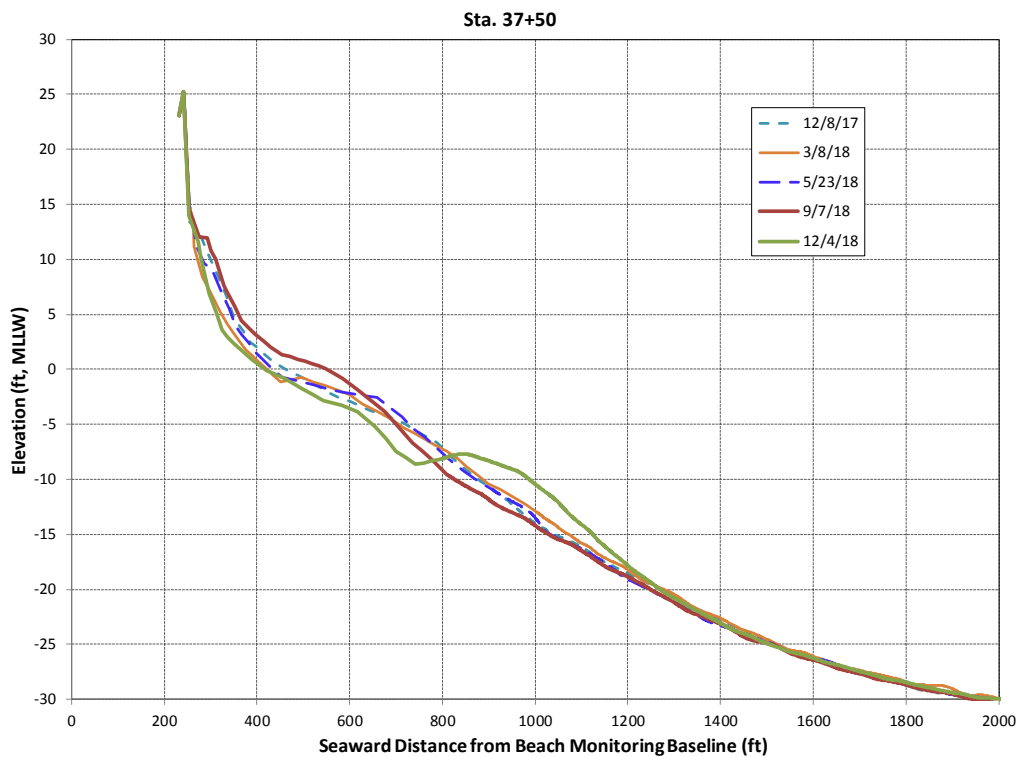


Figure 11. Surveyed Beach Profile at Station 37+50

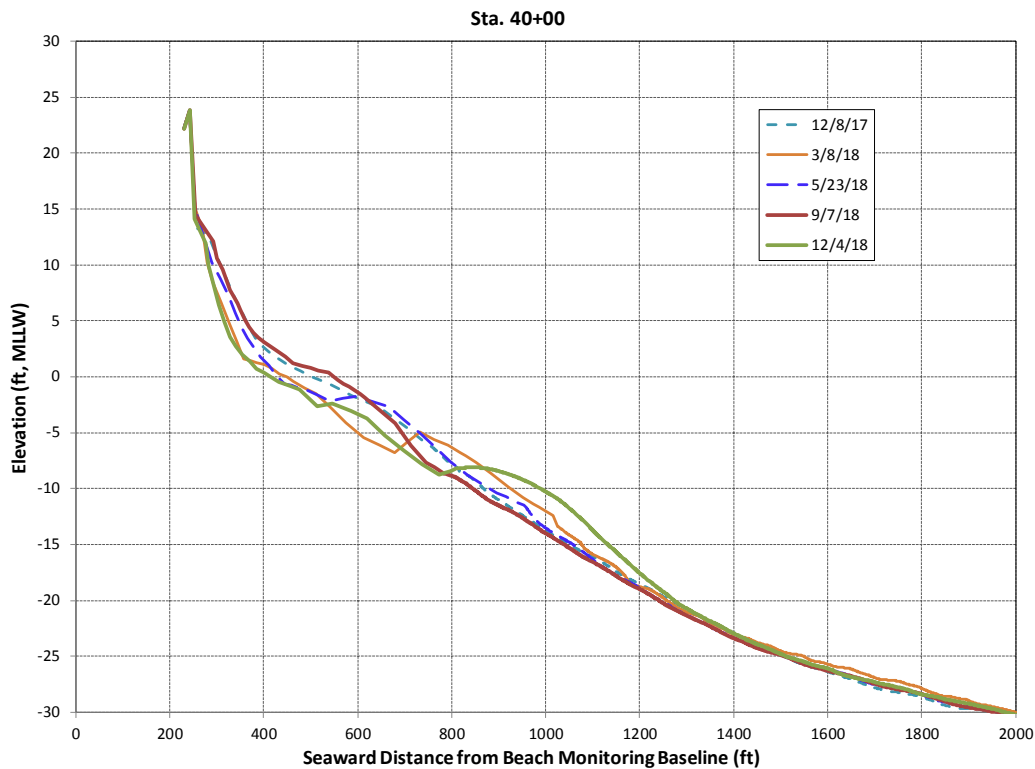


Figure 12. Surveyed Beach Profile at Station 40+00

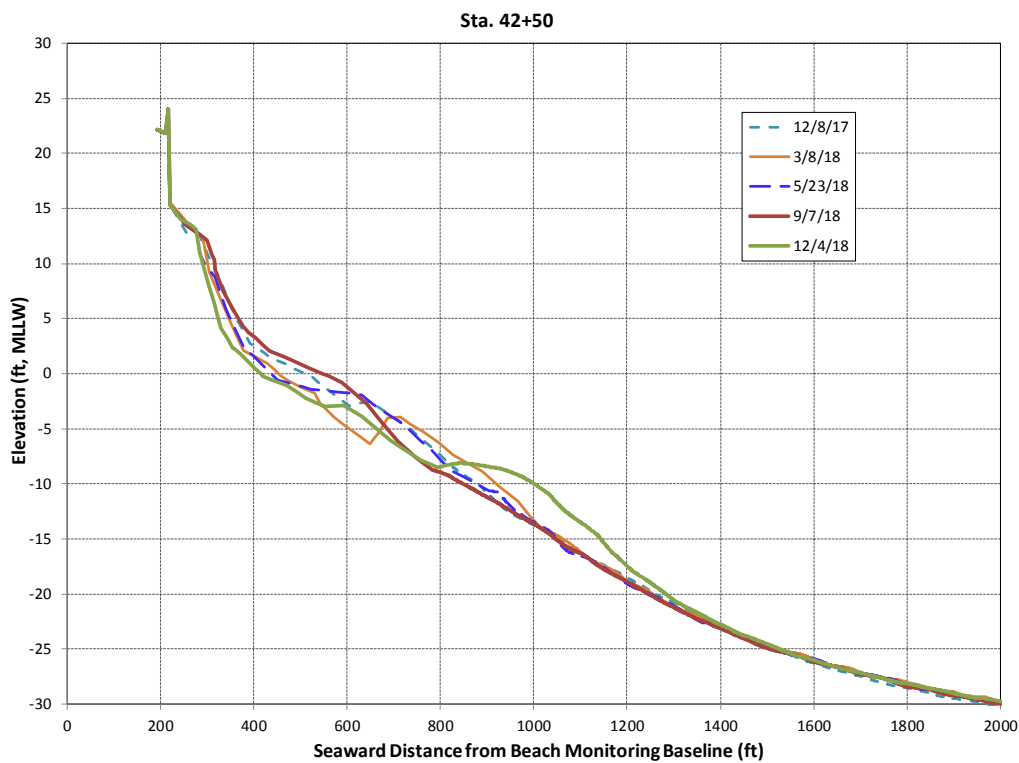


