

CITY OF JACKSONVILLE
ADAPTATION ACTION AREA WORKING GROUP
MEETING

Proceedings held on Monday, March 25, 2019,
commencing at 9:00 a.m., Ed Ball Building, 214 North
Hogan Street, 8th Floor Conference Room, Jacksonville,
Florida, before Matthew S. McKinney, FPR, a Notary
Public in and for the State of Florida at Large.

PRESENT:

EMILY PIERCE, Chairwoman.
MICHELLE TAPPOUNI, Vice Chair.
SHANNON BLANKINSHIP, Working Group Member
AMANDA ASKEW, Working Group Member.
JOSEPH LORETTA, Working Group Member.
JEFF MARTIN, Working Group Member.
SAM NEWBY, Working Group Member.
ERIK OLSEN, Working Group Member.

ALSO PRESENT:

BILL KILLINGSWORTH, Director, Planning Dept.
KRISTEN REED, Chief, Community Planning Div.
SUSAN KELLY, Planning and Development Dept.
HELENA PAROLA, Planning and Development Dept.
SHANNON ELLER, Office of General Counsel.

- - -

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 ultimately provide to the Planning Department
2 and the City recommendations regarding
3 actionable items or steps over the long
4 planning horizon, such as studies and the
5 consideration of policies and/or regulatory
6 changes related to the 2030 Comprehensive Plan.

7 With that, we're going to go around the
8 room very quickly and have everyone introduce
9 themselves. We have a new member on our work
10 group, so when she comes up, she can tell you
11 her name and what's going on.

12 Susan, do you want to start?

13 MS. KELLY: Sure. I'm Susan Kelly. I'm
14 with the Planning Department.

15 MS. PAROLA: I'm Helena Parola with the
16 Planning Department.

17 MS. REED: Kristen Reed, Planning.

18 W/G MEMBER ASKEW: Hi, I'm Amanda Askew
19 with the City of Neptune Beach. Our mayor was
20 here. She asked that I attend for her.

21 THE CHAIRWOMAN: Excellent, welcome.

22 W/G MEMBER LORETTA: I'm Joe Loretta, land
23 planner with Genesis Halff.

24 COUNCIL MEMBER NEWBY: Sam Newby with
25 Jacksonville City Council.

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

PROCEEDINGS

1 March 25, 2019 9:00 a.m.

2 - - -

3 THE CHAIRWOMAN: We have a quorum, so
4 we're going to go ahead and get started.

5 Welcome, everybody, to the AAA or the
6 Adaptation Action Area Work Group. I'm going
7 to go through a couple of quick things at the
8 beginning, like we did last time. Again, we
9 have a court reporter that is waving to us
10 handling this, so we need to remember to please
11 speak one at a time. We can't have
12 conversations back and forth with each other or
13 he will scream and yell at us. It's going to
14 be ugly, so don't do that.

15 The other thing, which I think everybody
16 has a handle on right now, but we cannot
17 discuss the actions of this work group before
18 this meeting or after this meeting. We can
19 only -- if we are talking about something that
20 this work group is interested in, we can only
21 talk during this meeting because this is a
22 public body and we have to comply with the
23 Sunshine law.

24 And the focus of our group, again, is to
25 Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 THE CHAIRWOMAN: Emily Pierce with Rogers
2 Towers.

3 W/G MEMBER TAPPOUNI: Michelle Tappouni,
4 property development director for Ability
5 Housing.

6 W/G MEMBER OLSEN: Erik Olsen, consulting
7 engineer.

8 W/G MEMBER MARTIN: Jeff Martin,
9 climatologist with Jacksonville University.

10 DIRECTOR KILLINGSWORTH: Bill
11 Killingsworth, Planning Department.

12 MS. ELLER: Shannon Eller from the City's
13 Office of General Counsel.

14 THE CHAIRWOMAN: All right. Thank you,
15 everyone.

16 Has everybody had a chance to look at
17 the -- we call them the minutes, but the
18 transcript from the March 11th meeting?

19 W/G MEMBER OLSEN: Motion to approve.

20 COUNCIL MEMBER NEWBY: Second.

21 THE CHAIRWOMAN: All right. We've got a
22 motion to approve and a second. Can I see a
23 show of hands for everyone who approves
24 minutes?

25 All right. Mr. Newby? Hand?
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

5

1 COUNCIL MEMBER NEWBY: Oh, all right. I'm
2 sorry.
3 THE CHAIRWOMAN: All right. It's
4 unanimous.
5 Okay. We're going to do one thing a
6 little bit out of order from what we did last
7 time. If you would look at the information
8 that was given to you in the paper-clipped
9 stack, you will go to -- behind the minutes you
10 will see the City of Jacksonville AAA Work
11 Group staff's key findings. Staff is going to
12 prepare key findings after each presentation,
13 so if you could -- and these are also available
14 I believe on the web; is that correct?
15 MS. KELLY: They will be.
16 THE CHAIRWOMAN: If you could take a look
17 at these, and we are going to be getting --
18 beginning the process of putting together our
19 recommendations, so this is a great tool that
20 we can use. If you would look at the key
21 findings and start thinking about
22 recommendations. It should be behind your
23 minutes. I see Jeff looking for it. It's one
24 page.
25 W/G MEMBER MARTIN: Sorry. I can't find
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

6

1 it.
2 THE CHAIRWOMAN: Okay. You want to pass
3 this down to him?
4 W/G MEMBER MARTIN: I have it. I have it.
5 THE CHAIRWOMAN: Okay.
6 This is going to be a great tool, so I'm
7 going to actually assign everybody some
8 homework at the end of the meeting today. But
9 please include this in there, and we are going
10 to start at the end of the meeting -- probably
11 not this meeting, probably the next meeting --
12 and start talking about some proposals and
13 putting together some recommendations now that
14 we are having our presentations.
15 All right. We're right on time. Our
16 first topic today is going to be talking about
17 the geographic boundaries. We've already
18 touched on this a little bit in the last couple
19 of meetings, and there's definitely been
20 discussion in this group that maybe the
21 boundaries of the AAA should not be restricted
22 to the boundaries of the CHHA or the Coastal
23 High Hazard Area.
24 And there was discussion last week about
25 the fact that Jacksonville has both the river
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

7

1 and the oceans and that we are -- actually, I'm
2 just going to leave it to Erik to talk about it
3 in just a minute, but the fact that we flood in
4 areas that the CHHA does not show would flood.
5 So one of the topics that this group is
6 definitely interested in looking at is
7 expanding the area of the Adaptation Action
8 Area.
9 All right. I'm going to introduce you to
10 our first speaker, who many of you already
11 know, Erik Olsen. Erik received both his
12 Bachelor of Science and his master of
13 engineering from the University of Florida in
14 civil engineering -- yep, go Gators. His
15 master's is in coastal and oceanographic
16 engineering. He's the principal engineer for
17 Olsen Associates, Inc. He has been a special
18 consultant to both erosion and inlet districts,
19 counties, municipalities, states and
20 governmental agencies.
21 He routinely acts as an expert witness on
22 coastal engineering topics for private and
23 public sector. Similarly, Mr. Olsen frequently
24 makes educational presentations regarding
25 coastal construction regulation and other
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

8

1 related matters to the Florida Bar, the State
2 Chamber of Commerce environmental seminar,
3 engineering and architect professional
4 societies, public bodies, homeowner groups and
5 pretty much anybody that needs to know about
6 this topic.
7 So with that, welcome Mr. Olsen.
8 W/G MEMBER OLSEN: Thank you, Madam
9 Chairman.
10 We might need to adjust the seating. I
11 was going to talk from down there, but I don't
12 want to hit anybody with my laser light, so I
13 may need to get closer to the board.
14 THE CHAIRWOMAN: Whatever works best for
15 you.
16 W/G MEMBER OLSEN: Okay. Looks like
17 everybody's seated. I appreciate it and
18 appreciate the opportunity to make a
19 presentation regarding that particular topic,
20 the maps themselves. You may not need to take
21 too many notes. There is a white paper that I
22 included in your agenda this meeting, and so
23 most of the salient points of the topic will be
24 in there.
25 I'm going to focus primarily on
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

9

1 Jacksonville's Downtown north and south banks
2 and the historical neighborhoods of San Marco,
3 Ortega and Riverside Avenue, all of which front
4 the portion of the river you just alluded to.
5 All of these areas were severely impacted by
6 Irma in 2017, but they're not mapped presently
7 as being hazard zones in the maps that we are
8 charged with looking at for the rise in sea
9 level.

10 Just a view of Riverside. This is a
11 couple days afterwards. Probably -- I'm not
12 sure if you can see it or not here, but
13 Riverside Avenue continues to be flooded. Many
14 of the homes that are in this vicinity were
15 evacuated and highly damaged. Stockton Street
16 is the street on the right, which is really the
17 culprit where drainage does not occur. It
18 doesn't adequately take away Riverside's
19 drainage. Downtown looked like this. San
20 Marco looked like this, significant damage in
21 San Marco.

22 Three topics that I want to talk about is
23 flood vulnerability with respect to low
24 frequency events. Low frequency events are
25 hurricanes and tropical storms, things that do

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

10

1 not occur with a high frequency. Conversely,
2 there's another flooding event or phenomenon
3 that we suffer with here in Jacksonville and/or
4 suffer more greatly when we have a 2-foot level
5 sea rise, and that's high frequency events.

6 Now, this may be kind of trivial. And I
7 don't want to talk down to anybody, but I want
8 to make sure we're all on the same definitional
9 scheme. Probably everybody knows that there's
10 a tide in Downtown Jacksonville. The
11 situation, however, is that the tide range
12 downtown is fairly significant. What you're
13 looking at here is a plot of the tides for the
14 entire year of 2019.

15 You can notice the dissimilarity in the
16 low tides and high tides from various days. On
17 the right-hand side of the slide, we always
18 have higher high tides, higher spring tides in
19 the St. Johns River, everywhere in the
20 St. Johns River, but most of it of course
21 matters to us in the downtown area. These are
22 referred to in some vernacular as king tides,
23 but really we've always, as engineers and most
24 people, they're referred to as the spring tides
25 of the month.

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

11

1 Note also that the mean tide level, which
2 is the mean water level in the river, varies
3 seasonally. Of interest here is that the time
4 of the year when we have our highest tides,
5 which is in the fall months, we also have our
6 nor'easter season when the river also super
7 elevates.

8 Now, nor'easter and other meteorological
9 events are not included in this. This is
10 strictly astronomical tides. So any
11 meteorological events that you have are on top
12 of this, which results in higher high waters
13 within the river, particularly in the area that
14 I'm interested in.

15 I don't know if you can see it up there,
16 but there's a little asterisk, which is really
17 off the slide. That represents the potential
18 effects of a nor'easter, which in this section
19 of the river can be as much as a foot above the
20 normal tide levels.

21 Again, king tides, there's really no such
22 thing; it's not a scientific term. The first
23 time I ever heard it was being used by the City
24 of Miami, but it is synonymous with spring
25 tide, so it's another vernacular for the

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

12

1 highest tides of the month, basically.

2 Now, again, I mentioned that the tide
3 range downtown can be influenced by nor'easters
4 and other meteorological events including just
5 major thunderstorms. An overarching long-term
6 influence on the tidal conditions that we have
7 today have to do with the stabilization of the
8 St. Johns River for purposes of navigation,
9 commercial navigation. In the 1880s, the
10 jetties were constructed, and subsequent to
11 that time there's been a series of deepening
12 projects, one of which is on the table right
13 now, to take portions of the river down and
14 authorize portions of the river down to 47
15 feet.

16 The long-term sea level rise for the
17 river, and based upon the Mayport gauge and
18 also the data downtown, is about a foot per
19 century. That's what we've experienced here.
20 And that is sort of the same number that most
21 of the east coast of the United States
22 experiences. You also need to understand that
23 all of the upland drainage from the areas I'm
24 talking about here, San Marco, Ortega,
25 Avondale, the city core, everything drains to

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 the river, okay.
2 Again, this is the sea level trend rise,
3 rise in sea level that we've experienced here.
4 It's a little under a foot. The cocktail
5 knowledge number is a foot per century. If you
6 hindcast that to 1822, which is I think the
7 time the city was first platted, it's about 1.8
8 feet of sea level rise over two centuries, so
9 again almost the same thing. We're talking
10 about a historic sea level rise of about a foot
11 per century.
12 Now, people may tell you that they've
13 looked at the Mayport gauge and they see sea
14 level rise accelerating. If you look at the
15 right-hand side of that slide, it really is not
16 evident. What is evident here is that the mean
17 tide level annually varies significantly.
18 That's why it's such a jagged series of lines
19 there. What we have is a trend line that is
20 struck through that. You can pick any period
21 of time and try to prove to yourself the sea
22 level rise, if you look at only a three- or
23 four-year period, is either increasing or
24 decreasing, but the data does not show that it
25 is increasing at this point in time, in the

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 City of Jacksonville.
2 Another interesting fact is that global
3 sea level change, as measured mostly by
4 satellites these days, varies significantly
5 worldwide. Very often you see in the
6 literature that the average sea level rise
7 across the globe is accelerating at such and
8 such a rate. It doesn't really relate to us.
9 The area in red is the highest levels. The
10 areas that we experience right now are still a
11 foot per century, and so do not put any
12 credence in anybody that tells you that sea
13 level rise globally is such and such a number
14 and that's the number that you should be
15 worried about. It varies significantly.
16 A lot of it has to do with irregularities
17 in the surface of the Earth, tectonic activity
18 and a number of other factors. But, again,
19 this is a global picture of sea level rise over
20 this period of time based on satellite
21 telemetry. But, again, our sea level rise
22 here, at least up until 2018, was
23 2.62 millimeters per year, which is about a
24 foot per century.

25 The other factor I want to talk about here
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 is a little bit different than your basic
2 flooding associated with a flood insurance
3 program, is nuisance flooding. This is by
4 definition flooding which causes public
5 inconvenience, road closures, overwhelmed storm
6 drains, and compromised infrastructure. Most
7 of the compromised infrastructure is the
8 drainage.
9 Now, the poster child for this particular
10 phenomena is Venice, Italy. If anybody's ever
11 been there, you've seen people there walking
12 around in boots or on boardwalks. They've had
13 a long-term measure of sea level rise. This is
14 the data for that particular area. Things look
15 like this during their king tides, during their
16 spring tides, during storm events when water
17 backs up through this particular area.
18 South Florida has well documented their
19 sea level rise -- well, I say sea level rise
20 phenomena -- their nuisance flooding phenomena.
21 And, again, South Florida has basically the
22 same level of sea level rise that we do. One
23 of the major problems in South Florida is that
24 the elevations of the upland are lower.
25 Much of Miami Beach is hydraulically

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 filled. In fact, all of Miami Beach, the
2 hotels and whatever, actually were filled
3 originally on mangroves. That's how low things
4 are in this particular area. But nuisance
5 flooding has caught up with them in Miami, and
6 these are shots of the phenomena that is now
7 beginning to occur frequently. Annapolis is
8 another area that is struggling with the
9 problem of nuisance flooding.
10 And, again, there's two types of nuisance
11 flooding. One is when water literally gets so
12 high that it goes over the sea walls or the
13 bulkheads or whatever structures that you have
14 at the interface of the water and the land.
15 The other is compromised upland drainage which
16 causes water to back up into areas. Hendricks
17 Avenue in San Marco is one of those areas that
18 occurs frequently. It can occur with a
19 thunderstorm and a relatively high water in the
20 river.
21 Downtown Jacksonville, if we consider our
22 charge here, which is a 2-foot level rise in
23 the mean water level of the St. Johns River, it
24 will eventually experience nuisance flooding in
25 various areas. Again, just so you understand

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 what the phenomena is when we talk about
 2 impeded drainage or compromised drainage --
 3 (W/G Member Tappouni exits the
 4 proceedings.)
 5 W/G MEMBER OLSEN: -- if we look at a
 6 culvert system, let's say, in San Marco where
 7 the drainage is coming off Hendricks Avenue,
 8 obviously there's catchment basins; there are
 9 culverts that take the water to the river.
 10 It's usually collected in a larger culvert
 11 system that discharges through the existing
 12 seawall somewhere. The ability of that culvert
 13 to discharge its designed quantity or any
 14 quantity, Q, varies on the head difference or
 15 literally the elevation between the upland
 16 where the drainage water is impounded and the
 17 level of the river at any point in time.
 18 (W/G Member Tappouni enters the
 19 proceedings.)
 20 W/G MEMBER OLSEN: And so you can see, at
 21 low water, obviously the drainage capability is
 22 greater than at high water because the delta H
 23 or the head difference is greater at lower
 24 water.
 25 Now, what happens over time and/or with
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 events -- when we have a nor'easter event, then
 2 all of a sudden the water is super elevated, so
 3 the delta H becomes diminished even greater;
 4 the Q becomes diminished; it no longer can
 5 carry the drainage from the area that it's
 6 intended to carry, and so we get ponding of
 7 water which can last for hours or days,
 8 particularly in San Marco.
 9 An interesting fact is that when the next
 10 harbor deepening project is constructed, by the
 11 Corps' own numbers, it will increase the water
 12 levels within the St. Johns River by two-tenths
 13 of a foot. That will not be in 2060; that will
 14 be as soon as the dredging contract is done,
 15 and that's important to understand. So that's
 16 something we have to live with. San Marco is
 17 going to have a much harder time living with
 18 that. Today it's not necessarily relevant to
 19 Downtown, but it will be in 2060, but it will
 20 be relevant to San Marco in the very new
 21 future.
 22 W/G MEMBER LORETTA: Erik?
 23 W/G MEMBER OLSEN: Yes.
 24 W/G MEMBER LORETTA: What does .2 feet
 25 mean to you? Is that 2 and a half inches?
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 W/G MEMBER OLSEN: It's .2 feet,
 2 two-tenths of a foot.
 3 W/G MEMBER LORETTA: So 2 and a half
 4 inches?
 5 W/G MEMBER OLSEN: Exactly, which is 20
 6 percent of the historical sea level rise that
 7 we've seen in a hundred years. You're going to
 8 get that immediately, 20 percent of it
 9 immediately.
 10 Let's see. So, again, if you look at San
 11 Marco over time, again the same phenomena. You
 12 get some type of head difference that varies
 13 over time. Two-tenths of a foot will be
 14 meaningful to that area because it doesn't
 15 drain at the present time with the high waters
 16 that are experienced there, both on a monthly
 17 basis and also of course in the fall when we
 18 have nor'easters.
 19 Now, nuisance flooding: We've done a
 20 prediction for downtown which is based on
 21 actual tidal data measured at the south bank.
 22 So this is relevant. This is a computation you
 23 haven't seen and I don't think anybody's really
 24 seen. This was done for me as a favor by
 25 Dr. David Kriebel, who is a professor of
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 oceanography at the Naval Academy. He is a
 2 graduate student who was one of my peers way
 3 back in the day. He is an expert nationally on
 4 the issue of nuisance flooding and has done a
 5 number of papers nationally on this issue. He
 6 did this computation very quickly for me.
 7 What this says -- these are -- the blue
 8 curve is the occurrence per year of various
 9 elevations of the water level. And for the
 10 most part, you can see that unless your seawall
 11 is very low, your seawall will not be overcome
 12 by the water within the river.
 13 Now, there's a series of curves here; each
 14 is an increment of half a foot rise in sea
 15 level. So if we can go to the 2 foot rise in
 16 sea level, you see that with a seawall
 17 elevation of plus 4 feet in NAVD 88, which is
 18 the datum of the wall, we will have 33
 19 occurrences per year of water coming over that
 20 wall or beating the elevation of the wall in
 21 2060 if we do experience 2 feet rise in sea
 22 level.
 23 Of course, you can use the data to make
 24 other judgments based on different wall heights
 25 and different rises in sea level. If you add
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

21

1 two-tenths of a foot to that, it goes up to
 2 over 40, 45, the two-tenths being the super
 3 elevation for the harbor deepening project. If
 4 you add it to the sea level rise that we're
 5 talking about, you're increasing this
 6 occurrence number to over 40.
 7 So what we're looking at in the top slide
 8 is literally water coming over the wall if we
 9 have capped elevations in the vicinity of 3 to
 10 4 feet. If we have elevations of 5 to 6 feet,
 11 which we do Downtown -- and I did a quick
 12 visual summary about a week or two ago of my
 13 own. We do have capped elevations of 5 to 6
 14 feet in various areas. The CSX cap is about
 15 5 or 5 and a half feet in NAVD.
 16 Well, you're not necessarily safe in 2060
 17 even if your capped elevation is at that
 18 particular height because with the high water,
 19 you still may have water coming over due to
 20 wind waves, due to boat wake, any type of
 21 perturbances in the river, because the first
 22 phenomena that I'm talking about that was on
 23 the previous slide, that is for still water; it
 24 does not include any wave-type activity or any
 25 type of potential super elevation with wind

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

22

1 waves or boat wake, so you're not necessarily
 2 safe even if you have an elevation of 5 or 6
 3 feet. You will have some overtopping
 4 phenomena.
 5 Now, our group's charge is to look at 2
 6 feet of sea level rise which will occur by
 7 2060. That's basically equivalent to two
 8 centuries of sea level rise as we've
 9 experienced it. Now, we've talked about very
 10 quickly the mapping that we've been provided,
 11 which is the predicted area of influence on a
 12 category 1 hurricane using what is called the
 13 SLOSH model, which is a model that's used
 14 nationally for various types of uses,
 15 evacuations, even in this particular use. It
 16 is not the most sophisticated model. There's
 17 nothing wrong with it. But like the FEMA
 18 model, it is basically designed to predict open
 19 coast surge, and then the users of that data
 20 propagate that surge inland. FEMA does that,
 21 the SLOSH model does it, in order to get water
 22 levels further inland.
 23 Well, in the case of the St. Johns River,
 24 obviously we have a very robust and very
 25 hydraulically efficient rivering system. Well,

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

23

1 the predictions of the water downtown by either
 2 of these models lacks somewhat when we're
 3 talking about the area within the river that is
 4 south of Downtown, that is influenced by wind
 5 coming up the river, like the type of winds we
 6 experienced with Hurricane Irma. That is not
 7 modeled in any of these models, the FEMA model
 8 or the SLOSH model. So my opinion and my
 9 experience is that neither of these models is
 10 the best tool for using the prediction of what
 11 is in danger within the urban core or the three
 12 historical neighborhoods.
 13 Again, these are excerpted from our
 14 models. If you look at the St. Johns River
 15 along San Marco, there's very little area
 16 that's demarcated as being a hazard zone; same
 17 thing of downtown; same thing with Riverside,
 18 irrespective of what we've experienced in
 19 recent past. So the SLOSH model, there's
 20 nothing wrong with what the staff did in
 21 utilizing the SLOSH model and the SLOSH model
 22 data, but it's just not suitable for the use
 23 intended, which is a rivering system such as
 24 what we have from the Downtown, southward to
 25 the county line.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

24

1 (Chairwoman Pierce exits the proceedings.)
 2 W/G MEMBER OLSEN: Sort of the proof of
 3 all this is that the dramatic effects that we
 4 experienced with Hurricane Irma in these areas
 5 in 2017 for a storm that wasn't even a category
 6 1 storm basically points out the lack of
 7 ability of these models and it points out the
 8 vulnerability of various-type storms. It
 9 doesn't even have to be a category 1 storm with
 10 respect to piling water up in the downtown area
 11 and producing the type of record river flooding
 12 that we've experienced.
 13 To a large degree, what we've found is the
 14 elevations from Hurricane Irma met or exceeded
 15 the elevations from Hurricane Dora, which was a
 16 flood of record for Duval County. Hurricane
 17 Dora was the first hurricane that ever came on
 18 land and basically came across the county.
 19 Most of the storms of record for Northeast
 20 Florida, the storms pass offshore. So, again,
 21 in the areas that are mapped as being
 22 non-hazard, this is what we saw, clearly not an
 23 accurate prediction.
 24 Now, something else that's relevant here
 25 has to do with today's flood insurance

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 elevations. These are not exactly the
2 elevations. These are from a -- they've been
3 proffered and adopted by the City just
4 recently, I think last year. But they are from
5 a previous flood insurance study, so they're
6 pretty close to what are still on the table,
7 although I think the current elevations may
8 even be slightly lower, believe it or not. But
9 these were the elevations from about 10 or 20
10 years ago.

