



Matthew Rodriquez
Secretary for
Environmental
Protection



Edmund G. Brown Jr.
Governor

DRAFT

STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER QUALITY
P.O. BOX 100
SACRAMENTO, CA 95812-0100

Addendum to the Initial Study/Mitigated Negative Declaration For Resolution No. 2004-0052 (SCH# 2004051018)

I. Background

Project Title: Exception to the California Ocean Plan for the University of California
Scripps Institution of Oceanography Discharge into the San Diego - Scripps
Area of Special Biological Significance

Applicant: University of California San Diego for the Scripps Institution of Oceanography
Office of Environmental Health and Safety, 0920
9500 Gilman Drive
La Jolla, CA 92093-0920

Applicant's Contact Person: Kimberly O'Connell, kconnell@ucsd.edu (858) 442-3076

Introduction

On March 21, 1974, the State Water Resources Control Board (State Water Board) designated 31 Areas of Special Biological Significance (ASBS) (State Water Board 1974a). Among those ASBS designated were the San Diego-Scripps ASBS (previously named San Diego Marine Life Refuge ASBS) and La Jolla ASBS (previously named San Diego La Jolla Ecological Reserve ASBS). The State Water Board designated three additional ASBSs in Resolutions No. 74-32 and 75-61 (State Water Board 1974b; 1975). Since 1983, the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) has prohibited waste discharges to ASBS (State Water Board 1983). Similar to previous versions of the Ocean Plan, the Ocean Plan 2012 states:

“Waste shall not be discharged to areas designated as being of special biological significance. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas.”

Assembly Bill 2800 (Chapter 385, Statutes of 2000), added sections to the Public Resources Code (PRC) relevant to ASBS. The PRC now defines a state water quality protection area as:

“a nonterrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality,

including, but not limited to, areas of special biological significance that have been designated by the State Water Resources Control Board through its water quality control planning process.” (PRC § 36700, subd. (f))

Additionally, section 36710 (f) of the PRC states:

“In a state water quality protection area, waste discharges shall be prohibited or limited by the imposition of special conditions in accordance with the Porter-Cologne Water Quality Control Act (Division 7 (commencing with Section 13000) of the Water Code) and implementing regulations, including, but not limited to, the California Ocean Plan adopted and reviewed pursuant to Article 4 (commencing with Section 13160) of Chapter 3 of Division 7 of the Water Code and the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (California Thermal Plan) adopted by the state board. No other use is restricted.”

The change in terminology from ASBS to State Water Quality Protection Area (SWQPA) went into effect on January 1, 2003 (without State Water Board action) pursuant to section 36750 of the PRC.

The University of California San Diego, Scripps Institution of Oceanography (UCSD/SIO) is located on the coast adjacent to the San Diego-Scripps ASBS. SIO was founded in the early twentieth century and has been discharging waste seawater into the ocean in the vicinity of its pier since 1910. The first Waste Discharge Requirements were issued by the San Diego Regional Water Quality Control Board (Regional Water Board) on September 30, 1969 (Regional Water Board 1969). The Regional Water Board issued UCSD/SIO its first National Pollutant Discharge Elimination System (NPDES) permit in Order 74-47, on September 16, 1974, about six months after the San Diego Marine Life Refuge was designated an ASBS. The Ocean Plan in effect at that time prohibited discharges into an ASBS that could alter natural water quality. Finding Five of Regional Water Board Order 74-47 states:

“On March 21, 1974 the State Water Resources Control Board designated the La Jolla Ecological Reserve as an Area of Special Biological Significance. This action by the State Water Board also prohibited any discharge to Areas of Special Biological Significance which could alter the natural water quality conditions. Staff is of the opinion that the discharge would not alter the natural water quality conditions” (Regional Water Board 1974).

The Regional Water Board incorrectly identified the discharge as entering the La Jolla ASBS when instead it was flowing into the San Diego-Scripps ASBS. The permit was re-issued in 1979, 1984, 1994, 1999, and 2004 (Regional Water Board 1979; 1984; 1994; 1999, 2005).