Figure 13. Surveyed Beach Profile at Station 42+50

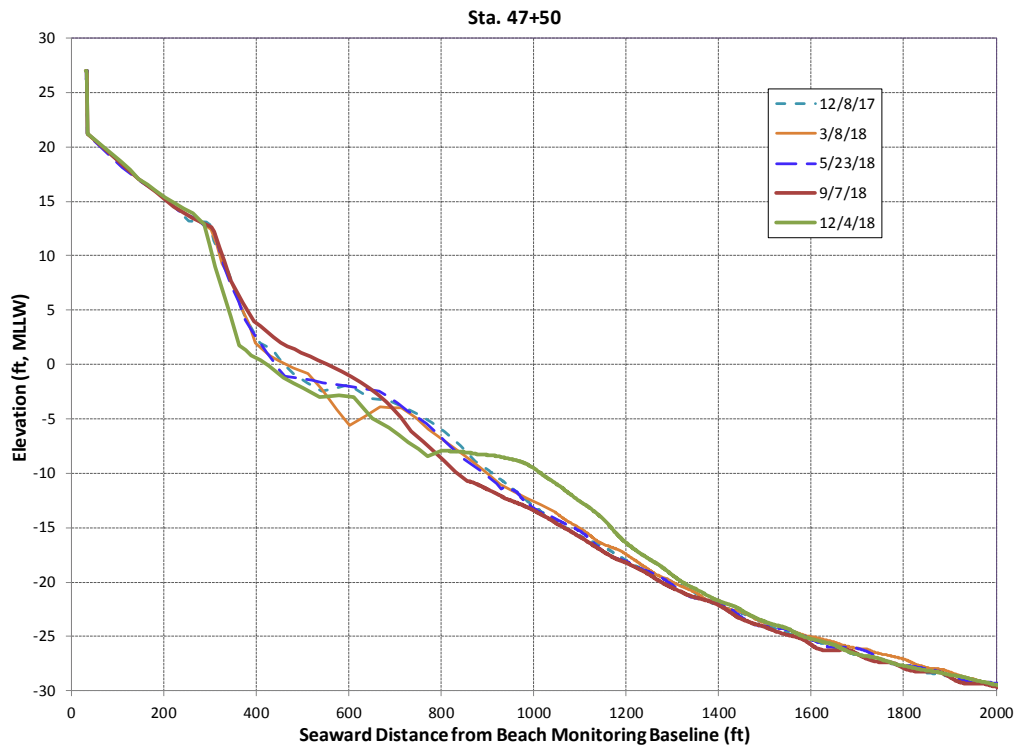


Figure 14. Surveyed Beach Profile at Station 47+50

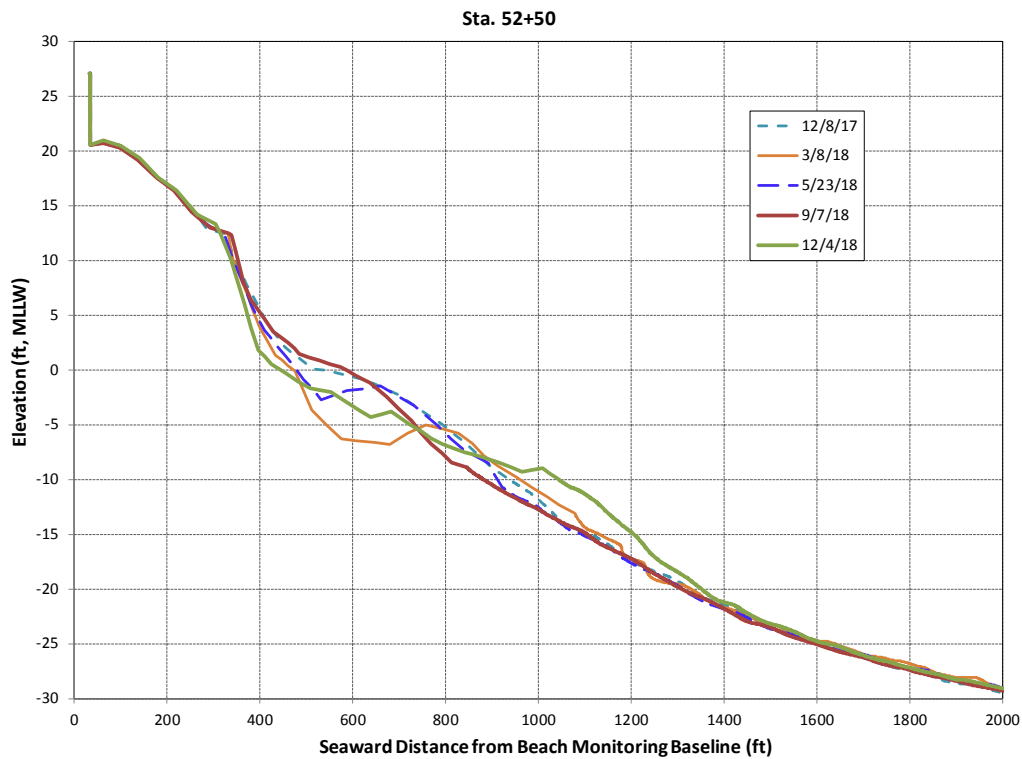


Figure 15. Surveyed Beach Profile at Station 52+50

