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September 15, 2017

Alvin K.C. Au  
Interim Executive Director  
Oahu Metropolitan Planning Organization  
Ocean View Center  
707 Richards Street, Suite 200  
Honolulu, HI 96813

Re: Oahu Metropolitan Planning Organization ("OMPO") Citizen Advisory  
Committee Bylaws.

Dear Mr. Au:

We have the following comments to the draft of the OMPO Citizen Advisory  
Committee bylaws:

1. Were Section 4 and 5 on pages 3 – 4 intentionally deleted?<sup>1</sup> If so: (1) what will be the applicable time frame to submit a Membership Reinstatement Application form; and (2) when will the reinstatement to the CAC membership be effective; and (3) what happens if an incomplete application is submitted?
2. Section B.2 on page 6, second sentence provides that "If the Chair asks for a motion to declare the seat vacant, and none is made, the provisions of this section have been fulfilled. It is not clear what provisions are fulfilled if no motion is made.
3. Section B.3. on page 7 makes reference to "Committee" and "Citizen Advisory Committee." These references should be revised to "CAC" to be consistent with the rest of the document.

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<sup>1</sup> The reference to page numbers in this memo is based on the red-lined version of the draft bylaws.

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Alvin K.C. Au  
September 15, 2017  
Page 2

4. Section D on page 8: Section III.B.1-6 is titled “Member Absences, Removal Process, and Resignation” (not “Member Organizations’ Responsibilities”).

5. Section III.E.9 on page 11 references to “Section IV.A.7” but there is no such section in the draft bylaws.

6. Section III.E.10 on page 11, last sentence, addresses voting privileges and cites Section III.B. Member Organizations’ Rights and Privileges. The voting provisions, however, are found in Section III.C.1 on page 8 and Section IV.C on page 14 (Section III.B. addresses member absences, removal, and resignation – it does not address voting privileges).

Please call me at 587-2981 if you have any questions.

Very truly yours,



Michael Q.Y. Lau  
Deputy Attorney General



T.S.M.04.21  
17-14034

August 24, 2017

Mr. William J. Wynhoff, Esq.  
Deputy Attorney General Supervisor  
Land/Transportation Division  
Department of the Attorney General  
465 South King Street  
Honolulu, Hawaii 96813

Attn: Mr. Michael Q.Y. Lau, Esq., Deputy Attorney General

**Oahu Metropolitan Planning Organization  
Citizen Advisory Committee Bylaws**

Dear Mr. Wynhoff:

With this letter, we are transmitting copies of both the current and proposed Citizen Advisory Committee Bylaws (proposed revisions shown in red). We respectfully ask for your review and opinion of the legality and form of the proposed revisions to the bylaws.

If you have further questions, please contact Ms. Kiana Otsuka, Transportation Planner, at 586-2305.

Sincerely,

Alvin K.C. Au  
Interim Executive Director

c: Kiana Otsuka

2017 AUG 24 P 2:54  
LAND/TRANSPORTATION DIV.  
ATTORNEY GENERAL

# **BYLAWS OF THE CITIZEN ADVISORY COMMITTEE**

**FOR THE  
OAHU METROPOLITAN PLANNING ORGANIZATION**

**Approved by the  
OahuMPO Policy Committee  
on January 26, 2009**

**Amended by the  
OahuMPO Policy Committee  
February 22, 2011**

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## **I. GENERAL PROVISIONS**

### **A. Definition**

The Citizen Advisory Committee, hereinafter referred to as the "CAC", for the Oahu Metropolitan Planning Organization, hereinafter referred to as the "OahuMPO", shall consist of non-governmental organizations and City and County of Honolulu neighborhood boards as approved for CAC membership by the Policy Committee.

The CAC shall be broadly based, include minorities and disadvantaged groups, reflected through the composition of its member organizations, and have an interest in and concern for the transportation planning process.

### **B. Purpose**

The CAC shall be a vehicle whereby public input can be solicited to advise the Policy Committee and the OahuMPO Executive Director on transportation planning issues in accordance with the OahuMPO Participation Plan; and a means of keeping citizen's groups and the public informed of the aims and progress of the cooperative, comprehensive, and continuing transportation planning process.

### **C. Non-Member Participation**

Non-Member organizations and individuals may participate in all CAC activities without the privileges as stated in item *III. B. Member Organizations' Rights and Privileges*.

## **II. CAC MEMBERSHIP**

### **A. Eligibility Requirements**

1. To assure that organizations interested in applying for membership for the first time are committed to attending CAC meetings, such an organization shall earn at least four attendance credits within the twelve months prior to submitting a membership application.
2. Organizations applying for reinstatement following their removal from the CAC shall earn at least six attendance credits within the twelve months prior to submitting a membership reinstatement application.
3. Attendance credits earned during an organization's active membership shall not be applied toward reinstatement attendance requirements.

### **B. Earning of Attendance Credits**

1. "Attendance Credit" shall be defined as credit earned by signing in for one organization at any regularly scheduled CAC meeting.
2. An organization may earn only one attendance credit at each meeting.
3. Should an individual sign in as the designated representative for more than one organization at the same meeting, attendance credit will only be awarded to one organization.
4. Member organizations shall not receive attendance credits if the person signing in for its organization is not said organization's designated representative, alternate, or presiding officer as stated in *Section III.A.1. Member Organizations' Responsibilities*.
5. Only organizations may earn attendance credits.

### **C. Membership Requests**

1. Each organization seeking initial CAC membership shall submit to OahuMPO an official OahuMPO CAC Initial Membership Application form (provided by the OahuMPO staff). This form shall be accompanied by a cover letter printed on the organization's official letterhead, signed and dated by its presiding officer or authorized representative.
2. The completed initial application and cover letter must be sent to the OahuMPO office no later than two months after earning four OahuMPO attendance credits within a twelve-month period. The organization's appointment to the CAC shall become effective immediately following the Policy Committee's approval of said request.
3. Each organization seeking reinstatement as a CAC member shall submit to OahuMPO an official OahuMPO Membership Reinstatement Application form (provided by the OahuMPO staff). This form shall be accompanied by a cover letter printed on the organization's official letterhead, signed and dated by its presiding officer or authorized representative.
4. The completed Membership Reinstatement Application form and cover letter must be sent to the OahuMPO office no later than two months after earning six attendance credits within a twelve-month period. The organizations' reinstatement to the CAC membership shall become effective immediately following the Policy Committee's approval of the request.

5. Applications found to be incomplete will be returned to the originating organization, along with notification that the application was incomplete. The application must be completed and resubmitted before the request for membership will be processed. Any resubmitted application(s) must be received by the OahuMPO within the two-month period following the return of the original incomplete application submittal to the originating organization.

### **III. RULES AND PROCEDURES FOR MEMBER ORGANIZATIONS**

#### **A. Member Organizations' Responsibilities**

1. The presiding officer or authorized representative of each member organization shall designate, in writing, a representative to serve on the CAC, and reaffirm its representative in writing at the beginning of each calendar year (from January 1 through December 31). Such designation must be received by the OahuMPO no later than 24 hours prior to the first regularly scheduled CAC meeting of the calendar year. If no designation is made prior to that meeting, the presiding officer of the member organization shall serve as the designated representative for said organization until notification identifying a designated representative is received by the OahuMPO.
2. The member organization's representative serving on the CAC, hereinafter referred to as "designated representative", shall be entitled to the rights and privileges of its member organization as stated in *Section III.B. Member Organizations' Rights and Privileges*.

3. Designation of an alternate(s) shall be subject to the same provisions as the designation of a member representative (See Section III.A.I). Designation of more than one alternate shall be in sequential order of authority to represent its member organization (i.e., alternate #1, alternate #2) and identified in writing to the OahuMPO.
4. In the absence of its designated representative, an alternate (in sequence), if available, shall serve as the designated representative for its member organization and shall be entitled to the same rights and privileges as the designated representative.
5. In the absence of its designated representative and alternate(s), the presiding officer of the member organization shall serve as the designated representative for said organization.
6. Any changes in member organization information, including the designated representative and alternate(s), shall be made by the presiding officer or authorized representative of the member organization and shall be sent to the OahuMPO in writing. The notification shall reach the OahuMPO office at least 24 hours prior to any meeting(s) for which the organization wishes to earn attendance credit(s) or exercise the organization's voting rights.
7. In order to retain CAC membership, each member organization shall earn attendance credits for participation in at least 50 percent or six, whichever is less, of the regularly scheduled CAC meetings during each calendar year.

8. If a member organization misses three consecutive regularly scheduled CAC meetings, they may be subject to being placed on probation by the Chair of the CAC at the next regularly scheduled meeting.
9. Member organizations that do not meet the attendance requirement as stated in Section III.A.7 during each calendar year will be placed on probation. The OahuMPO staff will notify organizations with deficient attendance of their probationary status at the conclusion of each calendar year.
10. Member organizations on probation must attend at least four regularly scheduled CAC meetings within the six months following probation notification to retain membership.
11. Member organizations on probation that fail to attend at least four regularly scheduled CAC meetings within six months of probation notification will be automatically removed from the CAC.
12. Designated representatives are responsible for reporting to and from their organizations regarding transportation matters and issues.
13. The CAC shall request and receive the approval of the Policy Committee or Executive Committee before testifying before a legislative body as representing the CAC. If said request is approved, the testimony shall be submitted to the Chair of the Policy Committee, through the OahuMPO Executive Director, for approval prior to being publicly released. The approved testimony shall reflect a majority opinion of the CAC membership. Nothing in these rules shall prevent a member organization from presenting independent testimony on behalf of its own organization without reference to its CAC affiliation.

14. The CAC shall not issue press releases.

**B. Member Organizations' Rights and Privileges**

1. Only member representatives may move and second formal motions, cast votes, serve on subcommittees of the CAC, and serve as CAC officers.
2. Each member organization shall be entitled to one copy, free of charge, of the following OahuMPO documents: the Oahu Regional Transportation Plan, the Transportation Improvement Program, and the Overall Work Program. The designated representative shall be given said document for its member organization.

**C. Termination of An Organization's Membership**

1. Member organizations may be terminated due to deficient attendance, as stated in *Section III.A.7-11, Member Organizations' Responsibilities*.
2. Member organizations may also be removed from the CAC at any time by the Policy Committee or by written request from the presiding officer or authorized representative of the member organization itself.

**D. Officers and Their Duties**

1. The officers of the CAC shall be a Chair and Vice Chair elected annually by the designated representatives. Each officer's term shall be for one calendar year. No member shall serve more than two consecutive years as Chair or more than two consecutive years as Vice Chair.