The Natural Water Quality Committee (NWQC) was created by the Deputy Director of the Division of Water Quality of the State Water Board in 2005. The NWQC is composed of State and Regional Water Board staff, a representative from UCSD/SIO, and two scientists selected by Regional Water Board staff from academic organizations other than UCSD/SIO. The NWQC met annually from 2005 to 2010 to review the monitoring data and to advise the Regional Water

Board on whether or not natural water quality is being altered in the ASBS as a result of the UCSD/SIO discharges (Dickson *et al.* 2010).

UCSD/SIO's first exception to the Ocean Plan was adopted by the State Water Board on July 22, 2004. This exception included conditions that were incorporated into Order No. R9-2005-0008, NPDES Permit No.CA0107239, adopted by the Regional Water Board on February 9, 2005 and revised on November 26, 2008. The purpose of these conditions is to ensure that the discharges into San Diego-Scripps ASBS from UCSD/SIO do not adversely impact the biological communities in the ASBS or compromise protection of ocean waters for beneficial uses.

The Ocean Plan was revised in 2009 and 2012 (State Water Board 2009; 2012). The water quality objectives Table B was renamed as Table 1 in Ocean Plan 2012. Chapter III section J.1 of the Ocean Plan 2012 states:

“The State Water Board may, in compliance with the California Environmental Quality Act, subsequent to a public hearing, and with the concurrence of the Environmental Protection Agency, grant exceptions where the Board determines: a. The exception will not compromise protection of ocean waters for beneficial uses, and, b. The public interest will be served.”

Project Description

UCSD/SIO seeks a renewal of the exception from the Ocean Plan's prohibition on discharges into the San Diego-Scripps ASBS. The exception, if renewed, would allow their continued waste seawater and commingled storm water discharge into the San Diego-Scripps ASBS.

Compliance with the Board Resolution No. 2004-0052

The standing Ocean Plan exception was issued in 2004 and allowed UCSD/SIO to discharge waste into the San Diego-Scripps ASBS, subject to specific conditions. UCSD/SIO has complied with the conditions of the Ocean Plan exception as summarized below:

Condition 3a.

“The discharge must comply with all other applicable provisions, including water quality standards, of the Ocean Plan. Natural water quality conditions in the receiving water, seaward of the surf zone, must not be altered as a result of the discharge...”

To assess whether the discharge achieved the permit specified effluent limitations and water quality objectives, UCSD/SIO participated in the Southern California Bight'08 Regional Monitoring Program (Dickson *et al.* 2010). One of the studies assessed the water quality status of the San Diego-Scripps ASBS by addressing the following two questions:

- 1) What is the range of natural water quality near reference drainage locations?
- 2) How does water quality near ASBS discharges compare to the natural water quality near reference drainage locations?

Based on the data collected during this study, it was found that all ASBSs in southern California (including the San Diego-Scripps ASBS) are consistently similar to natural water quality following storm events. On average, the range of post-storm pollutant concentrations in receiving waters sampled near ASBS discharge sites were not significantly different from post-storm concentrations at reference drainage sites, which included storm water inputs free of (or minimally influenced by) anthropogenic sources. Furthermore, no post-storm samples collected near ASBS discharges exhibited toxicity (Dickson *et al.* 2010). UCSD/SIO also participated in the Southern California Bight '13 regional monitoring program (Bight '13 2013). The Bight '13 program includes water quality monitoring and comprehensive biological surveys of the ASBS. Results of this monitoring are not yet available.

Condition 3b.

“UCSD/SIO must minimize the concentrations of chemical additives, including antibiotics, in the effluent...”

To address this condition, UCSD/SIO re-plumbed the seawater system by diverting treated water to the sanitary sewer system and installed a 12,500 gallon holding tank to prevent seawater treated with medication/chemicals from being discharged to the ocean outfall. Seawater treated with chemicals is discharged to the sanitary sewer system in accordance with guidelines established by the San Diego Metropolitan Waste Water Department.

Conditions 3c, 3d, and 3e.

“Effluent and receiving water analysis for copper must employ the approved analytical method with the lowest minimum detection limits. A quarterly report of all chemical additives discharged via waste seawater must be submitted in the quarterly report to the RWQCB [Regional Water Board]. Flow measures (using a flow metering device) for Outfall 001, and estimates for all other permitted outfalls, must be made and reported quarterly to the Regional Water Board.”