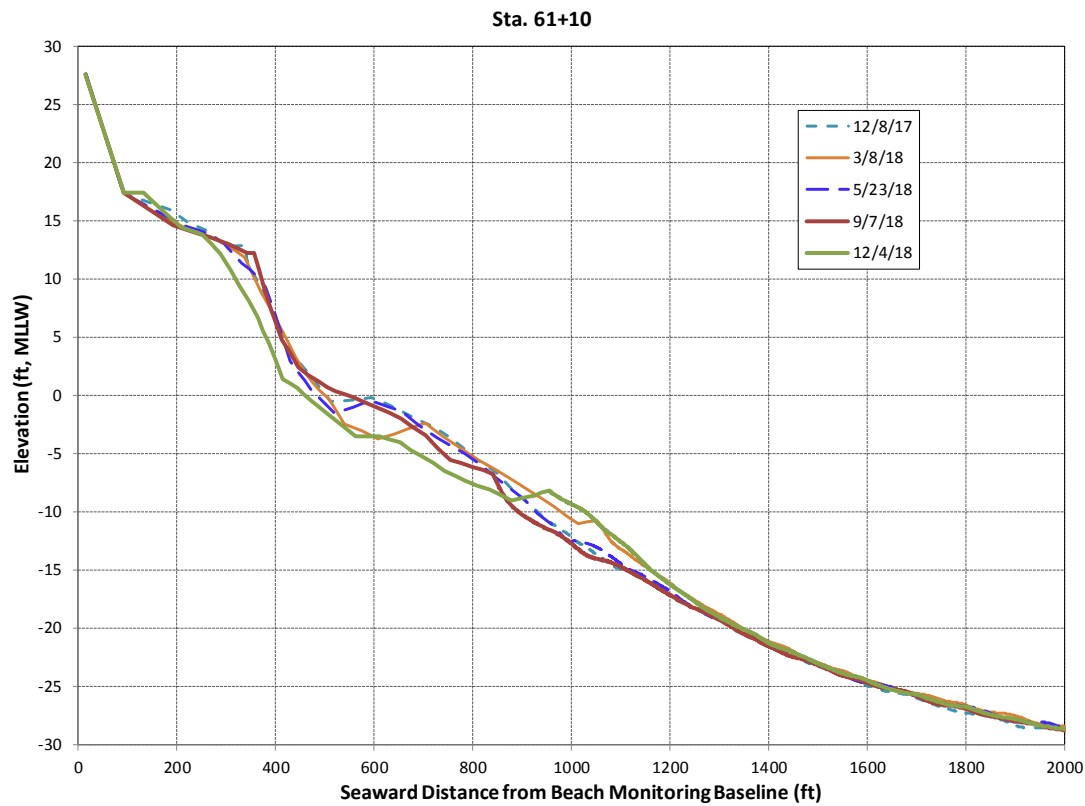


Figure 16. Surveyed Beach Profile at Station 62+10

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 December 24, 2018

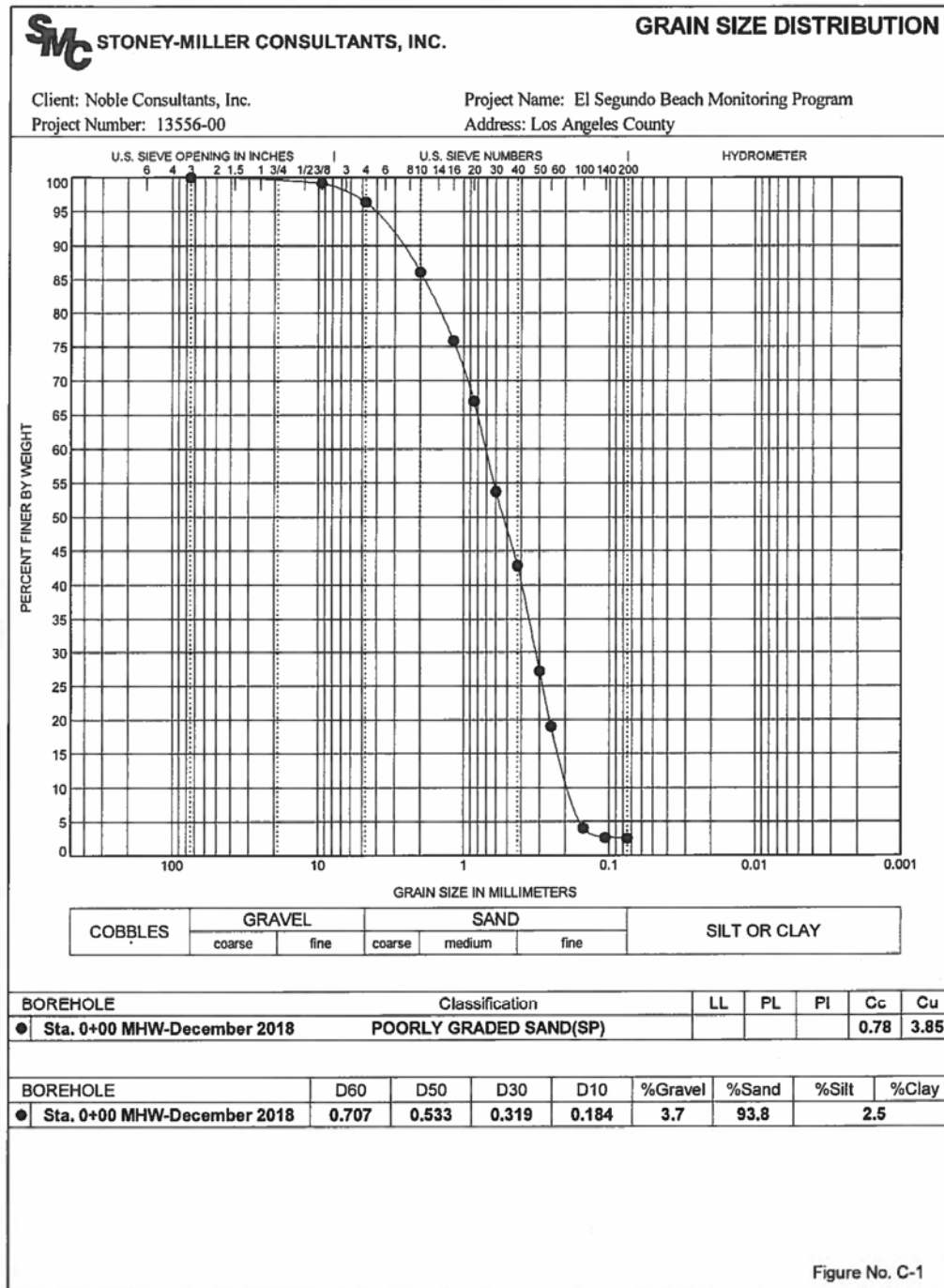


