

Incorporating Analysis of Sea-Level Rise Into Environmental Impact Reports

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INTRODUCTION

The California Environmental Quality Act¹ is a powerful tool both for understanding and for mitigating the risk of environmental degradation because it mandates full public disclosure of the significant effects that a future development will have on the environment.² However, confusing judicial treatment on the issue of sea-level rise analysis in EIRs has resulted in inconsistency in analysis. The judiciary has suggested in dicta that analysis of sea-level rise

1. CAL. PUB. RES. CODE §§ 21001–21189.

2. CAL. PUB. RES. CODE § 21002.1.

is “reverse-CEQA,” and not required. This muddled dicta is in conflict with CEQAs policy of complete and good faith disclosure in EIRs. Perhaps due to the conflict between CEQAs principle of full disclosure of environmental effects, and the well accepted prohibition on “reverse-CEQA” analysis, some EIRs for projects in coastal areas include analysis of sea-level rise in environmental impact reports, and some do not.³

This Comment argues that, regardless of the ambiguity in the law and inconsistency in its application, analysis of sea-level rise is in fact required in an environmental impact report in order to properly forecast the significant effects of a project on the environment. When dynamic coastlines continue to rise and cause “coastal squeeze,” development can significantly interfere with tideland ecosystems, wetlands, and coastal processes like beach migration, affecting mineral resources, biological resources, and resources that implicate the public trust doctrine. While the effects of sea-level rise may be analyzed in an EIR under resource categories listed in Appendix G of the CEQA Guidelines, an independent analysis of sea-level rise should be included in an EIR to determine at what point the project could threaten or deplete coastal resources.

Part I of this Comment will provide an overview of how sea-level rise affects coastal resources, and the role that CEQA can play in mitigating these affects. Part II will detail what an EIR currently requires with regard to sea-level rise analysis and forecasting. Part III will then argue that the paradigm created by the judiciary and inconsistently adhered to by practitioners fails to account for the science behind coastal dynamics, and that a lead agency should always consider sea-level rise over time in an EIR to sufficiently protect coastal environmental resources.

I. SEA-LEVEL RISE: PROJECTIONS, EFFECTS, AND DAMAGE CONTROL TOOLS

Our coastline is dynamic, in that it changes seasonally. However, anthropogenic climate change has seen the coastline move more consistently inland. Where development interferes with this natural process, sea-level rise can

3. Often, where a local government has commissioned the EIR, there is analysis of sea-level rise. However, where the local government is the lead agency in approving a project that will developed by private entity, the EIR lacks sea-level rise analysis. *Compare* MONTEREY BAY SANCTUARY SCENIC TRAIL NETWORK MASTER PLAN FINAL ENVIRONMENTAL IMPACT REPORT, Santa Cruz County Regional Transportation Commission (November 7, 2013), 111, available at <https://scrtc.org/wp-content/uploads/2013/05/MBSST-Network-Master-Plan-FEIR.pdf> [<https://perma.cc/SUJ9-CT58>], *with* Final Environmental Impact Report, South of Tioga (May 9, 2018) https://www.sandcity.org/wp-content/uploads/2018/05/South-of-Tioga-Project_FEIR.pdf [<https://perma.cc/M22M-AU3J>].

threaten expensive coastal infrastructure⁴ and deplete coastal environmental resources, thereby endangering coastal ecosystems.⁵

Where rising seas meet development instead of cliffside, sandy beach, or marshy wetland, flooding can destroy valuable property and cause “coastal squeeze.”⁶ “Coastal squeeze” occurs where coastal development impedes the natural inland migration of beaches, depleting habitat for one of the most biodiverse marine ecosystems on the planet, and harming a crucial cultural resource.⁷ Many coastal communities in California are already experiencing these impacts,⁸ and the best available science suggests that damages will worsen as sea-level rise accelerates.⁹ Further, the dense development on the

4. See generally CAL. COASTAL COMM’N, SEA LEVEL RISE POLICY GUIDANCE: INTERPRETIVE GUIDELINES FOR ADDRESSING SEA LEVEL RISE IN LOCAL COASTAL PROGRAMS AND COASTAL DEVELOPMENT PERMITS 26 (2018), <https://documents.coastal.ca.gov/reports/2018/9/w6g/w6g-9-2018-exhibits.pdf> [<https://perma.cc/9NRF-FRRN>] [hereinafter CCC SLR Guidelines] (for a discussion of the infrastructure affected by rising seas in California).

5. CCC SLR GUIDELINES, *supra* note 4, at 27, n.4 (clarifying that the threat to coastal resources means a threat to beaches, wetlands, agricultural lands, coastal habitats, recreational opportunities, and more); CAL. OCEAN PROT. COUNCIL, SEA-LEVEL RISE GUIDANCE: 2018 UPDATE 7–8 (2018), http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf [<https://perma.cc/MG3F-3S2K>] [hereinafter OPR GUIDANCE] (describing those threats of sea-level rise that are specific to California).

6. Griggs, *infra* note 9, at 45.

7. *Id.* at 45. See also CTR. FOR OCEAN SOLS., THE PUBLIC TRUST DOCTRINE: A GUIDING PRINCIPLE FOR GOVERNING CALIFORNIA’S COAST UNDER CLIMATE CHANGE 3 (2017), <https://oceansolutions.stanford.edu/news-stories/public-trust-doctrine-guiding-principle-governing-californias-coast-under-climate> [<https://perma.cc/43X5-F86Z>] (“If not proactively managed, coastal development may impede natural landward migration of these important coastal features and impair the public’s ability to enjoy the social and economic benefits provided by the coast.”).