To address this condition, inductively coupled plasma/mass spectrometry (EPA method 1640) is used to analyze for copper in the effluent and receiving water samples collected at UCSD/SIO. This EPA approved analytical method has the lowest minimum detection limits for copper. UCSD/SIO includes a log of all chemical additives used in the seawater system (discharged to the sanitary sewer system) and daily flow data for each of the permitted outfalls in the quarterly reports to the Regional Water Board.

Condition 3f.

“By January 1, 2007, UCSD/SIO must eliminate all discharges of non-storm water urban runoff...”

UCSD/SIO Facilities Management staff receives training on an annual basis on storm water pollution prevention, including source control best management practices (BMPs) for dry weather flow prevention and elimination (e.g., irrigation system retrofits, outdoor washing BMPs, etc.). In addition, UCSD/SIO installed treatment controls to prevent dry weather flows from reaching the San Diego-Scripps ASBS including four media filters along the seawall above

the beach, dry weather flow diversions to bioswales, and infiltration galleries around storm drains. These treatment systems mimic the natural environment and do not require mechanical equipment or energy, making them ideal for developed coastal areas where space is limited. Wash racks were also installed at various locations at UCSD/SIO to capture wash water and discharge it to the sanitary sewer system. In addition, the irrigation system at UCSD/SIO has been retrofitted with water efficient sprinkler heads, master valves, and controllers. These improvements to the irrigation system reduce the discharge of irrigation runoff and associated pollutants by:

- 1) Automatically adjusting watering to the weather and soil conditions, preventing irrigation of saturated soils;
- 2) Automatically turning off water flow to the system if a line breaks or an increase in the expected programmed amount of water is detected, eliminating flows created by leaking sprinklers, valves, or line breaks; and
- 3) Improving water distribution uniformity, preventing over watering to compensate for dry areas and controlling runoff.

Conditions 3g, 3h, 3i, and 3j.

“UCSD/SIO must specifically address the prohibition of non-storm water runoff and the reduction of pollutants in storm water discharges draining to the ASBS in a revised Storm Water Management Plan/Program (SWMP)...”

To address this condition, UCSD/SIO developed and submitted a SWMP to the Regional Water Board in August 2005. In December 2012, UCSD/SIO was enrolled in the Phase II Small Municipal Separate Storm Sewer Systems (MS4) General Permit (Order No. 2013-0001 DWQ). UCSD/SIO has developed a SWMP designed to reduce the discharge of pollutants “to the maximum extent possible” through public education and participation; elimination of illicit discharges (non-storm water runoff); construction site storm water runoff control; post-construction site storm water management; and pollution prevention for municipal operations. The source control BMPs that were developed to prevent dry weather flows from discharging into the ASBS and to reduce pollutant loadings into the ASBS during storm events are part of UCSD/SIO’s SWMP.

The Phase II Permit includes water quality objectives pertaining to campus operations and all construction. In addition, post construction guidelines are required to maintain the quality of storm water emanating from all project sites after completion and occupancy. UCSD/SIO’s SWMP (including the SWMP, source control BMPs, and an inventory of the treatment controls that have been installed throughout campus to prevent storm water pollution) is summarized on the webpage: <http://stormwater.ucsd.edu>.

Condition 3k.

“Once every permit cycle, a quantitative survey of benthic marine life must be performed.”

To address this condition, UCSD/SIO has partnered with other ASBS dischargers, Regional Water Boards, and the State Water Board through the Southern California Bight Regional

Monitoring Program (Bight '08 and Bight '13). The water quality and biological data (rocky intertidal and subtidal assessments) that is collected at ASBS locations throughout the region is used to better evaluate and assess the condition and health of the ASBS over time in the Southern California region.

Condition 3I.

“Once during the upcoming permit cycle, a bioaccumulation study using sand crabs and mussels must be conducted to determine the concentrations of metals near field and far field in the ASBS.”

To address this condition, UCSD/SIO partnered with the City of San Diego and performed a comprehensive bioaccumulation study using sand crabs and mussels in both the San Diego-Scripps ASBS and the La Jolla ASBS in 2006 and 2007 (Parnell and Rasmussen 2007). In 2012, UCSD/SIO and the City of San Diego conducted additional bioaccumulation work in both ASBSs using mussels during the rainy season and during the dry season (AMEC 2014). In addition, the Southern California Bight'13 Regional Monitoring Program included a mussel bioaccumulation study in both ASBSs, as well as other ASBSs and reference locations in southern California (Bight' 13, 2013).