Figure 17. Grain Size Distribution at Sta. 0+00 MHW Line

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 December 24, 2018

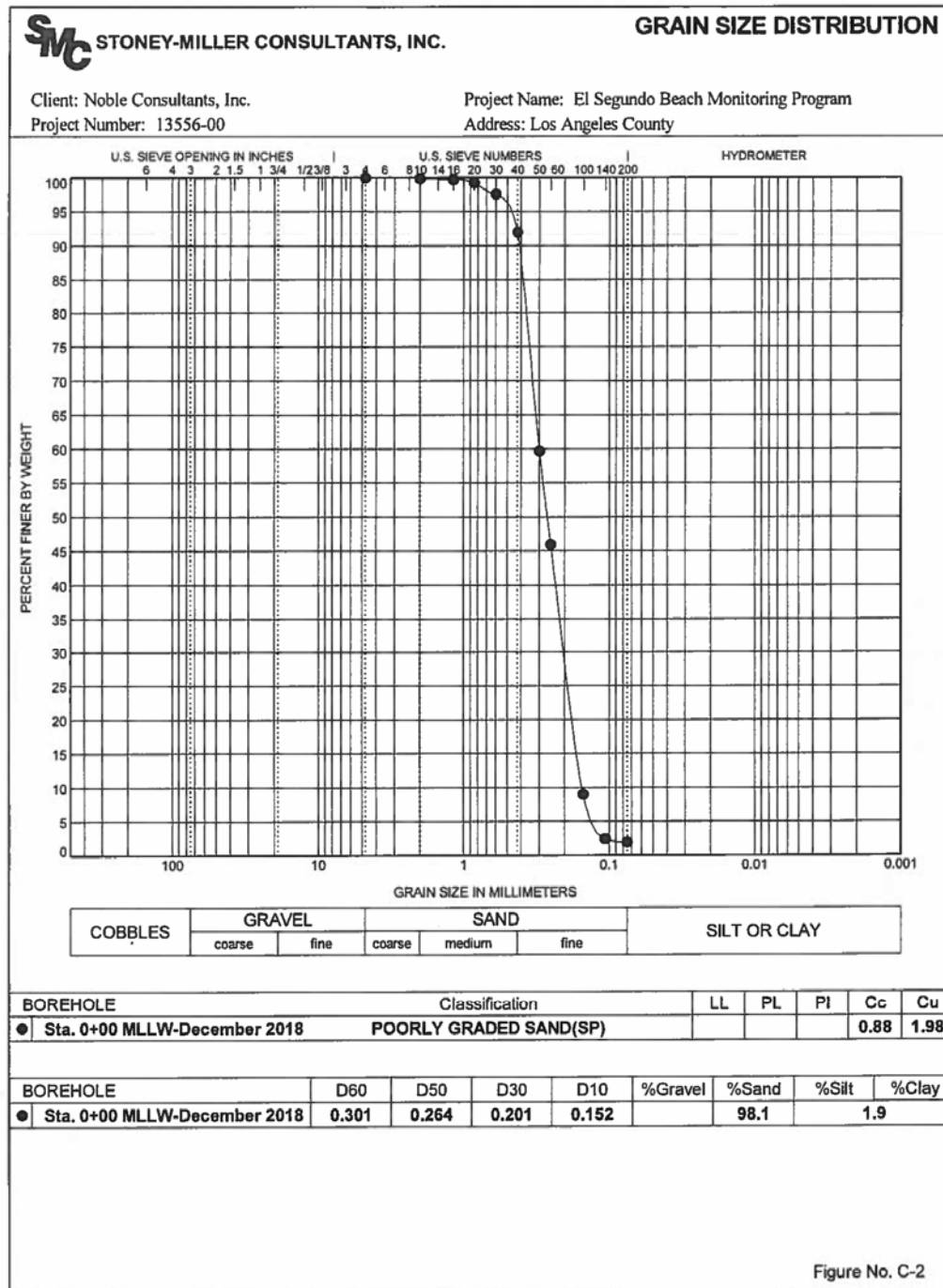


Figure 18. Grain Size Distribution at Sta. 0+00 MLLW Line