2. The election of Chair and Vice Chair will be scheduled for the first meeting of each calendar year, and may be rescheduled in subsequent meeting(s) until a Chair and Vice Chair are elected. Designated representatives will have the opportunity to cast their votes for each officer utilizing a roll-call voting system. The candidate receiving at least 50 percent of the votes cast will assume the position for which she or he was elected. In the event that no candidate receives the necessary number of votes to win the election, the two candidates receiving the highest number of votes will become the only candidates in the subsequent vote.
3. In the event that no Chair or Vice Chair has been elected at the adjournment of the first CAC meeting of the calendar year, the terms of the presiding officers shall be extended until such a time as new officers are elected.
4. The Vice Chair shall preside in the absence of the Chair. If both the Chair and Vice Chair are absent, the Chair, prior to the meeting, shall appoint a *pro tempore* officer from the CAC membership. If the Chair fails to designate a *pro tempore* officer, the members present may select a *pro tempore* officer either from the CAC membership or from the OahuMPO staff.
5. Should a vacancy occur in the office of the Chair, the Vice Chair shall complete the unexpired term of the Chair. The CAC shall then elect a successor to fill the unexpired term of the Vice Chair.
6. Should a vacancy occur in the office of the Vice Chair, the CAC shall elect a successor to fill the unexpired term.

7. The Chair shall have general supervision over the affairs of the CAC. The Chair shall perform such other duties which include, but are not limited to:
  - a. Scheduling meetings as set forth in item *IV. Conduct of Business*.
  - b. Preparing the agenda and notifying all members and interested parties.
  - c. Opening all meetings at the appointed hour, calling all meetings to order, and adjourning all meetings.
  - d. Conducting the meeting in accordance with the current edition of *Robert's Rules of Order* where *Bylaws of the CAC for the OahuMPO* are silent.
  - e. Authenticating by his/her signature all acts of and doings by the CAC, when necessary.
  - f. Attending and representing the CAC at Policy Committee meetings.
  - g. Transmitting CAC views to the Policy Committee and the OahuMPO Executive Director.
  - h. Receiving all CAC communications and presenting them to the CAC.
  - i. Participating in Policy Committee meeting discussions, if so approved by the Policy Committee.
  - j. Reporting relevant Policy Committee meeting discussions and actions to the CAC.
8. The Chair may designate members to represent the CAC in matters pertaining to the duties and functions of the CAC.
9. The Chair may appoint special or standing subcommittees as needed. (See Section IV.A.7)

#### **IV. CONDUCT OF BUSINESS**

##### **A. Meetings**

1. The CAC shall hold regular meetings at a day, time, and area of the island chosen by the Chair with consideration of the majority preferences of the CAC as determined by an annual written poll. The location for the meetings shall be arranged by the OahuMPO staff.
2. The presence of 30 percent of the total membership shall constitute a quorum and is required for any meeting of the CAC to be held.
3. The agenda shall be set, meeting notifications shall be posted, and meetings shall be conducted in accordance with the current edition of *Robert's Rules of Order*, only in cases where *Bylaws of the CAC for the OahuMPO* or Chapter 92 of the *Hawaii Revised Statutes* and applicable laws are silent.
4. The agenda for each meeting shall be set by the Chair in consultation with the OahuMPO Executive Director.
5. The agenda may be modified by a vote of two-thirds of the entire membership.
6. Agenda items may be proposed by any member organization for consideration by the CAC Chair.
7. Subcommittees of the CAC may be formed either by the Chair's designation or by a motion approved by the CAC. Subcommittee membership shall be less than a quorum of the total CAC membership. Participation and voting privileges are extended only to designated representatives of member organizations, as stated in *Section III.B Member Organizations' Rights and Privileges*.

8. Special meetings of the CAC may be called at any time by the Chair or by a majority of the total membership. Notice of said meeting shall be made in accordance with the requirements of Chapter 92 of the *Hawaii Revised Statutes* and applicable laws.
9. The CAC shall promote full participation through discussion by members of the public, as well as by member organizations. In order to provide for the orderly conduct of a meeting, persons wishing to present lengthy statements of position on agenda items shall notify the CAC Chair of their intention in advance. Statements should be to the point and as brief and clear as possible. At the discretion of the CAC Chair, statements on non-agenda items that have pertinence to CAC activities may be accepted after all other agenda items have been covered or may be placed on a subsequent meeting's agenda.
10. Persons wishing to distribute relevant materials at a CAC meeting should indicate their intention to the CAC Chair within a reasonable amount of time prior to the start of the meeting. Materials having no immediate pertinence to the CAC activities shall not be distributed at a CAC meeting.
11. All CAC meetings shall be open to the public.

**B. Voting Procedures**

1. Only designated representatives may move and second formal motions, and cast votes.

2. Each member organizations having a designated representative present at a meeting of the CAC shall be allowed one vote on each issue. A concurrence of the majority of the votes cast shall be necessary to make any action of the CAC valid. A quorum, as identified in *Section IV.A.4 Conduct of Business*, must be present when a vote is taken. Abstentions shall not be counted as a vote.

**C. Minutes**

1. Minutes shall be kept for all meetings and distributed in accordance with Chapter 92 of the *Hawaii Revised Statutes*.
2. Copies of the approved minutes shall be made available to the public at the business office of the OahuMPO as stated in the *OahuMPO Office Policy Regarding Duplication and Distribution of Meeting Materials*.

**V. AMENDMENTS**

**A. Bylaws Amendments**

1. The CAC may recommend amendments to the *Bylaws of the CAC for the OahuMPO* to the OahuMPO Policy Committee.
2. The *Bylaws of the CAC for the OahuMPO* may only be amended by the Policy Committee.

**VI. RULES OF ORDER**

**A. Parliamentary Authority**

The current edition of *Robert's Rules of Order* shall govern only in cases where the *Bylaws of the CAC for the OahuMPO* or Chapter 92 of the *Hawaii Revised Statutes* are silent.

***This report was funded in part through grants from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. The views and opinions of the agency expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.***

**2017**  
**REVISED BYLAWS OF THE**  
**CITIZEN ADVISORY COMMITTEE**

FOR THE  
OAHU METROPOLITAN PLANNING ORGANIZATION

*(with proposed 2016 & 2017 bylaws shown in red)*

**Approved by the**  
**OahuMPO Policy Board**  
**on January 26, 2009**

**Amended by the**  
**OahuMPO Policy ~~Committee~~ Board**  
**Month Day, 2017**



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## I. GENERAL PROVISIONS

### A. Definition

The Citizen Advisory Committee, hereinafter referred to as the “CAC,” for the Oahu Metropolitan Planning Organization, hereinafter referred to as the “OahuMPO,” shall consist of non-governmental organizations and City and County of Honolulu neighborhood boards as approved for CAC membership by the ~~Policy Committee~~ Policy Board. The CAC shall be broadly based, include minorities and disadvantaged groups, reflected through the composition of its member organizations, and have an interest in and concern for the transportation planning process.

### B. Purpose

The CAC shall be a vehicle whereby public input can be solicited to advise the ~~Policy Committee~~ Policy Board and the OahuMPO Executive Director on transportation planning issues in accordance with the OahuMPO Participation Plan; and a means of keeping citizens’ groups and the public informed of the aims and progress of the cooperative, comprehensive, and continuing transportation planning process. The CAC Chair or designated representative shall provide input on important matters raised at CAC meetings to the Policy Board at regular scheduled meetings or by written report.

### C. Non-Member Participation

Non-Member organizations and individuals may participate in all CAC activities without the privileges as stated in item III.~~BC~~. *Member Organizations’ Rights and Privileges.*

## II. CAC MEMBERSHIP

### A. Eligibility Requirements

1. To assure that organizations interested in applying for membership for the first time are committed to attending CAC meetings, such an organization shall earn at least four attendance credits within the twelve months prior to submitting a membership application.
2. Organizations applying for reinstatement following their removal from the CAC shall earn at least six attendance credits within the twelve months prior to submitting a membership reinstatement application.
3. ~~Attendance credits earned during an organization's active membership shall not be applied toward reinstatement attendance requirements~~

### B. Earning of Attendance Credits

1. "Attendance Credit" shall be defined as credit earned by signing in for one organization at any regularly scheduled CAC meeting.
2. An organization may earn only one attendance credit at each meeting.
3. ~~Should an individual sign in as the designated representative for more than one organization at the same meeting, attendance credit will only be awarded to one organization~~ No individual may sign in as a representative for more than one organization.
4. Member organizations shall not receive attendance credits if the person signing in for its his or her organization is not said organization's designated representative, alternate, or presiding officer as stated in *Section III.A.1. Member Organizations' Responsibilities.*

5. Only organizations may earn attendance credits.

### C. Membership Requests

1. Each organization seeking initial CAC membership shall submit to OahuMPO an official OahuMPO CAC Initial Membership Application form (provided by the OahuMPO staff). This form shall be accompanied by a cover letter printed on the organization's official letterhead, signed and dated by its presiding officer or authorized representative.
2. The completed initial application and cover letter must be sent to the OahuMPO office no later than two months after earning four OahuMPO attendance credits within a twelve-month period. The organization's appointment to the CAC shall become effective immediately following the **Policy Committee Policy Board's** approval of said request.
3. Each organization seeking reinstatement as a CAC member shall submit to OahuMPO an official OahuMPO Membership Reinstatement Application form (provided by the OahuMPO staff). This form shall be accompanied by a cover letter printed on the organization's official letterhead, signed and dated by its presiding officer or authorized representative.

~~4. The completed Membership Reinstatement Application form and cover letter must be sent to the OahuMPO office no later than two months after earning six attendance credits within a twelve-month period. The organizations' reinstatement to the CAC membership shall become effective immediately following the Policy Committee Policy Board's approval of the request.~~

*Why was the deleted? What time from to submit? When effective?*

~~5. Applications found to be incomplete will be returned to the originating organization, along with notification that the application was incomplete. The application must be completed and resubmitted before the request for membership will be processed. Any resubmitted application(s) must be received by the OahuMPO within the two-month period following the return of the original incomplete application submittal to the originating organization.~~

Why  
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### III. RULES AND PROCEDURES FOR MEMBER ORGANIZATIONS

#### A. Member Organizations' Responsibilities

1. The presiding officer or authorized representative of each member organization shall designate, in writing, a representative to serve on the CAC, ~~and reaffirm its representative in writing at the beginning of each calendar year (from January 1 through December 31).~~ Such designation must be received by the OahuMPO no later than 24 hours prior to the first regularly scheduled CAC meeting of the calendar year. If no designation is made prior to that meeting, the presiding officer of the member organization shall serve as the designated representative for said organization until notification identifying a designated representative is received by the OahuMPO.
2. The member organization's representative serving on the CAC, hereinafter referred to as "designated representative," shall be entitled to the rights and privileges of its member organization as stated in *Section III.B.C. Member Organizations' Rights and Privileges.*

3. Designation of an alternate(s) shall be subject to the same provisions as the designation of a member representative (See Section III.A.I). ~~Designation of more than one alternate shall be in sequential order of authority to represent its member organization (i.e., alternate #1, alternate #2) and identified in writing to the OahuMPO.~~
4. In the absence of its designated representative, an alternate ~~(in sequence), if available,~~ shall serve as the designated representative for its his or her member organization and shall be entitled to the same rights and privileges as the designated representative.
5. In the absence of its designated representative and alternate(s), the presiding officer of the member organization shall serve as the designated representative for said organization.
6. Any changes in member organization information, including the designated representative and alternate(s), shall be made by the presiding officer or authorized representative of the member organization and shall be sent to the OahuMPO in writing. The notification shall reach the OahuMPO office at least 24 hours prior to any meeting(s) for which the organization wishes to earn attendance credit(s) or exercise the organization's voting rights.
7. Designated representatives are responsible for reporting to and from their organizations regarding transportation matters and issues.
8. The CAC shall request and receive the approval of the Policy Board or Executive Committee before testifying before a legislative body as representing the CAC. If said request is approved, the testimony shall be submitted to the Chair of the

Policy Board, through the OahuMPO Executive Director, for approval prior to being publicly released. The approved testimony shall reflect a majority opinion of the CAC membership. Nothing in these rules shall prevent a member organization from presenting independent testimony on behalf of its own organization without reference to its CAC affiliation.