11 But the meaningful part of this particular
12 slide is the probabilistic water elevations.
13 You have a 10-year frequency storm, a 50-year
14 frequency storm, 100-year frequency storm and a
15 500-year frequency storm. Notice that the
16 10-year storm, if we add 2 feet of sea level to
17 it, it's equivalent to FEMA's 100-year flood
18 event today, the elevation. And that's
19 significant, and it's something we need to take
20 into account and the City needs to take into
21 account, actually, if they believe in sea level
22 rise and want to accommodate sea level rise
23 into the planning and design for the future of
24 this city and development and redevelopment.

25 So the 10-year surge elevation is
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 equivalent to the 100-year surge of today when
2 you consider the 2-foot rise in sea level.
3 Now, what this implies is the probability of
4 occurrence of this 100-year elevation will
5 increase basically by a factor of 10 times if
6 we experience a 2-foot level of sea level rise
7 into the future. So 6.2 feet will be the
8 10-year storm and not the 100-year storm.

9 So conclusions: The Downtown waterfront
10 will eventually become susceptible to high
11 frequency nuisance flooding in areas where it
12 is not necessarily today.

13 (Chairwoman Pierce enters the
14 proceedings.)

15 W/G MEMBER OLSEN: A 100-year
16 probabilistic event will become equivalent to
17 that of today's 10-year storm. Harbor
18 deepening is going to exacerbate the overall
19 problem. The timing of interest is the timing
20 of the harbor deepening increase will be at the
21 end of the dredging contract; it will not be in
22 2060.

23 With the 2-foot level of sea level rise,
24 anyone that develops waterfront property today
25 pursuant to today's mapping will find that by

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 2060 they may be at significant risk for
2 frequent flood damage, and probably of more
3 interest to them, accelerated insurance
4 premiums for being out of compliance with the
5 rates or the elevations that are incorporated
6 in the future. And things are changing. It's
7 pretty widely acknowledged that all flood
8 insurance mapping that is proffered and adopted
9 by a county is out of date the minute they
10 adopt it.

11 More importantly, the federal government
12 is now looking at the significant fiscal
13 liability they have with risk of flood
14 insurance around the country. And they're
15 looking at different rates -- different ways of
16 now assigning that risk to the homeowner. As
17 indicated here in the second bullet, they're
18 looking at ways to assign risk to the insurance
19 premium over and above just the mapping that
20 the property is in.

21 So you can be in an A zone, but if you're
22 determined to be at a higher risk, you'll pay a
23 higher premium, and that's where the program
24 appears to be going right at this moment.

25 Similarly, some waterfront properties that are
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 mapped as A zone today, with 2-foot level sea
2 rise, you're going to find that you're in a B
3 zone. That not only affects you from an impact
4 standpoint but it also will affect you
5 dramatically from an insurance policy premium
6 effect.

7 THE CHAIRWOMAN: Erik, could you explain
8 quickly to the group what an A zone means and
9 what a V zone means?

10 W/G MEMBER OLSEN: An A zone is an area
11 that basically is inundated by the 100-year
12 flood and has wave activity of less than 2 and
13 a half feet. If waves are greater than 2 and a
14 half feet, you then become a V zone. A V zone
15 was determined years ago -- I won't go into the
16 history of it -- that a 3-foot wave would --
17 the impact of a 3-foot wave would be
18 destructive to a conventional structure. And
19 so the federal government adopted the 3-foot
20 wave as the definition between an A zone and a
21 V zone. When it's in application, they round
22 it off. If you're less than 2.5 feet, you're
23 an A zone, but you can still have a 2.4 foot
24 wave hitting your property. But if it's 2 and
25 a half feet, then all of a sudden you're in a

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 V zone.
2 THE CHAIRWOMAN: Okay.
3 W/G MEMBER OLSEN: And of course, V zone,
4 it could be 3 foot, it could be 4 foot, it
5 could be 5 foot.
6 But all the fringe properties that we have
7 right now, based on the maps that are right on
8 the perimeter of the river, many of them are
9 declared as A zone because the flood maps stop
10 at or close to the seawall. But if you believe
11 we will have 2-foot level of sea level rise,
12 many of these properties will physically be in
13 V zones in the future.
14 Recommendations for expansion of the study
15 area: As I mentioned before, since a 2 foot
16 sea level rise will make today's 100-year storm
17 surge equivalent to the future 10-year surge,
18 one recommendation would be the mapping that
19 reflects the limits of flooding documented to
20 have occurred during Hurricane Irma. There
21 is -- I believe there is actual mapping of the
22 impact zones of Hurricane Irma, and of course
23 if we go -- as we go forward, we have to have a
24 mapped area of interest. There has to be a
25 mapped area. That's one alternative.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 Another alternative is you can go to
2 today's flood maps and assume that the 100-year
3 storm is basically equivalent to the 10-year
4 storm in the future and you can adopt those
5 maps, because that's basically true. 10-year
6 storm is probably less than a category 1
7 hurricane. But, again, those types of maps are
8 readily available because the City's adopted
9 them.

10 So those are two alternatives that we
11 could use for expanding the zone of interest.
12 Where would we do this? Basically you're
13 talking about from the Fuller Warren Bridge
14 southward to the county line. That would be
15 the area of interest for the downtown urban
16 core and the historical neighborhoods.

17 So, again, I'll be glad to answer any
18 questions. I have some backup slides here too.

19 Yes, sir?

20 MR. SANDRIK: Al Sandrik from the National
21 Weather Service, Jacksonville. I'm a
22 meteorologist.

23 Excellent presentation, sir.

24 W/G MEMBER OLSEN: Thanks.

25 MR. SANDRIK: I agree with 99% of what you

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 had to say. One of the things I would like to
2 point out, when you were pointing out the
3 hydraulic head in downtown along the seawall,
4 the arrows on the Qs from the land indicated
5 flow from the land to the water.

6 Unfortunately, that's not the case.
7 During these peak high tides, especially during
8 a nor'easter, we're actually seeing the flow
9 from the water into San Marco. This is
10 especially true in Landon Park neighborhood,
11 Lasalle in San Marco and by Childrens Way
12 and -- is it Palm or Nira?

13 W/G MEMBER OLSEN: Nira, I think.

14 MR. SANDRIK: Yeah, Nira.

15 And we had a peak storm surge or peak
16 flooding actually on Nira where the pizza
17 parlor is. I measured 5 and a half feet there.
18 It's my contention that if I could have gotten
19 out there at, say, 6:00 o'clock in the morning
20 or so, before the water came over the seawall
21 in San Marco, and taken salinity samples, if I
22 had gotten down to the bottom of the water
23 column in Lasalle, we probably would have had
24 very saline water, somewhere maybe around 30
25 parts per million.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 The very, very top where the rainwater
2 was -- we probably would have come up with
3 somewhere around 10 or 15 parts per -- excuse
4 me, parts per thousand salinity. So it's a
5 very complex situation, as was indicated, with
6 not just rainwater that's flooding San Marco.
7 We already have water coming through.

8 W/G MEMBER OLSEN: And not only that, when
9 you have one area of drainage in San Marco
10 draining into another area through a culvert
11 system, again that can actually supercharge the
12 drainage where it comes out of the drainage
13 culverts in one area of San Marco from another
14 area, because it cannot get to the river.

15 MR. SANDRIK: And I do have a total
16 flooding map, so I can provide you with that.

17 W/G MEMBER OLSEN: Great.

18 THE CHAIRWOMAN: Excellent.

19 W/G MEMBER OLSEN: I knew it existed, I
20 just didn't know where.

21 MR. SANDRIK: Yeah. We did four days of
22 storm surveys after the storm, mapped
23 everything from NAS Jacksonville all the way
24 over to the (inaudible).

25 THE CHAIRWOMAN: That would be extremely

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 helpful because we've got -- as our work group,
2 we have to come up with some policies. And if
3 we're going to be increasing the area, we have
4 to have data to provide to the City on how to
5 define those areas.

6 MR. SANDRIK: The mapping that I will
7 provide will have a dot for every sample we
8 took.

9 THE CHAIRWOMAN: Okay.

10 W/G MEMBER OLSEN: This is the seawall at
11 St. Vincent's. The elevation of the seawall at
12 St. Vincent's is 3.5 feet NAVD. The measured
13 water elevation at St. Vincent's, which I think
14 may have been the highest measured, was 7.1
15 feet. There were waves breaking literally on
16 the walls of St. Vincent's Hospital.

17 MR. SANDRIK: This is different data. We
18 were using Mean High Water as our data.

19 W/G MEMBER OLSEN: We use NAVD.

20 MR. SANDRIK: Yeah.

21 THE CHAIRWOMAN: Okay. Councilman Newby?

22 COUNCIL MEMBER NEWBY: Question for you.

23 During the storm, San Marco was flooded,
24 but over in the Brooklyn area where I live, we
25 had not a drop of water. Why do you think

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 that? Because it was almost the same area.

2 W/G MEMBER OLSEN: Well, it's -- the
3 Downtown area and San Marco in the
4 neighborhoods suffered the highest water
5 elevations because the storm came up westward
6 of the river, and so the wind field actually
7 pushed water up the river. The highest
8 elevations were in the downtown area and San
9 Marco and Ortega, and of course that sort of
10 peters out as you get into other areas, at
11 least for this particular storm.

12 Now, if you look at the FEMA maps, it may
13 be different because the FEMA maps will
14 propagate the storm from the jetties up the
15 river toward your area of interest, and you may
16 see different predicted elevations. But this
17 was the experienced phenomena, kind of a unique
18 storm, but really not that unique. It's just
19 this type of storm really is not included in
20 FEMA's or in SLOSH model methodologies. I
21 don't know what the elevations of your
22 particular area are. That will dictate the
23 propensity for flooding in most places.

24 COUNCIL MEMBER NEWBY: Because you could
25 go to one area and it was flooded, and two

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 blocks over it was dry.

2 MR. SANDRIK: This is one of the points
3 where we differ, because SLOSH will account for
4 the seiche effect on the river. I have recs
5 files, the old single-storm runs, that allow us
6 to actually see it on a six-minute basis, on
7 how things are changing.

8 W/G MEMBER OLSEN: For a storm-by-storm
9 basis or a combination of all storm events?

10 MR. SANDRIK: All storm events. I mean,
11 we were looking at a westerly projection of the
12 storm as we were forecasting, and these guys
13 from emergency management will tell you, we
14 were always forecasting 3 to 5 feet above
15 ground level for the Downtown area, San Marco
16 area. So we do make adjustments to what we
17 have based on the situation with trap tides and
18 that type of thing in the river. I agree with
19 you that it's not great. But we do capture the
20 seiche effect, just not as well as ADCIRC
21 would.

22 W/G MEMBER OLSEN: And that really still
23 would not -- wouldn't model the Downtown area
24 for the event that we had with Irma.

25 MR. SANDRIK: Not extremely well. We --
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 W/G MEMBER OLSEN: It's a propagation of a
2 100-year storm up the river as it affects this
3 area.

4 MR. SANDRIK: And we did adjust based on
5 the 1846 hurricane, because I'm the person that
6 did it.

7 W/G MEMBER OLSEN: Well, you're modeling
8 on a case-by-case basis.

9 THE CHAIRWOMAN: Okay. Hold on. We can't
10 talk back and forth --

11 MR. SANDRIK: Sorry.

12 THE CHAIRWOMAN: -- or we're going to get
13 yelled at.

14 Mr. Killingsworth?

15 DIRECTOR KILLINGSWORTH: Erik, you
16 provided some evidence that the historic and at
17 least the near-term future projection is
18 1 foot, and currently there isn't evidence that
19 there's 2 foot. So if we're looking at the
20 boundaries, is 2 foot appropriate?

21 Because we chose 2 foot because I think
22 that was the median of the RPC's analysis, and
23 we chose their boundaries because those were
24 the boundaries.

25 Is the 2 foot an appropriate measure?

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 W/G MEMBER OLSEN: It depends on how much
2 credibility you give to the effect of climate
3 change as it potentially could affect us here.
4 Obviously, we don't see it yet, so you've got
5 to make the lion's leap of faith that there
6 will be a change in the rate of sea level rise
7 into the future, which is really what this is
8 all about. And as you say, the conundrum there
9 is to determine what it is.

10 DIRECTOR KILLINGSWORTH: Right.

11 W/G MEMBER OLSEN: If you look at a
12 federal study for the harbor deepening project,
13 they're charged with looking at 2 foot, 4 foot
14 and 6 foot of sea level rise. That's what the
15 feds say that that agency must look at. You
16 know, if you get 4 foot of sea level rise in
17 Downtown Jacksonville, that's not going to be
18 habitable, never mind 6 foot. 2 foot is going
19 to be impactful and it's going -- you know, we
20 are talking into the future here, and of course
21 buildings will last to more than 2060.

22 DIRECTOR KILLINGSWORTH: Right.

23 W/G MEMBER OLSEN: If you're
24 developing lot J or you're developing where the
25 JEA should put their offices, I would suggest
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 that they need to include some safeguards with
2 respect to sea level rise rather than just base
3 their sitings on the base flood elevations,
4 which is what the problem is today.

5 You know, I would suspect that if I was
6 Peter Rummell or the civil engineer for Peter
7 Rummell doing Healthy Town, I would guess that
8 his civil engineer will look at where the
9 baseline elevation is and how much detention of
10 water comes off the site, based on the City's
11 code or Water Management's code, and that's
12 what they will design around. And what I'm
13 suggesting here or what I would suggest is they
14 are no longer relevant for the City of
15 Jacksonville, particularly in the Downtown
16 area.

17 You've got to look at the possibility of
18 nuisance flooding and super elevation of the
19 water elevations at the time, all of which
20 affect the drainage off of any site which is
21 being developed, and it's a reoccurring problem
22 we have Downtown. We collect this water in
23 most areas, and people don't even consider the
24 various variations of the tidal aspects of the
25 receiving body, which controls how much water
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 can come out of the culvert.
2 So it's an issue in my opinion that needs
3 to be addressed by code, which may be something
4 that this committee could address to the City
5 Public Works Group, because I have experienced
6 it directly. I live in the Villa Riva
7 Condominiums. It was designed just like that,
8 and it's completely insufficient to handle any
9 type of major rain event. It will handle maybe
10 a 10-, 20-year rain event.

11 Other than that, the water backs up into
12 the building because that's the way the civil
13 engineers designed it back in 2005, not very
14 long ago. So these are the modern standards,
15 and there's a reoccurring issue -- well, it's a
16 sub-issue, over and above what I presented
17 here.

18 THE CHAIRWOMAN: So is it your opinion
19 that the 2 foot is a reasonable height for this
20 group to be looking at?

21 W/G MEMBER OLSEN: I would say so, because
22 if you're going to develop something, it's
23 going to last beyond 2060; if you're going to
24 redevelop something, it's going to last beyond
25 2060, so it's not a ridiculous amount. If
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 you're up 3 or 4 feet, I'd say probably not.

2 THE CHAIRWOMAN: Joe?

3 W/G MEMBER LORETTA: I'll ask the same
4 question a third time. But first off, I want
5 to mention -- I mean, Matthew at the Beaches at
6 least on the Intracoastal rose probably half a
7 foot higher in Matthew than it did in Irma, so
8 the Intracoastal and kind of the Beaches area
9 is one of the areas that we're supposed to be
10 taking into consideration here. So if we were
11 to overlay a map of the hurricane, we should
12 almost consider overlaying a map of both
13 hurricanes for the area, versus just utilizing
14 Irma only, would be one of my feelings.

15 But then I want to just kind of go back
16 and ask that question again. Based on what I'm
17 hearing you say, you're not really agreeing
18 with the fact that it's going to be rising
19 2 feet by 2060; you're accepting that it's
20 going to rise .2, 2 and a half inches, once
21 this dredging occurs, but still we're going to
22 be on a traditional trend of 1 foot over 100
23 years?

24 W/G MEMBER OLSEN: Well, I'm not a
25 climatologist nor a politician. I'll just tell
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

41

1 you that -- you know, there are a lot of
2 predictions out there. There are people
3 predicting we'll see 4 feet of sea level rise.
4 You can make your own judgment. I go by the
5 historical data.
6 But, again, the charge here is to go
7 beyond just what is measured. It's to make a
8 judgment as to what is a reasonable super
9 elevation of the water levels in these areas
10 that we need to accommodate into the future.
11 If the climatologists are right, we may see 2
12 feet of sea level rise. I don't want to temper
13 it with my opinion.
14 W/G MEMBER LORETTA: That's okay. No, I
15 mean, it's more of a personal issue for me.
16 So the next question: The dredging's
17 really occurring west of the Intracoastal too
18 for that matter, so is that going to be -- is
19 that dredging going to increase the sea level
20 rise within the Intracoastal Waterway?
21 W/G MEMBER OLSEN: It could. The Corps
22 has actually mapped that in their studies. You
23 can see the predicted super elevation of the
24 next deepening project in your engineering
25 reports. I don't know what happens down the
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

42

1 ditch. Probably there may be. The worst case
2 area is up around Blount Island and just to the
3 west of that, where it gets up to about half a
4 foot above today's water levels. So if you
5 live in Mill Cove, you're going to have issues
6 that you may not have today. That is the worst
7 case area. But Downtown is about two-tenths of
8 a foot.
9 THE CHAIRWOMAN: Yes, Shannon?
10 W/G MEMBER BLANKINSHIP: In your
11 suggestion about using Hurricane Irma and
12 possibly Hurricane Matthew as sort of the base
13 level map, are you then suggesting to include
14 2 foot beyond that because we're trying to look
15 to 2060, not just current? Is that what you're
16 saying?
17 W/G MEMBER OLSEN: I would say for the
18 Downtown, that includes the 2 foot, because it
19 wasn't even a cat 1 storm when it hit. But the
20 level of flooding is probably -- you know,
21 probabilistically may be a cat 1 plus 2 feet.
22 So it's the best thing you have. You wouldn't
23 add 2 feet to that. Again, the directionality
24 of the storm affects what happens, Matthew
25 versus Irma.
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

43

1 Most of the storms that -- like Matthew,
2 the FEMA maps and also the SLOSH model maps all
3 are basically passing storms because we're very
4 lucky in Northeast Florida. We don't have a
5 high incidence of entering storms.
6 Hurricane Dora I think is the only storm of
7 record that ever entered the coastline. Most
8 of the storms sweep by us some distance, and
9 that affects the flooding that we see at the
10 Beaches and the flooding that affects the
11 river. So in our particular part of the
12 country, the southeast, we're very fortunate
13 that it's kind of rare that we have entering
14 storms.
15 THE CHAIRWOMAN: Is there -- for purposes
16 of making a recommendation to the Planning
17 Department, is there a group, is there a
18 consulting group, is there somebody that we
19 could recommend to the Planning Department that
20 they talk with to make these new maps? Is it a
21 group of people?
22 W/G MEMBER OLSEN: There are companies who
23 literally are structuring their business around
24 this issue. There's one in South Florida that
25 I know of. So there are consulting groups who
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

44

1 come in and will consult with you on a city
2 basis, on a condominium basis, on a subdivision
3 basis, and make you aware of what the
4 probabilistic events are, and they literally
5 give you maps with different scenarios. So,
6 yeah, there are people who do that.
7 THE CHAIRWOMAN: Any other questions from
8 the Work Group?
9 W/G MEMBER TAPPOUNI: I do.
10 Erik, you showed the effects if you're
11 living on the river. What about the two --
12 especially the two urban core creeks, McCoy
13 Creek and Hogan's Creek, and what those impacts
14 could be based on what's happening at the river
15 during these storms?
16 W/G MEMBER OLSEN: They would show up
17 either in the Irma mapping or in the base flood
18 mapping. I would assume there's some
19 propagation, you know, but I haven't looked.
20 MR. SANDRIK: As far as McCoy Creek is
21 concerned, it's basically tidal all the way up
22 into Stockton, so the tide from the river would
23 have stopped the drainage at that Q once again
24 and backed it up under the Stockton Street
25 Bridge. All the rainfall flooding would
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 have flooded onto McCoy Creek Boulevard and the
2 neighborhood. We did not get there to map
3 that. It just wasn't our priority.

4 W/G MEMBER OLSEN: Were you working with
5 USGS?

6 MR. SANDRIK: Yes. I took them out to
7 some of the primary sites, but they only had
8 about 10 sites. I've got a sample of about 400
9 sites.

10 THE CHAIRWOMAN: Any other questions?

11 Yes, Bill.

12 DIRECTOR KILLINGSWORTH: What format is
13 the map in?

14 MR. SANDRIK: I have it in both GIS and
15 KML.

16 DIRECTOR KILLINGSWORTH: Is that an
17 Esri-based product?

18 MR. SANDRIK: Yeah. Basically what we did
19 is we have a tool that we can quickly take a
20 picture and record a GIS point. So I'm not
21 going to tell you these are surveys. These
22 will just show you the aerial extent of the
23 flooding that occurred. And it's not just
24 surge from the river. It's the total water
25 level that we've captured.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 So it's the rainfall flooding; it's the
2 trap tide; it's the seiche effect up the river
3 that Erik was talking about. So all those
4 things combined, but there's no separating them
5 out. It's just total water level and just
6 where the water level was.

7 DIRECTOR KILLINGSWORTH: And it's not
8 contours; it's just point data?

9 MR. SANDRIK: It's just point data, yes,
10 but at least it will show you aerial extent of
11 the flooding.

12 DIRECTOR KILLINGSWORTH: Right, and you
13 can convert it.

14 MR. SANDRIK: Yeah. And we do have water
15 depths at particular locations, and I still
16 have marks that I put out around Downtown which
17 I could take you to and show you some of the
18 actual marks, if you wanted to get an idea of
19 the 1988 recording on those.

20 (Audience member approaches the podium.)

21 THE CHAIRWOMAN: Yes?

22 AUDIENCE MEMBER: Hi, I'm Jim Seaton, and
23 I live in Riverside. Has this group or any of
24 the planners talked with other cities and just
25 gotten a sense of what planning assumptions

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 they're using as they project ahead?

2 THE CHAIRWOMAN: Excellent question
3 because that's going to lead into our second
4 discussion here. This is the third meeting of
5 this group and we have not yet, but we have
6 asked staff to look at other coastal
7 communities, particularly coastal communities
8 that have rivers, and see what they are doing
9 and how they're approaching it.

10 And actually in the information that is
11 handed out to us -- I don't want to jump the
12 gun -- but staff actually provided information
13 from Broward, both as to what comp plan
14 policies they have adopted and the basis of it.