8. See e.g., Mary Callahan, *Caltrans Prepares to Shift Highway 1 at Gleason Beach*, PRESS DEMOCRAT (Apr. 16, 2014), <https://www.pressdemocrat.com/news/1860880-181/caltrans-prepares-to-shift-highway> [<https://perma.cc/KQ86-AJ3V>]; Peter Flimrite, *Pacific Ocean Devours Pacifica Cliffs in Aerial Photos Over Decades*, SF GATE (Feb. 3, 2016, 4:00 AM), <https://www.sfgate.com/bayarea/article/Pacific-Ocean-devours-Pacifica-cliffs-in-aerial-6802840.php> [<https://perma.cc/S5UT-WJ77>]; Oliver Milman, *Sinking Santa Cruz: Climate Change Threatens Famed California Beach Town*, GUARDIAN (Oct. 11, 2018, 1:00 PM), <https://www.theguardian.com/us-news/2018/oct/11/santa-cruz-sinking-climate-change-beaches-surfing> [<https://perma.cc/H8UL-JBRV>]; *The Grand Bayway*, RESILIENT BY DESIGN BAY AREA CHALLENGE, <http://www.resilientbayarea.org/grand-bayway> (describing the plan to modify the low lying Highway 37, which will soon be inundated as a result of sea-level rise).

9. The rate of sea-level rise will accelerate over the next century even under the most conservative emissions scenarios. California specific reports estimate 6 to 11 feet of rise by 2100. See GRIGGS ET AL., CALIFORNIA’S COAST AND OCEAN SUMMARY REPORT, CALIFORNIA’S FOURTH CLIMATE CHANGE ASSESSMENT 17 (2018), <http://www.climateassessment.ca.gov/state/docs/20180827-oceancoastsummary.pdf> [<https://perma.cc/86Y7-CQXF>]; GARY GRIGGS ET AL., *Rising Seas in California: An Update on Sea-Level Rise in California* 24 (2017), <http://www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf> [<https://perma.cc/WD5T-LD2J>]; See generally JOHN A. CHURCH ET AL., *Sea Level Change 2013: The Physical Science Basis*, in 1137 CLIMATE CHANGE 2013: *The Physical*

California coast suggests even more so that the damage will be devastating: 68 percent of the state population lives within its nineteen coastal counties, and these coastal areas account for 80 percent of the state GDP.¹⁰

However, local governments have the requisite tools to mitigate the economic, cultural, and environmental consequences of sea-level rise, but need adequate information to evaluate risk and make planning decisions that alleviate the burden rising sea-levels place on coastal communities and ecosystems.¹¹

Since land use decisions in California are made on a local level, local governments in California bear the responsibility of making land use decisions that mitigate these harms. Thereby, they have the power to adopt and implement adaptation strategies in order to save valuable coastal infrastructure and ecosystems.¹² Whereas local governments may implement any of several strategies to mitigate the effects of sea-level rise, these local governments need to be adequately informed in order to implement them. Adaptation strategies include: (1) *retreat* from the shoreline; (2) *adapt* infrastructure to be resilient to sea-level rise; and (3) *protect* shoreline infrastructure from sea-level rise.¹³ Local governments have a repertoire of regulatory tools with which to implement one or more of these adopted strategies.¹⁴ However, to effectively implement any one of these strategies, it is crucial for local government officials and their constituents to be properly informed of the way that sea-level rise will affect development on the coastline—enter the California Environmental Quality Act.

Science Basis (T.F. Stocker et al., eds., 2013), http://www.climatechange2013.org/images/report/WG1AR5_Chapter13_FINAL.pdf [<https://perma.cc/NY7F-2URH>] [hereinafter IPCC Report] (providing a global assessment of sea-level rise projections).

10. GARY GRIGGS ET AL., CALIFORNIA'S COAST AND OCEAN SUMMARY REPORT, CALIFORNIA'S FOURTH CLIMATE CHANGE ASSESSMENT 12 (2018), <http://www.climateassessment.ca.gov/state/docs/20180827-oceancoastsummary.pdf> [<https://perma.cc/ZC6B-VT5L>] (noting that much of California's coast was developed at a time where there was little El Niño flooding or storm activity).

11. OPR GUIDANCE, *supra* note 5, at 23–27.

12. See IPCC REPORT, *supra* note 9.

13. Jesse Reiblich et al., *Enabling and Limiting Conditions of Coastal Adaptation: Local Governments, Land Uses, and Legal Challenges*, 22 OCEAN & COASTAL L.J. 156, 162–63 (2017) (“Proactive planning and preparation for these likely effects should be a top priority for coastal communities on the frontlines of climate change. Linking the best available scientific information on climate hazards to adaptation policy is the vital next step in successful coastal adaptation . . . this information may be necessary for determining the appropriate adaptation approaches for an area.”). See also Megan M. Herzog & Sean B. Hecht, *Combating Sea Level Rise in Southern California: How Local Governments Can Seize Adaptation Opportunities While Minimizing Legal Risk*, 19 HASTINGS W. N.W. J. ENVTL. L. & POL'Y 463, 543 (2013) (“local governments already exercise a robust suite of police powers and other regulatory powers that can be harnessed to achieve successful adaptation outcomes Preparing for sea level rise will require local governments to make difficult decisions about the future of their coastal communities.”).

14. See generally Herzog & Hecht, *supra* note 13.

Without adequate information about the risks of sea-level rise to coastal development (and vice versa), local governments often approve development in high-risk areas.¹⁵ Accordingly, the OPR Guidelines for Sea-Level Rise Adaptation set forth a five-step decision-making process to help local governments plan appropriate development in coastal areas.¹⁶ Knowledge and disclosure of risks is a crucial part of the five-step process, and where a private development requires discretionary approval, local government can use the CEQA process to be adequately informed of the risks that the development may create with respect to sea-level rise.