9. The CAC shall not issue press releases.

**B. Member Absences, Removal Process, and Resignation**

1. If a CAC member is absent for three regular CAC meetings during the calendar year, the OahuMPO Executive Director shall notify the member of the absences in writing sent by both email and mail at the member's last known email address and mailing address, not less than seven calendar days prior to the regular board meeting that is held immediately after the CAC member's third absence unless the third absence occurs at the last regularly scheduled meeting for the applicable term.
2. The notice shall inform the organization of the accumulated three absences, and that the CAC will consider whether to remove the organization based on their absences and declare the seat vacant, at the next scheduled meeting. If the Chair asks for a motion to declare the seat vacant, and none is made, the provisions of this section have been fulfilled. A motion to retain the organization is never in order.
3. A CAC member who has accumulated three absences and received written notice from the OahuMPO Executive Director shall have the opportunity to appear before the CAC to explain the circumstances of their absences and

What does this mean?

request to be retained on the CAC. After hearing the matter, the Committee may act to remove your organization from the Citizen Advisory Committee.

4. The CAC shall not adopt any policy providing for the automatic removal of an organization based on absences; it must take a specific action to declare an organization's removal from the CAC.
5. So long as an organization remains on the CAC, the CAC shall continue to formally consider removal of the organization pursuant to subsections III.B.1-5, whenever the member accumulates an additional two absences during the calendar year.
6. A CAC member may resign from the CAC at any time and for any reason in writing to the OahuMPO Executive Director. The Executive Director shall provide a copy to the board chair.
- ~~7. In order to retain CAC membership, each member organization shall earn attendance credits for participation in at least 50 percent or six, whichever is less, of the regularly scheduled CAC meetings during each calendar year.~~
- ~~8. If a member organization misses three consecutive regularly scheduled CAC meetings, they may be subject to being placed on probation by the Chair of the CAC at the next regularly scheduled meeting.~~
- ~~9. Member organizations that do not meet the attendance requirement as stated in Section III.A.7 during each calendar year will be placed on probation. The OahuMPO staff will notify organizations with deficient attendance of their probationary status at the conclusion of each calendar year.~~

~~10. Member organizations on probation must attend at least four regularly scheduled CAC meetings within the six months following probation notification to retain membership.~~

~~11. Member organizations on probation that fail to attend at least four regularly scheduled CAC meetings within six months of probation notification will be automatically removed from the CAC.~~

### C. Member Organizations' Rights and Privileges

1. Only member representatives may move and second formal motions, cast votes, serve on subcommittees of the CAC, and serve as CAC officers.
2. Each member organization shall be entitled to one copy, free of charge, of the following OahuMPO documents: the Oahu Regional Transportation Plan, the Transportation Improvement Program, and the Overall Work Program. The designated representative shall be given said document for its member organization.

### D. Termination of an Organization's Membership

1. Member organizations may be terminated due to deficient attendance, as stated in Section ~~III.A.7-11~~ III.B.1-6, Member-Organizations' Responsibilities. *Member Absence, Removal Process, and Resignation*
2. A member organizations' representatives may be removed from the CAC at any time by the ~~Policy Committee~~ Policy Board or the CAC Chair for disruptive behavior. Member organizations may be removed by request of an authorized representative of the organization.

### E. Officers and Their Duties

1. The officers of the CAC shall be a Chair and Vice Chair elected annually by the designated representatives. Each officer's term shall be for one calendar year. No member shall serve more than two consecutive years as Chair or more than two consecutive years as Vice Chair.
2. The election of Chair and Vice Chair will be undertaken as scheduled for the first agenda item of the first meeting of each calendar year, and may be rescheduled in subsequent meeting(s) until a Chair and Vice Chair are elected. Designated representatives will have the opportunity to cast their votes for each officer utilizing a show of hands, unless a member requests a roll-call vote voting system. The candidate receiving at least 50 percent plus one of the votes cast will assume the position for which she or he was elected. In the event that no candidate receives the necessary number of votes to win the election, the two candidates receiving the highest number of votes will become the only candidates in the subsequent vote.
3. In the event that no Chair or Vice Chair has been elected at the adjournment of the first CAC meeting of the calendar year, the terms of the presiding officers shall be extended until such a time as new officers are elected.
4. The Vice Chair shall preside in the absence of the Chair. If both the Chair and Vice Chair are absent, the Chair, prior to the meeting, shall appoint a pro tempore officer from the CAC membership. If the Chair fails to designate a pro tempore officer, the members present may select a pro tempore officer either from the CAC membership or from the OahuMPO staff.
5. Should a vacancy occur in the office of the Chair, the Vice Chair shall complete

the unexpired term of the Chair. The CAC shall then elect a successor to fill the unexpired term of the Vice Chair.

6. Should a vacancy occur in the office of the Vice Chair, the CAC shall elect a successor to fill the unexpired term.
7. The Chair shall have general supervision over the affairs of the CAC. The Chair shall perform such other duties that include, but are not limited to:
  - a. Scheduling meetings as set forth in item *IV. Conduct of Business*.
  - b. Preparing the agenda and notifying all members and interested parties.
  - c. Opening all meetings at the appointed hour, calling all meetings to order, and adjourning all meetings.
  - d. Conducting the meeting in accordance with the current edition of *Robert's Rules of Order* where *Bylaws of the CAC for the OahuMPO* are silent.
  - e. Authenticating by his/her signature all acts of and doings by the CAC, when necessary.
  - f. Attending and representing the CAC at ~~Policy-Committee~~ Policy Board meetings.
  - g. Transmitting CAC views to the ~~Policy-Committee~~ Policy Board and the OahuMPO Executive Director.
  - h. Receiving all CAC communications and presenting them to the CAC.
  - i. Participating in ~~Policy-Committee~~ Policy Board meeting discussions, if so approved by the ~~Policy-Committee~~ Policy Board.
  - j. Reporting relevant ~~Policy-Committee~~ Policy Board meeting discussions and actions to the CAC.

8. The Chair may designate members to represent the CAC in matters pertaining to the duties and functions of the CAC.
9. The Chair may appoint chairs to special, or standing subcommittees, or permitted interaction groups, as needed. (See Section IV.A.7) ?
10. Subcommittees and Permitted Interaction Groups of the CAC may be formed either by the Chair's designation or by a motion approved by the CAC. Subcommittee and Permitted Interaction Group membership shall be less than a quorum of the total CAC membership. Voting privileges are extended only to designated representatives of member organizations, as stated in Section III.B Member Organizations' Rights and Privileges. Non-CAC members may participate in sub-committees in an ex-official/non-voting capacity.

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voting

#### IV. CONDUCT OF BUSINESS

##### A. Order of Business

1. The business of the CAC shall be taken up for consideration and disposition in the following order:
  - Call to order by Chair
  - Roll call
  - Approval of minutes of previous meeting
  - Reports of ~~Policy Committee~~ Policy Board and Technical Advisory Committee meetings
  - Unfinished business
  - New business

- Invitation to interested members of the public to be heard on matters not included in the agenda
  - Announcements
  - Announcement of next scheduled meeting
  - Adjournment
2. The CAC Chair may alter the order of the agenda if there are no objections. If there are objections, a majority vote of the members present will be required to change the order.

## **B. Meetings**

1. The CAC shall hold regular meetings at a date, time, and area of the island chosen by the Chair with consideration of the **majority known** preferences of the CAC as determined by an annual written poll. The location for the meetings shall be arranged by the OahuMPO staff.
2. The presence of 30 percent of the total membership shall constitute a quorum and is required for any meeting of the CAC to be held.
3. The agenda shall be set, meeting notifications shall be posted, and meetings shall be conducted in accordance with the current edition of *Robert's Rules of Order*, only in cases where *Bylaws of the CAC for the OahuMPO* or Chapter 92 of the *Hawaii Revised Statutes* and applicable laws are silent.
4. The agenda for each meeting shall be set by the Chair in consultation with the OahuMPO Executive Director.
5. The agenda may be modified by a vote of two-thirds of the entire membership, **except for the election of the Chair and Vice Chair at the first meeting of the**

new calendar year.

6. Agenda items may be proposed by any member organization for consideration by the CAC Chair.
7. ~~Subcommittees of the CAC may be formed either by the Chair's designation or by a motion approved by the CAC. Subcommittee membership shall be less than a quorum of the total CAC membership. Participation and Voting privileges are extended only to designated representatives of member organizations, as stated in Section III.B Member Organizations' Rights and Privileges. Non-CAC members may participate in sub-committees in an ex-official/non-voting capacity.~~
8. Special meetings of the CAC may be called at any time by the Chair or by a majority of the total membership. Notice of said meeting shall be made in accordance with the requirements of Chapter 92 of the *Hawaii Revised Statutes* and applicable laws.
9. The CAC shall promote full participation through discussion by members of the public, as well as by member organizations. In order to provide for the orderly conduct of a meeting, persons wishing to present lengthy statements of position on agenda items shall notify the CAC Chair of their intention in advance. Statements should be to the point and as brief and clear as possible. At the discretion of the CAC Chair, public statements on agenda or non-agenda items may be subject to time limits to allow for all speakers and subsequent agenda matters. Topics not fully covered may be placed on a subsequent meeting agenda to allow sufficient time for continued discussions.

10. Persons wishing to distribute relevant materials at a CAC meeting should indicate their intention to the CAC Chair within a reasonable amount of time prior to the start of the meeting. Materials having no immediate pertinence to the CAC activities shall not be distributed at a CAC meeting.

11. All CAC meetings shall be open to the public.

**C. Voting Procedures**

1. Only designated representatives may move and second formal motions, and cast votes.
2. Each member organization having a designated representative present at a meeting of the CAC shall be allowed one vote on each issue. A concurrence of the majority of the votes cast shall be necessary to make any action of the CAC valid. A quorum, as identified in *Section IV.A.4 B.2 ~~Conduct of Business Meetings~~*, must be present when a vote is taken. Abstentions shall not be counted as a vote.

**D. Minutes**

1. Minutes shall be kept for all meetings and distributed in accordance with Chapter 92 of the *Hawaii Revised Statutes*.
2. Copies of the approved minutes shall be made available to the public at the business office of the OahuMPO as stated in the OahuMPO *Office Policy Regarding Duplication and Distribution of Meeting Materials*.

**V. AMENDMENTS**

**A. Bylaws Amendments**

1. The CAC may recommend amendments to the *Bylaws of the CAC for the OahuMPO* to the OahuMPO ~~Policy Committee~~ Policy Board.
2. The *Bylaws of the CAC for the OahuMPO* may only be amended by the ~~Policy Committee~~ Policy Board.