15 So that is going to be everybody's
16 homework that I talked about earlier, is to
17 look at the information that Mr. Olsen has
18 given us, the information that Kristen is going
19 to give us, and look at Broward and start the
20 process of formulating some suggestions that we
21 can turn back over at the end, of
22 recommendations of potentially policies to put
23 into our comprehensive plan and some guidance
24 and information to give to the Planning
25 Department.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 MR. SEATON: Are you going to look at
2 Norfolk also? Them as well as Broward are
3 doing some pretty neat stuff.

4 THE CHAIRWOMAN: I actually went to a
5 planning and zoning -- a Northeast Florida
6 Planning and Zoning meeting where the former
7 facilities director for the Naval Academy made
8 a presentation about what was happening,
9 particularly with the Naval Academy. So we may
10 see if we can get some of that information as
11 well to see, because then it turned over to
12 both Naval Academy policies and some Norfolk
13 policies, because they are similarly situated.

14 MR. SEAT: Thanks.

15 THE CHAIRWOMAN: Anyone else?
16 (Audience member approaches the podium.)

17 THE CHAIRWOMAN: Yes, Mr. Jones?

18 MR. JONES: I'm Warren Jones. I'm the
19 executive director of Riverside Avondale
20 Preservation.

21 I don't have facts and figures, but I just
22 wanted to give you a sense of what our
23 community's thinking is and support Erik's
24 recommendation. If you go anywhere in a
25 business or homes around Riverside or Avondale,

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

49

1 you'll see a famous picture. It's this picture
2 shot by Mark Krancer at Memorial Park. It's
3 early in the morning after Irma or during Irma
4 and at a time where people in Riverside
5 Avondale, San Marco, Ortega were trying to
6 figure out, if they lived near the river, what
7 they were going to take out of their house and
8 get out of their house as quickly as they
9 could.

10 We're here to support Erik's
11 recommendation that the area be expanded
12 because we are seeing some nuisance flooding
13 after large rainfall around Riverside and the
14 Stockton area, and we would really appreciate
15 knowing more about what's coming in the future.

16 So thank you for your good work, and we
17 hope you'll expand the area of study.

18 Thank you.

19 THE CHAIRWOMAN: Thank you.

20 All right. The next thing on our agenda
21 is whether or not we should vote on expanding
22 the boundary. So we as a group don't need to
23 adopt a particular recommendation right now as
24 set forth by Erik.

25 But just in general, does the group agree
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

50

1 that we should expand the AAA beyond the CHHA?
2 Do we have a motion from anyone?

3 W/G MEMBER TAPPOUNI: I would move to
4 explore expanding -- are we exploring, or are
5 we saying we want to?

6 THE CHAIRWOMAN: Exploring.

7 W/G MEMBER TAPPOUNI: Exploring based on
8 new information coming in to expand the
9 boundaries as outlined in our charge.

10 W/G MEMBER ASKEW: Second.

11 THE CHAIRWOMAN: Can we see a show of
12 hands on who supports this?

13 All right. It's unanimous. It's our
14 first vote. Very exciting.

15 Do we have anything at this point in
16 time that we would like -- staff, as I
17 explained, brought to us from our last meeting
18 information about Broward County. Do we have
19 any additional information that we would like
20 staff to go out and look for based on the
21 information that Mr. Olsen has just presented?

22 W/G MEMBERS: (No response.)

23 THE CHAIRWOMAN: I would recommend that we
24 see what Norfolk and Annapolis have by way of
25 policies or procedures, not a -- you don't have
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

51

1 to do expansive research, but if they have
2 comprehensive plan policies or something
3 related to sea level rise, I think it would be
4 good to get that information to the group.

5 W/G MEMBER MARTIN: I would be interested
6 in the 400-point map from NOAA from the last
7 storm. I'd also be interested -- and I've
8 looked at this on the internet some and haven't
9 found anything other than area information --
10 for example, area being Duval County. I would
11 be interested in a claims map, if there is an
12 insurance claims map as a result of Irma; you
13 know, this is a point where there was an
14 insurance claim, this is another point where
15 there was an insurance claim, and you would
16 have a dot density map that would give you an
17 idea of just how dense the flooding was,
18 because that's going to tell you how far the
19 water went because you're going to make claims
20 against that damage.

21 THE CHAIRWOMAN: Okay.

22 W/G MEMBER MARTIN: And I can't find that.

23 THE CHAIRWOMAN: I don't know if -- staff,
24 if you guys could look and see if you can find
25 it. I sat -- I've sat through some hearings at
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

52

1 the City of Fernandina Beach, and there were a
2 number of insurance adjusters that spoke about
3 claims following Irma at Fernandina Beach. I
4 don't know if they would know anything about
5 claims in this area, but if necessary I can dig
6 up those names and pass them over to you.

7 W/G MEMBER MARTIN: Again, only thing I
8 found so far is that Duval County had the
9 highest -- one of the highest claim incidences
10 over all the other counties in Florida with
11 Irma, but it doesn't tell you exactly in Duval
12 County where those claims were.

13 THE CHAIRWOMAN: That would be great.
14 Yes?

15 DIRECTOR KILLINGSWORTH: Question to Erik.
16 Erik, are you familiar with any public
17 domain maps that you think might be
18 appropriate, that we could get our hands on
19 fairly quickly and readily?

20 W/G MEMBER OLSEN: No. There is an
21 interesting website. It's Flood IQ or
22 something like that, which is pretty clever.
23 You can go in and you can pull up the Downtown
24 core, San Marco or whatever you want, and you
25 can cue it to a category storm. You can also
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

53

1 cue it to five years into the future, ten years
2 or more into the future. Now, how accurate
3 that is, I don't know. It is great for the
4 layman to determine potential flood levels
5 because you can do it instantaneously. I'm not
6 sure I would bank my mapping on that, but it's
7 extremely instructive.
8 DIRECTOR KILLINGSWORTH: What about like a
9 category 1 surge or category 2 surge?
10 W/G MEMBER OLSEN: Well, again, the
11 problem is the genesis of these predictions are
12 basically all flood insurance related
13 typically, and again they don't model this
14 section of the river in the manner that is
15 required. They look at storm surge. We end up
16 looking at all the tracks of history across the
17 county, but what dictates it is the surge in
18 the ocean and the propagation of that surge up
19 the river, and that's the shortcoming that we
20 have in the current mapping systems, whether
21 it's a cat 1, cat 2 or cat 3, at least from
22 FEMA standards.
23 THE CHAIRWOMAN: Al, are you aware of any?
24 MR. SANDRIK: Yes. Coastal Services
25 Center in Charleston has produced a sea level
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

54

1 rise viewer that you can go online and take a
2 look at. And what it does is it gives you
3 scenarios from mean, high or high water up to
4 10 foot mean high or high water in
5 1-foot gradations, and you can switch that to
6 meters should you choose to do so. Doug Marcy,
7 who put that together, worked very
8 conscientiously to make sure he captured mean
9 high or high water in each location.
10 As Erik indicated in his presentation, I
11 would warn you it's what we call a bathtub
12 fill, so we rose the water just like it was in
13 your bathtub. So it doesn't account for any
14 currents; it doesn't account for any wind
15 action; it doesn't account for wave runoff, so
16 it's just still water like you were sitting in
17 your swimming pool. So be careful about that.
18 But it gives you a good visualization on how
19 things would rise with each different scenario,
20 as I said, on 1-foot gradations.
21 W/G MEMBER OLSEN: I suspect that's
22 probably where Flood IQ got their database
23 because that sounds very similar. Again, in
24 all of this, you need to be careful. When you
25 get down to where the rubber meets the road,
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

55

1 you need to be sure you're working off of
2 datum, because the datum matters. So even if
3 it's mean high or high water, you need to be
4 able to physically tie into it knowing the
5 data.
6 THE CHAIRWOMAN: Bill, does the City or
7 the Planning Department have a designated
8 resiliency officer that is...
9 DIRECTOR KILLINGSWORTH: Not that I'm
10 aware of, no.
11 THE CHAIRWOMAN: Okay.
12 Yes, Michelle?
13 W/G MEMBER TAPPOUNI: I'm asking the
14 general group. Would there be any value in the
15 area where the Indian River or Indian River
16 Lagoon, whatever that county might be doing,
17 since that comes up into the Intracoastal? Are
18 they dealing with some of the same types of
19 issues we might be dealing with?
20 W/G MEMBER OLSEN: Well, probably not.
21 It's actually a closed system. This is the
22 only rivering system you're going to find in
23 the state. I mean, there's nothing analogous
24 to this. You're not going to find another
25 analogy for a rivering system like ours or the
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

56

1 part of the rivering system that we're dealing
2 with.
3 THE CHAIRWOMAN: So the other things like
4 Broward or Annapolis, Newport, those are things
5 we can use in guidance, but they don't
6 necessarily mimic ours exactly.
7 W/G MEMBER OLSEN: Not the floods
8 phenomena, but the codes may be extremely
9 relevant.
10 THE CHAIRWOMAN: Is there any other
11 information that we'd like to get from staff?
12 MR. SEATON: Jim Seaton again.
13 Do any of the models or any of the
14 research account for different rainfall
15 amounts? I don't know how much we got in Irma,
16 but I live right at the corner of Riverside and
17 Stockton, so water was coming from the river
18 and it was also flowing down very heavily from
19 the higher ground on Stockton. And that's
20 localized, but there's got to be other areas
21 here too, and it would seem that if we expect
22 higher frequency or higher rainfall amounts,
23 that would impact too.
24 So, again, when you throw everything into
25 the mix, I don't know if rainfall is
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 significant enough or if that's covered with
 2 the 2-foot limit.
 3 That's the question I have.
 4 THE CHAIRWOMAN: Al or Erik?
 5 MR. SANDRIK: I'm going to let Erik go
 6 first.
 7 W/G MEMBER OLSEN: It's not included in
 8 this. It's not included in the base mapping,
 9 just like the rivering flow; river flow is not.
 10 Most of that is high frequency. That's really
 11 a nuisance flooding event for the most part.
 12 Although it is also a significant area of
 13 inundation during the major storm flow, because
 14 it comes in Stockton Street and flows out.
 15 Living in that area, I know that just
 16 thunderstorms alone can cause nuisance flooding
 17 in that area, and it's one of the areas where
 18 this group may want to make recommendations to
 19 Public Works as to how to handle this nuisance
 20 flooding. For example, at the end of Stockton
 21 Street, there ought to be a pumping system, and
 22 there's several areas where there ought to be a
 23 pumping system because there's no way we're
 24 going to get rid of the water. But, again,
 25 those are sort of tertiary.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 THE CHAIRWOMAN: Alan.
 2 MR. SANDRIK: Right now, where NOAA is
 3 trying to go is a total water forecast, total
 4 water level forecast. So we're looking at
 5 storm surge; we're looking at trap tides; we're
 6 looking at the seiche effect on the river that
 7 Erik was alluding to and also rainfall. It's
 8 years down the road, but probably 5 to 10
 9 years. I'll be retired before it comes out.
 10 But 5 to 10 years down the road, that will be
 11 the future of forecasting and the products that
 12 are put out for planning. But, again, that's
 13 the future.
 14 As far as how much rainfall contributed to
 15 Irma, my gut estimate is in San Marco there was
 16 probably about a foot to probably a foot and a
 17 half of standing rainwater in the streets
 18 before the water came out of the river. Again,
 19 some water was coming up through the drainage
 20 system before it came over the seawall.
 21 So, again, there was probably some
 22 spreadation of salinity across the water column
 23 on streets like Lasalle. But it was
 24 significant, the amount of rainwater that
 25 occurred in the San Marco area, as well as

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 Riverside. There probably was not quite as
 2 much in Riverside as there was in San Marco.
 3 THE CHAIRWOMAN: One of the things -- and
 4 then we're going to need to get over to
 5 Kristen -- that -- your comment saying that
 6 this is 10 years out, NOAA's prediction.
 7 MR. SANDRIK: Just being realistic with
 8 how things move.
 9 THE CHAIRWOMAN: Correct. In looking
 10 at -- not jumping the gun again, but looking at
 11 what Broward did in their comprehensive plan is
 12 something I think we as a group should
 13 consider, that they do a review each -- I think
 14 it's five years, because this is an
 15 ever-changing science. All the different
 16 agencies are out collecting data rapidly,
 17 trying to put it together. Broward did not do
 18 a here's what we're going to do and this is it.
 19 What they've done is put policies in place to
 20 continually analyze things as the data comes in
 21 and make recommendations as the data is
 22 changing.
 23 So we, I think, ought to as a group
 24 consider the fact that we need to look at this
 25 as steps. We have a local and state group that

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 is looking at immediate fixes right now, which
 2 we've already been told about, and we're
 3 looking at the 2060 horizon, but it doesn't
 4 mean we can only say, "Okay. Here's what we
 5 need to put in place right now, and it's all
 6 going to be in place by 2060."
 7 One of the things we might want to
 8 consider putting in place is steps to continue
 9 to analyze the data as things come online,
 10 because as Erik says, each storm that comes in,
 11 each group of data that comes in, we're honing
 12 in on what those impacts are. So when we are
 13 thinking about what types of policies we'd like
 14 to see put in place in the city, we ought to be
 15 thinking in terms of not just one concrete
 16 policy but perhaps policies that come into play
 17 as steps.
 18 All right. Now we're going to switch to
 19 our next speaker.
 20 Kristen Reed, would you please introduce
 21 yourself?
 22 W/G MEMBER REED: Kristen Reed, I'm chief
 23 of Community Planning Division. I've been with
 24 the City of Jacksonville for going on 19 years
 25 now. I'm going to give you an overview today

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 of the existing policies in the City's
2 Comprehensive Plan that are primarily related
3 to the Coastal High Hazard Area, as that was
4 our starting point, and also to give you some
5 examples of some best practices, as Emily had
6 discussed, from Broward County and a tool kit
7 that has been created for our consideration
8 also and will help orient our discussion and
9 give ideas to the group about ways that we can
10 make recommendations.

11 Again, today our focus is on the
12 Comprehensive Plan policies, and I'm looking at
13 things that are at the very highest level.
14 They're how we assign development entitlements
15 to property. So the details later on that we
16 will discuss such as drainage, floodplains,
17 things of that nature, there are policies that
18 address those, and we'll present those as those
19 discussion topics come up.

20 To go back to our first presentation, I
21 gave a brief overview of the Comprehensive
22 Plan, what it is and how it relates to our
23 detailed land development regulations. Just to
24 go back and reiterate, the Comprehensive Plan
25 is the highest policy level. It's general in

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 nature and allows flexibility for
2 interpretation and implementation. It's a set
3 of guidelines that tells us how the city is
4 intended to grow and develop.

5 One example is that the policy establishes
6 this very group and tells us that we need to
7 meet and we need to discuss and evaluate our
8 regulations and come up with recommendations,
9 but it doesn't tell you exactly how you're to
10 do that, as with the discussion for whether or
11 not the CHHA is appropriate for consideration
12 or not.

13 The Comprehensive Plan is policy
14 statements about a long-term intended goal or
15 outcome, and then it's to be implemented in our
16 day-to-day actions through our city's policies,
17 programs and regulations, again, such as the
18 flood plan regulations, the zoning code itself,
19 the code of subdivision regulations and even
20 the capital improvements program. So, again,
21 we're going to focus on the top-tier
22 development, how we assign development
23 entitlements to property, and it's typically
24 done in the evaluation of requests to amend the
25 City's future land use map and the zoning map.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 So if you'll look at your handouts, the
2 first one is the 2030 Comprehensive Plan Land
3 Development and Entitlement Property Related to
4 Coastal High Hazard Areas. Now, I will
5 acknowledge that there are some policies that
6 are not specifically oriented towards Coastal
7 High Hazard, but they overlap, such as wetlands
8 policies and floodplain regulations.

9 So these policies are divided into three
10 general strategies: They are site planning;
11 property use, density and intensity; and review
12 criteria for the application of the various
13 land use categories and zoning districts. Land
14 use categories are the general description of
15 the type of use that would be permitted, is it
16 residential or commercial, and very general
17 distributions of the intensities of those uses,
18 such as residential being divided into low
19 density residential, medium density residential
20 and high density residential. That would be
21 single family to multifamily to the high rises
22 that you see Downtown.

23 Now, the site planning strategy refers to
24 how the Department reviews and evaluates site
25 design characteristics of proposals, such as

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 through a rezoning that includes a site plan.
2 It would entitle the way the development is
3 laid out generally on the site.

4 Property use, density and intensity refers
5 to how we review the proposed uses, densities
6 and intensities included in a zoning category
7 or a land use category and considers the
8 specific limitations that a high level on uses
9 that could occur in a certain area, such as a
10 Coastal High Hazard Area. And then the land
11 use category and zoning district change
12 evaluation refers to how we review those
13 requests and the general distribution is in the
14 appropriate location for that general use.

15 So these strategies for allocating
16 development entitlements are typically under
17 the following list that I'll provide to you of
18 the ways that we look at and review and the
19 criteria that we consider when we look at these
20 things: They encourage clustering away from
21 wetlands in the Coastal High Hazard Area. This
22 can be done through transfer of development
23 rights to another non-impacted portion of the
24 property or another area.

25 They recommend setbacks, buffer zones and
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 open space to direct development away from
 2 those environmentally sensitive areas. They
 3 call for low density zoning and land use, again
 4 with the focus on keeping development out of
 5 these areas and limiting those that would be
 6 exposed to hazards.
 7 We encourage placing environmentally
 8 sensitive lands into conservation easements or
 9 conservation land use and zoning. It
 10 encourages the limitation of use in highly
 11 valuable wetlands areas. In fact, for
 12 wetlands, it's very specifically limited to two
 13 or three uses and very low density residential,
 14 if any at all. It prohibits nursing homes,
 15 community residential homes, hospitals, group
 16 homes, things of that nature in the Coastal
 17 High Hazard Areas and also discourages the
 18 expansion of those types of uses if they
 19 already exist in those areas. It requires
 20 consideration of development issues that impact
 21 the river and its tributaries, such as septic
 22 systems, wetlands, the Coastal High Hazard
 23 Area, any other environmentally sensitive land,
 24 flood zones. It also considers the potential
 25 impervious surface area.

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 The Planning Department, when someone
 2 comes in and asks for a land use map amendment
 3 in an area adjacent to the river and those that
 4 have highly valuable, environmentally sensitive
 5 lands, wetlands, takes them to the City's
 6 Waterways Commission and does a more in depth
 7 review and makes a recommendation in the
 8 process of reviewing those requests that would
 9 not otherwise be included.

10 So do you have the maps? I have a very
 11 high-level general perspective on how we would
 12 apply some of these criteria. So this is just
 13 a very generalized concept of how we would
 14 apply some of these strategies when we are
 15 reviewing development. There are three maps in
 16 here. This is a map that shows -- if you look
 17 at that general triangular area, I believe
 18 that's I-295 and Trout River Boulevard on the
 19 south and the river on the east, and you'll see
 20 that the light green indicates the area of the
 21 wetlands.

22 And you can pull up the other map as we
 23 talk. If you were looking at that and looking
 24 at these policies and someone came in and said
 25 they wanted to do a land use map amendment, and

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 being near the river, those are highly valuable
 2 category 1, what we would call wetlands, and
 3 then it also overlaps with the flood zones. So
 4 the pink and blue is the flood zones on that
 5 same area. And then the next map is the
 6 Coastal High Hazard Area. So the areas are not
 7 identical, but they overlap quite a bit.

8 One, they ask for a request to, say,
 9 change the land use from a low density
 10 residential that allows single-family
 11 dwellings and up to potentially seven dwelling
 12 units per acre, and they came in and wanted to
 13 do a medium density residential development
 14 there; one, we would take the request to the
 15 Waterways Commission for their review and
 16 evaluation. And in the Department's review, we
 17 would look at the overlapping of all these
 18 factors and encourage the applicant on the
 19 front end to try to take those wetlands out,
 20 either out of their request, to not increase
 21 the intensity in those, or would we ask them to
 22 take them to conservation.

23 Typically, that would be a recommendation
 24 that would also come out of the Waterways
 25 Commission. Today, we've been pretty lucky

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 that a lot of the development that comes to the
 2 City that has these issues, especially with the
 3 Coastal High Hazard Area, is generally willing
 4 to cluster out of those things, to put them
 5 into conservation easements or land use
 6 categories or remove them from their request
 7 entirely.

8 Now, if they already had the entitlements
 9 and they came in for a site plan review or if
 10 they were doing some type of zoning change on
 11 their site that would include a site plan,
 12 again we would do the same thing. Zonings
 13 don't go to the Waterways Commission. The
 14 Department would still encourage clustering
 15 away from those conservation, dedication of
 16 those lands through the zoning or through an
 17 easement. Just a high-level perspective on how
 18 we would look at those types of uses.

19 So for the next section of this, we want
 20 to get into some best practices from around the
 21 state. And as Emily had pointed out, we
 22 provided you with actually two handouts. One
 23 is kind of a toolkit.

24 The first one is the Adaptation Action
 25 Areas Policy Options for Adaptive Planning for

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 Sea Level Rise. This was a group effort that
2 included the State Department of Economic
3 Opportunity, Broward County, the City of Fort
4 Lauderdale, as well as you can see NOAA is on
5 here, Department of Environmental Protection
6 and the Florida Coastal Management Program.

7 This report is intended to be a resource
8 for local communities in identifying strategies
9 to address the impacts of sea level rise. And
10 I would strongly -- I'm going to go very high
11 level over this, but it's an easy read, it's a
12 good read; it gives you more understanding of
13 the Comprehensive Plan and the types of
14 policies that might come out of that as well as
15 some more detailed considerations.

16 But the report identifies four main
17 strategies for adaptation, and these are on
18 page 4 of the report. The strategies include
19 protection, accommodation, managed retreat, and
20 avoidance. Protection being hard and soft
21 structurally defensive measures to mitigate
22 impacts of rising seas. Accommodations are
23 measures that do not act as barriers, but do
24 alter the design through measures such as
25 elevation or storm water improvements. Managed

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 retreats involve the removal of existing
2 development and possible relocation to other
3 areas. And avoidance, as it sounds, is
4 limiting or prohibiting development in certain
5 areas.

6 Beginning on page 13 of the report,
7 there's a listing of 17 different tools that
8 local communities can consider to implement the
9 intent of an Adaptation Action Area. These
10 include but are not limited to zoning overlays,
11 floodplain regulations, building codes and
12 design, setbacks and buffers, hard and soft
13 armoring permits, and conservation easements.

14 And going back to the presentation about
15 the policies in our existing Comprehensive
16 Plan, we do address a lot of these policies and
17 these strategies focused on the Coastal High
18 Hazard Area and flood zones. They were not
19 intended at their initial development to
20 address the Adaptation Action Area, but they
21 still give the same general concepts of
22 avoiding, protecting, and limiting development
23 impacts in these areas.

24 So an example of a zoning overlay is an
25 area that you can design, and it would be

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 similar to the Adaptation Action Area. That's
2 essentially an overlay in the Comprehensive
3 Plan rather than the zoning code, the zoning
4 code being the specific land development
5 regulations and which could get into far more
6 detail about the structures, the location of
7 the structures, the setbacks, things of that
8 nature. It can establish stricter standards or
9 criteria for development, again such as
10 increased buffers, open space requirements. It
11 can define the areas and implement some of the
12 other tools identified in this report.

13 The floodplain regulations can require
14 additional structural elevations or freeboard
15 over and above those established in the flood
16 zones. And hard and soft armoring projects can
17 protect property and structures from flooding
18 and erosion through shoreline armoring,
19 structures such as bulkheads, seawalls or
20 manmade barriers that mimic natural buffers.