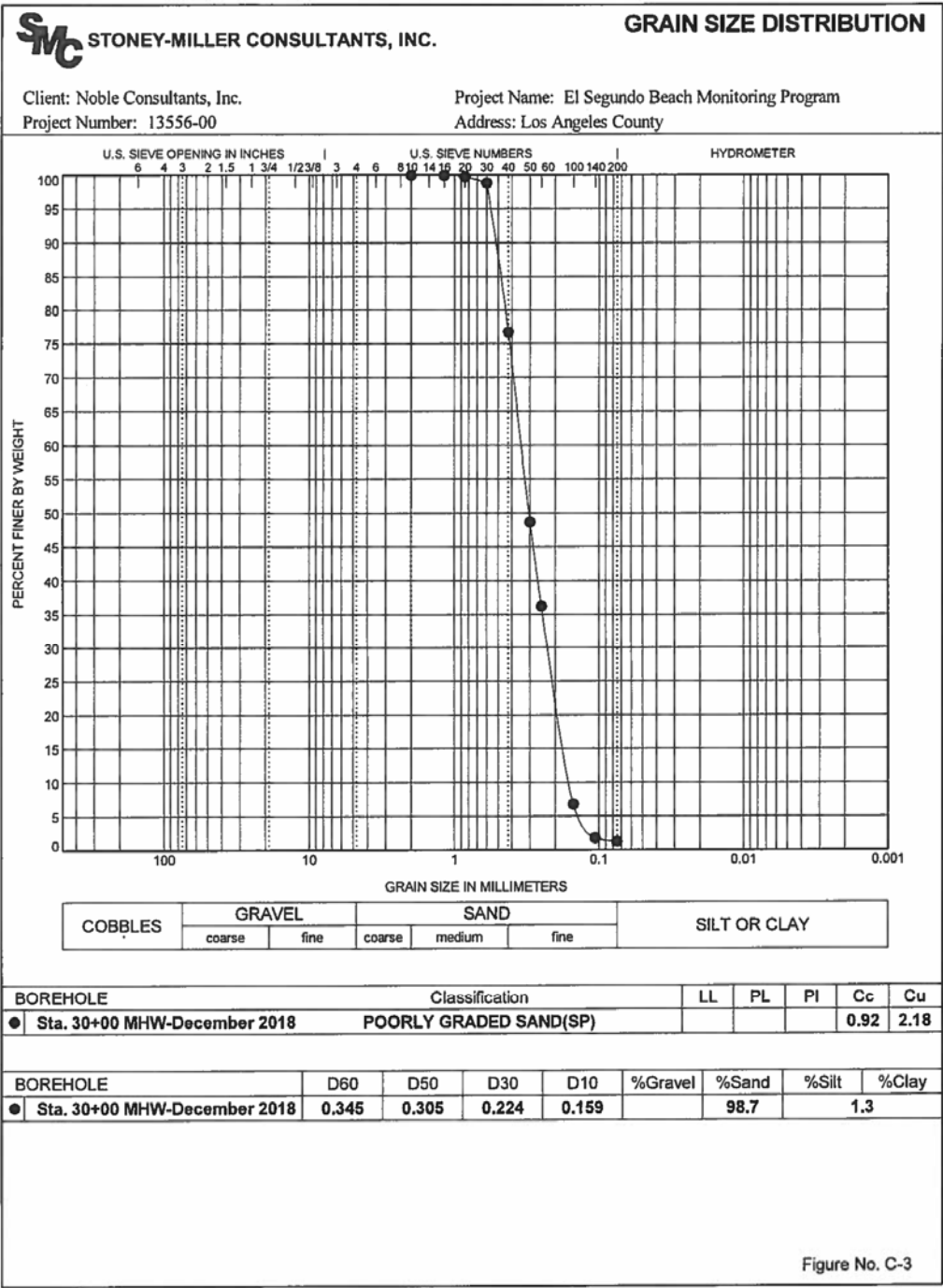


Figure 19. Grain Size Distribution at Sta. 30+00 MHW Line

El Segundo Energy Center LLC
 Quarterly Beach Survey for El Segundo Generating Station
 December 24, 2018