## VI. RULES OF ORDER

### A. Parliamentary Authority

The current edition of *Robert's Rules of Order* shall govern only in cases where the *Bylaws of the CAC for the OahuMPO* or Chapter 92 of the *Hawaii Revised Statutes* are silent.



## **Sea Level Guidance**

*City and County of Honolulu – Climate Change Commission*

Adopted: June 5, 2018

The Climate Change Commission consists of five members with expertise in climate change in Hawai'i. The Climate Change Commission was created after O'ahu voters approved an amendment to the City Charter in the 2016 general election that also mandated the creation of the Office of Climate Change, Sustainability and Resiliency. The role of the Climate Change Commission is to gather the latest science and information on climate change impacts to Hawai'i and provide advice and recommendations to the mayor, City Council, and executive departments as they look to draft policy and engage in planning for future climate scenarios.

<https://www.resilientoahu.org/about-the-commission/>



Figure 1. Left Global mean sea level. Right North Pacific mean sea level.

Source: <https://www.aviso.altimetry.fr/en/data/products/ocean-indicators-products/mean-sea-level/products-images.html>

### KEY POINTS

- 1) Global sea level is projected to rise by the end of this century 1.0 to 4.3 ft (0.3 to 1.3 m). This includes 0.3 to 0.6 ft (0.09 to 0.18 m) by 2030, and 0.5 to 1.2 ft (0.15 to 0.36 m) by 2050. Sea-level rise is extremely likely to continue beyond 2100.
- 2) Extreme tide flooding will develop decades ahead of these milestones, very likely before mid-century. Extreme tides will erode beaches, interfere with traffic flow, and when it rains lead to extensive and disruptive flooding.
- 3) The 2017 Hawai'i Sea Level Rise Vulnerability and Adaptation Report found that with 3.2 ft (0.98 m) of sea level rise this century on O'ahu: 9400 acres of land (over half of which is designated for urban uses) will experience chronic flooding, erosion, and/or high wave impacts; \$12.9 billion in assets are threatened; 13,300 residents will be displaced; 3,880 structures will be flooded; and 17.7 miles of major road will be flooded.
- 4) Native Hawaiian cultural sites, loko i'a, Hawaiian Home Lands, and kalo lo'i are threatened with flooding and erosion by sea level rise.
- 5) O'ahu has lost more than 5 miles of beaches to coastal erosion fronting seawalls and other shoreline armoring. Many more miles of beach could be lost with sea level rise, if widespread armoring is allowed.
- 6) The Honolulu Climate Change Commission recommends the following actions for all C&C departments and agencies:
  - a. Utilize the 2017 Hawai'i Sea Level Rise Vulnerability and Adaptation Report and online viewer for baseline planning activity and infrastructure assessment and development.
  - b. Establish a 3.2 ft sea level rise exposure area (3.2SLR-XA) as a planning benchmark and revise the SMA to include the area.
  - c. Plan for high tide flooding in the 3.2SLR-XA by mid-century.
  - d. Establish a 6 ft sea level rise in the later decades of the century exposure area (6SLR) as a planning benchmark for critical infrastructure with long expected lifespans and low risk tolerance.
  - e. Adopt these areas as hazard overlays for planning, require disclosure in all transactions and on city property information sheets, and direct all city departments and agencies to adopt them in their plans and activities.
  - f. Support all relevant City departments and agencies with adequate resources and capacity to implement these recommendations and proactively plan for sea level rise.

## PURPOSE

Pursuant to the Revised Charter of Honolulu ("RCH") Section 6-107(h), the City and County of Honolulu ("City") Climate Change Commission is charged with gathering the latest science and information on climate change impacts to Hawai'i and providing advice and recommendations to the mayor, City Council, and executive departments as they look to draft policy and engage in planning for future climate scenarios and reducing Honolulu's contribution to global greenhouse gas emissions. This report provides a description of findings and recommendations with regard to adapting to sea level rise.

## INTRODUCTION

There has been considerable detailed research on the global and local implications of accelerating sea level rise. This report by the City Climate Change Commission builds on findings in the Hawai'i Sea Level Rise Vulnerability and Adaptation Report (2017), Sweet et al. (2017), USGCRP (2017), Sweet et al. (2018), and other scientific literature to provide specific policy and planning guidance on responding to sea level rise by the City.

## SUMMARY OF KEY FINDINGS

1. The projected median global temperature increase this century is 5.8°F (3.2°C).<sup>1</sup>
  - a. The likely range of global temperature increase is 3.6 to 8.8°F (2.0 to 4.9°C), with a 5% chance that it will be less than 3.6°F (2°C) and a 1% chance that it will be less than 2.7°F (1.5°C) by the end of this century.<sup>2</sup>
2. Relative to the year 2000, the projected rise of global mean sea level (GMSL) by the end of this century is 1.0 to 4.3 ft (0.3 to 1.3 m).<sup>3</sup>
  - a. Relative to the year 2000, GMSL is very likely (90 to 100% confidence) to rise 0.3 to 0.6 ft (0.09 to 0.18 m) by 2030, 0.5 to 1.2 ft (0.15 to 0.36 m) by 2050, and 1.0 to 4.3 ft (0.3 to 1.3 m) by 2100.<sup>4</sup>
3. High tide flooding will arrive decades ahead of any GMSL rise scenario.<sup>5</sup>
  - a. Table 1 (supplementary information) provides estimates of when minor high tide flooding will arrive in Honolulu 6, 12, and 24 days per year.
  - b. Based on the location of the Honolulu Tide Station,<sup>6</sup> high tide flooding will occur by mid-century, and as early as 2028, at least two dozen times per year, at certain locations in the 3 2SLR-XA.<sup>8</sup>
4. Modeling results, as mapped in the Hawai'i Sea Level Rise Viewer,<sup>b</sup> reveal a critical elevation in GMSL rise between 2.0 and 3.2 ft (0.6 to 1 m) relative to mean higher high water.<sup>c</sup>
  - a. This is a critical range of rising sea level where there is a rapid increase in the amount of land exposed to hazards on low-lying coastal plains, such as characterize the urbanized south shore of O'ahu.
  - b. This is a dangerous elevation range, where reacting after the fact to establish adaptation strategies is likely to be less successful and costlier than taking proactive measures.
5. Globally, energy-related carbon dioxide emissions are projected to grow an average 0.6% per year between 2015 and 2040, 1.3% per year below the level from 1990 to 2015.<sup>7</sup>
6. Future emission pathways have little effect on projected GMSL rise in the first half of the century, but significantly affect projections for the second half of the century.<sup>8</sup>
  - a. Table 2 (supplementary information) provides estimates of projected GMSL under NOAA scenarios.<sup>9</sup>
7. Regardless of emissions pathway, it is extremely likely (95 to 100% confidence) that GMSL rise will continue beyond 2100.<sup>10</sup>
8. The world's major ice systems including Antarctica and Greenland,<sup>11</sup> and the mountain glaciers<sup>12</sup> of the world are all in a state of decline.

<sup>a</sup> "SLR-XA" is an acronym that stands for *sea level rise-exposure area*. The Hawai'i Sea Level Rise Vulnerability and Adaptation Report (2017) recommends (p. 217) that the SLR-XA at 3.2 ft (0.98 m) of sea level rise be recognized as a state-wide vulnerability zone and that it be employed by agencies to formulate comprehensive adaptation strategies. 3.2 ft (0.98 m) of sea level rise is modeled by Church et al. (2013) as the worst case scenario at the end of the century. However, the scenario does not take into account potential instability in marine-based sectors of the Antarctic ice sheet.

<sup>b</sup> The online Hawai'i Sea Level Rise Viewer is served by the Pacific Islands Ocean Observing System at the School of Ocean and Earth Science and Technology, University of Hawai'i at Mānoa: <http://www.pacioos.hawaii.edu/shoreline/slr-hawaii/>

<sup>c</sup> Mean higher high water (MHHW) is the average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch, a 19 year period determined by the National Oceanic and Atmospheric Administration.

- a. Research indicates that on multiple occasions over the past three million years, when global temperatures increased 1.8 to 5.4°F (1 to 3°C), melting polar ice sheets caused global sea levels to rise at least 20 ft (6 m) above present levels.<sup>13</sup>
  - b. If atmospheric warming exceeds 2.7 to 3.6°F (1.5 to 2°C) above present (ca. 2015), collapse of the major Antarctic ice shelves triggers a centennial- to millennial-scale response of the Antarctic ice sheet that produces a long-term commitment (an unstoppable contribution) to sea-level rise.<sup>14</sup> Substantial Antarctic ice loss can be prevented only by limiting greenhouse gas emissions to RCP2.6<sup>4</sup> levels. Higher-emissions scenarios lead to ice loss from Antarctica that will raise sea level by 1.9 to 9.8 ft (0.6 to 3 m) by the year 2300.<sup>15</sup>
  - c. Antarctica has the potential to contribute more than 3.28 ft (1 m) of sea-level rise by 2100 and more than 49.2 ft (15 m) by 2500, if emissions continue unabated. In this case atmospheric warming will soon become the dominant driver of ice loss, but prolonged ocean warming will delay its recovery for thousands of years.<sup>16</sup>
  - d. Emerging science regarding Antarctic ice sheet stability suggests that under high emission pathways, a GMSL rise exceeding 8 ft (2.4 m) by 2100 is physically possible.<sup>17</sup>
  - e. The Greenland ice sheet is more sensitive to long-term climate change than previously thought. Studies<sup>18</sup> estimate that the warming threshold leading to an essentially ice-free state is in the range of 1.4 to 5.8°F (0.8 to 3.2°C), with a best estimate of 2.9°F (1.6°C) above preindustrial levels. The Arctic is on track to double this amount of warming before mid-century.<sup>19</sup>
  - f. Further melting of mountain glaciers cannot be prevented in the current century - even if all emissions were stopped now.<sup>20</sup> Around 36% of the ice still stored in mountain glaciers today will melt even without further emissions of greenhouse gases. That means: more than one-third of the glacier ice that still exists today in mountain glaciers can no longer be saved even with the most ambitious measures.
9. Rising seas threaten human communities and natural ecosystems in multiple ways.
- a. Urbanized coastal areas become increasingly vulnerable to four types of flooding during high water and high wave events:
    - 1) Flooding across the shoreline due to wave run-up.
    - 2) Saltwater intrusion of engineered drainage systems.
    - 3) Groundwater inundation.<sup>21</sup>
      - a) Intrusion of buried infrastructure and other buried assets that are not sealed.
      - b) Formation of new wetlands, initially concurrent with high tide.
    - 4) Rainstorms, especially concurrent with high tide.
  - b. Land loss and coastal erosion.
    - 1) If the back-beach area is composed of sand-rich dunes, sandy paleo shoreline deposits, or high wave sand berms, the released sand nourishes the retreating beach.
    - 2) If the back-beach area is hardened, a beach is prevented from retreating. This leads to beach erosion, beach narrowing, and beach loss. Hardening has caused at least 5.4 mi (8.7 km) of beach loss on O'ahu.<sup>22</sup>
  - c. Saltwater will intrude streams and coastal wetlands, increasing the salinity of the environment and threatening low-lying agriculture (e.g., kalo farming) and wildlife sanctuaries.
  - d. Wave, and eventually still water overtopping of Loko I'a kuapā (fishpond walls) will increase.
    - 1) Interior circulation will change (including at mākāhā).
    - 2) Upland discharge into the pond will change.
    - 3) Fishpond connections to the shore will become unstable.
  - e. Wave energy at the shore will increase.
    - 1) Muddy shore deposits may be released.
  - f. Damaging flooding will increase when hurricanes, tsunamis, and seasonal high waves strike.
  - g. Annual high waves, which arrive in Hawai'i seasonally, will flood further landward and cause more damage, as sea level continues to rise.