21 The report also heavily relies on Broward
22 County's Comprehensive Plan policies, and
23 there's reference to them in the toolkit, but
24 there's also in your handout a copy of the
25 Broward County -- and I know I have a copy

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 here -- Broward County's goals, objectives and
2 policies.

3 And as Emily alluded to, they have a lot
4 of strategies that might be useful to implement
5 locally in the City of Jacksonville. I
6 strongly encourage that you read through those
7 as well, bring some of those thoughts back with
8 you to our upcoming meetings. It talks
9 about -- now, Broward County is considering it
10 from a variety of municipalities within the
11 county in coordination. The City of
12 Jacksonville is consolidated aside from the
13 Beaches communities, which have their own
14 comprehensive plan, so if they chose to
15 implement these, they would do them separately.
16 Whether or not they're similar or not to the
17 City of Jacksonville would be up to them.

18 But it does talk about promoting the
19 adoption of specific goals in the comprehensive
20 plan to support and establish sustainable
21 development patterns, especially in areas that
22 reduce risk to sea level rise. It talks about
23 identifying public investments and
24 infrastructure at risk from sea level rise and
25 other climate-related impacts and to update the

Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 assessment every five years so it can be a
 2 living document.
 3 It says that the county shall evaluate the
 4 costs and benefits of adaptation alternatives
 5 in the location and design of new
 6 infrastructure as well as the fortification or
 7 retrofitting of existing infrastructure. The
 8 plan also leaves open Broward County to
 9 coordinate in identifying other adaptation
 10 action areas that should be incorporated into
 11 their existing areas of consideration.
 12 So again, it's a living document that can
 13 evolve. The comprehensive plan policies
 14 wouldn't necessarily have to be revisited
 15 continually. They would guide the development
 16 of very specific procedures and regulations
 17 that would then go forth and implement
 18 strategies to protect development from impacts
 19 of sea level rise. And, again, I would
 20 encourage you all to read through these things.
 21 There's a lot of great examples in there.
 22 And I will return it back to the Chair,
 23 Ms. Pierce.
 24 THE CHAIRWOMAN: Thank you.
 25 The other thing that I forgot to point out
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 at the beginning that the City gave us was
 2 information that we asked for last time, and
 3 it's in your handouts. It is the acreage and
 4 developed acreage within the different land use
 5 categories, so we can kind of see from a very
 6 high-level view how much acreage, like
 7 agricultural acreage, has actually been
 8 developed in the city, how much low density
 9 residential, how much medium density
 10 residential, et cetera. That information can
 11 be used in looking at potential policies.
 12 Does anybody have any questions for
 13 Kristen about the Comprehensive Plan or where
 14 we are right now?
 15 Yes, Shannon.
 16 W/G MEMBER BLANKINSHIP: I know there's
 17 currently the Comprehensive Review 2030 sort of
 18 going forward. So everything you were just
 19 citing is current and not -- okay. So maybe
 20 just some thoughts or recommendations on things
 21 this group might be able to do to influence the
 22 next comprehensive plan which is being, you
 23 know, discussed right now.
 24 W/G MEMBER REED: Through the Chair, the
 25 assessment of the current comprehensive plan,
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 which is a 2030 Comprehensive Plan, there is
 2 already a report out there that does talk about
 3 resiliency to some degree, definitely not to
 4 the depth that we're getting to now. So that
 5 report I would anticipate -- hopefully, in the
 6 next few weeks it will be introduced for
 7 consideration and approval by the Council. We
 8 would go forth and implement those.
 9 This group's work wouldn't be necessarily
 10 bound to that. We can make recommendations
 11 that can be updated in the Comprehensive Plan
 12 outside of that process. So working on our
 13 timeline, they may end up being implemented in
 14 the adoption of the actual text changes, but
 15 they don't have to be in the assessment report.
 16 THE CHAIRWOMAN: Bill?
 17 DIRECTOR KILLINGSWORTH: If I can, so what
 18 we hope will be introduced is really just a set
 19 of recommendations to direct the Department to
 20 go forth and identify changes to the
 21 Comprehensive Plan, whether that be goals,
 22 objectives or policies, consistent with the
 23 recommendations that came out of another
 24 working group. So depending on when that
 25 resolution gets adopted, I would expect that it
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 would be at least a year before those policy
 2 changes, recommendations would come before
 3 Council. So I think there's plenty of time
 4 where whatever recommendations this group has,
 5 that they would all be weaved in together at
 6 one time.
 7 THE CHAIRWOMAN: Okay. Joe?
 8 W/G MEMBER LORETTA: So looking at -- two
 9 questions. The first one's kind of a leading
 10 question. This exhibit here, it floors me. I
 11 would never have guessed like -- let's say
 12 medium density residential. If I'm reading
 13 this correct, there's 506 acres of medium
 14 density residential within the CHHA or the AAA
 15 right now as it is, but only 37 of them have
 16 been developed. Is that correct?
 17 W/G MEMBER REED: Through the Chair,
 18 actually, this is developable acreage, so it's
 19 slightly the opposite.
 20 W/G MEMBER LORETTA: Okay. So there's
 21 only 37 remaining to be developed?
 22 W/G MEMBER REED: Correct.
 23 W/G MEMBER LORETTA: Okay. So that's a
 24 huge difference.
 25 Okay. So, you know, a lot of what we're
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 dealing with is now retrofit-type situations.
 2 There can't be that many -- you know, this is
 3 now showing we're at 10 to 15 percent left for
 4 developable areas here. So it's tough for me.
 5 When I think of retrofit, I think of more
 6 tangible-type things, you know, we've got to
 7 say, "Hey, you've got to build your finished
 8 floor 2 feet above flood elevation now versus
 9 1 foot."
 10 Is that sort of thing going to go as a
 11 comp plan policy, or would that sort of thing
 12 be a zoning policy? I still kind of struggle
 13 with -- you know, a lot of this is just, you
 14 know, very vague, as you said, just drastically
 15 up for interpretation. I'm just trying to get
 16 to what it is that --
 17 I mean, I know, Bill, you just said what
 18 you wanted, but I'm still struggling to
 19 understand what it is you want our group to be
 20 doing here.
 21 DIRECTOR KILLINGSWORTH: To the extent
 22 that the policies don't provide direction for
 23 change to the land development regulations and
 24 to the extent that the land development
 25 regulations don't address the adaptation needs
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 for whatever boundary comes up, I think that's
 2 open to the group. Just recognize we need the
 3 guidance in the comp plan to make the changes
 4 to the land development regulations. I think
 5 that's why Kristen is starting here. We've got
 6 to have at least some policies that direct us
 7 to make those changes in the Comp Plan, and
 8 then we can come in and make additional changes
 9 in the land development regulations.
 10 So some of the strategies that you heard,
 11 whether they're soft or actual armory, you
 12 know, there needs to be guidance I would think
 13 in the Comp Plan, A, to direct the City to
 14 identify locations suitable for those things,
 15 and then there might be criteria in the land
 16 development regulations that defines how
 17 something is armored or some form of soft
 18 hardening. So that's kind of how I see it
 19 playing out.
 20 Does that make sense to you, Joe?
 21 W/G MEMBER LORETTA: I mean, I think I
 22 need to get myself a little bit more
 23 familiarized.
 24 DIRECTOR KILLINGSWORTH: We're still at a
 25 pretty high level because our plan doesn't
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 really address adapting, and we've got some
 2 policies that we put into the EER update, the
 3 state-mandated EER update, but I think we're
 4 looking for more guidance.
 5 Go ahead, Kristen.
 6 W/G MEMBER REED: Just to throw out an
 7 example that might be more specific, Broward
 8 County has policy 19.3.12 on page 3 of the
 9 handout. It says that by 2012, Broward County
 10 shall designate areas that are at increased
 11 risk of flooding due to or exacerbated by sea
 12 level rise over the next 50 years, and those
 13 within the priority planning areas for sea
 14 level rise map, and work to make these areas
 15 more climate resilient by discouraging density
 16 increases and encouraging the use of adaptation
 17 and mitigation strategies.
 18 So it very clearly directs Broward County
 19 to develop detailed regulations and guidelines
 20 based on data and updated data to address these
 21 issues. So it doesn't say -- you could discuss
 22 the flood zones, maybe the elevation above
 23 flood levels to some degree, but it doesn't put
 24 the actual specific guidelines in there.
 25 THE CHAIRWOMAN: So we can use something
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 similar to this policy and also include things
 2 that say and particularly review building
 3 codes, floodplain management requirements,
 4 zoning code densities. We could put more
 5 specificity in there, but I think we, at our
 6 very first meeting, got a director saying our
 7 job is not to say, you know, the current
 8 standard is base flood elevation plus 1 and
 9 therefore we think that the city or county
 10 should have base flood elevation plus 2.
 11 They're not -- that's not the level of what
 12 we're to do.
 13 That's one of the reasons that -- I got a
 14 sneak peek at these policies beforehand and
 15 this really helped get what I think our
 16 direction is. Because that's something I've
 17 been struggling with, is how do we help the
 18 City in getting to where they need to go.
 19 Because Bill's going to have to go ask for
 20 money and have plans done and make changes to
 21 the zoning code, and our job is to help Bill
 22 and the staff get to that point.
 23 DIRECTOR KILLINGSWORTH: And it may be --
 24 in terms of like the boundary, the discussion
 25 we had today on the boundary, it may be that,
 Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 you know, in two weeks or even two months, we
2 don't have the tools to define a boundary that
3 you all can take a vote on. But you could
4 establish the criteria in which that boundary
5 would be established under, and then we could
6 seek the -- you know, and a timeframe in which
7 to do so, and then we can put that in our work
8 plan and go forth and do that, which is based
9 off my questions.

10 You know, if the map's in public domain
11 right now and there's something that fits, we
12 can do that pretty quick and you can look at it
13 and make a decision. But if what you want to
14 see is some criteria that defines a contour
15 that doesn't exist right now, then we'll have
16 to do fieldwork that generates that, and that
17 will take time and money.

18 THE CHAIRWOMAN: Correct.

19 Joe?

20 W/G MEMBER LORETTA: Just one more
21 question for Bill. So, you know, as a part of
22 the Comprehensive Plan, you know, policy
23 recommendations, I mean, we should be looking
24 at retrofit as well as new development. So,
25 you know, really a lot of this is going to be

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 recommending, you know, things to assist the
2 City for major infrastructure improvements for
3 the future?

4 DIRECTOR KILLINGSWORTH: Right.

5 W/G MEMBER LORETTA: Okay. I just wanted
6 to confirm that.

7 DIRECTOR KILLINGSWORTH: I mean, both in
8 terms of capital infrastructure and how does
9 this city help private development adapt, you
10 know, through regulatory controls or other
11 controls, whether it be retrofitting or
12 ordinary development, and it may be different
13 strategies for each of those.

14 THE CHAIRWOMAN: Does the City have
15 density bonuses that they -- and I should know
16 the answer, but I don't -- density bonuses they
17 give to developers if you stay out of Coastal
18 High Hazard or potential wetlands or
19 conservation? Are there current policies in
20 the Comprehensive Plan that give you bonuses
21 for the clustering?

22 DIRECTOR KILLINGSWORTH: We let you
23 count the total acreage towards your
24 residential units and then cluster. So, yes,
25 there's a specific clustering policy that

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 allows you to cluster your density and then --
2 but maintain the density for lands that are
3 uplands, and then as part of that, we ask --
4 which Kristen brought up earlier, that you
5 either put it into conservation land use or an
6 easement or something like that. There is
7 also -- didn't we do a bonus for the one in
8 Riverside? But it wasn't to stay out of the
9 Coastal High Hazard. It was some other bonus.

10 The challenge that Jacksonville has -- I
11 had the same discussion regarding affordable
12 housing. The challenge that Jacksonville and
13 the State of Florida has in terms of, like,
14 transferred development rights and bonuses is,
15 unlike some areas in which these tools are very
16 popular and effective, the price of our land
17 just isn't high enough to make those bonuses
18 meaningful to a lot of developers.

19 Sometimes the situation arises where it
20 plays out, but in general what I hear from the
21 development community is typically it's just
22 not worth the effort. And I don't know. I
23 mean, you work on the other side of that. You
24 may hear the same thing.

25 THE CHAIRWOMAN: Well, I'm coming at it
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 from the thought that we are -- development
2 right now is very strong, and I'm hearing from
3 some of our clients that land is getting harder
4 to find. And if we're going to take out
5 Coastal High Hazard Areas and wetlands and
6 potentially expand the boundaries of the AAA,
7 that is going to decrease the amount of land.
8 And at some point -- Jacksonville has high
9 densities available in general compared to
10 other cities and counties. So I don't know
11 that bonuses would ever come into play. But at
12 some point --

13 DIRECTOR KILLINGSWORTH: But it would be a
14 tool. I mean, you could have a transfer of
15 development rights. If the rights were there
16 and the City moved a boundary and established
17 regulatory controls over that parcel, there
18 could be an incentive program to cooperate in
19 the transfer of those development rights to a
20 parcel outside of the CHHA. I mean, at some
21 point Jacksonville will become dense enough
22 that those types of tools will become
23 meaningful.

24 THE CHAIRWOMAN: I would think that would
25 be something as a group that we might want to

Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 talk about or consider. While right now it may
2 not be something people will take advantage of,
3 maybe it's something to look at or something
4 staff might want to put in the Comprehensive
5 Plan in the future as an incentive to stay out
6 of these areas and possibly to abandon things
7 that are currently in the areas, if somebody
8 has the option of updating an existing facility
9 and comparing the costs of that versus moving
10 out of that facility to a new area. There's
11 probably some way to capture that to encourage
12 people to abandon the areas.

13 Any other questions for Kristen?

14 W/G MEMBERS: (No response.)

15 THE CHAIRWOMAN: All right. We're going
16 to go to a couple of things before I head to
17 public comment, because we've got just a couple
18 of minutes. Are there any what we'll call
19 staff deliverables that you would like to see
20 Kristen or Helena or Susan bring to us related
21 to the current comp plan, or do you want to
22 just digest what we've been given so far and
23 come back and talk about it next week?

24 W/G MEMBERS: (No response.)

25 THE CHAIRWOMAN: Okay. We're going to go
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 with the come back and talk about it next week.
2 Susan is handing out to us a sheet that
3 we're at the point I think in this to start
4 reviewing other people's policies. This is
5 your homework, is to review the information
6 Kristen gave you for the Comprehensive Plan and
7 also what Broward County has been doing, and
8 start essentially -- and the information Erik
9 gave us, and start putting together some ideas
10 of how we would like to help guide the City.

11 So staff has prepared this outline for us
12 that should help us in kind of taking these
13 ideas and getting them to paper. And then we
14 can -- I'd like everybody to read the documents
15 that were given to us today, including Erik's
16 white paper as well, and spend some time over
17 the next two weeks in starting to think about
18 what kinds of policies and guidelines we'd like
19 to work with the staff on developing. And
20 obviously, we're not going to be -- we're going
21 to look to the staff for helping us in actually
22 drafting those so we can get to what they want,
23 but I think this guidance document will help us
24 in putting that all down on paper.

25 All right. Now we're going to go to --
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 W/G MEMBER TAPPOUNI: Through the Chair,
2 Kristen, you mentioned that there were some
3 recommendations in the 2030 report related to
4 resiliency. Could we see those?

5 W/G MEMBER REED: Absolutely. They're
6 very high level. They weren't directly
7 associated with this, but they do overlap to a
8 degree.

9 W/G MEMBER TAPPOUNI: Okay. Thank you.

10 THE CHAIRWOMAN: Okay. All right. We're
11 going to go to public comments. We have about
12 20 minutes available to us for public comment.
13 We are going to limit public comment to three
14 minutes each, and Helena has these lovely signs
15 that she has made that will help everybody know
16 when your three minutes are just about up. And
17 we're going to let staff call because they've
18 got the cards.

19 MS. KELLY: This is just empty cards. We
20 request that anybody that wants to speak just
21 fill out a card so that we have a good record
22 of who spoke.

23 THE CHAIRWOMAN: We had a card. Warren
24 Jones from Riverside Avondale Preservation
25 submitted a card. He actually spoke during
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 Mr. Olsen's presentation, but he represents --
2 he's the president of what we call RAP, and he
3 will be following this closely because they
4 flood on a regular basis. That's Warren's
5 three minutes.

6 Is there anybody else that would like to
7 fill out a card and speak?

8 AUDIENCE MEMBER: (Indicating.)

9 THE CHAIRWOMAN: Yes?

10 MR. RAY: Noah Ray, I'm actually with the
11 City Emergency Preparedness Division. I just
12 thought of this during Ms. Reed's presentation.
13 An alternative dataset to possibly complement
14 the floodplain data could be building permits
15 after Irma, how many permits were taken out
16 where, just maybe a heat map that way.

17 THE CHAIRWOMAN: That would be great.
18 That's a great suggestion.

19 MR. RAY: That was it.

20 THE CHAIRWOMAN: Hang on real quick. So
21 staff, is that information -- you may not be
22 able to get it in this next two weeks, but is
23 that information --

24 DIRECTOR KILLINGSWORTH: It's available to
25 us. We'll have to -- so like, you know, we did
Diane M. Tropa, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 a roofing rebate as a result of the storm, so
2 we certainly could query those out pretty
3 easily.
4 THE CHAIRWOMAN: Great.
5 DIRECTOR KILLINGSWORTH: And then I'll
6 talk to -- Tom's out today, but I'll talk to
7 Tom to see -- those I think would be easy
8 because I know we track those and we issue
9 rebates on those, so those are a finite subset.
10 What I don't know is whether or not any of the
11 other storm-related permits that weren't
12 roofing, if he flagged those in some kind of
13 way. We may have captured those to report back
14 to FEMA. I just don't know the answer to that
15 question.
16 THE CHAIRWOMAN: Okay. If you would check
17 with Tom, that would be great.
18 All right. Next?
19 MR. MOWRY: I'm Bruce Mowry. That's
20 M-o-w-r-y. I'm with Stantec Consulting
21 Services here in Jacksonville. Again, I
22 appreciate it, and I enjoyed your meeting
23 today. It's very well done.
24 Comment on Mr. Olsen's presentation: It
25 was a great presentation. The issue of sea
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 level rise and what's happening, I was a city
2 engineer for about five years in Miami Beach,
3 and in 2013 we went and looked at the
4 historical data for about 50 years back of the
5 peak tidal elevation during a nonstorm event.
6 And we found an elevation of about 1.8 NAVD as
7 being our highest.
8 Believe it or not, for the next four
9 years, we exceeded that elevation by as much as
10 6 inches, it progressed in that time period. I
11 was hoping that's not going to be a trend for
12 the future, but again we had many people who
13 doubted. We had a lot of engineers like myself
14 that said, "How can you see this much sea level
15 rise?" Well, what I'm saying is we are seeing
16 significant, whether the magnitudes are what
17 they're projecting.
18 I'm doing a lot of work on the Gulf Coast
19 right now, and we're looking at as much as 5
20 feet. And the presentation discussing the
21 areas of wetlands, wetlands areas will vastly
22 increase along coastal areas because of an
23 elevation, and the question's going to be the
24 interface between the wet lands and the uplands
25 and where is that going to either stay -- when
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 I was in Miami Beach, I was quoted as saying
2 not 1 inch is going to be given up because we
3 were very limited in land, and so we were
4 having to look at vertical type of
5 designations.
6 We actually established a minimum seawall
7 of 5.7 NAVD elevation. And why? Seawalls
8 basically have 50- to 100-year lifespans, and
9 they're not something you're going to rebuild
10 every 20 years. Now, when we did tell you to
11 rebuild it, you needed to build the foundation
12 such that it could be easily expanded up. For
13 planning and zoning purposes, you don't want to
14 see a big wall facing the water, but you need
15 to be building it so that it can adapt.
16 And your comments that you have concerning
17 adaptations -- and I've met with the Planning
18 Department, and we've discussed this, that
19 everything from buildings to seawalls to even
20 streets need to be looked at that they can be
21 adapted to higher elevations. And that's what
22 one of the key aspects would be, is that
23 flexibility.
24 We're not sure 100 percent we're going to
25 see the sea level rise we think we're going to.
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 We know we're going to see some. And we need
2 to have that type of method to be flexible
3 enough so that we aren't tasking on future
4 generations the kind of infrastructure that has
5 to be rebuilt but instead can be adapted.
6 And when I met with the Planning
7 Department, we talked about even first-floor
8 elevations, building ceiling heights so that
9 floors can be raised without having to rebuild.
10 The key issue when you looked at maps of
11 claims, it's a lot of times key not only to the
12 area but the elevations of the actual
13 structures.
14 And so you're going to see areas with
15 buildings from 50 or 100 years ago that may not
16 have claims because their architects were smart
17 enough in how they built their buildings that
18 they stayed dry even in a floodplain. And by
19 building to an elevation -- and you can talk
20 about other things --
21 (Timer notification.)
22 MR. MOWRY: My time is up. But basically,
23 the comment is pump stations, the small city of
24 Miami Beach added 60 pump stations alone just
25 for flooding. And we were only looking at
Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
(904) 821-0300

1 normal rainfall events of 3 inches per hour for
 2 two consecutive hours, and we saw that we had
 3 to increase our pump stations by three times
 4 what we had.
 5 I'll speak at future ones too.
 6 THE CHAIRWOMAN: Thank you.
 7 MR. SANDRIK: I wanted to make a quick
 8 clarification.
 9 THE CHAIRWOMAN: Can you state your last
 10 name, please?
 11 MR. SANDRIK: Sure. Sandrik,
 12 S-a-n-d-r-i-k.
 13 I wanted to make a quick clarification on
 14 that database. It is indeed 400 points, but
 15 that is from Flagler Beach all the way up to
 16 Brunswick. Thinking about it in the
 17 Jacksonville metropolitan area, I think we're a
 18 little closer to 150, maybe 200 points. It's
 19 still extensive enough in this area to capture
 20 the aerial extent of the flooding.
 21 THE CHAIRWOMAN: Great. Thank you.
 22 Is there anybody else that would like to
 23 speak?
 24 AUDIENCE MEMBER: (No response.)
 25 THE CHAIRWOMAN: Seeing no one, we're
 Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 going to close the public comment.
 2 We're still a little bit early. All
 3 right, group. Thank you very much for coming.
 4 Our next meeting is April 8th at
 5 9:00 a.m., if you would please review all the
 6 information that was given to you today. We'd
 7 like to put into our normal agenda -- we're
 8 going to start adding a section basically
 9 called "Old Business" so that we can -- once we
 10 have digested all the information that we have,
 11 we can then talk about it and start talking
 12 about how to assist the Planning Department
 13 with putting together some policies.
 14 Any other comments?
 15 W/G MEMBERS: (No response.)
 16 THE CHAIRWOMAN: All right. We're going
 17 to close the meeting.
 18 Thank you.
 19 (The above proceedings were adjourned at
 20 10:47 a.m.)
 21 - - -
 22
 23
 24
 25
 Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1 CERTIFICATE OF REPORTER
 2
 3 STATE OF FLORIDA)
 4 COUNTY OF DUVAL)
 5
 6 I, MATTHEW MCKINNEY, Florida Professional Reporter,
 7 do hereby certify that I was authorized to and did
 8 stenographically report the foregoing proceedings and
 9 that the transcript is a true and complete record of my
 10 stenographic notes.
 11
 12 DATED this 4th day of April, 2019.
 13
 14
 15 _____
 Matthew McKinney, FPR
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 Diane M. Tropia, Inc., P.O. Box 2375, Jacksonville, FL 32203
 (904) 821-0300