The comprehensive bioaccumulation study, which used both mussels and sand crabs, occurred in the vicinity of localized reference and ASBS discharge sites. The bioaccumulation of metals, pesticides, PAHs¹, and PCBs² by mussels was studied along approximately 12 kilometers of coast line from La Jolla to Del Mar, extending well north and south of the two ASBSs located within La Jolla Bay using caged mussels that were deployed for three months. The bioaccumulation of metals and PAHs by sand crabs was studied by sampling crabs at sandy beaches over nearly the same spatial scale.

The results indicated that:

- 1) Most organic constituents were present at statistically non-significant levels relative to a reference site during the study period.
- 2) Certain metals were elevated in transplanted mussels near the UCSD/SIO pier (Cr, Ni, Fe, and Mn) and at the south end of the adjoining La Jolla ASBS (As) where the City of San Diego storm outfalls are located relative to other sites within the study area.
- 3) Certain metals were elevated in transplanted mussels near the UCSD/SIO pier (Cr and Ni) relative to historical statewide Mussel Watch results.
- 4) Large relative variability in tissue concentrations from sand crabs due to age/reproductive status precluded an assessment of spatial scale gradients and an evaluation of potential effects. Therefore, mussels were selected as the bioaccumulation test organism and sand crabs were not recommended as bioaccumulation organism in this permit cycle.

¹ Polycyclic aromatic hydrocarbons

² Polychlorinated biphenyls

The elevated metals concentration in mussels could be from the bases of steel pilings left behind from the temporary steel pier used during the construction and demolition of the UCSD/SIO pier in 1988, instead of from the UCSD/SIO discharge (Parnell and Rasmussen 2007). UCSD/SIO sampled effluent from Outfall 001 and Outfall 004B during dry weather events. The results show that all of the tested metals and organic constituents are below Ocean Plan 2012 Table 1 water quality objectives. Effluent from Outfall 001, Outfall 002, Outfall 003 and Outfall 004B was sampled and analyzed during wet weather event. At Outfall 001, Outfall 002, Outfall 003, copper (Cu) concentration is above Ocean Plan 2012 Table 1 water quality objectives. However, the seawater system has been re-plumbed so that seawater treated with Cu or any other treatment chemical is discharged to the sanitary sewer system. Concentration of lead and total residual chlorine at Outfall 001 is above six month medians but still below daily maximum Ocean Plan 2012 Table 1 water quality objectives.

Condition 3m.

“The effluent from Outfall 001 must be sampled and analyzed monthly for copper concentrations. If after UCSD/SIO had demonstrated that copper as a treatment additive has been eliminated from the discharge into the ASBS, the Regional [Water] Board in consultation with the State [Water] Board Division of Water Quality may reduce the frequency of monitoring for copper in the effluent.”

To address this condition, UCSD/SIO sampled and analyzed the effluent from Outfall 001 for Cu on a monthly basis for more than nine years. The copper concentrations were consistently below permit limits. The seawater system has been re-plumbed so that seawater treated with Cu or any other treatment chemical is discharged to the sanitary sewer system, not to Outfall 001. As a result, UCSD/SIO requests a reduction to the Outfall 001 copper monitoring to once per year.

Condition 3n.

“During the first year of the permit cycle, two samples from Outfall 001 (once during dry weather and once during wet weather) and analyzed for all Ocean Plan Table B constituents...”

To address this condition, UCSD/SIO conducted a Reasonable Potential Analysis (RPA) using the Reasonable Potential Calculator Software (RPCalc, Version 2.0) and effluent monitoring data obtained between December 2004 and August 2006. The RPA calculations were based on the results from 39 discharge samples collected during wet and dry weather in 2004, 2005, and 2006. The RPA concluded that 65 constituents in the monitoring and reporting program do not have the potential to cause, or contribute to, an excursion above the Ocean Plan 2012 Table 1 water quality objectives. Under the Ocean Plan, an RPA analysis result of Endpoint 2 does not require effluent monitoring. The monitoring requirements in the NPDES permit were revised by the Regional Water Board on November 26, 2008 such that no further monitoring was required for constituents with a calculated RPA endpoint of 2 for the duration of the permit. A summary of the results of the RPA analysis and the revised NPDES permit No. CA107239 (Order No. R9-2005-0008) were included in the Attachments A and B in the Ocean Plan Exception Request Update Letter sent to the State Water Board dated July 6, 2012. Monitoring of the 14 remaining constituents is still required.