<sup>4</sup> To provide guidance for developing mitigation and adaptation strategies, scientists have defined four different 21<sup>st</sup> century pathways of greenhouse gas emissions called "RCP's" for Representative Concentration Pathways. The RCP's include a stringent mitigation scenario (RCP2.6), two intermediate scenarios (RCP4.5 and RCP6.0), and one scenario with very high greenhouse gas emissions (RCP8.5).

## RECOMMENDATIONS

Given the tools available to planners, stakeholders and policy-makers with the Hawai'i Sea Level Rise Viewer, the NOAA SLR Viewer, and the Climate Central–Surging Seas Risk Finder,<sup>a</sup> the City Climate Change Commission, pursuant to RCH Section 6-107(h), recommends that:

1. The mayor, City Council, and executive departments of the City utilize the 2017 Hawai'i Sea Level Rise Vulnerability and Adaptation Report (hereafter "Report") and online Viewer, for baseline planning activity and infrastructure assessment and development with regard to sea level rise.
2. The research finds that it is reasonable to set as a planning benchmark up to 3.2 ft (~1 m; 3.2SLR-XA) of GMSL rise by mid-century as it will be an area experiencing chronic high tide flooding.
3. The research finds that it is reasonable to set as a planning benchmark up to 6 ft (1.8 m; 6SLR) of GMSL rise in the later decades of the century, especially for critical infrastructure with long expected lifespans and low risk tolerance, as it will be an area experiencing chronic high tide flooding.
4. The Special Management Area (SMA) boundary be revised to include parts of the 3.2SLR-XA that are not currently in the SMA.
5. Disclosure of all lands be required in the 3.2SLR-XA and 6SLR.
  - a. Disclosure on all real estate sales, City Property Information Sheets, and all other real estate transactions.
6. The 3.2SLR-XA and 6SLR be adopted as a vulnerability zone (hazard overlay) for planning by the City.
  - a. The hazard overlays should be used for planning purposes, for example in the general plan, all development plans, and sustainable community plans.
7. That all City departments and agencies be directed to use the Report, the 3.2SLR-XA, and the 6SLR in their plans, programs, policies, and capital improvement decisions, to mitigate impacts to infrastructure and critical facilities related to sea level rise.
8. All ordinances related to land development, such as policy plans and regulations should be reviewed and updated, as necessary.
9. Relevant City departments and agencies be supported with adequate resources and capacity to implement these recommendations and proactively plan for sea level rise, as it will rapidly become a major challenge to City functions.

The City Climate Change Commission adopts the precautionary principle and a scenario-based planning approach and supports these recommendations as planning targets informed by the best available science. This set of recommendations are important each and in their own right and are designed to complement each other and be implemented together. Implementing one does not eliminate the need to adopt the others. The City Climate Change Commission fully acknowledges that there is uncertainty in the timing and magnitude of sea level rise projections globally and for Hawai'i. This is a living document that will be updated as additional information becomes available.

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<sup>a</sup> Surging Seas Viewer: [https://riskfinder.climatecentral.org/county/honolulu-county-hi.us?comparisonType=postal-code&forecastType=NOAA2017\\_int\\_p50&level=3&unit=ft](https://riskfinder.climatecentral.org/county/honolulu-county-hi.us?comparisonType=postal-code&forecastType=NOAA2017_int_p50&level=3&unit=ft)

**SUPPLEMENTARY INFORMATION**

NOAA has published a model of high tide flooding for the Honolulu Tide Station (Sweet et al., 2018). Relative to MHHW, the threshold for minor high tide flooding is 1.7 ft (0.52 m), for moderate high tide flooding is 2.6 ft (0.8 m), and for major high tide flooding is 3.8 ft (1.17 m). High tide flooding will arrive decades ahead of global mean sea level rise.

High tide flooding, as defined by NOAA, has never occurred at the Honolulu Tide Station as none of these thresholds has ever been crossed. Table 1 provides estimates of when minor high tide flooding will arrive in Honolulu 6, 12, and 24 days per year using the NOAA model.

Table 1 - When will minor (0.52 m) high tide flooding occur in Honolulu?			
Scenario	6 x per year	12 x per year	24 x per year
Intermediate Scenario	2038	2041-2042	2044-2045
Intermediate High Scenario	2030	2033	2035-2036
High Scenario	2025-2026	2028-2029	2030-2031
Extreme Scenario	2024	2026	2028-2029

Because of the exponential nature of the NOAA sea level scenarios, the doubling time of high tide flooding is rapid in all scenarios. High tide flooding events are likely to cluster around the summer and winter solstices. High tide flooding will occur first at certain locations in the 3.2SLR-XA as defined in the Hawai'i Sea Level Rise Vulnerability and Adaptation Report (2017).

High tide flooding can take several forms. Beach erosion will be pronounced during high tide flooding events. Storm drain flooding will occur where marine water blocks drainage and spills out onto the street, or where runoff cannot drain and causes flooding around storm drain sites. Groundwater inundation will develop where the water table rises to break the ground surface and creates a wetland.

At first this flooding will be most common when high tide and precipitation occur simultaneously, but eventually will occur without precipitation at high tide. Rainfall that occurs at high tide when storm drains are blocked and the ground is saturated will lead to widespread flooding. Marine flooding will occur at high tide when seawater flows across the shoreline. Wave flooding will occur at high tide during typical seasonal swell events as waves run-up past the shoreline and into the backshore. Tsunami and storm surge occurring at high tide will cause greater flood damage than historically.

Global mean sea level will rise 3.2 ft (~1 m) relative to the year 2000. NOAA (Sweet et al., 2017) has published scenarios that provide estimates, by decade, of when GMSL will hit this benchmark (Table 2).

Table 2 - When will global mean sea level rise 3.2 feet (~1 m)?	
Intermediate Scenario	end of the century
Intermediate High Scenario	decade of the 2080's
High Scenario	decade of the 2070's
Extreme Scenario	decade of the 2060's

Gravitational forces will cause regional sea level in the North Central Pacific to rise above the global mean (Spada et al., 2015). NOAA suggests planners use higher scenarios for large projects with low risk tolerance. This recommendation is also made by the U.S. Army Corps of Engineers.

Modeling of sea level rise impacts on O'ahu (Report) reveals the following:

1. Homes and businesses on Oahu's shorelines will be severely impacted by sea level rise. Nearly 4,000 structures will be chronically flooded with 3.2 ft (~1 m) of sea level rise (Figure 1).
2. Of the 9,400 acres of land located within the 3.2SLR-XA, over half is designated for urban land uses, making O'ahu the most vulnerable of all the islands.

- With 3.2 ft (~1 m) of sea level rise, almost 18 mi (30 km) of Oahu's coastal roads will become impassible, jeopardizing access to and from many communities.
- O'ahu has lost more than 5 mi (8 km) of beaches to coastal erosion fronting seawalls and other shoreline armoring. Many more miles of beach will be lost with sea level rise if widespread armoring is allowed. In the Report, Chapter 5 (Recommendations) explores opportunities to reduce beach loss by improving beach protection policies.
- A more detailed economic loss analysis is needed of Oahu's critical infrastructure, including harbor facilities, airport facilities, sewage treatment plants, and roads. State and County agencies should consider potential long-term cost savings from implementing sea level rise adaption measures as early as possible (e.g., relocating infrastructure sooner than later) compared to the cost of maintaining and repairing chronically threatened public infrastructure.

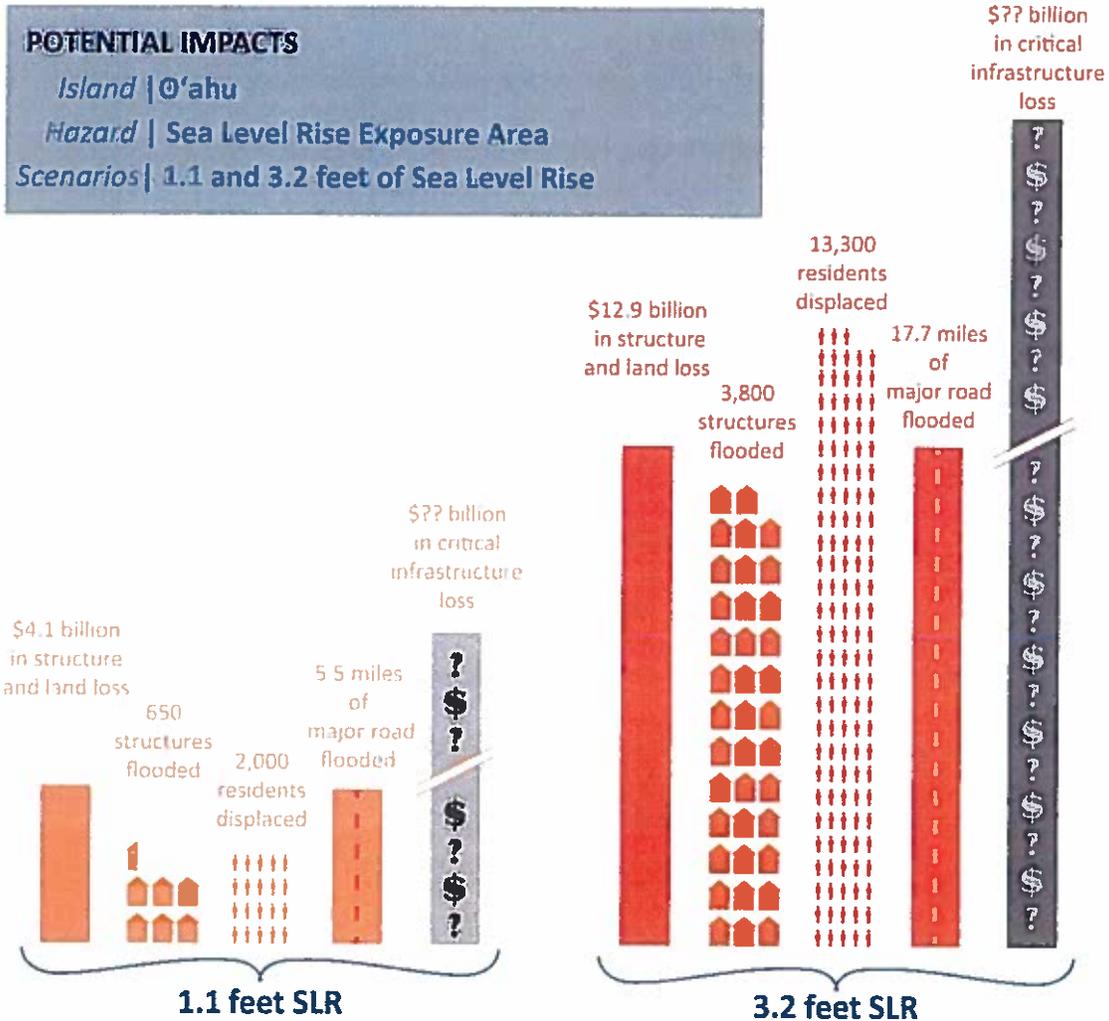


Figure 1. Sea level rise impacts on O'ahu.