1	<p>200 [1] - 93:18 2005 [1] - 39:13 2012 [1] - 79:9 2013 [1] - 90:3 2017 [2] - 9:6, 24:5 2018 [1] - 14:22 2019 [4] - 1:6, 2:2, 10:14, 95:12 2030 [5] - 3:6, 63:2, 74:17, 75:1, 87:3 2060 [14] - 18:13, 18:19, 20:21, 21:16, 22:7, 26:22, 27:1, 37:21, 39:23, 39:25, 40:19, 42:15, 60:3, 60:6 214 [1] - 1:7 25 [2] - 1:6, 2:2</p>	<p>90:10 6.2 [1] - 26:7 60 [1] - 92:24 6:00 [1] - 31:19</p>	<p>ACTION [1] - 1:2 action [2] - 54:15, 73:10 Action [6] - 2:7, 7:7, 68:24, 70:9, 70:20, 71:1 actionable [1] - 3:3 actions [2] - 2:18, 62:16 activity [3] - 14:17, 21:24, 28:12 acts [1] - 7:21 actual [7] - 19:21, 29:21, 46:18, 75:14, 78:11, 79:24, 92:12 adapt [2] - 82:9, 91:15 ADAPTATION [1] - 1:2 adaptation [5] - 69:17, 73:4, 73:9, 77:25, 79:16 Adaptation [6] - 2:7, 7:7, 68:24, 70:9, 70:20, 71:1 adaptations [1] - 91:17 adapted [2] - 91:21, 92:5 adapting [1] - 79:1 Adaptive [1] - 68:25 ADCIRC [1] - 35:20 add [4] - 20:25, 21:4, 25:16, 42:23 added [1] - 92:24 adding [1] - 94:8 additional [3] - 50:19, 71:14, 78:8 address [8] - 39:4, 61:18, 69:9, 70:16, 70:20, 77:25, 79:1, 79:20 addressed [1] - 39:3 adequately [1] - 9:18 adjacent [1] - 66:3 adjourned [1] - 94:19 adjust [2] - 8:10, 36:4 adjusters [1] - 52:2 adjustments [1] - 35:16 adopt [3] - 27:10, 30:4, 49:23 adopted [6] - 25:3, 27:8, 28:19, 30:8, 47:14, 75:25 adoption [2] - 72:19, 75:14 advantage [1] - 85:2 aerial [3] - 45:22, 46:10, 93:20 affect [3] - 28:4, 37:3, 38:20</p>	<p>affects [5] - 28:3, 36:2, 42:24, 43:9, 43:10 affordable [1] - 83:11 afterwards [1] - 9:11 agencies [2] - 7:20, 59:16 agency [1] - 37:15 agenda [3] - 8:22, 49:20, 94:7 ago [5] - 21:12, 25:10, 28:15, 39:14, 92:15 agree [3] - 30:25, 35:18, 49:25 agreeing [1] - 40:17 agricultural [1] - 74:7 ahead [3] - 2:5, 47:1, 79:5 AI [3] - 30:20, 53:23, 57:4 Alan [1] - 58:1 allocating [1] - 64:15 allow [1] - 35:5 allows [3] - 62:1, 67:10, 83:1 alluded [2] - 9:4, 72:3 alluding [1] - 58:7 almost [3] - 13:9, 34:1, 40:12 alone [2] - 57:16, 92:24 ALSO [1] - 1:17 alter [1] - 69:24 alternative [3] - 29:25, 30:1, 88:13 alternatives [2] - 30:10, 73:4 AMANDA [1] - 1:14 Amanda [1] - 3:18 amend [1] - 62:24 amendment [2] - 66:2, 66:25 amount [3] - 39:25, 58:24, 84:7 amounts [2] - 56:15, 56:22 analogous [1] - 55:23 analogy [1] - 55:25 analysis [1] - 36:22 analyze [2] - 59:20, 60:9 Annapolis [3] - 16:7, 50:24, 56:4 annually [1] - 13:17 answer [3] - 30:17, 82:16, 89:14 anticipate [1] - 75:5 applicant [1] - 67:18 application [2] - 28:21, 63:12</p>
	3	A		
	<p>3 [7] - 21:9, 29:4, 35:14, 40:1, 53:21, 79:8, 93:1 3-foot [3] - 28:16, 28:17, 28:19 3.5 [1] - 33:12 30 [1] - 31:24 33 [1] - 20:18 37 [2] - 76:15, 76:21</p>	<p>a.m [4] - 1:7, 2:2, 94:5, 94:20 AAA [6] - 2:6, 5:10, 6:21, 50:1, 76:14, 84:6 abandon [2] - 85:6, 85:12 Ability [1] - 4:4 ability [2] - 17:12, 24:7 able [3] - 55:4, 74:21, 88:22 absolutely [1] - 87:5 Academy [4] - 20:1, 48:7, 48:9, 48:12 accelerated [1] - 27:3 accelerating [2] - 13:14, 14:7 accepting [1] - 40:19 accommodate [2] - 25:22, 41:10 accommodation [1] - 69:19 accommodations [1] - 69:22 account [7] - 25:20, 25:21, 35:3, 54:13, 54:14, 54:15, 56:14 accurate [2] - 24:23, 53:2 acknowledge [1] - 63:5 acknowledged [1] - 27:7 acre [1] - 67:12 acreage [6] - 74:3, 74:4, 74:6, 74:7, 76:18, 82:23 acres [1] - 76:13 act [1] - 69:23</p>		
	4			
	<p>4 [8] - 20:17, 21:10, 29:4, 37:13, 37:16, 40:1, 41:3, 69:18 40 [2] - 21:2, 21:6 400 [2] - 45:8, 93:14 400-point [1] - 51:6 45 [1] - 21:2 47 [1] - 12:14 4th [1] - 95:12</p>			
	5			
	<p>5 [11] - 21:10, 21:13, 21:15, 22:2, 29:5, 31:17, 35:14, 58:8, 58:10, 90:19 5.7 [1] - 91:7 50 [4] - 79:12, 90:4, 91:8, 92:15 50-year [1] - 25:13 500-year [1] - 25:15 506 [1] - 76:13</p>			
	6			
	<p>6 [6] - 21:10, 21:13, 22:2, 37:14, 37:18,</p>			
2				
<p>2 [31] - 18:24, 18:25, 19:1, 19:3, 20:15, 20:21, 22:5, 25:16, 28:12, 28:13, 28:24, 29:15, 36:19, 36:20, 36:21, 36:25, 37:13, 37:18, 39:19, 40:19, 40:20, 41:11, 42:14, 42:18, 42:21, 42:23, 53:9, 53:21, 77:8, 80:10 2-foot [8] - 10:4, 16:22, 26:2, 26:6, 26:23, 28:1, 29:11, 57:2 2.4 [1] - 28:23 2.5 [1] - 28:22 2.62 [1] - 14:23 20 [5] - 19:5, 19:8, 25:9, 87:12, 91:10 20-year [1] - 39:10</p>				

<p>apply [2] - 66:12, 66:14 appreciate [4] - 8:17, 8:18, 49:14, 89:22 approaches [2] - 46:20, 48:16 approaching [1] - 47:9 appropriate [5] - 36:20, 36:25, 52:18, 62:11, 64:14 approval [1] - 75:7 approve [2] - 4:19, 4:22 approves [1] - 4:23 April [2] - 94:4, 95:12 architect [1] - 8:3 architects [1] - 92:16 area [63] - 7:7, 10:21, 11:13, 14:9, 15:14, 15:17, 16:4, 16:8, 18:5, 19:14, 22:11, 23:3, 23:15, 24:10, 28:10, 29:15, 29:24, 29:25, 30:15, 32:9, 32:10, 32:13, 32:14, 33:3, 33:24, 34:1, 34:3, 34:8, 34:15, 34:22, 34:25, 35:15, 35:16, 35:23, 36:3, 38:16, 40:8, 40:13, 42:2, 42:7, 49:11, 49:14, 49:17, 51:9, 51:10, 52:5, 55:15, 57:12, 57:15, 57:17, 58:25, 64:9, 64:24, 65:25, 66:3, 66:17, 66:20, 67:5, 70:25, 85:10, 92:12, 93:17, 93:19 Area [13] - 2:7, 6:23, 7:8, 61:3, 64:10, 64:21, 65:23, 67:6, 68:3, 70:9, 70:18, 70:20, 71:1 AREA [1] - 1:2 Areas [4] - 63:4, 65:17, 68:25, 84:5 areas [43] - 7:4, 9:5, 12:23, 14:10, 16:16, 16:17, 16:25, 21:14, 24:4, 24:21, 26:11, 33:5, 34:10, 38:23, 40:9, 41:9, 56:20, 57:17, 57:22, 65:2, 65:5, 65:11, 65:19, 67:6, 70:3, 70:5, 70:23, 71:11, 72:21, 73:10, 73:11, 77:4, 79:10, 79:13, 79:14,</p>	<p>83:15, 85:6, 85:7, 85:12, 90:21, 90:22, 92:14 arises [1] - 83:19 armored [1] - 78:17 armoring [3] - 70:13, 71:16, 71:18 armory [1] - 78:11 arrows [1] - 31:4 aside [1] - 72:12 Askew [1] - 3:18 ASKEW [3] - 1:14, 3:18, 50:10 aspects [2] - 38:24, 91:22 assessment [3] - 73:1, 74:25, 75:15 assign [4] - 6:7, 27:18, 61:14, 62:22 assigning [1] - 27:16 assist [2] - 82:1, 94:12 associated [2] - 15:2, 87:7 Associates [1] - 7:17 assume [2] - 30:2, 44:18 assumptions [1] - 46:25 asterisk [1] - 11:16 astronomical [1] - 11:10 attend [1] - 3:20 Audience [2] - 46:20, 48:16 AUDIENCE [3] - 46:22, 88:8, 93:24 authorize [1] - 12:14 authorized [1] - 95:7 available [5] - 5:13, 30:8, 84:9, 87:12, 88:24 Avenue [4] - 9:3, 9:13, 16:17, 17:7 average [1] - 14:6 avoidance [2] - 69:20, 70:3 avoiding [1] - 70:22 Avondale [5] - 12:25, 48:19, 48:25, 49:5, 87:24 aware [3] - 44:3, 53:23, 55:10</p>	<p>Ball [1] - 1:7 bank [2] - 19:21, 53:6 banks [1] - 9:1 Bar [1] - 8:1 barriers [2] - 69:23, 71:20 base [7] - 38:2, 38:3, 42:12, 44:17, 57:8, 80:8, 80:10 based [15] - 12:17, 14:20, 19:20, 20:24, 29:7, 35:17, 36:4, 38:10, 40:16, 44:14, 45:17, 50:7, 50:20, 79:20, 81:8 baseline [1] - 38:9 basic [1] - 15:1 basins [1] - 17:8 basis [9] - 19:17, 35:6, 35:9, 36:8, 44:2, 44:3, 47:14, 88:4 bathtub [2] - 54:11, 54:13 Beach [9] - 3:19, 15:25, 16:1, 52:1, 52:3, 90:2, 91:1, 92:24, 93:15 Beaches [4] - 40:5, 40:8, 43:10, 72:13 beating [1] - 20:20 become [5] - 26:10, 26:16, 28:14, 84:21, 84:22 becomes [2] - 18:3, 18:4 beforehand [1] - 80:14 beginning [5] - 2:9, 5:18, 16:7, 70:6, 74:1 behind [2] - 5:9, 5:22 benefits [1] - 73:4 best [5] - 8:14, 23:10, 42:22, 61:5, 68:20 between [3] - 17:15, 28:20, 90:24 beyond [5] - 39:23, 39:24, 41:7, 42:14, 50:1 big [1] - 91:14 bill [2] - 55:6, 75:16 BILL [1] - 1:18 Bill [5] - 4:10, 45:11, 77:17, 80:21, 81:21 Bill's [1] - 80:19 bit [6] - 5:6, 6:18, 15:1, 67:7, 78:22, 94:2 BLANKINSHIP [3] - 1:14, 42:10, 74:16 blocks [1] - 35:1</p>	<p>Blount [1] - 42:2 blue [2] - 20:7, 67:4 board [1] - 8:13 boardwalks [1] - 15:12 boat [2] - 21:20, 22:1 bodies [1] - 8:4 body [2] - 2:23, 38:25 bonus [2] - 83:7, 83:9 bonuses [6] - 82:15, 82:16, 82:20, 83:14, 83:17, 84:11 boots [1] - 15:12 bottom [1] - 31:22 Boulevard [2] - 45:1, 66:18 bound [1] - 75:10 boundaries [8] - 6:17, 6:21, 6:22, 36:20, 36:23, 36:24, 50:9, 84:6 boundary [7] - 49:22, 78:1, 80:24, 80:25, 81:2, 81:4, 84:16 breaking [1] - 33:15 Bridge [2] - 30:13, 44:25 brief [1] - 61:21 bring [2] - 72:7, 85:20 Brooklyn [1] - 33:24 brought [2] - 50:17, 83:4 Broward [18] - 47:13, 47:19, 48:2, 50:18, 56:4, 59:11, 59:17, 61:6, 69:3, 71:21, 71:25, 72:1, 72:9, 73:8, 79:7, 79:9, 79:18, 86:7 Bruce [1] - 89:19 Brunswick [1] - 93:16 buffer [1] - 64:25 buffers [3] - 70:12, 71:10, 71:20 build [2] - 77:7, 91:11 Building [1] - 1:7 building [7] - 39:12, 70:11, 80:2, 88:14, 91:15, 92:8, 92:19 buildings [4] - 37:21, 91:19, 92:15, 92:17 built [1] - 92:17 bulkheads [2] - 16:13, 71:19 bullet [1] - 27:17 Business [1] - 94:9 business [2] - 43:23, 48:25</p>	<p style="text-align: center;">C</p> <p>cannot [2] - 2:17, 32:14 cap [1] - 21:14 capability [1] - 17:21 capital [2] - 62:20, 82:8 capped [3] - 21:9, 21:13, 21:17 capture [3] - 35:19, 85:11, 93:19 captured [3] - 45:25, 54:8, 89:13 card [4] - 87:21, 87:23, 87:25, 88:7 cards [2] - 87:18, 87:19 careful [2] - 54:17, 54:24 carry [2] - 18:5, 18:6 case [6] - 22:23, 31:6, 36:8, 42:1, 42:7 case-by-case [1] - 36:8 cat [5] - 42:19, 42:21, 53:21 catchment [1] - 17:8 categories [4] - 63:13, 63:14, 68:6, 74:5 category [11] - 22:12, 24:5, 24:9, 30:6, 52:25, 53:9, 64:6, 64:7, 64:11, 67:2 caught [1] - 16:5 causes [2] - 15:4, 16:16 ceiling [1] - 92:8 Center [1] - 53:25 centuries [2] - 13:8, 22:8 century [5] - 12:19, 13:5, 13:11, 14:11, 14:24 certain [2] - 64:9, 70:4 certainly [1] - 89:2 CERTIFICATE [1] - 95:1 certify [1] - 95:7 cetera [1] - 74:10 Chair [5] - 1:13, 73:22, 74:24, 76:17, 87:1 Chairman [1] - 8:9 CHAIRWOMAN [67] - 2:4, 3:21, 4:1, 4:14, 4:21, 5:3, 5:16, 6:2, 6:5, 8:14, 28:7, 29:2, 32:18, 32:25, 33:9, 33:21, 36:9, 36:12, 39:18, 40:2, 42:9,</p>
	B			

<p>43:15, 44:7, 45:10, 46:21, 47:2, 48:4, 48:15, 48:17, 49:19, 50:6, 50:11, 50:23, 51:21, 51:23, 52:13, 53:23, 55:6, 55:11, 56:3, 56:10, 57:4, 58:1, 59:3, 59:9, 73:24, 75:16, 76:7, 79:25, 81:18, 82:14, 83:25, 84:24, 85:15, 85:25, 87:10, 87:23, 88:9, 88:17, 88:20, 89:4, 89:16, 93:6, 93:9, 93:21, 93:25, 94:16</p> <p>Chairwoman [3] - 1:13, 24:1, 26:13</p> <p>challenge [2] - 83:10, 83:12</p> <p>Chamber [1] - 8:2</p> <p>chance [1] - 4:16</p> <p>change [7] - 14:3, 37:3, 37:6, 64:11, 67:9, 68:10, 77:23</p> <p>changes [8] - 3:6, 75:14, 75:20, 76:2, 78:3, 78:7, 78:8, 80:20</p> <p>changing [4] - 27:6, 35:7, 59:15, 59:22</p> <p>characteristics [1] - 63:25</p> <p>charge [4] - 16:22, 22:5, 41:6, 50:9</p> <p>charged [2] - 9:8, 37:13</p> <p>Charleston [1] - 53:25</p> <p>check [1] - 89:16</p> <p>CHHA [6] - 6:22, 7:4, 50:1, 62:11, 76:14, 84:20</p> <p>Chief [1] - 1:19</p> <p>chief [1] - 60:22</p> <p>child [1] - 15:9</p> <p>Childrens [1] - 31:11</p> <p>choose [1] - 54:6</p> <p>chose [3] - 36:21, 36:23, 72:14</p> <p>cities [2] - 46:24, 84:10</p> <p>citing [1] - 74:19</p> <p>CITY [1] - 1:1</p> <p>City [27] - 3:2, 3:19, 3:25, 5:10, 11:23, 14:1, 25:3, 25:20, 33:4, 38:14, 39:4, 52:1, 55:6, 60:24, 68:2, 69:3, 72:5, 72:11, 72:17, 74:1,</p>	<p>78:13, 80:18, 82:2, 82:14, 84:16, 86:10, 88:11</p> <p>city [11] - 12:25, 13:7, 25:24, 44:1, 60:14, 62:3, 74:8, 80:9, 82:9, 90:1, 92:23</p> <p>city's [1] - 62:16</p> <p>City's [6] - 4:12, 30:8, 38:10, 61:1, 62:25, 66:5</p> <p>civil [4] - 7:14, 38:6, 38:8, 39:12</p> <p>claim [3] - 51:14, 51:15, 52:9</p> <p>claims [8] - 51:11, 51:12, 51:19, 52:3, 52:5, 52:12, 92:11, 92:16</p> <p>clarification [2] - 93:8, 93:13</p> <p>clearly [2] - 24:22, 79:18</p> <p>clever [1] - 52:22</p> <p>clients [1] - 84:3</p> <p>climate [3] - 37:2, 72:25, 79:15</p> <p>climate-related [1] - 72:25</p> <p>climatologist [2] - 4:9, 40:25</p> <p>climatologists [1] - 41:11</p> <p>clipped [1] - 5:8</p> <p>close [4] - 25:6, 29:10, 94:1, 94:17</p> <p>closed [1] - 55:21</p> <p>closely [1] - 88:3</p> <p>closer [2] - 8:13, 93:18</p> <p>closures [1] - 15:5</p> <p>cluster [3] - 68:4, 82:24, 83:1</p> <p>clustering [4] - 64:20, 68:14, 82:21, 82:25</p> <p>Coast [1] - 90:18</p> <p>coast [2] - 12:21, 22:19</p> <p>Coastal [15] - 6:22, 61:3, 63:4, 63:6, 64:10, 64:21, 65:16, 65:22, 67:6, 68:3, 69:6, 70:17, 82:17, 83:9, 84:5</p> <p>coastal [7] - 7:15, 7:22, 7:25, 47:6, 47:7, 53:24, 90:22</p> <p>coastline [1] - 43:7</p> <p>cocktail [1] - 13:4</p> <p>code [9] - 38:11, 39:3,</p>	<p>62:18, 62:19, 71:3, 71:4, 80:4, 80:21</p> <p>codes [3] - 56:8, 70:11, 80:3</p> <p>collect [1] - 38:22</p> <p>collected [1] - 17:10</p> <p>collecting [1] - 59:16</p> <p>column [2] - 31:23, 58:22</p> <p>combination [1] - 35:9</p> <p>combined [1] - 46:4</p> <p>coming [12] - 17:7, 20:19, 21:8, 21:19, 23:5, 32:7, 49:15, 50:8, 56:17, 58:19, 83:25, 94:3</p> <p>commencing [1] - 1:7</p> <p>comment [7] - 59:5, 85:17, 87:12, 87:13, 89:24, 92:23, 94:1</p> <p>comments [3] - 87:11, 91:16, 94:14</p> <p>Commerce [1] - 8:2</p> <p>commercial [2] - 12:9, 63:16</p> <p>Commission [4] - 66:6, 67:15, 67:25, 68:13</p> <p>committee [1] - 39:4</p> <p>communities [5] - 47:7, 69:8, 70:8, 72:13</p> <p>community [2] - 65:15, 83:21</p> <p>Community [2] - 1:19, 60:23</p> <p>community's [1] - 48:23</p> <p>comp [4] - 47:13, 77:11, 78:3, 85:21</p> <p>Comp [2] - 78:7, 78:13</p> <p>companies [1] - 43:22</p> <p>compared [1] - 84:9</p> <p>comparing [1] - 85:9</p> <p>complement [1] - 88:13</p> <p>complete [1] - 95:9</p> <p>completely [1] - 39:8</p> <p>complex [1] - 32:5</p> <p>compliance [1] - 27:4</p> <p>comply [1] - 2:23</p> <p>Comprehensive [20] - 3:6, 61:2, 61:12, 61:21, 61:24, 62:13, 63:2, 69:13, 70:15, 71:2, 71:22, 74:13, 74:17, 75:1, 75:11, 75:21, 81:22, 82:20, 85:4, 86:6</p> <p>comprehensive [8] -</p>	<p>47:23, 51:2, 59:11, 72:14, 72:19, 73:13, 74:22, 74:25</p> <p>compromised [4] - 15:6, 15:7, 16:15, 17:2</p> <p>computation [2] - 19:22, 20:6</p> <p>concept [1] - 66:13</p> <p>concepts [1] - 70:21</p> <p>concerned [1] - 44:21</p> <p>concerning [1] - 91:16</p> <p>conclusions [1] - 26:9</p> <p>concrete [1] - 60:15</p> <p>conditions [1] - 12:6</p> <p>condominium [1] - 44:2</p> <p>Condominiums [1] - 39:7</p> <p>Conference [1] - 1:8</p> <p>confirm [1] - 82:6</p> <p>conscientiously [1] - 54:8</p> <p>consecutive [1] - 93:2</p> <p>conservation [8] - 65:8, 65:9, 67:22, 68:5, 68:15, 70:13, 82:19, 83:5</p> <p>consider [10] - 16:21, 26:2, 38:23, 40:12, 59:13, 59:24, 60:8, 64:19, 70:8, 85:1</p> <p>consideration [7] - 3:5, 40:10, 61:7, 62:11, 65:20, 73:11, 75:7</p> <p>considerations [1] - 69:15</p> <p>considering [1] - 72:9</p> <p>considers [2] - 64:7, 65:24</p> <p>consistent [1] - 75:22</p> <p>consolidated [1] - 72:12</p> <p>constructed [2] - 12:10, 18:10</p> <p>construction [1] - 7:25</p> <p>consult [1] - 44:1</p> <p>consultant [1] - 7:18</p> <p>consulting [3] - 4:6, 43:18, 43:25</p> <p>Consulting [1] - 89:20</p> <p>contention [1] - 31:18</p> <p>continually [2] - 59:20, 73:15</p> <p>continue [1] - 60:8</p> <p>continues [1] - 9:13</p> <p>contour [1] - 81:14</p> <p>contours [1] - 46:8</p>	<p>contract [2] - 18:14, 26:21</p> <p>contributed [1] - 58:14</p> <p>controls [4] - 38:25, 82:10, 82:11, 84:17</p> <p>conundrum [1] - 37:8</p> <p>conventional [1] - 28:18</p> <p>conversations [1] - 2:13</p> <p>conversely [1] - 10:1</p> <p>convert [1] - 46:13</p> <p>cooperate [1] - 84:18</p> <p>coordinate [1] - 73:9</p> <p>coordination [1] - 72:11</p> <p>copy [2] - 71:24, 71:25</p> <p>core [5] - 12:25, 23:11, 30:16, 44:12, 52:24</p> <p>corner [1] - 56:16</p> <p>Corps [1] - 41:21</p> <p>Corps' [1] - 18:11</p> <p>correct [6] - 5:14, 59:9, 76:13, 76:16, 76:22, 81:18</p> <p>costs [2] - 73:4, 85:9</p> <p>COUNCIL [5] - 3:24, 4:20, 5:1, 33:22, 34:24</p> <p>Council [3] - 3:25, 75:7, 76:3</p> <p>Councilman [1] - 33:21</p> <p>Counsel [2] - 1:20, 4:13</p> <p>count [1] - 82:23</p> <p>counties [3] - 7:19, 52:10, 84:10</p> <p>country [2] - 27:14, 43:12</p> <p>COUNTY [1] - 95:4</p> <p>county [9] - 23:25, 24:18, 27:9, 30:14, 53:17, 55:16, 72:11, 73:3, 80:9</p> <p>County [14] - 24:16, 50:18, 51:10, 52:8, 52:12, 61:6, 69:3, 71:25, 72:9, 73:8, 79:8, 79:9, 79:18, 86:7</p> <p>County's [2] - 71:22, 72:1</p> <p>couple [5] - 2:8, 6:18, 9:11, 85:16, 85:17</p> <p>course [7] - 10:20, 19:17, 20:23, 29:3, 29:22, 34:9, 37:20</p>
--	---	---	---	--