In addition, UCSD/SIO has conducted wet weather monitoring under the Southern California Bight '08 Regional Monitoring Program. UCSD/SIO requests the option of continuing to participate in regional wet weather monitoring in the future in lieu of individual wet weather monitoring.

Condition 3o.

“Twice annually, once during dry weather and once during wet weather, the receiving water and sediment in the vicinity of the UCSD/SIO pier must be sampled and analyzed for Ocean Plan Table B constituents...”

To address this condition, UCSD/SIO has sampled the receiving water and sediment in the vicinity of the UCSD/SIO pier in accordance with the NPDES permit. Acute toxicity has not been observed in the sediment samples collected over the last seven years. In addition to the permit required wet and dry weather receiving water monitoring, UCSD/SIO has also conducted receiving water monitoring under the Southern California Bight '08 Regional Monitoring Program and requests the option of continuing to participate in regional monitoring in the future (e.g., Bight '13) in lieu of individual monitoring.

Condition 3p.

“If the results of the receiving water monitoring indicate that wet weather discharges that include storm water are causing or contributing to an alteration of natural water quality in the ASBS, UCSD/SIO is required to submit a report to the Regional [Water] Board within 30 days. Those constituents in storm water that alter natural water quality must be identified in that report. The report must describe the BMPs that are currently being implemented, BMPs that are planned for in the SWMP, and additional BMPs that may be added to the SWMP...”

To protect the San Diego-Scripps ASBS, UCSD/SIO partnered with the City of San Diego, San Diego Coastkeeper, and the State Water Board to develop and implement the La Jolla Shores Integrated Coastal Watershed Management (ICWM) Plan to reduce or prevent pollutants associated with urban run-off from going into the ocean using consolidated grant funding provided by the State Water Board. The ICWM Plan, dated February 2008, includes an ASBS Protection Model that integrates water quality data from the watershed with other ecosystem assessment findings to identify the watershed pollutants, or constituents of concern (COCs), most likely to negatively impact the ASBS. A three tiered approach was then used to develop BMPs to address these COCs (i.e., Tier 1 = non-structural BMPs and activities; Tier 2 = structural BMPs and activities; and Tier 3 = treatment BMPs and activities). These BMPs were then prioritized using a phased management approach (i.e., Phase 1: 3-5 years; Phase 2: 5-10 years; Phase 3: 10+ years). UCSD/SIO and the City of San Diego have implemented most of the Phase 1 Tier 1, 2, and 3 BMPs.

Leveraging campus funding with American Recovery and Reinvestment Act (ARRA) grant funding provided by the State Water Board and funding donated by the Miocean Foundation, UCSD/SIO has allowed the installation of innovative storm water treatment controls at SIO and on the main campus to prevent dry weather flow discharges (e.g., irrigation run-off and wash water) from reaching the ocean and to remove pollutants from storm water run-off.

Source and site controls at SIO were selected based on their effectiveness at protecting the ASBS from pollutants of concern (i.e., heavy metals, organics, bacteria, and sediment) and include:

- Low impact development (LID) urban retrofit projects including four innovative ecology embankment/media filters that are designed to eliminate dry weather flows and treat storm water run-off prior to discharge into the ASBS.
- Erosion and sediment controls.
- Pollution prevention controls for material storage areas.
- Wash racks with sanitary sewer connections to eliminate the discharge of wash water from marine activities into the storm water conveyance system.

In addition, San Diego Coastkeeper and Birch Aquarium at Scripps (BAS) have developed outreach materials and programs to educate the public about ocean protection and what can be done to protect our ASBS.

In 2011, the suite of treatment control BMPs at SIO won “Project of the Year” by the American Public Works Association. In addition, the UCSD/SIO Storm Water Pollution Control Plan was selected by the American Society of Civil Engineers (ASCE) to receive the “Outstanding Award” in Water Quality, Flood Control, and Drainage Facilities as part of their Civil Engineering Project Awards Program.