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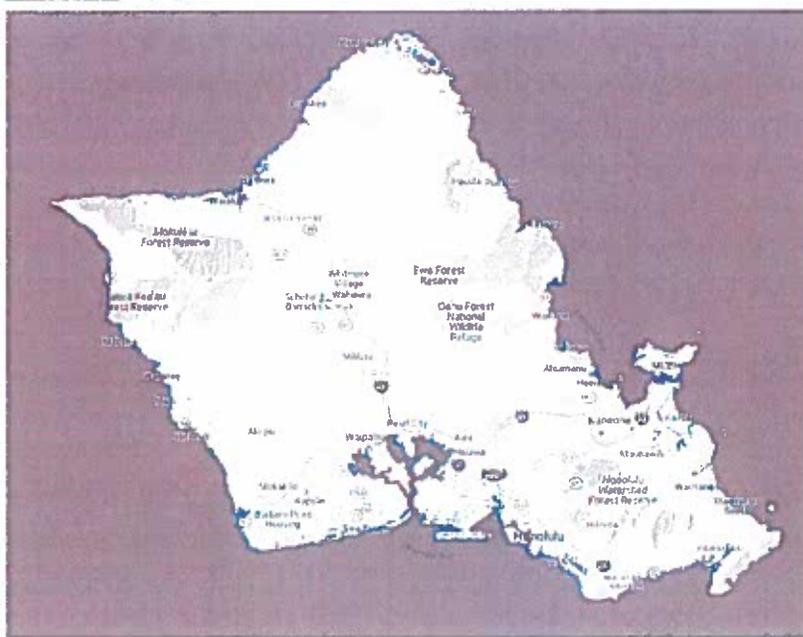


Figure 2.3 2SLR-XA island-wide.

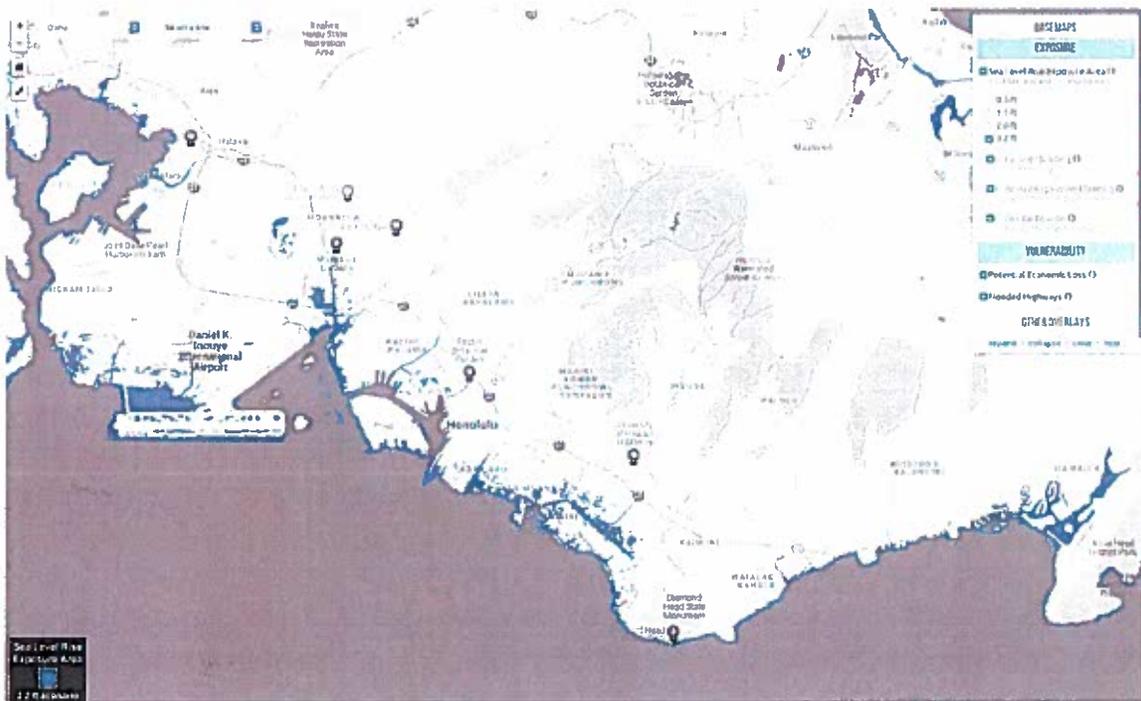


Figure 3. 2SLR-XA primary urban corridor and south shore.

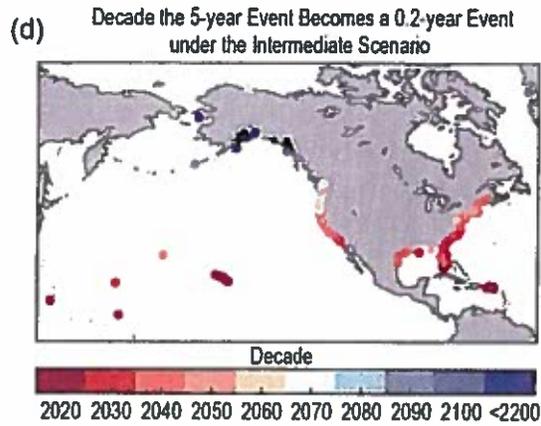


Figure 4. NOAA model for high tide flooding; decade the 5-year king tide becomes the 5 times per year king tide (2020).

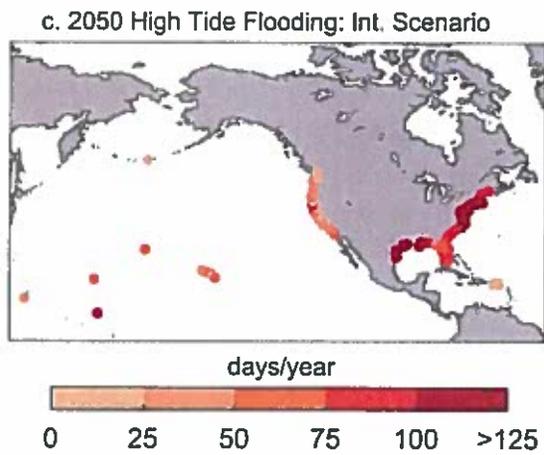


Figure 5. NOAA model for high tide flooding; by mid-century under the intermediate scenario, high tide flooding is occurring 50-75 days per year.

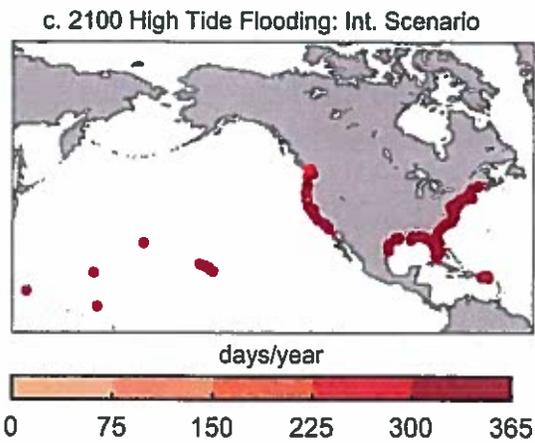
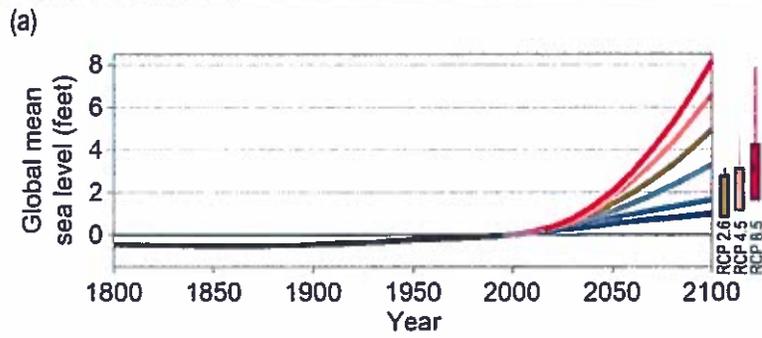


Figure 6. NOAA model for high tide flooding; by end of the century under the intermediate scenario, high tide flooding occurs every day.



(b) Projected Relative Sea Level Change for 2100 under the Intermediate Scenario

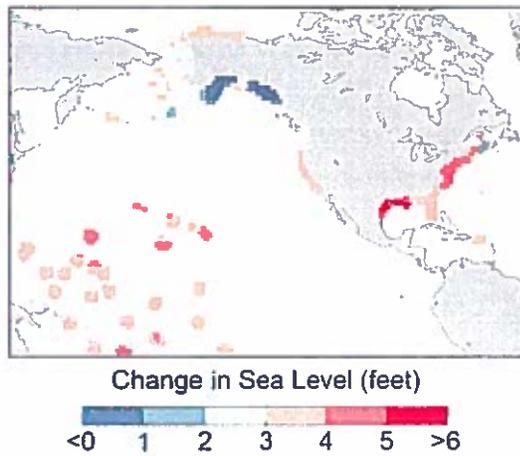


Figure 7. NOAA sea level rise scenarios.

Table 5. GMSL rise scenario heights in meters for 19-year averages centered on decade through 2200 (showing only a subset after 2100) initiating in year 2000. Only median values are shown.

GMSL Scenario (meters)	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2120	2150	2200
Low	0.03	0.06	0.09	0.13	0.16	0.19	0.22	0.25	0.28	0.30	0.34	0.37	0.39
Intermediate-Low	0.04	0.08	0.13	0.18	0.24	0.29	0.35	0.4	0.45	0.50	0.60	0.73	0.95
Intermediate	0.04	0.10	0.16	0.25	0.34	0.45	0.57	0.71	0.85	1.0	1.3	1.8	2.8
Intermediate-High	0.05	0.10	0.19	0.30	0.44	0.60	0.79	1.0	1.2	1.5	2.0	3.1	5.1
High	0.05	0.11	0.21	0.36	0.54	0.77	1.0	1.3	1.7	2.0	2.8	4.3	7.5
Extreme	0.04	0.11	0.24	0.41	0.63	0.90	1.2	1.6	2.0	2.5	3.6	5.5	9.7

Figure 8. NOAA sea level rise scenarios timeframe.



# **Climate Change Brief**

*City and County of Honolulu – Climate Change Commission*

Adopted: June 5, 2018

The Climate Change Commission consists of five members with expertise in climate change in Hawai'i. The Climate Change Commission was created after O'ahu voters approved an amendment to the City Charter in the 2016 general election that also mandated the creation of the Office of Climate Change, Sustainability and Resiliency. The role of the Climate Change Commission is to gather the latest science and information on climate change impacts to Hawai'i and provide advice and recommendations to the mayor, City Council, and executive departments as they look to draft policy and engage in planning for future climate scenarios.