A. *CEQA Can Help Local Governments Evaluate the Risks of Sea-Level Rise*

The California Environmental Quality Act (CEQA)¹⁷ is a regulatory tool that mandates the disclosure of environmental risks when a state or local agency approves a discretionary project. Therefore, one of the myriad tools local government can harness to employ sea-level rise adaptation strategies in a proactive planning context is the Environmental Impact Report (EIR). Through the EIR, CEQA “may provide an opportunity for local governments to evaluate, on a project-by-project basis or at the planning stage, the relationship between future sea-level rise and planned development near the coastline.”¹⁸ Because CEQA requires public agencies to disclose any significant environmental impacts of a proposed development and mitigate any effects they deem above a certain threshold of significance, it is a powerful public disclosure tool.¹⁹ As will be discussed in Part II, analysis of sea-level rise is not explicitly required by CEQA or its guidelines, so there is not currently uniform disclosure of the effects of sea-level rise on a project over time. Nonetheless, CEQA does require agencies to forecast environmental risks to the best of their ability.²⁰ Sea-level rise may, over time, affect traditional resource categories that are governed by CEQA.

II. THE CURRENT CASE LAW AND OPR GUIDELINES

Case law indicates that lead agencies need not analyze sea-level rise in EIRs unless a proposed development would exacerbate the effects of sea-level

15. Kevin Stark & Mary Catherine O’Connor, *Mapping the Shoreline Building Boom as Seas Rise*. S.F. PUB. PRESS (Apr. 21, 2017, 5:36 PM), <https://sfpublicpress.org/news/searise/2017-04/mapping-the-shoreline-building-boom-as-seas-rise> [https://perma.cc/W44Y-UA66] (implying that a surge in coastal development is a result of the loosening of CEQA requirements, but it is unclear whether the projects described in the article are all subject to CEQA or whether an evolution of sea-level rise flooding would have changed the decision of the lead agencies in those cases).

16. OPR GUIDANCE, *supra* note 5, at 23.

17. CAL. PUB. RES. CODE § 21000–21189 (West 2016).

18. Herzog & Hecht, *supra* note 13, at 485.

19. CAL. PUB. RES. CODE § 21002.1(a) (setting forth the purpose of the EIR).

20. CAL. CODE REGS. tit. 14, § 15144 (2019).

rise. Due to the lack of direction in the California Public Resources Code and the California Code of Regulations, decisions about whether or not an analysis of sea-level rise is required in an EIR have been made on a case-by-case basis in CEQA litigation. Executive Order S-13-08 and B-30-15 both direct state agencies to consider sea-level rise in planning and financing decisions, but there is no indication that local agencies are required to consider sea-level rise in planning decision.²¹

The California Court of Appeal held in *Ballona Wetlands* that sea-level rise analysis was not required because that would be reverse-CEQA. The California Supreme Court confirmed this holding in a different case that did not involve sea-level rise and added an exception to the general rule for cases where the project might exacerbate the existing environmental conditions. However, the Court did not clarify whether sea-level rise fell within this exception. According to recently approved environmental impact reports (EIRs), practitioners and lead agencies still interpret *CBIA v. BAAQMD* to mean that sea-level rise analysis is not required for coastal projects. In other words, sea-level rise does not fit into the exacerbation exception. However, this approach is inconsistent with the idea that a project affected by sea-level rise will always interrupt the littoral cycle. It is also inconsistent with the idea that blocking the sea-level rise with a development project will always affect environmental resources. For these reasons, the holding in *Sierra Club v. City of Oxnard* presents a better approach to the sea-level rise analysis.]

This Part presents an analysis of the judicial decisions on this question. The ambiguities presented herein underscore both the complexity of CEQA and judicial misunderstanding of coastal processes. Further ambiguity arises from application of the law to the incredible variety of coastal environments in California—built, armored, and undeveloped.

A. *Sea-Level Rise in the Public Resources Code and the OPR Guidelines*

Given that the California Public Resources Code (CPR) includes only broad language about the requirements of an EIR, it is not surprising that sea-level rise is not specifically mentioned in the CEQA statute. Rather, the CPR requires an EIR to analyze significant impacts on the “environment,” which is defined as “physical conditions that exist within the area of the proposed project including land, air, water, minerals, flora, fauna, noise, or objects of historic or aesthetic significance.”²² This definition is devoid of the words “sea-level rise” and “mean high tide.” However, if placing a development in the way of sea-level rise would cause coastal squeeze and thus affect the inward migration of beach over time, an EIR analyzing potential effects on environmental resources would be appropriate. The EIR would consider issues

21. See Cal. Exec. Order No. B-30-15 (Apr. 29, 2015) (requiring state agencies to factor climate change into all planning and investment decisions).

22. CAL. PUB. RES. CODE § 21060.5 (2016).

explicitly contemplated by CEQA's Appendix G such as sand ("minerals") and wave energy ("water").²³ Again, analysis of sea-level rise may be necessary to adequately forecast the effects that sea-level rise may have on those listed environmental resource categories that are more traditionally considered in an EIR.

Often, agencies rely on Appendix G in the OPR Guidelines when completing an EIR. The CPR mandates that the Office of Planning and Resources promulgate guidelines detailing how to comply with CEQA.²⁴ Appendix G is the result; it is a nonexhaustive checklist of environmental resources in the OPR Guidelines that an agency should consider in determining whether a project will have significant impacts on the environment. The Appendix generally reflects the categories listed in the CEQA definition of "environment," and fails to include "sea-level rise."²⁵ While this void is not dispositive, California courts have provided little additional guidance regarding analysis of sea-level rise in an EIR.

B. *Ballona Wetlands and CBIA vs. BAAQMD*

In *Ballona Wetlands Land Trust v. City of Los Angeles (Ballona Wetlands)*, the California Court of Appeal held that CEQA does not require the lead agency to analyze or disclose the effects of sea-level rise on the proposed development.²⁶ CEQA requires analysis and disclosure of a project's effects on the environment, and that to require the opposite—an analysis of the environment's effects on the project—would be contrary to the language and purpose of CEQA.²⁷ In *Cal. Bldg. Indus. Ass'n v. Bay Area Air Quality Mgmt. Dist. (CBIA)*, the California Supreme Court upheld the underlying rationale for the holding in *Ballona Wetlands* by condemning reverse-CEQA. However, the Court carved out an exception to this general rule where a development may exacerbate an environmental hazard.²⁸ The misunderstandings and ambiguity in these decisions reflect either a confusion about the nature of coastal dynamics, a confusion about the imminence of sea-level rise and its effects, or both. The forecasting and disclosure principles in CEQA suggest that it is not useful to put analysis of sea-level rise into the reverse-CEQA paradigm at all.