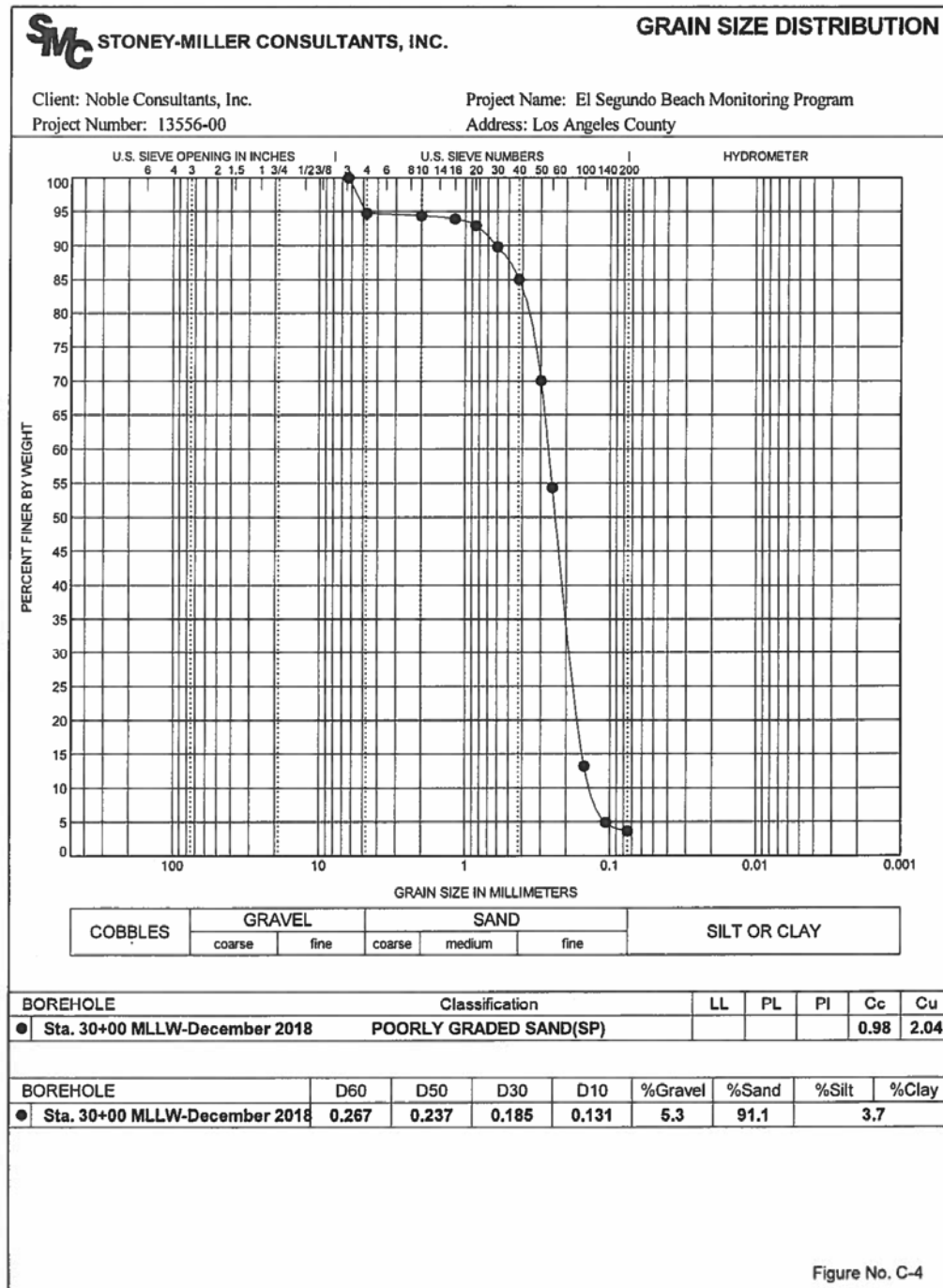


Figure 20. Grain Size Distribution at Sta. 30+00 MHW Line

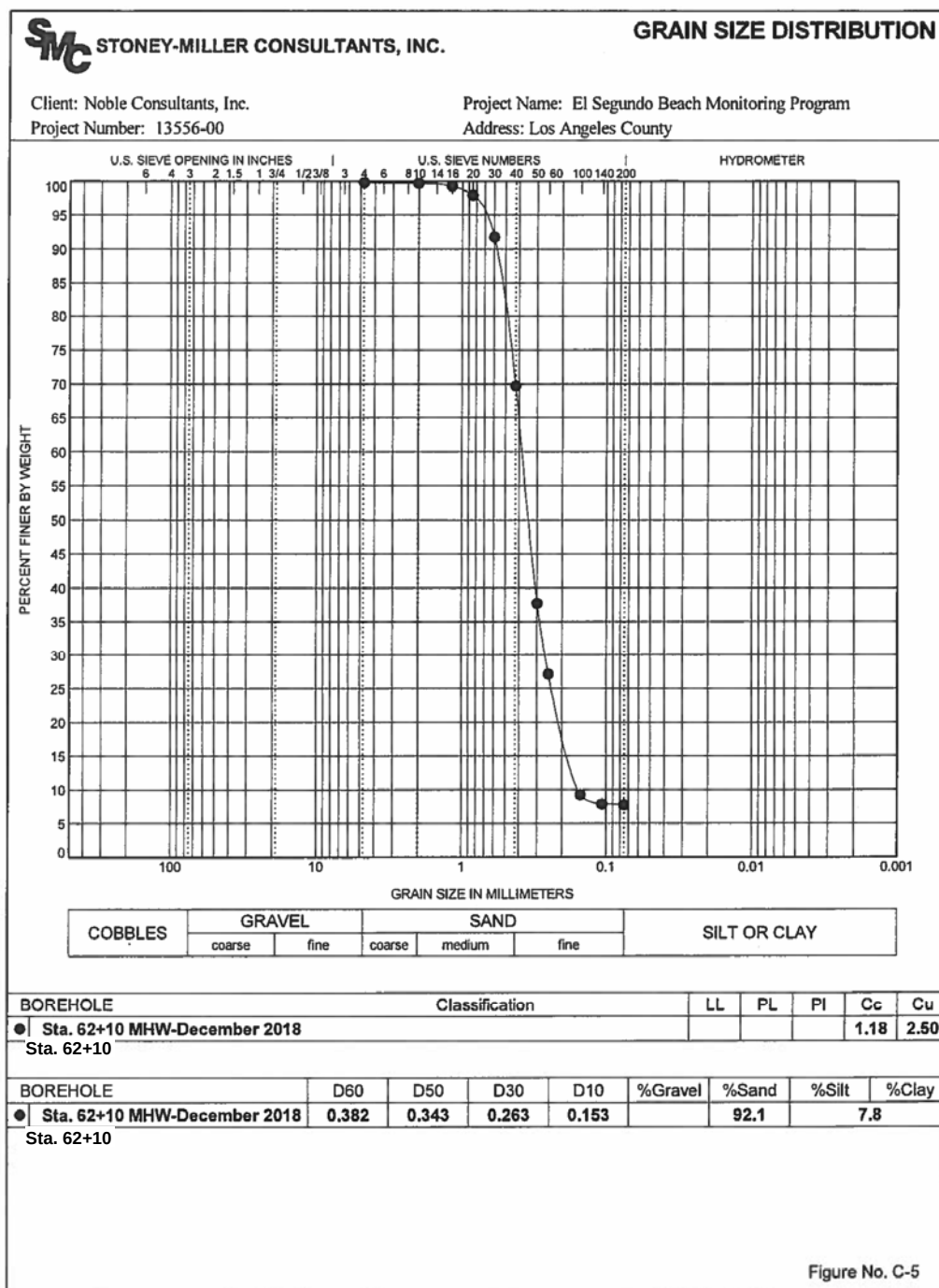


Figure 21. Grain Size Distribution at Sta. 62+10 MHW Line

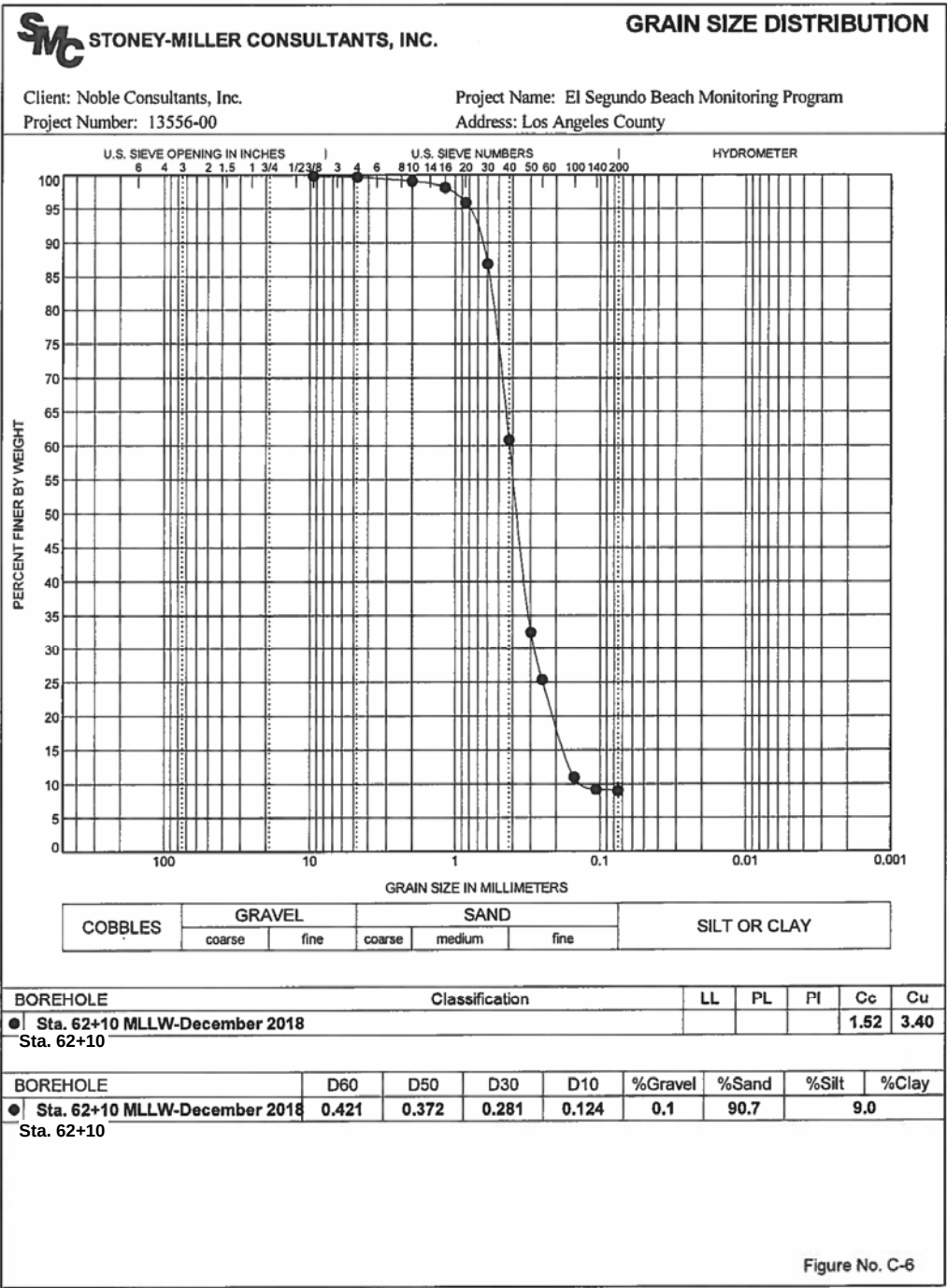


Figure 22. Grain Size Distribution at Sta. 62+10 MLLW Line

ATTACHMENT F

HAZ-1: List of Hazardous Materials

Condition Verification Summary:

Condition requires ESEC to provide to the Energy Commission, as part of its Annual Compliance Report, a list of hazardous Materials designated as regulated substances as set forth in Title 40, CFR Part 355, Subpart J section 355.50 Appendix A. This list shall also include maximum quantities of these substances at the facility. Copies of the list should also be provided to the City of El Segundo Fire Department (CESFD) and the City of Manhattan Beach Fire Department (CMBFD).

ESEC Submission:

ESEC has complied the following list of hazardous Materials designated as regulated substances as set forth in Title 40, CFR Part 355, Subpart J section 355.50. This list also includes maximum quantities of these substances at the facility. Copies of this list have also been provided to the CESFD and the CMBFD.