<https://www.resilientoahu.org/about-the-commission/>

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## PURPOSE

Pursuant to the Revised Charter of Honolulu ("RCH") Section 6-107(h), the City and County of Honolulu ("City") Climate Change Commission is charged with gathering the latest science and information on climate change impacts to Hawai'i and providing advice and recommendations to the mayor, City Council, and executive departments as they look to draft policy and engage in planning for future climate scenarios and reducing Honolulu's contribution to global greenhouse gas emissions.

To establish the factual basis and broad impact of climate change, the City Climate Change Commission adopts this CLIMATE CHANGE BRIEF 2018. This document describes the local, regional, and global impacts of climate change as documented by the peer-reviewed scientific literature and credible empirical data sources. It provides a benchmark for the commission, attesting to our concern, underpinning our decisions and recommendations, and serving to inform those we serve.

The information in this report reinforces the need for an urgent and sweeping transformation in our energy sources, food systems, and land-use practices to achieve a decarbonized world economy. Mitigation of future climate change must be achieved to avoid the very worst aspects of global warming. In the words of Dr. Jim Hansen, former chief scientist at the NASA Goddard Institute of Space Science, "There is a possibility, a real danger, that we will hand young people and future generations a climate system that is practically out of their control... we have a global emergency. Fossil fuel CO<sub>2</sub> emissions should be reduced as rapidly as practical."<sup>1</sup>

Because many changes in global biogeochemical systems have been irreversibly set into motion, and these threaten the health and welfare of human populations, it is important that the City and County of Honolulu take bold steps to reduce greenhouse gas emissions and build sustainability and resilience in the face of a rapidly changing climate.

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## INTRODUCTION

Excess heat, trapped by the anthropogenic greenhouse gases carbon dioxide, methane, nitrous oxide, and others in the atmosphere, is causing dramatic changes in ecosystems, the ocean, weather patterns, and other climate-dependent aspects of Earth's surface. Hawai'i, and other Pacific islands are impacted, and these impacts are growing.<sup>2</sup>

The negative impacts of climate change fall disproportionately on disadvantaged groups in a type of "vicious cycle":<sup>3</sup> Initial inequity or vulnerabilities can be exacerbated by climate change; for example, low income people are less likely to have air conditioning and can be much more susceptible to the effects of a heat wave. This in turn lowers the ability of already disadvantaged groups to cope and recover. It is important to recognize and resolve the impacts of climate change on vulnerable populations as the City pivots to meet the challenges of climate change.

Unrelenting impacts to Earth's ecosystems<sup>4</sup> and natural resources have led researchers to conclude that our planet is perched on the edge of a tipping point<sup>5</sup>, a planetary-scale critical transition resulting from human impacts.<sup>6</sup> These changes include the following.

### CARBON DIOXIDE

- Carbon dioxide levels in the air have passed 410 ppm compared to a natural level of 280 ppm<sup>7</sup> – an increase of over 45%. This is the highest level in millions of years.<sup>8</sup>
- Today, release of planet-warming carbon dioxide is ten times faster than the most rapid event in the past 66 million years, when an asteroid impact killed the dinosaurs.<sup>9</sup>

### TEMPERATURE

- Global temperature has risen approximately 1.8°F (1°C) from the late 19<sup>th</sup> Century.<sup>10</sup>
- The likely global temperature increase this century is a median 5.76°F (3.2°C). There is only a 5% chance that it will be less than 3.6°F (2°C), and a 1% chance that it will

be less than 2.7°F (1.5°C).<sup>11</sup>

- The last time it was this warm, 125,000 years ago, global sea level was 20 ft (6.6 m) higher.<sup>12 13 14</sup>
- Atmospheric humidity is rising.<sup>15</sup>
- The global water cycle has accelerated.<sup>16</sup>
- Air temperature over the oceans is rising.<sup>17</sup>

### HAWAII – LOCAL AND REGIONAL IMPACTS

#### *Air Temperature*

- In Hawai'i, the rate of warming air temperature has increased in recent decades. Currently, the air is warming at 0.3°F (0.17°C) per decade, four times faster than half a century ago.<sup>18</sup>
- Statewide, average air temperature has risen by 0.76°F (0.42°C) over the past 100 years, and 2015 and 2016 were the warmest years on record.<sup>19</sup>

structures. This adversely impacts coral reefs and threatens marine ecosystems more broadly.<sup>46</sup>

- In Hawai'i, extended periods of coral bleaching did not first occur until 2014 and 2015 as part of the 2014–17 global scale bleaching event that was the longest ever recorded.<sup>47</sup>
- Ocean warming and acidification are projected to cause annual coral bleaching in some areas, like the central equatorial Pacific Ocean, as early as 2030 and almost all reefs by 2050.<sup>48</sup> This will not only devastate local coral reef ecosystems but will also have profound impacts on ocean ecosystems in general. Ultimately it will threaten the human communities and economies that depend on a healthy ocean.<sup>49</sup>

#### **Sea Level Change**

- The mean sea level trend at the Honolulu tide station is 0.055 in (1.41 mm) per year with a 95% confidence interval of  $\pm 0.008$  in (0.21 mm) per year based on monthly mean sea level data, 1905 to 2015. This is equivalent to a change of 0.46 ft (14.0 cm) over the past century.<sup>50</sup>
- The frequency of high tide flooding in Honolulu since the 1960's, has increased from 6 days per year to 11 per year.<sup>51</sup>
- With 3.2 ft (0.98 m) of sea level rise, 25,800 acres experience chronic flooding, erosion, and/or high wave impacts. One third of this land is designated for urban use. Impacts include 38 mi (61 km) of major roads, and more than \$19 billion in assets.<sup>52</sup>
- Due to global gravitational effects, estimates of future sea level rise in Hawai'i and other Pacific islands are about 20%–30% higher than the global mean.<sup>53</sup>
- Over 70% of beaches in Hawai'i are in a state of chronic erosion.<sup>54</sup> This is likely related to long term sea level rise as well as coastal hardening.<sup>55, 56</sup>
- Coastal hardening of chronically eroding beaches caused the combined loss of 9% (13.4 mi, 21.5 km) of the length of sandy beaches on Kaua'i, O'ahu, and Maui.<sup>57</sup>

#### **Indigenous Communities**

- Indigenous populations will be disproportionately impacted by climate change due to their strong ties to place and greater reliance on natural resources for sustenance.<sup>58</sup>
- About 550 Hawaiian cultural sites are exposed to chronic flooding with a sea level rise of 3.2 ft (0.98 m).<sup>59</sup>
- Sea level rise impacts on traditional and customary practices (including fishpond maintenance, cultivation of salt, and gathering from the nearshore fisheries) have been observed.<sup>60</sup>
- Because of flooding and sea level rise, indigenous practitioners have had limited access to the land where salt is traditionally cultivated and harvested since 2014.

Detachment from traditional lands has a negative effect on the spiritual and mental health of the people.<sup>61</sup>

- Ocean warming and acidification, sea level rise and coastal erosion, drought, flooding, pollution, increased storminess, and over-development are negatively affecting tourism, fisheries, and forested ecosystems. This directly impacts the livelihood and security of Pacific communities. For example, across all Pacific Island countries and territories, industrial tuna fisheries account for half of all exports, 25,000 jobs, and 11% of economic production.<sup>62</sup> In Hawai'i, between 2011 and 2015, an annual average of 37,386 Native Hawaiians worked in tourism-intensive industries; based on the 2013 U.S. census, this number represents 12.5% of the Native Hawaiian population residing in Hawai'i.<sup>63</sup>
- In Hawai'i, climate change impacts, such as reduced streamflow, sea level rise, saltwater intrusion, episodes of intense rainfall, and long periods of drought, threaten the ongoing cultivation of taro and other traditional crops.<sup>64</sup>

#### **GLOBAL ECOSYSTEMS**

- Climate change impacts have been documented across every ecosystem on Earth, including shifts in species ranges, shrinking body size, changes in predator-prey relationships, new spawning and seasonal patterns, and modifications in the population and age structure of marine and terrestrial species.<sup>65</sup>
- In 2017 over 15,000 scientists published a "Warning to Humanity".<sup>66</sup> They said humans have pushed Earth's ecosystems to their breaking point and are well on the way to ruining the planet.
- Human activities have increased the acidity of oceans; increased the acidity of freshwater bodies and soils because of acid rain; increased acidity of freshwater streams and groundwater due to drainage from mines; and increased acidity of soils due to added nitrogen to crop lands.<sup>67</sup>
- Researchers have labeled ecosystem impacts "biological annihilation," and identify that a "sixth major mass extinction" is underway as a result of dwindling population sizes and range shrinkages among vertebrates.<sup>68</sup>
- Humans are causing the climate to change 170 times faster than natural forces.<sup>69</sup>
- Tree lines are shifting poleward and to higher elevations.<sup>70</sup>
- One-third of burnt forests experience no tree regeneration at all.<sup>71</sup>
- Species are migrating poleward and to higher elevations.<sup>72</sup>
- Spring is coming sooner to some plant species in the Arctic while other species are delaying their emergence amid warm winters. The changes are associated with diminishing sea ice.<sup>73</sup>

levels. Higher-emissions scenarios lead to ice loss from Antarctica that will raise sea level by 1.9 to 9.8 ft (0.6 to 3 m) by the year 2300.<sup>114</sup>

- If emissions continue unabated, Antarctica has the potential to contribute more than 3.28 ft (1 m) of sea-level rise by 2100 and more than 49.2 ft (15 m) by 2500. In this case, atmospheric warming will soon become the dominant driver of ice loss, but prolonged ocean warming will delay its recovery for thousands of years.<sup>115</sup>
- The Greenland ice sheet is more sensitive to long-term climate change than previously thought. Studies<sup>116</sup> estimate that the warming threshold leading to an essentially ice-free state is in the range of 1.4 to 5.8°F (0.8 to 3.2°C), with a best estimate of 2.9°F (1.6°C) above preindustrial levels. The Arctic is on track to double this amount of warming before mid-century.<sup>117</sup>
- Cloud cover over Greenland is decreasing at 0.9 +/- 3% per year. Each 1% of decrease drives an additional 27 +/- 13 billion tons of ice melt each year.<sup>118</sup>
- Further melting of mountain glaciers cannot be prevented in the current century - even if all emissions were stopped now.<sup>119</sup> Around 36% of the ice still stored in mountain glaciers today will melt even without further emissions of greenhouse gases. That means: more than one-third of the glacier ice that still exists today in mountain glaciers can no longer be saved even with the most ambitious measures.
- Alpine glaciers have shrunk to their lowest levels in 120 years and are wasting two times faster than they did in the period 1901-1950, three times faster than they did in 1851-1900, and four times faster than they did 1800-1850.<sup>120</sup>
- Arctic sea ice is shrinking (13% per decade) as a result of global warming.<sup>121</sup>
- Winter Arctic sea ice was the lowest on record in 2017.<sup>122</sup>
- In the Arctic, average surface air temperature for the year ending September 2016 was the highest since 1900, and new monthly record highs were recorded for January, February, October, and November 2016.<sup>123</sup>
- Rapid warming in the Arctic is causing the jet stream to slow down and become unstable.<sup>124</sup>
- Regions of Earth where water is frozen for at least one month each year are shrinking with impacts on related ecosystems.<sup>125</sup>
- Extreme warm events in winter are much more prevalent than cold events.<sup>126</sup>
- Global snow cover is shrinking.<sup>127</sup>
- The southern boundary of Northern Hemisphere permafrost is retreating poleward.<sup>128</sup>
- Large parts of permafrost in northwest Canada are slumping and disintegrating into running water. Similar large-scale landscape changes are evident across the Arctic including in Alaska, Siberia, and Scandinavia.<sup>129</sup>