23. See CAL.'S FOURTH CLIMATE CHANGE ASSESSMENT, CALIFORNIA'S COAST AND OCEAN SUMMARY REPORT, *supra* note 9, at 45 (describing coastal squeeze and its effects on the environment). See generally KIKI PATSCH & GARY GRIGGS, INST. OF MARINE SCI. AT U.C., SANTA CRUZ, LITTORAL CELLS, SAND BUDGETS, AND BEACHES: UNDERSTANDING CALIFORNIA'S SHORELINE (2006), <http://s3-us-west-2.amazonaws.com/ucldc-nuxeo-ref-media/a956aa7a-bef7-423a-9b96-9708b00072d1> [<https://perma.cc/PE4E-9VZP>] (describing the way that coastal development can interfere with the littoral cycle and deplete beaches).

24. CAL. PUB. RES. CODE § 21083 (2016).

25. CAL. CODE REGS. tit. 14, App. G (2019).

26. *Ballona Wetlands Land Tr. v. City of L.A.*, 201 Cal. App. 4th 455 (2011).

27. *Id.*

28. *Cal. Bldg. Indus. Ass'n v. Bay Area Air Quality Mgmt. Dist.*, 62 Cal. 4th 369 (2015).

In *Ballona Wetlands*, the lead agency certified a revised EIR for a mixed-use real estate development two miles from the ocean.²⁹ The project was subject to CEQA because it required the City of Los Angeles to amend both its general and specific plan, approve a vesting tentative map, and adopt an ordinance authorizing a development agreement.³⁰ The revised EIR discussed sea-level rise caused by global climate change only to the extent that it was required to in order to respond to public comments, and included no analysis of projected rise as related to the development.³¹

The court held that analysis of sea-level rise beyond the statutory requirements for comment response would be reverse-CEQA: “Identifying the effects on the project and its users of locating the project in a particular environmental setting is neither consistent with CEQA’s legislative purpose nor required by the CEQA statutes *we hold that an EIR need not identify or analyze [the effects on the project caused by the environment].*”³² While Appendix G of the Guidelines requires lead agencies to analyze the exacerbation of environmental hazards, the court held that this guideline was invalid to the extent that it required an analysis of the environment’s effect on a project.³³

The court’s holding in *Ballona Wetlands* reflects judicial misunderstanding of both coastal dynamics and the rapidly increasing rate of sea-level rise. This misunderstanding led the court to hold that analysis of sea-level rise is reverse-CEQA, which kept the court from reaching the issue of whether the lead agency met its duty to reasonably forecast future environmental impacts. While this holding is widely-followed,³⁴ its application to sea-level rise is unique to this opinion and not consistent with the science of coastal dynamics. This application ignores the effects that a coastal development could have on environmental resources in the future as a result of sea-level rise. Whereas sea-level rise analysis is not explicitly required by CEQA or the OPR Guidelines, a developments interference with sea-level rise does in fact effect resources that are explicitly protected by CEQA.

29. *Ballona Wetlands*, 201 Cal. App. 4th at 462–63.

30. *Id.*

31. The city responded by refuting a comment which presented a projection of sea-level rise (the projection enumerated in “The Impacts of Sea-Level Rise on the California Coast” by the California Climate Change Center) because it was a worst-case scenario projection. The comment response also noted that the development was two miles from the coastline, unlikely to be affected by wave action, and that the land between the development and the coast was elevated. *Id.* at 472 (“[The Draft EIR] briefly noted that global warming could result in a rise in sea-level and the inundation of coastal areas. They stated that the ccc paper failed to account for the fact that the project site was two miles from the ocean and unlikely to be affected by wave action, failed to account for elevated land between the project site and the coastline that would act as a barrier, and failed to account for the topography of the project site and building elevations.”).

32. *Id.* at 474.

33. *Id.*; CAL. CODE REGS. tit. 14, App. G (2019).

34. See e.g., *Pres. Poway v. City of Poway*, 245 Cal. App. 4th 560, 582 (2016).

In *CBIA*, the California Supreme Court upheld the rule against reverse-CEQA, while also potentially opening the door to sea-level rise analysis requirements in certain instances. There, the air quality management district promulgated new thresholds of significance for certain air pollutants. The new thresholds would be standards against which lead agencies would compare the pollutants emitted by their projects for the purposes of CEQA analysis. The plaintiff petitioned for mandamus and argued that the air district's new thresholds were arbitrary and capricious because they required lead agencies to analyze the way that a project would affect future users. The court held that, "it is the project's impact on the environment—and not the environment's impact on the project—that compels an evaluation of how future residents or users could be affected by exacerbated conditions . . . In light of CEQA's text and structure, we conclude that *CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents*."³⁵ The court thereby held that reverse-CEQA analysis is not required.

Yet, because the facts in *CBIA* did not involve sea-level rise, the court did not speak directly to whether sea-level rise fell within the reverse-CEQA paradigm or into the court's new exception. Whereas the court in *Ballona Wetlands* invalidated Appendix G of the Guidelines to the extent that it violated the no reverse-CEQA rule, the court in *CBIA* qualified this wipeout with an exception for developments that could exacerbate an already existing environmental hazard.³⁶ The court cited *Ballona Wetlands* when holding that reverse-CEQA is not required in an EIR. However, regarding the exacerbation exception, the court noted that "the holding from *Ballona Wetlands* is not explicitly overruled," but that it merely "considered factors that the court in *Ballona Wetlands* did not." On one hand, the court cited *Ballona Wetlands* to come to its main conclusion, and on the other, it did not have the opportunity to decide whether sea-level rise should be analyzed or even fit into the paradigm.