CAS No.	Chemical Name	Threshold Planning Quantity (pounds)	Quantity Stored On Site (pounds)
7664-41-7	Ammonia	500	1,000*
7664-93-9	Sulfuric Acid	1,000	15,300**

* Based on 800 gallons of 19% aqueous ammonia.

** Based on total capacity of wet lead-acid batteries on-site.

ATTACHMENT G

TLSN-3: Complaint Report/Resolution Form Log for Electro Interference Complaints

Condition Verification Summary:

Condition requires ESEC to summarize all line-related complaints and include in the Annual Compliance Report.

ESEC Submission:

No complaints were received in 2018 related to the electrical power lines either on or off site.

ATTACHMENT H

VIS-2: Landscape maintenance activities; and
VIS-3: Seawall Maintenance Activities

VIS-2 Condition Verification Summary:

VIS-2 condition requires ESEC to report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in this Annual Compliance Report.

ESEC Submission:

ESEC conducted the following landscape maintenance activities during 2018:

Activity Date	Activity Description	Functional Area
Weekly Throughout the year	Weed eradication	Southern berm, tank farm Area, Vista Del Mar, East Slope, and Bike Path/Seawall
Quarterly Inspection and replacement as needed.	Groundcover Maintenance	Southern berm, tank farm Area, East Slope
Quarterly Inspection and replacement as needed.	Replacement of dead shrubs	Southern berm, tank farm Area, Vista Del Mar, East Slope, and Bike Path/Seawall
Quarterly Inspection and replacement as needed.	Tree pruning	South berm, tank farm, and Vista Del Mar
Quarterly Inspection and replacement as needed.	Tree replacement	Southern berm, tanks Farm Area, East Slope, Vista Del Mar

ATTACHMENT H (Continued)

VIS-3: Seawall Maintenance Activities

Condition Verification Summary:

VIS-3 condition requires ESEC provide a wall maintenance status report in the Annual Compliance Report. There were no graffiti incidents during 2018. The anti-graffiti coating works well for enabling easy removal and maintenance.

ESEC Submission:

ESEC inspects the seawall for graffiti and general conditions on a weekly basis. ESEC conducted no graffiti removal activities in 2018:

Activity Date	Activity Description
Weekly throughout year	Trash cleanup and graffiti inspection.
Periodic inspection for graffiti	Graffiti removal as needed.

Condition of Certification

VIS-2 & VIS-3

Landscape & Seawall Maintenance Activities