- In North America, spring snow cover extent in the Arctic is the lowest in the satellite record, which started in 1967.<sup>130</sup>

## OCEANS

- The Atlantic Meridional Overturning Circulation has decreased 20%. The North Atlantic has the coldest water in 100 yrs of observations.<sup>131</sup>
- Global sea surface temperature is rising.<sup>132</sup>
- The oceans are warming rapidly.<sup>133</sup>
- Sea level is rising and the rate of rise has accelerated.<sup>134</sup>
- Today global mean sea level is rising three times faster than it was in the 20<sup>th</sup> Century.<sup>135</sup>
- Between 1993 and 2014, the rate of global mean sea level rise increased 50% with the contribution from melting of the Greenland Ice Sheet rising from 5% in 1993 to 25% in 2014.<sup>136</sup>
- With existing greenhouse gas emissions, we are committed to future sea level of at least 4.3 to 6.2 ft (1.3 to 1.9 m) higher than today and are adding about 0.32 m/decade to the total: ten times the rate of observed contemporary sea-level rise.<sup>137</sup>
- Over 90% of the heat trapped by greenhouse gases since the 1970's has been absorbed by the oceans and today the oceans absorb heat at twice the rate they did in the 1990's.<sup>138</sup>
- Excess heat in the oceans has reached deeper waters,<sup>139</sup> and deep ocean temperature is rising.<sup>140</sup>
- Sea surface temperatures have increased in areas of tropical cyclone genesis suggesting a connection with strengthened storminess.<sup>141</sup>
- Oxygen levels in the ocean have declined by 2% over the past five decades because of global warming, probably causing habitat loss for many fish and invertebrate species.<sup>142</sup>
- Marine ecosystems can take thousands, rather than hundreds, of years to recover from climate-related upheavals.<sup>143</sup>
- Marine ecosystems are under extreme stress.<sup>144</sup>
- The world's richest areas for marine biodiversity are also those areas mostly affected by both climate change and industrial fishing.<sup>145</sup>
- The number of coral reefs impacted by bleaching has tripled over the period 1985-2012.<sup>146</sup>
- By 2050 over 98% of coral reefs will be afflicted by bleaching-level thermal stress each year.<sup>147</sup>
- Scientists have concluded that when seas are hot enough for long enough nothing can protect coral reefs. The only hope for securing a future for coral reefs is urgent and rapid action to reduce global warming.<sup>148</sup>
- Average pH of ocean water fell from 8.21 to 8.10, a 30% increase in acidity. Ocean water is more acidic from dissolved CO<sub>2</sub>, which is negatively affecting marine organisms.<sup>149</sup>

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Work Element	WE Title	Funds from Previous Obligations as of March 30, 2018	FY2018 Obligation	Budget Adjustments in FY2018	Total Funds Available as of April 1, 2018	Contracts	Remaining Contract Balance	Total Expenditures thru - June 30, 2018	Balance of Funds Available (Not Including Contract Balance) As of June 30, 2018	Total Remaining Balance (Contract and Available Funds) As of June 30, 2018
201.02	OahuMPO Participation Plan Evaluation	\$ 165,861.25	\$ 8,550.00		\$ 174,411.25	\$ 147,739.00	\$ 9,572.02	\$ 19,616.30	\$ 7,055.95	<b>16,627.97</b>
201.04	Title VI & Environmental Justice Monitoring	\$ 454,348.76	\$ 9,690.00		\$ 464,038.76	\$ 196,446.00	\$ 62,082.37	\$ 20,526.52	\$ 247,066.24	<b>309,148.61</b>
201.05	Congestion Management Process Update	\$ 221,923.76	\$ 2,850.00		\$ 224,773.76			\$ 16,670.07	\$ 208,103.69	<b>208,103.69</b>
201.16	Comprehensive Data Management and Sharing Study	\$ 165,000.00	\$ 18,975.00		\$ 183,975.00	\$ 165,000.00	\$ 130,976.76	\$ 2,352.90	\$ 16,622.10	<b>147,598.86</b>
202.02	Central Oahu Transportation Study	\$ 520,860.00	\$ 34,500.00		\$ 555,360.00	\$ 499,244.00	\$ 110,162.04	\$ 30,609.97	\$ 25,506.03	<b>135,668.07</b>
202.03	Transportation Revenue Forecasting & Alternatives Revenue Exploration	\$ 223,766.25	\$ 23,000.00		\$ 246,766.25			\$ 228.80	\$ 246,537.45	<b>246,537.45</b>
202.04	Farrington Highway Makaha Beach Park Realignment Feasibility Study	\$ 410,472.51	\$ 36,820.00		\$ 447,292.51	\$ 383,998.00	\$ 383,998.00	\$ 12,546.29	\$ 50,748.22	<b>434,746.22</b>
202.07	Oahu Bike Plan Update	\$ 250,000.00			\$ 250,000.00			\$ 152,175.00	\$ 97,825.00	<b>97,825.00</b>
203.03	PM Peak Period Tow-Away Zone Time Modifications	\$ 267,500.00			\$ 267,500.00			\$ 70,000.00	\$ 197,500.00	<b>197,500.00</b>
203.06	Oahu Mass Transit Joint Operational Study	\$ 267,400.00	\$ 267,400.00		\$ 534,800.00			\$ -	\$ 534,800.00	<b>534,800.00</b>
203.07	Review and Update of Planned Rights-of-Way for Existing Streets	\$ 500,000.00	\$ 187,500.00		\$ 687,500.00			\$ -	\$ 687,500.00	<b>687,500.00</b>
203.08	Transit Fares Scenario Modeling Study	\$ 130,000.00			\$ 130,000.00			\$ -	\$ 130,000.00	<b>130,000.00</b>
203.09	Transit Rider Survey Project	\$ -	\$ 1,400,112.50		\$ 1,400,112.50			\$ -	\$ 1,400,112.50	<b>1,400,112.50</b>
203.10	Ala Wai Canal Bridge Alternatives Analysis	\$ -	\$ 500,000.00		\$ 500,000.00			\$ -	\$ 500,000.00	<b>500,000.00</b>
203.75	Ewa Impact Fees for Traffic & Roadway Improvements Update Study	\$ 23,291.00			\$ 23,291.00			\$ -	\$ 23,291.00	<b>23,291.00</b>
203.82	Separate Left-Turn Phase Alternatives Study	\$ 42,280.00			\$ 42,280.00			\$ 8,200.00	\$ 34,080.00	<b>34,080.00</b>
206.02	Oahu Coastal Communities Evacuation Planning	\$ 800,000.00			\$ 800,000.00			\$ 282,985.91	\$ 517,014.09	<b>517,014.09</b>
301.01	Program Administration	\$ -	\$ 290,743.26		\$ 290,743.26			\$ 251,352.90	\$ 39,390.36	<b>39,390.36</b>
301.02	Gen. Tech. Assistance	\$ 37,518.40	\$ 129,150.00		\$ 166,668.40			\$ 33,057.14	\$ 133,611.26	<b>133,611.26</b>
301.03	OWP		\$ 57,000.00		\$ 57,000.00			\$ 36,953.05	\$ 20,046.95	<b>20,046.95</b>
301.04	CAC	\$ 13,013.00	\$ 59,280.00		\$ 72,293.00			\$ 26,035.79	\$ 46,257.21	<b>46,257.21</b>
301.05	Audit	\$ 409,524.69	\$ 82,000.00		\$ 491,524.69	\$ 150,000.00	\$ 25,851.63	\$ 292,483.17	\$ 49,041.52	<b>74,893.15</b>
301.06	Public Participation Plan	\$ 15,000.00	\$ 22,800.00		\$ 37,800.00			\$ 12,794.49	\$ 25,005.51	<b>25,005.51</b>
301.08	DBE	\$ 4,500.00	\$ 3,420.00		\$ 7,920.00			\$ 4,490.29	\$ 3,429.71	<b>3,429.71</b>
301.09	Prof. Development	\$ 59,000.00	\$ 48,240.00		\$ 107,240.00			\$ 26,717.87	\$ 80,522.13	<b>80,522.13</b>
301.10	Computer & Network	\$ 49,920.00	\$ 34,120.00		\$ 84,040.00	\$ 25,000.00	\$ 25,000.00	\$ 22,253.42	\$ 36,786.58	<b>61,786.58</b>
301.11	Subrecipient Monitoring	\$ 50,000.00	\$ 62,700.00		\$ 112,700.00			\$ 56,793.27	\$ 55,906.73	<b>55,906.73</b>
301.12	Transit Oriented Development Advisory Committee	\$ 20,000.00	\$ -		\$ 20,000.00			\$ -	\$ 20,000.00	<b>20,000.00</b>
301.13	Data	\$ 18,047.71	\$ 95,600.00		\$ 113,647.71			\$ 32,016.27	\$ 81,631.44	<b>81,631.44</b>
301.14	Fed. Requirements	\$ 88,628.74	\$ -		\$ 88,628.74			\$ 65,904.08	\$ 22,724.66	<b>22,724.66</b>
301.15	Computer Models	\$ 598,934.07	\$ 339,200.00		\$ 938,134.07	\$ 638,000.00	\$ 433,726.60	\$ 142,399.37	\$ 157,734.70	<b>591,461.30</b>
301.16	ORTP	\$ 806,949.94	\$ 75,810.00		\$ 882,759.94	\$ 350,000.00	\$ 313,970.67	\$ 340,773.81	\$ 191,986.13	<b>505,956.80</b>
301.17	TIP	\$ 178,672.72	\$ 202,840.00		\$ 381,512.72			\$ 235,985.38	\$ 145,527.34	<b>145,527.34</b>
301.18	TAP	\$ 8,916.05	\$ 11,970.00		\$ 20,886.05			\$ 14,550.41	\$ 6,335.64	<b>6,335.64</b>
301.19	OahuMPO Staff Support of Consultant Projects	\$ 2,180.45	\$ -		\$ 2,180.45			\$ 2,180.45	\$ -	<b>0.00</b>
302.01	Overhead	\$ 20,216.29	\$ 38,500.00		\$ 58,716.29			\$ 15,368.17	\$ 43,348.12	<b>43,348.12</b>
	<b>Total</b>	\$ <b>6,823,182.59</b>	\$ <b>4,042,770.76</b>		\$ <b>10,866,496.35</b>			\$ <b>2,228,021.09</b>	\$ <b>6,083,048.26</b>	\$ <b>7,578,388.35</b>