1. Sea-Level Rise Analysis is Not Reverse-CEQA

Both *Ballona Wetlands* and *CBIA* condemn the use of reverse-CEQA under the rationale that the purpose of CEQA is to forecast foreseeable significant impacts of a project on the environment, not the other way around.³⁷ Unfortunately, both cases make the issue of sea-level rise analysis in EIRs more complicated than it needs to be, muddling the issue in a way that contradicts CEQAs explicit purpose of disclosure of environmental risks. Part III argues that CEQA's purpose—protection of California's environmental resources—is better realized when an EIR is used to analyze sea-level rise over time, and presents ways to analyze sea-level rise in and EIR.

35. *Id.* (emphasis added).

36. *Cal. Bldg. Indus. Ass'n*, 62 Cal. 4th 369, 386 (2015).

37. *Id.*; *Ballona Wetlands*, 201 Cal. App. 4th at 474.

Moving forward, there are two ways to incorporate sea-level rise analysis into EIRs under the current law in order to adequately fulfill CEQAs purpose as a public disclosure statute.

First, using the exception created by the California Supreme Court in *CBIA*, an EIR could analyze sea-level rise on the basis that it is an existing environmental hazard and a development could exacerbate its effects. Although the Court in *CBIA* stopped short of an explicit statement that sea-level rise is an environmental hazard that may fall into the exception, it is clear that such an exemption is warranted where a development contributes to coastal squeeze. Using this exception may lead to an entire section of an EIR which looks at whether and to what degree sea-level rise effects may be exacerbated by a development over its lifetime.

Second, avoiding the concept of reverse-CEQA altogether, an EIR could analyze the effect that a development could have on coastal resources listed in Appendix G as the sea rises over the lifetime of the project. While this solution ignores the precedent set by *Ballona Wetlands*, this approach more adequately accounts for the way that the built environment affects coastal resources via the phenomenon of coastal squeeze. In these instances, the effects of sea-level rise do not necessarily fall within the typical reverse-CEQA paradigm because a project in the way of sea-level rise, by impeding the dynamic coastline's inland migration, will necessarily affect environmental resources. This approach would look at the resources listed in Appendix G and forecast how each one would be impacted by coastal squeeze.

Of course, this analysis would differ dependent on the coastal environment adjacent to or abutting the cited development. A development on land that is upland of undeveloped tidelands may impede migration of shoreline and cause coastal squeeze in the future. These developments may require an analysis of sea-level rise in their EIRs if the project is discretionary in order to evaluate the consequences of sea-level rise to cultural resources and coastal ecosystems.

Where a development is proposed on a coastline that is already developed, there may only be infrastructural consequences. In those areas, the coastal ecosystem and beaches have already been depleted. Thus, in such circumstances, CEQA's requirement that a lead agency consider sea-level rise to protect resources may not apply to developed coastlines. Much of California's recent boom in development has been concentrated in the San Francisco Peninsula. In this area, the environmental resources that an EIR would usually evaluate have already been depleted, so sea-level rise analysis in an EIR would be irrelevant.

III. INCORPORATING ANALYSIS OF SEA-LEVEL RISE INTO EIRs

CEQA provides long-term protection for environmental resources by mandating that public agencies approving projects disclose the significant environmental risks associated with those projects.³⁸ Further, agencies must either

38. CAL. PUB. RES. CODE §§ 21100, 21151 (mandating that lead agencies draft and

mitigate risks that they determine are above a threshold of significance or explain why the impact is necessary to the public good.³⁹ The purpose of the EIR process is to “[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.”⁴⁰ The OPR Guidelines acknowledge that this requires some degree of forecasting to determine future environmental risks and notes that “an agency must use its best efforts to find out and disclose all that it reasonably can” regarding future risks.⁴¹

After determining that a project is subject to CEQA, the lead agency on a project must determine whether the project will have any significant effect on the environment.⁴² If it determines that there is a significant effect, the lead agency must prepare a full EIR wherein all significant effects on the environment are analyzed and disclosed.⁴³ The purpose of an EIR “is to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided.”⁴⁴ This ensures that an EIR provides “decision makers with information they can use in deciding whether to approve a proposed project.”⁴⁵ “An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences.”⁴⁶ According to these principles of interpretation, the EIR should be drafted to include as much information as possible about present and reasonably foreseeable future environmental effects.

Despite these announced principles regarding the EIR process in general, neither the text of CEQA nor the Office of Planning and Resources Guidelines for interpreting CEQA mandate analysis of sea-level rise in an EIR. This is not dispositive. The Legislature has made clear that an EIR is “an

certify EIRs for discretionary state and private projects and setting forth what the EIR must include); CAL. CODE REGS. tit. 14, § 15002(f) (“An Environmental Impact Report (EIR) is the public document used by the governmental agency . . . to *disclose* possible ways to reduce or avoid the possible environmental damage”) (emphasis added). *See also* CAL. PUB. RES. CODE § 21065(a) (defining “project” as “an activity directly undertaken by any public agency.”); CAL. PUB. RES. CODE § 21068 (defining “significant effect on the environment” as a “substantial, or potentially substantial, adverse change in the environment.”).

39. CAL. PUB. RES. CODE § 21100.

40. CAL. CODE REGS. tit. 14, § 15002(a) (2019).

41. *Id.* at § 15144.

42. *See id.* at APPENDIX A (providing a flowchart of the CEQA process).

43. *Id.*

44. CAL. PUB. RES. CODE § 21002.1(a). The Code also sets forth the purpose of an EIR: “[t]he purpose . . . is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment” *Id.* at § 21061.