<p>court [1] - 2:10 Cove [1] - 42:5 covered [1] - 57:1 created [1] - 61:7 credence [1] - 14:12 credibility [1] - 37:2 Creek [4] - 44:13, 44:20, 45:1 creeks [1] - 44:12 criteria [7] - 63:12, 64:19, 66:12, 71:9, 78:15, 81:4, 81:14 CSX [1] - 21:14 cue [2] - 52:25, 53:1 culprit [1] - 9:17 culvert [5] - 17:6, 17:10, 17:12, 32:10, 39:1 culverts [2] - 17:9, 32:13 current [8] - 25:7, 42:15, 53:20, 74:19, 74:25, 80:7, 82:19, 85:21 currents [1] - 54:14 curve [1] - 20:8 curves [1] - 20:13</p>	<p>deepening [7] - 12:11, 18:10, 21:3, 26:18, 26:20, 37:12, 41:24 defensive [1] - 69:21 define [3] - 33:5, 71:11, 81:2 defines [2] - 78:16, 81:14 definitely [3] - 6:19, 7:6, 75:3 definition [2] - 15:4, 28:20 definitional [1] - 10:8 degree [4] - 24:13, 75:3, 79:23, 87:8 deliverables [1] - 85:19 delta [2] - 17:22, 18:3 demarcated [1] - 23:16 dense [2] - 51:17, 84:21 densities [3] - 64:5, 80:4, 84:9 density [19] - 51:16, 63:11, 63:19, 63:20, 64:4, 65:3, 65:13, 67:9, 67:13, 74:8, 74:9, 76:12, 76:14, 79:15, 82:15, 82:16, 83:1, 83:2 Department [17] - 3:1, 3:14, 3:16, 4:11, 43:17, 43:19, 47:25, 55:7, 63:24, 66:1, 68:14, 69:2, 69:5, 75:19, 91:18, 92:7, 94:12 Department's [1] - 67:16 Dept [3] - 1:18, 1:19, 1:20 depth [2] - 66:6, 75:4 depths [1] - 46:15 description [1] - 63:14 design [7] - 25:23, 38:12, 63:25, 69:24, 70:12, 70:25, 73:5 designate [1] - 79:10 designated [1] - 55:7 designations [1] - 91:5 designed [4] - 17:13, 22:18, 39:7, 39:13 destructive [1] - 28:18 detail [1] - 71:6 detailed [3] - 61:23, 69:15, 79:19 details [1] - 61:15 detention [1] - 38:9</p>	<p>determine [2] - 37:9, 53:4 determined [2] - 27:22, 28:15 develop [3] - 39:22, 62:4, 79:19 developable [2] - 76:18, 77:4 developed [5] - 38:21, 74:4, 74:8, 76:16, 76:21 developers [2] - 82:17, 83:18 developing [3] - 37:24, 86:19 Development [3] - 1:19, 1:20, 63:3 development [37] - 4:4, 25:24, 61:14, 61:23, 62:22, 64:2, 64:16, 64:22, 65:1, 65:4, 65:20, 66:15, 67:13, 68:1, 70:2, 70:4, 70:19, 70:22, 71:4, 71:9, 72:21, 73:15, 73:18, 77:23, 77:24, 78:4, 78:9, 78:16, 81:24, 82:9, 82:12, 83:14, 83:21, 84:1, 84:15, 84:19 develops [1] - 26:24 dictate [1] - 34:22 dictates [1] - 53:17 differ [1] - 35:3 difference [4] - 17:14, 17:23, 19:12, 76:24 different [15] - 15:1, 20:24, 20:25, 27:15, 33:17, 34:13, 34:16, 44:5, 54:19, 56:14, 59:15, 70:7, 74:4, 82:12 dig [1] - 52:5 digest [1] - 85:22 digested [1] - 94:10 diminished [2] - 18:3, 18:4 direct [4] - 65:1, 75:19, 78:6, 78:13 direction [2] - 77:22, 80:16 directionality [1] - 42:23 directly [2] - 39:6, 87:6 DIRECTOR [21] - 4:10, 36:15, 37:10, 37:22, 45:12, 45:16, 46:7, 46:12, 52:15, 53:8, 55:9, 75:17, 77:21,</p>	<p>78:24, 80:23, 82:4, 82:7, 82:22, 84:13, 88:24, 89:5 director [4] - 4:4, 48:7, 48:19, 80:6 Director [1] - 1:18 directs [1] - 79:18 discharge [1] - 17:13 discharges [1] - 17:11 discourages [1] - 65:17 discouraging [1] - 79:15 discuss [4] - 2:18, 61:16, 62:7, 79:21 discussed [3] - 61:6, 74:23, 91:18 discussing [1] - 90:20 discussion [8] - 6:20, 6:24, 47:4, 61:8, 61:19, 62:10, 80:24, 83:11 dissimilarity [1] - 10:15 distance [1] - 43:8 distribution [1] - 64:13 distributions [1] - 63:17 district [1] - 64:11 districts [2] - 7:18, 63:13 ditch [1] - 42:1 Div [1] - 1:19 divided [2] - 63:9, 63:18 Division [2] - 60:23, 88:11 document [3] - 73:2, 73:12, 86:23 documented [2] - 15:18, 29:19 documents [1] - 86:14 domain [2] - 52:17, 81:10 done [9] - 18:14, 19:19, 19:24, 20:4, 59:19, 62:24, 64:22, 80:20, 89:23 Dora [3] - 24:15, 24:17, 43:6 dot [2] - 33:7, 51:16 doubted [1] - 90:13 Doug [1] - 54:6 down [12] - 6:3, 8:11, 10:7, 12:13, 12:14, 31:22, 41:25, 54:25, 56:18, 58:8, 58:10, 86:24 downtown [13] - 9:19,</p>	<p>10:12, 10:21, 12:3, 12:18, 16:21, 19:20, 23:1, 23:17, 24:10, 30:15, 31:3, 34:8 Downtown [18] - 9:1, 10:10, 18:19, 21:11, 23:4, 23:24, 26:9, 34:3, 35:15, 35:23, 37:17, 38:15, 38:22, 42:7, 42:18, 46:16, 52:23, 63:22 Dr [1] - 19:25 drafting [1] - 86:22 drain [1] - 19:15 drainage [18] - 9:17, 9:19, 12:23, 15:8, 16:15, 17:2, 17:7, 17:16, 17:21, 18:5, 32:9, 32:12, 38:20, 44:23, 58:19, 61:16 draining [1] - 32:10 drains [2] - 12:25, 15:6 dramatic [1] - 24:3 dramatically [1] - 28:5 drastically [1] - 77:14 dredging [4] - 18:14, 26:21, 40:21, 41:19 dredging's [1] - 41:16 drop [1] - 33:25 dry [2] - 35:1, 92:18 due [3] - 21:19, 21:20, 79:11 Div [14] - 2:22, 15:15, 15:16, 29:20, 31:7, 33:23, 44:15, 49:3, 57:13, 87:25, 88:12, 90:5 Duval [4] - 24:16, 51:10, 52:8, 52:11 DUVAL [1] - 95:4 dwelling [1] - 67:11 dwelling's [1] - 67:11</p>
<p style="text-align: center;">D</p> <p>damage [3] - 9:20, 27:2, 51:20 damaged [1] - 9:15 danger [1] - 23:11 data [23] - 12:18, 13:24, 15:14, 19:21, 20:23, 22:19, 23:22, 33:4, 33:17, 33:18, 41:5, 46:8, 46:9, 55:5, 59:16, 59:20, 59:21, 60:9, 60:11, 79:20, 88:14, 90:4 database [2] - 54:22, 93:14 dataset [1] - 88:13 date [1] - 27:9 DATED [1] - 95:12 datum [3] - 20:18, 55:2 David [1] - 19:25 day-to-day [1] - 62:16 days [5] - 9:11, 10:16, 14:4, 18:7, 32:21 dealing [4] - 55:18, 55:19, 56:1, 77:1 decision [1] - 81:13 declared [1] - 29:9 decrease [1] - 84:7 decreasing [1] - 13:24 dedication [1] - 68:15</p>	<p style="text-align: center;">E</p> <p>early [2] - 49:3, 94:2 Earth [1] - 14:17 easement [2] - 68:17, 83:6 easements [3] - 65:8, 68:5, 70:13 easily [2] - 89:3, 91:12 east [2] - 12:21, 66:19 easy [2] - 69:11, 89:7 Economic [1] - 69:2 Ed [1] - 1:7 educational [1] - 7:24 EER [2] - 79:2, 79:3 effect [6] - 28:6, 35:4,</p>			

<p>35:20, 37:2, 46:2, 58:6 effective [1] - 83:16 effects [3] - 11:18, 24:3, 44:10 efficient [1] - 22:25 effort [2] - 69:1, 83:22 either [6] - 13:23, 23:1, 44:17, 67:20, 83:5, 90:25 elevated [1] - 18:2 elevates [1] - 11:7 elevation [27] - 17:15, 20:17, 20:20, 21:3, 21:17, 21:25, 22:2, 25:18, 25:25, 26:4, 33:11, 33:13, 38:9, 38:18, 41:9, 41:23, 69:25, 77:8, 79:22, 80:8, 80:10, 90:5, 90:6, 90:9, 90:23, 91:7, 92:19 elevations [23] - 15:24, 20:9, 21:9, 21:10, 21:13, 24:14, 24:15, 25:1, 25:2, 25:7, 25:9, 25:12, 27:5, 34:5, 34:8, 34:16, 34:21, 38:3, 38:19, 71:14, 91:21, 92:8, 92:12 ELLER [2] - 1:20, 4:12 Eller [1] - 4:12 emergency [1] - 35:13 Emergency [1] - 88:11 Emily [4] - 4:1, 61:5, 68:21, 72:3 EMILY [1] - 1:13 empty [1] - 87:19 encourage [7] - 64:20, 65:7, 67:18, 68:14, 72:6, 73:20, 85:11 encourages [1] - 65:10 encouraging [1] - 79:16 end [8] - 6:8, 6:10, 26:21, 47:21, 53:15, 57:20, 67:19, 75:13 engineer [5] - 4:7, 7:16, 38:6, 38:8, 90:2 engineering [6] - 7:13, 7:14, 7:16, 7:22, 8:3, 41:24 engineers [3] - 10:23, 39:13, 90:13 enjoyed [1] - 89:22 entered [1] - 43:7 entering [2] - 43:5,</p>	<p>43:13 enters [2] - 17:18, 26:13 entire [1] - 10:14 entirely [1] - 68:7 entitle [1] - 64:2 Entitlement [1] - 63:3 entitlements [4] - 61:14, 62:23, 64:16, 68:8 Environmental [1] - 69:5 environmental [1] - 8:2 environmentally [4] - 65:2, 65:7, 65:23, 66:4 equivalent [6] - 22:7, 25:17, 26:1, 26:16, 29:17, 30:3 ERIK [1] - 1:16 Erik [18] - 4:6, 7:2, 7:11, 18:22, 28:7, 36:15, 44:10, 46:3, 49:24, 52:15, 52:16, 54:10, 57:4, 57:5, 58:7, 60:10, 86:8 Erik's [3] - 48:23, 49:10, 86:15 erosion [2] - 7:18, 71:18 especially [5] - 31:7, 31:10, 44:12, 68:2, 72:21 Esri [1] - 45:17 Esri-based [1] - 45:17 essentially [2] - 71:2, 86:8 establish [3] - 71:8, 72:20, 81:4 established [4] - 71:15, 81:5, 84:16, 91:6 establishes [1] - 62:5 estimate [1] - 58:15 et [1] - 74:10 evacuated [1] - 9:15 evacuations [1] - 22:15 evaluate [2] - 62:7, 73:3 evaluates [1] - 63:24 evaluation [3] - 62:24, 64:12, 67:16 event [9] - 10:2, 18:1, 25:18, 26:16, 35:24, 39:9, 39:10, 57:11, 90:5 events [12] - 9:24, 10:5, 11:9, 11:11,</p>	<p>12:4, 15:16, 18:1, 35:9, 35:10, 44:4, 93:1 eventually [2] - 16:24, 26:10 ever-changing [1] - 59:15 everywhere [1] - 10:19 evidence [2] - 36:16, 36:18 evident [2] - 13:16 evolve [1] - 73:13 exacerbate [1] - 26:18 exacerbated [1] - 79:11 exactly [5] - 19:5, 25:1, 52:11, 56:6, 62:9 example [5] - 51:10, 57:20, 62:5, 70:24, 79:7 examples [2] - 61:5, 73:21 exceeded [2] - 24:14, 90:9 excellent [4] - 3:21, 30:23, 32:18, 47:2 excerpted [1] - 23:13 exciting [1] - 50:14 excuse [1] - 32:3 executive [1] - 48:19 exhibit [1] - 76:10 exist [2] - 65:19, 81:15 existed [1] - 32:19 existing [7] - 17:11, 61:1, 70:1, 70:15, 73:7, 73:11, 85:8 exits [2] - 17:3, 24:1 expand [4] - 49:17, 50:1, 50:8, 84:6 expanded [2] - 49:11, 91:12 expanding [4] - 7:7, 30:11, 49:21, 50:4 expansion [2] - 29:14, 65:18 expansive [1] - 51:1 expect [2] - 56:21, 75:25 experience [5] - 14:10, 16:24, 20:21, 23:9, 26:6 experienced [10] - 12:19, 13:3, 19:16, 22:9, 23:6, 23:18, 24:4, 24:12, 34:17, 39:5 experiences [1] - 12:22</p>	<p>expert [2] - 7:21, 20:3 explain [1] - 28:7 explained [1] - 50:17 explore [1] - 50:4 exploring [3] - 50:4, 50:6, 50:7 exposed [1] - 65:6 extensive [1] - 93:19 extent [5] - 45:22, 46:10, 77:21, 77:24, 93:20 extremely [4] - 32:25, 35:25, 53:7, 56:8</p> <p style="text-align: center;">F</p> <p>facilities [1] - 48:7 facility [2] - 85:8, 85:10 facing [1] - 91:14 fact [8] - 6:25, 7:3, 14:2, 16:1, 18:9, 40:18, 59:24, 65:11 factor [2] - 14:25, 26:5 factors [2] - 14:18, 67:18 facts [1] - 48:21 fairly [2] - 10:12, 52:19 faith [1] - 37:5 fall [2] - 11:5, 19:17 familiar [1] - 52:16 familiarized [1] - 78:23 family [2] - 63:21, 67:10 famous [1] - 49:1 far [6] - 44:20, 51:18, 52:8, 58:14, 71:5, 85:22 favor [1] - 19:24 federal [3] - 27:11, 28:19, 37:12 feds [1] - 37:15 feelings [1] - 40:14 feet [30] - 12:15, 13:8, 18:24, 19:1, 20:17, 20:21, 21:10, 21:14, 21:15, 22:3, 22:6, 25:16, 26:7, 28:13, 28:14, 28:22, 28:25, 31:17, 33:12, 33:15, 35:14, 40:1, 40:19, 41:3, 41:12, 42:21, 42:23, 77:8, 90:20 FEMA [8] - 22:17, 22:20, 23:7, 34:12, 34:13, 43:2, 53:22, 89:14 FEMA's [2] - 25:17, 34:20</p>	<p>Fernandina [2] - 52:1, 52:3 few [1] - 75:6 field [1] - 34:6 fieldwork [1] - 81:16 figure [1] - 49:6 figures [1] - 48:21 files [1] - 35:5 fill [3] - 54:12, 87:21, 88:7 filled [2] - 16:1, 16:2 findings [3] - 5:11, 5:12, 5:21 finished [1] - 77:7 finite [1] - 89:9 first [15] - 6:16, 7:10, 11:22, 13:7, 21:21, 24:17, 40:4, 50:14, 57:6, 61:20, 63:2, 68:24, 76:9, 80:6, 92:7 first-floor [1] - 92:7 fiscal [1] - 27:12 fits [1] - 81:11 five [4] - 53:1, 59:14, 73:1, 90:2 fixes [1] - 60:1 flagged [1] - 89:12 Flagler [1] - 93:15 flexibility [2] - 62:1, 91:23 flexible [1] - 92:2 flood [30] - 7:3, 7:4, 9:23, 15:2, 24:16, 24:25, 25:5, 25:17, 27:2, 27:7, 27:13, 28:12, 29:9, 30:2, 38:3, 44:17, 53:4, 53:12, 62:18, 65:24, 67:3, 67:4, 70:18, 71:15, 77:8, 79:22, 79:23, 80:8, 80:10, 88:4 Flood [2] - 52:21, 54:22 flooded [4] - 9:13, 33:23, 34:25, 45:1 flooding [35] - 10:2, 15:2, 15:3, 15:4, 15:20, 16:5, 16:9, 16:11, 16:24, 19:19, 20:4, 24:11, 26:11, 29:19, 31:16, 32:6, 32:16, 34:23, 38:18, 42:20, 43:9, 43:10, 44:25, 45:23, 46:1, 46:11, 49:12, 51:17, 57:11, 57:16, 57:20, 71:17, 79:11, 92:25, 93:20</p>
--	---	--	--	---

floodplain [6] - 63:8, 70:11, 71:13, 80:3, 88:14, 92:18
floodplains [1] - 61:16
floods [1] - 56:7
Floor [1] - 1:8
floor [2] - 77:8, 92:7
floors [2] - 76:10, 92:9
FLORIDA [1] - 95:3
Florida [15] - 1:9, 1:10, 7:13, 8:1, 15:18, 15:21, 15:23, 24:20, 43:4, 43:24, 48:5, 52:10, 69:6, 83:13, 95:6
flow [5] - 31:5, 31:8, 57:9, 57:13
flowing [1] - 56:18
flows [1] - 57:14
focus [5] - 2:25, 8:25, 61:11, 62:21, 65:4
focused [1] - 70:17
following [3] - 52:3, 64:17, 88:3
foot [40] - 11:19, 12:18, 13:4, 13:5, 13:10, 14:11, 14:24, 18:13, 19:2, 19:13, 20:14, 20:15, 21:1, 28:23, 29:4, 29:5, 29:15, 36:18, 36:19, 36:20, 36:21, 36:25, 37:13, 37:14, 37:16, 37:18, 39:19, 40:7, 40:22, 42:4, 42:8, 42:14, 42:18, 54:4, 58:16, 77:9
forecast [2] - 58:3, 58:4
forecasting [3] - 35:12, 35:14, 58:11
foregoing [1] - 95:8
forgot [1] - 73:25
form [1] - 78:17
format [1] - 45:12
former [1] - 48:6
formulating [1] - 47:20
Fort [1] - 69:3
forth [7] - 2:13, 36:10, 49:24, 73:17, 75:8, 75:20, 81:8
fortification [1] - 73:6
fortunate [1] - 43:12
forward [2] - 29:23, 74:18
foundation [1] - 91:11
four [4] - 13:23, 32:21, 69:16, 90:8
four-year [1] - 13:23

FPR [2] - 1:9, 95:15
freeboard [1] - 71:14
frequency [11] - 9:24, 10:1, 10:5, 25:13, 25:14, 25:15, 26:11, 56:22, 57:10
frequent [1] - 27:2
frequently [3] - 7:23, 16:7, 16:18
fringe [1] - 29:6
front [2] - 9:3, 67:19
Fuller [1] - 30:13
future [22] - 18:21, 25:23, 26:7, 27:6, 29:13, 29:17, 30:4, 36:17, 37:7, 37:20, 41:10, 49:15, 53:1, 53:2, 58:11, 58:13, 62:25, 82:3, 85:5, 90:12, 92:3, 93:5

G

Gators [1] - 7:14
gauge [2] - 12:17, 13:13
gel [1] - 80:15
General [2] - 1:20, 4:13
general [13] - 49:25, 55:14, 61:25, 63:10, 63:14, 63:16, 64:13, 64:14, 66:11, 66:17, 70:21, 83:20, 84:9
generalized [1] - 66:13
generally [2] - 64:3, 68:3
generates [1] - 81:16
generations [1] - 92:4
genesis [1] - 53:11
Genesis [1] - 3:23
geographic [1] - 6:17
GIS [2] - 45:14, 45:20
given [6] - 5:8, 47:18, 85:22, 86:15, 91:2, 94:6
glad [1] - 30:17
global [2] - 14:2, 14:19
globally [1] - 14:13
globe [1] - 14:7
goal [1] - 62:14
goals [3] - 72:1, 72:19, 75:21
government [2] - 27:11, 28:19
governmental [1] - 7:20
gradations [2] - 54:5,

54:20
graduate [1] - 20:2
great [13] - 5:19, 6:6, 32:17, 35:19, 52:13, 53:3, 73:21, 88:17, 88:18, 89:4, 89:17, 89:25, 93:21
greater [4] - 17:22, 17:23, 18:3, 28:13
greatly [1] - 10:4
green [1] - 66:20
ground [2] - 35:15, 56:19
GROUP [1] - 1:2
group [34] - 2:18, 2:21, 2:25, 3:10, 6:20, 7:5, 28:8, 33:1, 39:20, 43:17, 43:18, 43:21, 46:23, 47:5, 49:22, 49:25, 51:4, 55:14, 57:18, 59:12, 59:23, 59:25, 60:11, 61:9, 62:6, 65:15, 69:1, 74:21, 75:24, 76:4, 77:19, 78:2, 84:25, 94:3
Group [10] - 1:14, 1:14, 1:15, 1:15, 1:16, 1:16, 2:7, 5:11, 39:5, 44:8
group's [2] - 22:5, 75:9
groups [2] - 8:4, 43:25
grow [1] - 62:4
guess [1] - 38:7
guessed [1] - 76:11
guidance [6] - 47:23, 56:5, 78:3, 78:12, 79:4, 86:23
guide [2] - 73:15, 86:10
guidelines [4] - 62:3, 79:19, 79:24, 86:18
Gulf [1] - 90:18
gun [2] - 47:12, 59:10
gut [1] - 58:15
guys [2] - 35:12, 51:24