An inventory of the storm water treatment control BMPs that have been installed at SIO and on the main campus is available on UCSD’s Storm Water Management Program Web site: <http://blink.ucsd.edu/go/stormwater>

As state and grant funding becomes available, UCSD/SIO will continue to apply for funds to implement the BMPs identified in the La Jolla Shores ICWM plan.

Condition 3q.

“A study must be performed to determine the initial dilution and fate of the discharge during storms and non-storm periods...”

To address this condition, a Dilution and Dispersion Study dated February 5, 2007, was submitted to the Regional Water Board and State Water Board on February 9, 2007. The purpose of the study was to determine the initial dilution and fate of the discharge during storms and non-storm periods from UCSD/SIO into the San Diego Scripps ASBS. The SEDXPORT hydrodynamic modeling system was used to numerically simulate dry weather and wet weather case scenarios. Modeling results indicate the minimum dilution factor inside the surf zone exceeds 15:1 more than 96 percent of the time.

Based on a review of the dilution model and NWQC responses, the dilution factor was increased from 2:1 to 7:1 in UCSD/SIO’s NPDES permit on November 26, 2008. The Regional Water Board found that the minimum dilution factor of 7:1 observed during the study would be the most protective of the San Diego-Scripps ASBS. Effluent limits were recalculated to reflect the change in the dilution factor.

Condition 3r.

“In addition to the bacterial monitoring requirements in the Ocean Plan, indicator bacteria and total residual chlorine must be tested once monthly in the effluent from Outfall 003, draining the marine mammal holding facility, when in use.”

This condition was addressed with the closure of the marine mammal holding facility in 2004 (AMEC 2006).

Condition 3s.

“UCSD/SIO must develop and implement administrative and/or engineering controls that result in a negligible risk of the release of exotic species, including foreign pathogens (parasites, protozoa, bacteria, and viruses.)”

BAS and UCSD/SIO Hubbs Hall are the only facilities that house aquaria containing non-indigenous species (animals or plants whose historic or native recorded range does not include waters of the State of California). Both facilities have adopted Standard Operating Procedures (SOPs) that specify the administrative controls that are implemented to prevent the release of Non-Indigenous Species (NIS) into the ocean.

In 2011, USCD/SIO installed an NIS treatment system at Hubbs Hall to inactivate potential NIS in the seawater effluent through filtration and exposure to ultraviolet (UV) light based on the results of a pilot study and in consultation California Department of Fish and Wildlife (CDFW). An NIS treatment system for Birch Aquarium that includes filtration, UV exposure, and ozone exposure has already been installed and is operational. This system can treat seawater effluent from the aquaria tanks that contain plants or animals whose range does not include waters of the State of California.

The final treatment regime for the full-scale NIS treatment system at BAS includes:

- 25µm filtration
- Ozone dose of 1.5mg/L
- UV dose of 454,000 µW-s/cm²

The application of above regime resulted in removal of 99% of brine shrimp, rotifers, green algae, and mussel larvae, as well as 99.9% of heterotrophic bacteria. These organisms were chosen as appropriate indicator species for NIS by UCSD/SIO, and BAS staff with the consent of CDFW staff.

The final treatment regime employed at UCSD/SIO Hubbs Hall includes:

- 50-µm filtration
- UV dose of at least 100,000µW-s/cm²

This design was based on suggestions from a CDFW letter dated March 11, 2009.

Conclusions

Overall, UCSD/SIO is in compliance with the effluent limitations and water quality objectives in their NPDES permit. The water quality of their discharges has improved since the issuance of the Ocean Plan exception in 2004.

UCSD/SIO has complied with the conditions in State Water Board Resolution No. 2004-0052 and Regional Water Board Order No. R9-2005-0008 (NPDES Permit No. CA0107239). Based on the data collected to date, the discharges from UCSD/SIO will not result in undesirable alteration of natural water quality. Additionally, the people of California will benefit from the research and education provided by UCSD/SIO.

Reissuance of the ASBS exception to the Ocean Plan will not result in any new potential impacts to the environment of the San Diego-Scripps ASBS.

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