45. Laurel Heights Improvement Ass’n. of S.F. v. Regents of the Univ. of Cal., Cal. 3d 376, 394 (1988).

46. CAL. CODE REGS. tit. 14, § 15151 (2019) (detailing the “Standards for Adequacy of an EIR”).

informational document” and that “[t]he purpose of an environmental impact report is to provide public agencies and the public in general with detailed information about the effect which a proposed project is likely to have on the environment; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to such a project.”⁴⁷ In fact, CEQA should be interpreted to effect the broadest protections possible on the environment.⁴⁸

A. *Analysis of Sea-level Rise Effects on Resources Listed in Appendix G of the OPR Guidelines*

The primary effect that sea-level rise can have on the environment is coastal squeeze. When infrastructure is placed in the way of sea-level rise, it affects coastal retreat by interrupting the littoral cycle and depleting coastal resources. Our shoreline is dynamic—tons of sand move down the coast every day, placing buildings in the way of the rising sea as the coastline changes. Newly placed infrastructure prevents sand from moving down the coast, the accretion of beach land, and the shoreline from moving inland as a result of sea-level rise.⁴⁹

In an EIR, loss of beach may be evaluated under Appendix G as depletion of mineral resources or loss of habitat.⁵⁰ More controversially, an EIR could evaluate loss of beach as a depletion of public trust resources. In unpublished opinions, California Superior Courts have determined that an EIR must evaluate sea-level rise and its effects where wetland migration is impeded by a project or where groundwater supply is at risk of contamination.⁵¹ Although the collateral effects on these environmental resources are generally analyzed under other categories in Appendix G, a lead agency should follow the lead of the California courts and separately analyze sea-level rise over time with respect to the project in order to adequately disclose to the public and local government if and when beach migration or cliff erosion would be impeded by development.

1. Mineral Resources

Where a project includes an analysis of sea-level rise, that project will inherently interfere with the littoral cycle and deplete the sand budget of a littoral cell.

47. CAL. PUB. RES. CODE § 21061 (West 2016). See also CAL. CODE REGS. tit. 14, § 15003 (b–e) (2019).

48. See, e.g., *Ctr. for Biological Diversity v. Cty. of San Bernardino*, 247 Cal. App. 4th 326, 327 (2016) (“The foremost principle under CEQA is that the Legislature intended the act ‘to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language.’”) (quoting *Laurel Heights Improvement Ass’n*, 47 Cal. 3d at 394).

49. See generally, PATSCH & GRIGGS, *supra* note 23.

50. CAL. CODE REGS. tit. 14, App. G (2019).

51. E.g., *Sierra Club v. City of Oxnard*, No. 56201100401161, 2012 WL 7659201 (Cal. Super. Oct. 15, 2012). This decision is not binding. However, the court’s approach to sea-level rise and CEQA is more logical and persuasive than the court’s approach in *Ballona Wetlands*.

Appendix G of the OPR Guidelines requires that a lead agency analyze the project's significant impacts on mineral resources.⁵² An analysis of sea-level rise over time near a project should be conducted to determine whether, or approximately when, the project could interfere with the sand budget.⁵³

Coastal squeeze is caused by developing too close to the shoreline, combined with movement inland of beach. This results in loss of beach through erosion and lack of sand supply:

The coastline of California can be divided into a set of distinct, self-contained littoral cells or beach compartments. These compartments are geographically limited, and consist of a series of sand sources (such as rivers, streams, and eroding coastal bluffs) that provide sand to the shoreline, sand sinks (such as coastal dunes and submarine canyons) where sand is lost from the shoreline, and longshore transport or littoral drift that moves sand along the shoreline . . . Beach sand moves on and offshore seasonally in response to changing wave energy, and also moves alongshore, driven by waves that usually approach the beach at some angle. Most beach sand along the coast of California is transported from north to south as a result of the dominant waves approaching the shoreline from the northwest, although alongshore transport to the north occurs in some locations and at certain times of the year in response to waves from the south . . . It is the balance between the volumes of sand entering and leaving a littoral cell over the long-term that govern the long-term width of the beaches within the cell. Where sand supplies have been reduced through the construction of dams or debris basins in coastal watersheds, through armoring the sea cliffs, by mining sand or restricting littoral transport through large coastal engineering structures, the beaches may temporarily or permanently narrow.⁵⁴

Essentially, where bluffs and beaches are armored by seawalls or the development itself, the sand budget of a littoral cell is depleted. A lead agency may be required to analyze this environmental effect through the traditional resource categories in Appendix G. However, when development begins, the project's interaction with sea-level rise may not be immediately apparent. Therefore, the lead agency should analyze whether the project will, at any point during its lifetime, interact with sea-level rise.

Although the lead agency in *Ballona Wetlands* was correct to notice that the project was two miles out from the coast, sea-level rise analysis could have

52. CAL. CODE REGS. tit. 14, App. G, § XI (2016) (“Would the project: A) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?”).

53. See *The Public Trust Doctrine: A Guiding Principle for Governing California's Coast Under Climate Change*, CTR. FOR OCEAN SOLS. 2 (2017), <https://oceansolutions.stanford.edu/news-stories/public-trust-doctrine-guiding-principle-governing-californias-coast-under-climate> [https://perma.cc/QFW6-JP5H] (“California's policy makers, coastal managers, and communities increasingly recognize that the inevitable collision of sea-level rise with certain coastal development trends—what some have termed ‘coastal squeeze’—threatens California's Coast”).

54. PATSCH & GRIGGS, *supra* note 23, at 7.

been used to determine and ensure that the project would never, within its lifetime, interfere with a sand source. The ever-increasing rate of sea-level rise necessitates this type of analysis to protect mineral resources even where projects may not initially appear to be a risk to coastal resources.

2. Biological Resources

Where coastal development combines with sea-level rise to result in “coastal squeeze,” there will be a substantial reduction in habitat for wildlife species dependent upon the tidal biome. Appendix G requires assessment of impacts on wildlife and habitat that has already been designated as endangered or sensitive in a section labeled “Biological Resources.”⁵⁵ The Appendix also includes a catchall category at the end labeled “Mandatory Findings of Significance” wherein the lead agency must determine whether “the project ha[s] the potential to . . . substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant of animal community . . .”⁵⁶ If the project, over its lifetime, results in coastal squeeze, there would be a significant impact on the resources identified in this subsection of the Appendix.