H

habitable [1] - 37:18
half [12] - 18:25, 19:3, 20:14, 21:15, 28:13, 28:14, 28:25, 31:17, 40:6, 40:20, 42:3, 58:17
Half [1] - 3:23
hand [3] - 4:25, 10:17, 13:15
handed [1] - 47:11

handing [1] - 86:2
handle [4] - 2:17, 39:8, 39:9, 57:19
handling [1] - 2:11
handout [2] - 71:24, 79:9
handouts [3] - 63:1, 68:22, 74:3
hands [3] - 4:23, 50:12, 52:18
hang [1] - 88:20
harbor [5] - 18:10, 21:3, 26:17, 26:20, 37:12
hard [3] - 69:20, 70:12, 71:16
hardening [1] - 78:18
harder [2] - 18:17, 84:3
hazard [3] - 9:7, 23:16, 24:22
Hazard [14] - 6:23, 61:3, 63:4, 63:7, 64:10, 64:21, 65:17, 65:22, 67:6, 68:3, 70:18, 82:18, 83:9, 84:5
hazards [1] - 65:6
head [5] - 17:14, 17:23, 19:12, 31:3, 85:16
Healthy [1] - 38:7
hear [2] - 83:20, 83:24
heard [2] - 11:23, 78:10
hearing [2] - 40:17, 84:2
hearings [1] - 51:25
heat [1] - 88:16
heavily [2] - 56:18, 71:21
height [2] - 21:18, 39:19
heights [2] - 20:24, 92:8
held [1] - 1:6
Helena [3] - 3:15, 85:20, 87:14
HELENA [1] - 1:20
help [8] - 61:8, 80:17, 80:21, 82:9, 86:10, 86:12, 86:23, 87:15
helped [1] - 80:15
helpful [1] - 33:1
helping [1] - 86:21
Hendricks [2] - 16:16, 17:7
hereby [1] - 95:7
hi [1] - 3:18
Hi [1] - 46:22

high [33] - 10:1, 10:5, 10:16, 10:18, 11:12, 16:12, 16:19, 17:22, 19:15, 21:18, 26:10, 31:7, 43:5, 54:3, 54:4, 54:9, 55:3, 57:10, 63:20, 63:21, 64:8, 66:11, 68:17, 69:10, 74:6, 78:25, 83:17, 84:8, 87:6
High [15] - 6:23, 33:18, 61:3, 63:4, 63:7, 64:10, 64:21, 65:17, 65:22, 67:6, 68:3, 70:17, 82:18, 83:9, 84:5
high-level [3] - 66:11, 68:17, 74:6
higher [10] - 10:18, 11:12, 27:22, 27:23, 40:7, 56:19, 56:22, 91:21
highest [11] - 11:4, 12:1, 14:9, 33:14, 34:4, 34:7, 52:9, 61:13, 61:25, 90:7
highly [4] - 9:15, 65:10, 66:4, 67:1
hindcast [1] - 13:6
historic [2] - 13:10, 36:16
historical [6] - 9:2, 19:6, 23:12, 30:16, 41:5, 90:4
history [2] - 28:16, 53:16
hit [2] - 8:12, 42:19
hitting [1] - 28:24
Hogan [1] - 1:8
Hogan's [1] - 44:13
hold [1] - 36:9
homeowner [2] - 8:4, 27:16
homes [5] - 9:14, 48:25, 65:14, 65:15, 65:16
homework [3] - 6:8, 47:16, 86:5
honoring [1] - 60:11
hope [2] - 49:17, 75:18
hopefully [1] - 75:5
hoping [1] - 90:11
horizon [2] - 3:4, 60:3
Hospital [1] - 33:16
hospitals [1] - 65:15
hotels [1] - 16:2
hour [1] - 93:1
hours [2] - 18:7, 93:2
house [2] - 49:7, 49:8

<p>housing [1] - 83:12 Housing [1] - 4:5 huge [1] - 76:24 hundred [1] - 19:7 hurricane [6] - 22:12, 24:17, 30:7, 36:5, 40:11, 43:6 Hurricane [9] - 23:6, 24:4, 24:14, 24:15, 24:16, 29:20, 29:22, 42:11, 42:12 hurricanes [2] - 9:25, 40:13 hydraulic [1] - 31:3 hydraulically [2] - 15:25, 22:25</p>	<p>85:5 inch [1] - 91:2 inches [5] - 18:25, 19:4, 40:20, 90:10, 93:1 incidence [1] - 43:5 incidences [1] - 52:9 include [8] - 6:9, 21:24, 38:1, 42:13, 68:11, 69:18, 70:10, 80:1 included [8] - 8:22, 11:9, 34:19, 57:7, 57:8, 64:6, 66:9, 69:2 includes [2] - 42:18, 64:1 including [2] - 12:4, 86:15 inconvenience [1] - 15:5 incorporated [2] - 27:5, 73:10 increase [7] - 18:11, 26:5, 26:20, 41:19, 67:20, 90:22, 93:3 increased [2] - 71:10, 79:10 increases [1] - 79:16 increasing [4] - 13:23, 13:25, 21:5, 33:3 increment [1] - 20:14 indeed [1] - 93:14 Indian [2] - 55:15 indicated [4] - 27:17, 31:4, 32:5, 54:10 indicates [1] - 66:20 Indicating [1] - 88:8 influence [3] - 12:6, 22:11, 74:21 influenced [2] - 12:3, 23:4 information [22] - 5:7, 47:10, 47:12, 47:17, 47:18, 47:24, 48:10, 50:8, 50:18, 50:19, 50:21, 51:4, 51:9, 56:11, 74:2, 74:10, 86:5, 86:8, 88:21, 88:23, 94:6, 94:10 infrastructure [8] - 15:6, 15:7, 72:24, 73:6, 73:7, 82:2, 82:8, 92:4 initial [1] - 70:19 inland [2] - 22:20, 22:22 inlet [1] - 7:18 instantaneously [1] - 53:5</p>	<p>instead [1] - 92:5 instructive [1] - 53:7 insufficient [1] - 39:8 insurance [13] - 15:2, 24:25, 25:5, 27:3, 27:8, 27:14, 27:18, 28:5, 51:12, 51:14, 51:15, 52:2, 53:12 intended [6] - 18:6, 23:23, 62:4, 62:14, 69:7, 70:19 intensities [2] - 63:17, 64:6 intensity [3] - 63:11, 64:4, 67:21 intent [1] - 70:9 interest [7] - 11:3, 26:19, 27:3, 29:24, 30:11, 30:15, 34:15 interested [6] - 2:21, 7:6, 11:14, 51:5, 51:7, 51:11 interesting [3] - 14:2, 18:9, 52:21 interface [2] - 16:14, 90:24 internet [1] - 51:8 interpretation [2] - 62:2, 77:15 Intracoastal [5] - 40:6, 40:8, 41:17, 41:20, 55:17 introduce [3] - 3:8, 7:9, 60:20 introduced [2] - 75:6, 75:18 inundated [1] - 28:11 inundation [1] - 57:13 investments [1] - 72:23 involve [1] - 70:1 IQ [2] - 52:21, 54:22 Irma [20] - 9:6, 23:6, 24:4, 24:14, 29:20, 29:22, 35:24, 40:7, 40:14, 42:11, 42:25, 44:17, 49:3, 51:12, 52:3, 52:11, 56:15, 58:15, 88:15 irregularities [1] - 14:16 irrespective [1] - 23:18 is.. [1] - 55:8 Island [1] - 42:2 issue [10] - 20:4, 20:5, 39:2, 39:15, 39:16, 41:15, 43:24, 89:8, 89:25, 92:10 issues [5] - 42:5,</p>	<p>55:19, 65:20, 68:2, 79:21 Italy [1] - 15:10 items [1] - 3:3 itself [1] - 62:18</p>	<p>82:7, 82:22, 84:13, 88:24, 89:5 Killingsworth [2] - 4:11, 36:14 kind [13] - 10:6, 34:17, 40:8, 40:15, 43:13, 68:23, 74:5, 76:9, 77:12, 78:18, 86:12, 89:12, 92:4 kinds [1] - 86:18 king [3] - 10:22, 11:21, 15:15 kit [1] - 61:6 KML [1] - 45:15 knowing [2] - 49:15, 55:4 knowledge [1] - 13:5 knows [1] - 10:9 Krancer [1] - 49:2 Kriebel [1] - 19:25 KRISTEN [1] - 1:19 Kristen [13] - 3:17, 47:18, 59:5, 60:20, 60:22, 74:13, 78:5, 79:5, 83:4, 85:13, 85:20, 86:6, 87:2</p>
I		J		
<p>I-295 [1] - 66:18 idea [2] - 46:18, 51:17 ideas [3] - 61:9, 86:9, 86:13 identical [1] - 67:7 identified [1] - 71:12 identifies [1] - 69:16 identify [2] - 75:20, 78:14 identifying [3] - 69:8, 72:23, 73:9 immediate [1] - 60:1 immediately [2] - 19:8, 19:9 impact [5] - 28:3, 28:17, 29:22, 56:23, 65:20 impacted [2] - 9:5, 64:23 impactive [1] - 37:19 impacts [7] - 44:13, 60:12, 69:9, 69:22, 70:23, 72:25, 73:18 impeded [1] - 17:2 impervious [1] - 65:25 implement [6] - 70:8, 71:11, 72:4, 72:15, 73:17, 75:8 implementation [1] - 62:2 implemented [2] - 62:15, 75:13 implies [1] - 26:3 important [1] - 18:15 importantly [1] - 27:11 impounded [1] - 17:16 improvements [3] - 62:20, 69:25, 82:2 inaudible [1] - 32:24 Inc [1] - 7:17 incentive [2] - 84:18,</p>	<p>increases [1] - 79:16 increasing [4] - 13:23, 13:25, 21:5, 33:3 increment [1] - 20:14 indeed [1] - 93:14 Indian [2] - 55:15 indicated [4] - 27:17, 31:4, 32:5, 54:10 indicates [1] - 66:20 Indicating [1] - 88:8 influence [3] - 12:6, 22:11, 74:21 influenced [2] - 12:3, 23:4 information [22] - 5:7, 47:10, 47:12, 47:17, 47:18, 47:24, 48:10, 50:8, 50:18, 50:19, 50:21, 51:4, 51:9, 56:11, 74:2, 74:10, 86:5, 86:8, 88:21, 88:23, 94:6, 94:10 infrastructure [8] - 15:6, 15:7, 72:24, 73:6, 73:7, 82:2, 82:8, 92:4 initial [1] - 70:19 inland [2] - 22:20, 22:22 inlet [1] - 7:18 instantaneously [1] - 53:5</p>	<p>interested [6] - 2:21, 7:6, 11:14, 51:5, 51:7, 51:11 interesting [3] - 14:2, 18:9, 52:21 interface [2] - 16:14, 90:24 internet [1] - 51:8 interpretation [2] - 62:2, 77:15 Intracoastal [5] - 40:6, 40:8, 41:17, 41:20, 55:17 introduce [3] - 3:8, 7:9, 60:20 introduced [2] - 75:6, 75:18 inundated [1] - 28:11 inundation [1] - 57:13 investments [1] - 72:23 involve [1] - 70:1 IQ [2] - 52:21, 54:22 Irma [20] - 9:6, 23:6, 24:4, 24:14, 29:20, 29:22, 35:24, 40:7, 40:14, 42:11, 42:25, 44:17, 49:3, 51:12, 52:3, 52:11, 56:15, 58:15, 88:15 irregularities [1] - 14:16 irrespective [1] - 23:18 is.. [1] - 55:8 Island [1] - 42:2 issue [10] - 20:4, 20:5, 39:2, 39:15, 39:16, 41:15, 43:24, 89:8, 89:25, 92:10 issues [5] - 42:5,</p>	<p>JACKSONVILLE [1] - 1:1 Jacksonville [23] - 1:8, 3:25, 4:9, 5:10, 6:25, 10:3, 10:10, 14:1, 16:21, 30:21, 32:23, 37:17, 38:15, 60:24, 72:5, 72:12, 72:17, 83:10, 83:12, 84:8, 84:21, 89:21, 93:17 Jacksonville's [1] - 9:1 jagged [1] - 13:18 JEA [1] - 37:25 Jeff [2] - 4:8, 5:23 JEFF [1] - 1:15 jetties [2] - 12:10, 34:14 Jim [2] - 46:22, 56:12 job [2] - 80:7, 80:21 Joe [5] - 3:22, 40:2, 76:7, 78:20, 81:19 Johns [7] - 10:19, 10:20, 12:8, 16:23, 18:12, 22:23, 23:14 Jones [3] - 48:17, 48:18, 87:24 JONES [1] - 48:18 JOSEPH [1] - 1:15 judgment [2] - 41:4, 41:8 judgments [1] - 20:24 jump [1] - 47:11 jumping [1] - 59:10</p>	<p>knowing [2] - 49:15, 55:4 knowledge [1] - 13:5 knows [1] - 10:9 Krancer [1] - 49:2 Kriebel [1] - 19:25 KRISTEN [1] - 1:19 Kristen [13] - 3:17, 47:18, 59:5, 60:20, 60:22, 74:13, 78:5, 79:5, 83:4, 85:13, 85:20, 86:6, 87:2</p>
I		J		L
<p>I-295 [1] - 66:18 idea [2] - 46:18, 51:17 ideas [3] - 61:9, 86:9, 86:13 identical [1] - 67:7 identified [1] - 71:12 identifies [1] - 69:16 identify [2] - 75:20, 78:14 identifying [3] - 69:8, 72:23, 73:9 immediate [1] - 60:1 immediately [2] - 19:8, 19:9 impact [5] - 28:3, 28:17, 29:22, 56:23, 65:20 impacted [2] - 9:5, 64:23 impactive [1] - 37:19 impacts [7] - 44:13, 60:12, 69:9, 69:22, 70:23, 72:25, 73:18 impeded [1] - 17:2 impervious [1] - 65:25 implement [6] - 70:8, 71:11, 72:4, 72:15, 73:17, 75:8 implementation [1] - 62:2 implemented [2] - 62:15, 75:13 implies [1] - 26:3 important [1] - 18:15 importantly [1] - 27:11 impounded [1] - 17:16 improvements [3] - 62:20, 69:25, 82:2 inaudible [1] - 32:24 Inc [1] - 7:17 incentive [2] - 84:18,</p>	<p>increases [1] - 79:16 increasing [4] - 13:23, 13:25, 21:5, 33:3 increment [1] - 20:14 indeed [1] - 93:14 Indian [2] - 55:15 indicated [4] - 27:17, 31:4, 32:5, 54:10 indicates [1] - 66:20 Indicating [1] - 88:8 influence [3] - 12:6, 22:11, 74:21 influenced [2] - 12:3, 23:4 information [22] - 5:7, 47:10, 47:12, 47:17, 47:18, 47:24, 48:10, 50:8, 50:18, 50:19, 50:21, 51:4, 51:9, 56:11, 74:2, 74:10, 86:5, 86:8, 88:21, 88:23, 94:6, 94:10 infrastructure [8] - 15:6, 15:7, 72:24, 73:6, 73:7, 82:2, 82:8, 92:4 initial [1] - 70:19 inland [2] - 22:20, 22:22 inlet [1] - 7:18 instantaneously [1] - 53:5</p>	<p>interested [6] - 2:21, 7:6, 11:14, 51:5, 51:7, 51:11 interesting [3] - 14:2, 18:9, 52:21 interface [2] - 16:14, 90:24 internet [1] - 51:8 interpretation [2] - 62:2, 77:15 Intracoastal [5] - 40:6, 40:8, 41:17, 41:20, 55:17 introduce [3] - 3:8, 7:9, 60:20 introduced [2] - 75:6, 75:18 inundated [1] - 28:11 inundation [1] - 57:13 investments [1] - 72:23 involve [1] - 70:1 IQ [2] - 52:21, 54:22 Irma [20] - 9:6, 23:6, 24:4, 24:14, 29:20, 29:22, 35:24, 40:7, 40:14, 42:11, 42:25, 44:17, 49:3, 51:12, 52:3, 52:11, 56:15, 58:15, 88:15 irregularities [1] - 14:16 irrespective [1] - 23:18 is.. [1] - 55:8 Island [1] - 42:2 issue [10] - 20:4, 20:5, 39:2, 39:15, 39:16, 41:15, 43:24, 89:8, 89:25, 92:10 issues [5] - 42:5,</p>	<p>keeping [1] - 65:4 Kelly [1] - 3:13 KELLY [4] - 1:19, 3:13, 5:15, 87:19 key [6] - 5:11, 5:12, 5:20, 91:22, 92:10, 92:11 KILLINGSWORTH [22] - 1:18, 4:10, 36:15, 37:10, 37:22, 45:12, 45:16, 46:7, 46:12, 52:15, 53:8, 55:9, 75:17, 77:21, 78:24, 80:23, 82:4,</p>	<p>lack [1] - 24:6 lacks [1] - 23:2 Lagoon [1] - 55:16 laid [1] - 64:3 Land [1] - 63:2 land [30] - 3:22, 16:14, 24:18, 31:4, 31:5, 61:23, 62:25, 63:13, 64:7, 64:10, 65:3, 65:9, 65:23, 66:2, 66:25, 67:9, 68:5, 71:4, 74:4, 77:23, 77:24, 78:4, 78:9, 78:15, 83:5, 83:16, 84:3, 84:7, 91:3 Landon [1] - 31:10 lands [5] - 65:8, 66:5, 68:16, 83:2, 90:24 large [2] - 24:13, 49:13 Large [1] - 1:10 larger [1] - 17:10 Lasalle [3] - 31:11, 31:23, 58:23 laser [1] - 8:12 last [13] - 2:9, 5:6, 6:18, 6:24, 18:7, 25:4, 37:21, 39:23, 39:24, 50:17, 51:6, 74:2, 93:9 Lauderdale [1] - 69:4</p>

law [1] - 2:24
layman [1] - 53:4
lead [1] - 47:3
leading [1] - 76:9
leap [1] - 37:5
least [8] - 14:22,
 34:11, 36:17, 40:6,
 46:10, 53:21, 76:1,
 78:6
leave [1] - 7:2
leaves [1] - 73:8
left [1] - 77:3
less [3] - 28:12, 28:22,
 30:6
level [81] - 9:9, 10:4,
 11:1, 11:2, 12:16,
 13:2, 13:3, 13:8,
 13:10, 13:14, 13:17,
 13:22, 14:3, 14:6,
 14:13, 14:19, 14:21,
 15:13, 15:19, 15:22,
 16:22, 16:23, 17:17,
 19:6, 20:9, 20:15,
 20:16, 20:22, 20:25,
 21:4, 22:6, 22:8,
 25:16, 25:21, 25:22,
 26:2, 26:6, 26:23,
 28:1, 29:11, 29:16,
 35:15, 37:6, 37:14,
 37:16, 38:2, 41:3,
 41:12, 41:19, 42:13,
 42:20, 45:25, 46:5,
 46:6, 51:3, 53:25,
 58:4, 61:13, 61:25,
 64:8, 66:11, 68:17,
 69:9, 69:11, 72:22,
 72:24, 73:19, 74:6,
 78:25, 79:12, 79:14,
 80:11, 87:6, 90:1,
 90:14, 91:25
Level [1] - 69:1
levels [8] - 11:20,
 14:9, 18:12, 22:22,
 41:9, 42:4, 53:4,
 79:23
liability [1] - 27:13
lifespans [1] - 91:8
light [2] - 8:12, 66:20
limit [2] - 57:2, 87:13
limitation [1] - 65:10
limitations [1] - 64:8
limited [3] - 65:12,
 70:10, 91:3
limiting [3] - 65:5,
 70:4, 70:22
limits [1] - 29:19
line [3] - 13:19, 23:25,
 30:14
lines [1] - 13:18
lion's [1] - 37:5

list [1] - 64:17
listing [1] - 70:7
literally [6] - 16:11,
 17:15, 21:8, 33:15,
 43:23, 44:4
literature [1] - 14:6
live [6] - 18:16, 33:24,
 39:6, 42:5, 46:23,
 56:16
lived [1] - 49:6
living [5] - 18:17,
 44:11, 57:15, 73:2,
 73:12
local [3] - 59:25, 69:8,
 70:8
localized [1] - 56:20
locally [1] - 72:5
location [4] - 54:9,
 64:14, 71:6, 73:5
locations [2] - 46:15,
 78:14
long-term [4] - 12:5,
 12:16, 15:13, 62:14
look [36] - 4:16, 5:7,
 5:16, 5:20, 13:14,
 13:22, 15:14, 17:5,
 19:10, 22:5, 23:14,
 34:12, 37:11, 37:15,
 38:8, 38:17, 42:14,
 47:6, 47:17, 47:19,
 48:1, 50:20, 51:24,
 53:15, 54:2, 59:24,
 63:1, 64:18, 64:19,
 66:16, 67:17, 68:18,
 81:12, 85:3, 86:21,
 91:4
looked [8] - 9:19,
 9:20, 13:13, 44:19,
 51:8, 90:3, 91:20,
 92:10
looking [29] - 5:23,
 7:6, 9:8, 10:13, 21:7,
 27:12, 27:15, 27:18,
 35:11, 36:19, 37:13,
 39:20, 53:16, 58:4,
 58:5, 58:6, 59:9,
 59:10, 60:1, 60:3,
 61:12, 66:23, 74:11,
 76:8, 79:4, 81:23,
 90:19, 92:25
looks [1] - 8:16
LORETTA [13] - 1:15,
 3:22, 18:22, 18:24,
 19:3, 40:3, 41:14,
 76:8, 76:20, 76:23,
 78:21, 81:20, 82:5
Loretta [1] - 3:22
lovely [1] - 87:14
low [1] - 9:23, 9:24,
 10:16, 16:3, 17:21,

20:11, 63:18, 65:3,
 65:13, 67:9, 74:8
lower [3] - 15:24,
 17:23, 25:8
lucky [2] - 43:4, 67:25

M

M-o-w-r-y [1] - 89:20
Madam [1] - 8:8
magnitudes [1] -
 90:16
main [1] - 69:16
maintain [1] - 83:2
major [5] - 12:5,
 15:23, 39:9, 57:13,
 82:2
managed [2] - 69:19,
 69:25
management [2] -
 35:13, 80:3
Management [1] -
 69:6
Management's [1] -
 38:11
mandated [1] - 79:3
mangroves [1] - 16:3
manmade [1] - 71:20
manner [1] - 53:14
map [19] - 32:16,
 40:11, 40:12, 42:13,
 45:2, 45:13, 51:6,
 51:11, 51:12, 51:16,
 62:25, 66:2, 66:16,
 66:22, 66:25, 67:5,
 79:14, 88:16
map's [1] - 81:10
mapped [7] - 9:6,
 24:21, 28:1, 29:24,
 29:25, 32:22, 41:22
mapping [12] - 22:10,
 26:25, 27:8, 27:19,
 29:18, 29:21, 33:6,
 44:17, 44:18, 53:6,
 53:20, 57:8
maps [17] - 8:20, 9:7,
 29:7, 29:9, 30:2,
 30:5, 30:7, 34:12,
 34:13, 43:2, 43:20,
 44:5, 52:17, 66:10,
 66:15, 92:10
March [3] - 1:6, 2:2,
 4:18
Marco [26] - 9:2, 9:20,
 9:21, 12:24, 16:17,
 17:6, 18:8, 18:16,
 18:20, 19:11, 23:15,
 31:9, 31:11, 31:21,
 32:6, 32:9, 32:13,
 33:23, 34:3, 34:9,