3. The Public Trust

California has an affirmative and continuing duty to exercise supervision over public trust resources.⁵⁷ The public trust doctrine itself is a common law principle that reaffirms “the duty of the state to protect the people’s common heritage of streams, lakes, marshlands and tidelands, surrendering that right of protection only in rare cases.”⁵⁸ When a development could contribute to coastal squeeze by inhibiting shoreline migration or interrupting the littoral cycle, the development could interfere with the public’s right to use the land seaward of the mean high-tide line.⁵⁹ Although case law makes clear that the public trust doctrine obligates the state to protect tidelands independent of CEQA, it is unclear whether compliance with the public trust doctrine must be analyzed in an EIR, or otherwise accounted for in the CEQA review process. The purpose and structure of CEQA suggest that it is an ideal tool through which to obligate the government to consider the public trust doctrine in relation to a project. Accordingly, it would serve the needs of the people to streamline public trust review into CEQA review by adding consideration of the public trust to Appendix G of the guidelines.

55. See CAL. CODE REGS. tit. 14, App. G, § IV (2010).

56. *Id.* at § XXI.

57. See *Nat’l Audubon Soc’y v. Super. Ct.*, 33 Cal. 3d 419, 425 (1983) (“The core of the public trust doctrine is the state’s authority as sovereign to exercise a continuous supervision and control over the navigable waters of the state and the lands underlying those waters”).

58. *Id.* at 441.

59. CTR. FOR OCEAN SOLS., *supra* note 7, at 3.

In *Marks v. Whitney*, the Supreme Court held that the public trust doctrine applies to tidelands—land seaward of the mean high tide.⁶⁰ Further, the Court held that the state could consider the importance of recreational uses and conservation, such that the trust need not only exist in the traditional context of fishing and navigation.⁶¹ In fact, the very origins of the public trust doctrine in Roman law beg protection of the shores for the enjoyment of the people.⁶² Where a development could interfere with the use of a tideland for recreation and conservation of marine ecosystems, it might also interfere with resources protected by the public trust. Thus, the State has an obligation to protect those uses.

Since courts have construed CEQA to require analysis of effects on the environment, it is uncertain whether a lead agency must consider the public trust when certifying an EIR. Usually, an action for the state to consider a public trust resource is brought via an independent cause of action where plaintiffs seek injunctive relief. An allegedly deficient EIR is challenged via a petition for writ of mandate.⁶³ Neither precedent nor the OPR Guidelines confirm that a plaintiff could file a writ of mandamus specifically alleging that an EIR is deficient for failing to consider the public trust, rather than separately alleging that the state has not considered the public trust. On one hand, the purposes and disclosure mechanisms of CEQA make it a great vehicle through which to confirm that a lead agency (as a conduit for the state) has sufficiently considered the public trust. On the other hand, the court in *CBIA* made clear that CEQA must analyze a project's effects on the environment, and it eschewed expansions of CEQA to protect entities that are not environmental resources.⁶⁴ The public trust doctrine, despite effectively protecting environmental resources, is meant to protect public *uses* of certain protected resources. CEQA, however, usually mandates disclosure of impacts on *physical* environmental resources. Although the public trust doctrine is often litigated to meet an environmentally conscious end,⁶⁵ the legal principle remains grounded in common law property rights as a way to prioritize uses of property to prevent nuisance and collective action problems.⁶⁶

In *S.F. Baykeeper, Inc. v. State Lands Commission*, the First Appellate District held that an EIR regarding sand mining leases in the San Francisco Bay was

60. *Marks v. Whitney*, 6 Cal. 3d 251, 257 (1971); see also *Nat'l Audubon Soc'y*, 33 Cal. 3d at 425.

61. *Marks*, 6 Cal. 3d at 257.

62. CAESAR FLAVIUS JUSTINIAN, *THE INSTITUTES OF JUSTINIAN*, 2.1.1 (J.B. Moyle trans., 5th ed. 1913) (“Thus, the following things are by natural law common to all—the air, running water, the sea, and consequently the seashore. No one therefore is forbidden access to the seashore . . .”).

63. CAL. CIV. PROC. CODE § 1085 (West); See also CEQA: A Summary, Cal. Civ. Prac. Environmental Litigation Ch. 8 Summary).

64. *Cal. Bldg. Indus. Ass'n*, 62 Cal. 4th at 386.

65. See e.g., *Marks*, 6 Cal. 3d at 257.

66. See Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968)

inadequate because it failed to consider the public trust doctrine.⁶⁷ Rather than arguing that analysis of a project's effects on public trust resources is not required in an EIR, the State Lands Commission argued that "CEQA review eliminates the obligation to consider whether a project violates the public trust."⁶⁸ The court was unclear as to whether this evaluation of public trust resources needed to occur *in the EIR*, but it did make clear that an evaluation of the public trust doctrine by the State was required and could not be displaced by CEQA review.⁶⁹

The *S.F. Baykeeper* court relied on its prior decision in *Citizens for East Shore Parks v. State Lands Commission* to reach its conclusion.⁷⁰ There, the court held that consideration of the public trust doctrine through CEQA review was *sufficient* consideration of public trust needs, but not *necessary*.⁷¹ Nonetheless, the holding acknowledges that CEQA accepts the public trust doctrine into its legal framework.

Although CEQA requires analysis of significant impacts on the environment in an EIR, the public trust doctrine as a concept of the common law is not necessarily equivalent to "the environment." However, compliance with the public trust doctrine necessarily implicates the protection of resources listed under the definition of "environment." Development on the coastline will result in the eventual depletion of a resource held in trust by the state for the people. This occurs in two different ways.⁷² First, the proposed project could interfere with an up-current sand source.⁷³ Second, the proposed development, or armoring thereof, could interfere with the inward migration of beach ("impoundment").⁷⁴ Armoring of a bluff or beach to protect the development can affect the size of the beach through placement of the armoring ("placement loss").⁷⁵ Coastal structures can also interfere directly with beach access. Although some of these interferences would also affect mineral resources, they all implicate public trust resources.

Loss of beach necessarily has detrimental effects on other environmental resources, but the beach, which is seaward of the mean high tide, is protected

67. *S.F. Baykeeper, Inc. v. State Lands Com.*, 242 Cal. App. 4th 202, 242–43 (2015).

68. *Id.* at 235.

69. *Id.*

70. *See Citizens for E. Shore Parks v. State Lands Com.*, 202 Cal. App. 4th 549 (2011) ("Plaintiffs have cited no case, and we are aware of none, that suggests that where no change is being made to a public trust use and there has been compliance with CEQA, the public trust doctrine independently imposes an additional impact analysis requirement and requires the consideration of additional project alternatives and mitigation measures in connection with other public trust uses.").

71. *Id.*

72. Gary B. Griggs, *The Effects of Armoring Shorelines—The California Experience*, in *PUGET SOUND SHORELINES AND THE IMPACTS OF ARMORING—PROCEEDINGS OF A STATE OF THE SCIENCE WORKSHOP, MAY 2009* 77, 80 (Hugh Shipman et al. ed., 2009).

73. *Id.*

74. *Id.*

75. *Id.*

by the public trust doctrine. In this context, the public trust doctrine states that the state of California holds the navigable waters and the lands underlying those waters in trust for the people of the state.⁷⁶ Therefore, the state is obligated to protect these resources and to consider them in its decisionmaking. What remains undetermined, however, is whether a lead agency must consider the public trust in a CEQA determination.

While case law is inconclusive about the interaction between CEQA and the public trust doctrine, streamlining review of the public trust by combining it with CEQA review would serve both efficiency and the CEQA principle of full disclosure. Further, the relationship between the public trust uses and the availability of natural resources is too intertwined to argue that review of the public trust is not required as part of a CEQA determination.

4. The *Sierra Club v. City of Oxnard* Approach

Some lower courts have reasoned that sea-level rise analysis in an EIR is required only where it will affect more tangible environmental resources so that courts can avoid considering the public trust. For example, the Orange County Superior Court held that analysis of sea-level rise was required where the development might affect the inland migration of wetlands.⁷⁷ There, the lead agency (the City of Oxnard) certified a final EIR for a mixed-use development that would require an amendment to the City's general and specific plan.⁷⁸ That development was located 3.4 miles inland of a wetland area, where a wetland restoration plan would be completed in the future by the state coastal conservancy.⁷⁹ The City addressed sea-level rise in the FEIR only to the extent necessary to dismiss public comments, and declined to analyze the effects of sea-level rise fully.⁸⁰ Although the EIR noted that the sea-level would rise 1.6–6.6 feet in the next hundred years, the EIR did not map or analyze sea-level rise because it would not be possible to determine what the effect of the projects on the uncompleted wetlands preservation plan could be.⁸¹

The court relied on three main arguments for holding that sea-level rise analysis was required in this narrow situation.⁸² First, the court argued that sea-level rise analysis in this instance was not reverse-CEQA because sea-level rise would have direct effects on environmental resources. Second, the court argued that sea-level rise should be analyzed so that an EIR may disclose to the public the effects on these resources (in this case, wetlands) over time. The court recognized that “the research [on sea-level rise] all points in the

76. MARKS, 6 Cal. 3d 251 (1971).

77. *Sierra Club v. City of Oxnard*, No. 56201100401161, 2012 WL 7659201, 50–51 (Cal. Super. Oct. 15, 2012).

78. *Id.*

79. *Id.* at 13.

80. *Id.* at 14.

81. *Id.*

82. *Id.* at 47–50.

same direction, and that direction is the creation of a new paradigm in CEQA coastal land use analysis.”⁸³ The court further held that an EIR needs to consider not only the project’s immediate effect upon adjacent coastal wetlands but the projected long-term effect upon expected coastal wetlands migration over the project’s life.⁸⁴ Deferring analysis of sea-level rise would be deferred mitigation, and that the public has a right to know about wetland migration with respect to the project.⁸⁵ Third, the court held both that the reverse-CEQA paradigm did not fit this situation, as it involved the significant effects of the project on the environment.⁸⁶ The court did, however, note that if the case were inserted into that paradigm at all, it would fit an exception to the general rule: “Beyond the ultimate loss of coastal wetlands, as the coastal wetland moves inland toward the [project], the previously studied effects of the [project] upon those wetlands will likely be exacerbated.”⁸⁷

The court’s approach may also be applied where sea-level rise could cause a development to impact on environmental resources. In *Sierra Club v. Oxnard*, a wetland was at issue, but there are other environmental resources that would be similarly affected when a project is in the way of sea-level rise. For instance, where a project falls below mean high tide or comes into the path of a 100-year storm, there could be significant effects on the environmental resources listed in OPR’s Appendix G. Analysis of sea-level rise in an EIR is a way for a lead agency to disclose to public officials and citizens exactly when the project will come into contact with the mean high tide line, and how likely that is to occur within the project’s lifetime. The court in *Sierra Club v. Oxnard* applied this holding to assert that sea-level rise analysis should be conducted to determine the project’s *expected* impact on *future* wetland migration. This same rationale could be applied to protect other resources in natural habitats on the coastline such as mineral resources, biological resources, and resources protected by the public trust doctrine.

CONCLUSION

In order to adequately forecast a development’s environmental impacts, an EIR should evaluate whether the development will impede the inland migration of shoreline caused by sea-level rise. Where a development impedes shoreline migration, there will be onerous burdens on protected environmental resources. Local governments have regulatory tools aside from CEQA that they can use to affect positive coastal land use planning that considers accurate estimates of sea-level rise. More specifically, where an EIR is required for a discretionary project, CEQA becomes a unique tool for uniform disclosure of risk.

83. *Sierra Club*, 2012 WL 7659201, at 47.

84. *Id.*

85. *Id.* at 49–50.

86. *Id.*

87. *Id.*