35:15, 49:5, 52:24,
 58:15, 58:25, 59:2
Marcy [1] - 54:6
Mark [1] - 49:2
marks [2] - 46:16,
 46:18
Martin [1] - 4:8
MARTIN [7] - 1:15,
 4:8, 5:25, 6:4, 51:5,
 51:22, 52:7
master [1] - 7:12
master's [1] - 7:15
matter [1] - 41:18
matters [3] - 8:1,
 10:21, 55:2
MATTHEW [1] - 95:6
Matthew [7] - 1:9,
 40:5, 40:7, 42:12,
 42:24, 43:1, 95:15
mayor [1] - 3:19
Mayport [2] - 12:17,
 13:13
McCoy [3] - 44:12,
 44:20, 45:1
McKinney [3] - 1:9,
 95:6, 95:15
Mean [1] - 33:18
mean [21] - 11:1, 11:2,
 13:16, 16:23, 18:25,
 35:10, 40:5, 41:15,
 54:3, 54:4, 54:8,
 55:3, 55:23, 60:4,
 77:17, 78:21, 81:23,
 82:7, 83:23, 84:14,
 84:20
meaningful [4] -
 19:14, 25:11, 83:18,
 84:23
means [2] - 28:8, 28:9
measure [2] - 15:13,
 36:25
measured [6] - 14:3,
 19:21, 31:17, 33:12,
 33:14, 41:7
measures [3] - 69:21,
 69:23, 69:24
median [1] - 36:22
medium [5] - 63:19,
 67:13, 74:9, 76:12,
 76:13
meet [1] - 62:7
meeting [16] - 2:19,
 2:22, 4:18, 6:8, 6:10,
 6:11, 8:22, 47:4,
 48:6, 50:17, 80:6,
 89:22, 94:4, 94:17
MEETING [1] - 1:3
meetings [2] - 6:19,
 72:8
meets [1] - 54:25

Member [8] - 1:14,
 1:14, 1:15, 1:15,
 1:16, 1:16, 17:3,
 17:18
member [3] - 3:9,
 46:20, 48:16
MEMBER [84] - 3:18,
 3:22, 3:24, 4:3, 4:6,
 4:8, 4:19, 4:20, 5:1,
 5:25, 6:4, 8:8, 8:16,
 17:5, 17:20, 18:22,
 18:23, 18:24, 19:1,
 19:3, 19:5, 24:2,
 26:15, 28:10, 29:3,
 30:24, 31:13, 32:8,
 32:17, 32:19, 33:10,
 33:19, 33:22, 34:2,
 34:24, 35:8, 35:22,
 36:1, 36:7, 37:1,
 37:11, 37:23, 39:21,
 40:3, 40:24, 41:14,
 41:21, 42:10, 42:17,
 43:22, 44:9, 44:16,
 45:4, 46:22, 50:3,
 50:7, 50:10, 51:5,
 51:22, 52:7, 52:20,
 53:10, 54:21, 55:13,
 55:20, 56:7, 57:7,
 60:22, 74:16, 74:24,
 76:8, 76:17, 76:20,
 76:22, 76:23, 78:21,
 79:6, 81:20, 82:5,
 87:1, 87:5, 87:9,
 88:8, 93:24
MEMBERS [4] - 50:22,
 85:14, 85:24, 94:15
Memorial [1] - 49:2
mention [1] - 40:5
mentioned [3] - 12:2,
 29:15, 87:2
met [3] - 24:14, 91:17,
 92:6
meteorological [3] -
 11:8, 11:11, 12:4
meteorologist [1] -
 30:22
meters [1] - 54:6
method [1] - 92:2
methodologies [1] -
 34:20
metropolitan [1] -
 93:17
Miami [7] - 11:24,
 15:25, 16:1, 16:5,
 90:2, 91:1, 92:24
MICHELLE [1] - 1:13
Michelle [2] - 4:3,
 55:12
might [12] - 8:10,
 52:17, 55:16, 55:19,

<p>60:7, 69:14, 72:4, 74:21, 78:15, 79:7, 84:25, 85:4 Mill [1] - 42:5 millimeters [1] - 14:23 million [1] - 31:25 mimic [2] - 56:6, 71:20 mind [1] - 37:18 minimum [1] - 91:6 minute [3] - 7:3, 27:9, 35:6 minutes [9] - 4:17, 4:24, 5:9, 5:23, 85:18, 87:12, 87:14, 87:16, 88:5 mitigate [1] - 69:21 mitigation [1] - 79:17 mix [1] - 56:25 model [14] - 22:13, 22:16, 22:18, 22:21, 23:7, 23:8, 23:19, 23:21, 34:20, 35:23, 43:2, 53:13 modeled [1] - 23:7 modeling [1] - 36:7 models [6] - 23:2, 23:7, 23:9, 23:14, 24:7, 56:13 modern [1] - 39:14 moment [1] - 27:24 Monday [1] - 1:6 money [2] - 80:20, 81:17 month [2] - 10:25, 12:1 monthly [1] - 19:16 months [2] - 11:5, 81:1 morning [2] - 31:19, 49:3 most [14] - 8:23, 10:20, 10:23, 12:20, 15:6, 20:10, 22:16, 24:19, 34:23, 38:23, 43:1, 43:7, 57:10, 57:11 mostly [1] - 14:3 motion [3] - 4:19, 4:22, 50:2 move [2] - 50:3, 59:8 moved [1] - 84:16 moving [1] - 85:9 MOWRY [2] - 89:19, 92:22 Mowry [1] - 89:19 MR [33] - 30:20, 30:25, 31:14, 32:15, 32:21, 33:6, 33:17, 33:20, 35:2, 35:10, 35:25, 36:4, 36:11, 44:20,</p>	<p>45:6, 45:14, 45:18, 46:9, 46:14, 48:1, 48:14, 48:18, 53:24, 56:12, 57:5, 58:2, 59:7, 88:10, 88:19, 89:19, 92:22, 93:7, 93:11 MS [6] - 3:13, 3:15, 3:17, 4:12, 5:15, 87:19 multifamily [1] - 63:21 municipalities [2] - 7:19, 72:10 must [1] - 37:15</p>	<p>76:11 new [7] - 3:9, 18:20, 43:20, 50:8, 73:5, 81:24, 85:10 NEWBY [6] - 1:16, 3:24, 4:20, 5:1, 33:22, 34:24 Newby [3] - 3:24, 4:25, 33:21 Newport [1] - 56:4 next [18] - 6:11, 18:9, 41:16, 41:24, 49:20, 60:19, 67:5, 68:19, 74:22, 75:6, 79:12, 85:23, 86:1, 86:17, 88:22, 89:18, 90:8, 94:4 Nira [4] - 31:12, 31:13, 31:14, 31:16 NOAA [3] - 51:6, 58:2, 69:4 NOAA's [1] - 59:6 Noah [1] - 88:10 non [2] - 24:22, 64:23 non-hazard [1] - 24:22 non-impacted [1] - 64:23 nonstorm [1] - 90:5 nor'easter [5] - 11:6, 11:8, 11:18, 18:1, 31:8 nor'easters [2] - 12:3, 19:18 Norfolk [3] - 48:2, 48:12, 50:24 normal [3] - 11:20, 93:1, 94:7 North [1] - 1:7 north [1] - 9:1 Northeast [3] - 24:19, 43:4, 48:5 Notary [1] - 1:9 note [1] - 11:1 notes [2] - 8:21, 95:10 nothing [3] - 22:17, 23:20, 55:23 notice [2] - 10:15, 25:15 notification [1] - 92:21 nuisance [14] - 15:3, 15:20, 16:4, 16:9, 16:10, 16:24, 19:19, 20:4, 26:11, 38:18, 49:12, 57:11, 57:16, 57:19 number [8] - 12:20, 13:5, 14:13, 14:14, 14:18, 20:5, 21:6, 52:2 numbers [1] - 18:11</p>	<p>nursing [1] - 65:14</p>	<p>5:23, 7:5, 12:12, 15:22, 16:11, 16:17, 20:2, 29:18, 29:25, 31:1, 32:9, 32:13, 34:25, 35:2, 40:9, 40:14, 43:24, 52:9, 57:17, 59:3, 60:7, 60:15, 62:5, 63:2, 67:8, 67:14, 68:22, 68:24, 76:6, 80:13, 81:20, 83:7, 91:22, 93:25</p>
N			O	
<p>name [2] - 3:11, 93:10 names [1] - 52:6 NAS [1] - 32:23 National [1] - 30:20 nationally [3] - 20:3, 20:5, 22:14 natural [1] - 71:20 nature [4] - 61:17, 62:1, 65:16, 71:8 Naval [4] - 20:1, 48:7, 48:9, 48:12 NAVD [6] - 20:17, 21:15, 33:12, 33:19, 90:6, 91:7 navigation [2] - 12:8, 12:9 near [3] - 36:17, 49:6, 67:1 near-term [1] - 36:17 neat [1] - 48:3 necessarily [7] - 18:18, 21:16, 22:1, 26:12, 56:6, 73:14, 75:9 necessary [1] - 52:5 need [23] - 2:11, 8:10, 8:13, 8:20, 12:22, 25:19, 38:1, 41:10, 49:22, 54:24, 55:1, 55:3, 59:4, 59:24, 60:5, 62:6, 62:7, 78:2, 78:22, 80:18, 91:14, 91:20, 92:1 needed [1] - 91:11 needs [5] - 8:5, 25:20, 39:2, 77:25, 78:12 neighborhood [2] - 31:10, 45:2 neighborhoods [4] - 9:2, 23:12, 30:16, 34:4 Neptune [1] - 3:19 never [2] - 37:18,</p>	<p>name [2] - 3:11, 93:10 names [1] - 52:6 NAS [1] - 32:23 National [1] - 30:20 nationally [3] - 20:3, 20:5, 22:14 natural [1] - 71:20 nature [4] - 61:17, 62:1, 65:16, 71:8 Naval [4] - 20:1, 48:7, 48:9, 48:12 NAVD [6] - 20:17, 21:15, 33:12, 33:19, 90:6, 91:7 navigation [2] - 12:8, 12:9 near [3] - 36:17, 49:6, 67:1 near-term [1] - 36:17 neat [1] - 48:3 necessarily [7] - 18:18, 21:16, 22:1, 26:12, 56:6, 73:14, 75:9 necessary [1] - 52:5 need [23] - 2:11, 8:10, 8:13, 8:20, 12:22, 25:19, 38:1, 41:10, 49:22, 54:24, 55:1, 55:3, 59:4, 59:24, 60:5, 62:6, 62:7, 78:2, 78:22, 80:18, 91:14, 91:20, 92:1 needed [1] - 91:11 needs [5] - 8:5, 25:20, 39:2, 77:25, 78:12 neighborhood [2] - 31:10, 45:2 neighborhoods [4] - 9:2, 23:12, 30:16, 34:4 Neptune [1] - 3:19 never [2] - 37:18,</p>	<p>Nira [4] - 31:12, 31:13, 31:14, 31:16 NOAA [3] - 51:6, 58:2, 69:4 NOAA's [1] - 59:6 Noah [1] - 88:10 non [2] - 24:22, 64:23 non-hazard [1] - 24:22 non-impacted [1] - 64:23 nonstorm [1] - 90:5 nor'easter [5] - 11:6, 11:8, 11:18, 18:1, 31:8 nor'easters [2] - 12:3, 19:18 Norfolk [3] - 48:2, 48:12, 50:24 normal [3] - 11:20, 93:1, 94:7 North [1] - 1:7 north [1] - 9:1 Northeast [3] - 24:19, 43:4, 48:5 Notary [1] - 1:9 note [1] - 11:1 notes [2] - 8:21, 95:10 nothing [3] - 22:17, 23:20, 55:23 notice [2] - 10:15, 25:15 notification [1] - 92:21 nuisance [14] - 15:3, 15:20, 16:4, 16:9, 16:10, 16:24, 19:19, 20:4, 26:11, 38:18, 49:12, 57:11, 57:16, 57:19 number [8] - 12:20, 13:5, 14:13, 14:14, 14:18, 20:5, 21:6, 52:2 numbers [1] - 18:11</p>	<p>o'clock [1] - 31:19 objectives [2] - 72:1, 75:22 obviously [5] - 17:8, 17:21, 22:24, 37:4, 86:20 occur [6] - 9:17, 10:1, 16:7, 16:18, 22:6, 64:9 occurred [3] - 29:20, 45:23, 58:25 occurrence [3] - 20:8, 21:6, 26:4 occurrences [1] - 20:19 occurring [1] - 41:17 occurs [2] - 16:18, 40:21 ocean [1] - 53:18 oceanographic [1] - 7:15 oceanography [1] - 20:1 oceans [1] - 7:1 OF [4] - 1:1, 95:1, 95:3, 95:4 Office [2] - 1:20, 4:13 officer [1] - 55:8 offices [1] - 37:25 offshore [1] - 24:20 often [1] - 14:5 Old [1] - 94:9 old [1] - 35:5 Olsen [7] - 4:6, 7:11, 7:17, 7:23, 8:7, 47:17, 50:21 OLSEN [42] - 1:16, 4:6, 4:19, 8:8, 8:16, 17:5, 17:20, 18:23, 19:1, 19:5, 24:2, 26:15, 28:10, 29:3, 30:24, 31:13, 32:8, 32:17, 32:19, 33:10, 33:19, 34:2, 35:8, 35:22, 36:1, 36:7, 37:1, 37:11, 37:23, 39:21, 40:24, 41:21, 42:17, 43:22, 44:16, 45:4, 52:20, 53:10, 54:21, 55:20, 56:7, 57:7 Olsen's [2] - 88:1, 89:24 once [3] - 40:20, 44:23, 94:9 one [36] - 2:12, 5:5,</p>	<p>5:23, 7:5, 12:12, 15:22, 16:11, 16:17, 20:2, 29:18, 29:25, 31:1, 32:9, 32:13, 34:25, 35:2, 40:9, 40:14, 43:24, 52:9, 57:17, 59:3, 60:7, 60:15, 62:5, 63:2, 67:8, 67:14, 68:22, 68:24, 76:6, 80:13, 81:20, 83:7, 91:22, 93:25 one's [1] - 76:9 ones [1] - 93:5 online [2] - 54:1, 60:9 open [5] - 22:18, 65:1, 71:10, 73:8, 78:2 opinion [4] - 23:8, 39:2, 39:18, 41:13 opportunity [1] - 8:18 Opportunity [1] - 69:3 opposite [1] - 76:19 option [1] - 85:8 Options [1] - 68:25 order [2] - 5:6, 22:21 ordinary [1] - 82:12 orient [1] - 61:8 oriented [1] - 63:6 originally [1] - 16:3 Ortega [4] - 9:3, 12:24, 34:9, 49:5 otherwise [1] - 66:9 ought [4] - 57:21, 57:22, 59:23, 60:14 outcome [1] - 62:15 outline [1] - 86:11 outlined [1] - 50:9 outside [2] - 75:12, 84:20 overall [1] - 26:18 overarching [1] - 12:5 overcome [1] - 20:11 overlap [3] - 63:7, 67:7, 87:7 overlapping [1] - 67:17 overlaps [1] - 67:3 overlay [3] - 40:11, 70:24, 71:2 overlying [1] - 40:12 overlays [1] - 70:10 overtopping [1] - 22:3 overview [2] - 60:25, 61:21 overwhelmed [1] - 15:5 own [4] - 18:11, 21:13, 41:4, 72:13</p>

P				
<p>page [4] - 5:24, 69:18, 70:6, 79:8 Palm [1] - 31:12 paper [5] - 5:8, 8:21, 86:13, 86:16, 86:24 paper-clipped [1] - 5:8 papers [1] - 20:5 parcel [2] - 84:17, 84:20 Park [2] - 31:10, 49:2 parlor [1] - 31:17 PAROLA [2] - 1:20, 3:15 Parola [1] - 3:15 part [7] - 20:10, 25:11, 43:11, 56:1, 57:11, 81:21, 83:3 particular [13] - 8:19, 15:9, 15:14, 15:17, 16:4, 21:18, 22:15, 25:11, 34:11, 34:22, 43:11, 46:15, 49:23 particularly [6] - 11:13, 18:8, 38:15, 47:7, 48:9, 80:2 parts [3] - 31:25, 32:3, 32:4 pass [3] - 6:2, 24:20, 52:6 passing [1] - 43:3 past [1] - 23:19 patterns [1] - 72:21 pay [1] - 27:22 peak [4] - 31:7, 31:15, 90:5 peek [1] - 80:14 peers [1] - 20:2 people [11] - 10:24, 13:12, 15:11, 38:23, 41:2, 43:21, 44:6, 49:4, 85:2, 85:12, 90:12 people's [1] - 86:4 per [13] - 12:18, 13:5, 13:11, 14:11, 14:23, 14:24, 20:8, 20:19, 31:25, 32:3, 32:4, 67:12, 93:1 percent [4] - 19:6, 19:8, 77:3, 91:24 perhaps [1] - 60:16 perimeter [1] - 29:8 period [4] - 13:20, 13:23, 14:20, 90:10 permits [4] - 70:13, 88:14, 88:15, 89:11 permitted [1] - 63:15</p>	<p>person [1] - 36:5 personal [1] - 41:15 perspective [2] - 66:11, 68:17 perturbances [1] - 21:21 Peter [2] - 38:6 peters [1] - 34:10 phenomena [10] - 15:10, 15:20, 16:6, 17:1, 19:11, 21:22, 22:4, 34:17, 56:8 phenomenon [1] - 10:2 physically [2] - 29:12, 55:4 pick [1] - 13:20 picture [4] - 14:19, 45:20, 49:1 PIERCE [1] - 1:13 Pierce [4] - 4:1, 24:1, 26:13, 73:23 piling [1] - 24:10 pink [1] - 67:4 pizza [1] - 31:16 place [5] - 59:19, 60:5, 60:6, 60:8, 60:14 places [1] - 34:23 placing [1] - 65:7 plan [19] - 47:13, 47:23, 51:2, 59:11, 62:18, 64:1, 68:9, 68:11, 72:14, 72:20, 73:8, 73:13, 74:22, 74:25, 77:11, 78:3, 78:25, 81:8, 85:21 Plan [21] - 3:6, 61:2, 61:12, 61:22, 61:24, 62:13, 63:2, 69:13, 70:16, 71:3, 71:22, 74:13, 75:1, 75:11, 75:21, 78:7, 78:13, 81:22, 82:20, 85:5, 86:6 planner [1] - 3:23 planners [1] - 46:24 planning [9] - 3:4, 25:23, 46:25, 48:5, 58:12, 63:10, 63:23, 79:13, 91:13 Planning [20] - 1:18, 1:19, 1:19, 1:20, 3:1, 3:14, 3:16, 3:17, 4:11, 43:16, 43:19, 47:24, 48:6, 55:7, 60:23, 66:1, 68:25, 91:17, 92:6, 94:12 plans [1] - 80:20 platted [1] - 13:7 play [2] - 60:16, 84:11</p>	<p>playing [1] - 78:19 plays [1] - 83:20 plenty [1] - 76:3 plot [1] - 10:13 plus [4] - 20:17, 42:21, 80:8, 80:10 podium [2] - 46:20, 48:16 point [16] - 13:25, 17:17, 31:2, 45:20, 46:8, 46:9, 50:15, 51:13, 51:14, 61:4, 73:25, 80:22, 84:8, 84:12, 84:21, 86:3 pointed [1] - 68:21 pointing [1] - 31:2 points [6] - 8:23, 24:6, 24:7, 35:2, 93:14, 93:18 policies [35] - 3:5, 33:2, 47:14, 47:22, 48:12, 48:13, 50:25, 51:2, 59:19, 60:13, 60:16, 61:1, 61:12, 61:17, 62:16, 63:5, 63:8, 63:9, 66:24, 69:14, 70:15, 70:16, 71:22, 72:2, 73:13, 74:11, 75:22, 77:22, 78:6, 79:2, 80:14, 82:19, 86:4, 86:18, 94:13 policy [12] - 28:5, 60:16, 61:25, 62:5, 62:13, 76:1, 77:11, 77:12, 79:8, 80:1, 81:22, 82:25 Policy [1] - 68:25 politician [1] - 40:25 ponding [1] - 18:6 pool [1] - 54:17 popular [1] - 83:16 portion [2] - 9:4, 64:23 portions [2] - 12:13, 12:14 possibility [1] - 38:17 possible [1] - 70:2 possibly [3] - 42:12, 85:6, 88:13 poster [1] - 15:9 potential [6] - 11:17, 21:25, 53:4, 65:24, 74:11, 82:18 potentially [4] - 37:3, 47:22, 67:11, 84:6 practices [2] - 61:5, 68:20 predict [1] - 22:18 predicted [3] - 22:11, 34:16, 41:23</p>	<p>predicting [1] - 41:3 prediction [4] - 19:20, 23:10, 24:23, 59:6 predictions [3] - 23:1, 41:2, 53:11 premium [3] - 27:19, 27:23, 28:5 premiums [1] - 27:4 prepare [1] - 5:12 prepared [1] - 86:11 Preparedness [1] - 88:11 present [2] - 19:15, 61:18 PRESENT [2] - 1:12, 1:17 presentation [12] - 5:12, 8:19, 30:23, 48:8, 54:10, 61:20, 70:14, 88:1, 88:12, 89:24, 89:25, 90:20 presentations [2] - 6:14, 7:24 presented [2] - 39:16, 50:21 presently [1] - 9:6 Preservation [2] - 48:20, 87:24 president [1] - 88:2 pretty [9] - 8:5, 25:6, 27:7, 48:3, 52:22, 67:25, 78:25, 81:12, 89:2 previous [2] - 21:23, 25:5 price [1] - 83:16 primarily [2] - 8:25, 61:2 primary [1] - 45:7 principal [1] - 7:16 priority [2] - 45:3, 79:13 private [2] - 7:22, 82:9 probabilistic [3] - 25:12, 26:16, 44:4 probabilistically [1] - 42:21 probability [1] - 26:3 problem [5] - 16:9, 26:19, 38:4, 38:21, 53:11 problems [1] - 15:23 procedures [2] - 50:25, 73:16 Proceedings [1] - 1:6 proceedings [6] - 17:4, 17:19, 24:1, 26:14, 94:19, 95:8 process [4] - 5:18, 47:20, 66:8, 75:12</p>	<p>produced [1] - 53:25 producing [1] - 24:11 product [1] - 45:17 products [1] - 58:11 Professional [1] - 95:6 professional [1] - 8:3 professor [1] - 19:25 proffered [2] - 25:3, 27:8 Program [1] - 69:6 program [4] - 15:3, 27:23, 62:20, 84:18 programs [1] - 62:17 progressed [1] - 90:10 prohibiting [1] - 70:4 prohibits [1] - 65:14 project [5] - 18:10, 21:3, 37:12, 41:24, 47:1 projecting [1] - 90:17 projection [2] - 35:11, 36:17 projects [2] - 12:12, 71:16 promoting [1] - 72:18 proof [1] - 24:2 propagate [2] - 22:20, 34:14 propagation [3] - 36:1, 44:19, 53:18 propensity [1] - 34:23 properties [3] - 27:25, 29:6, 29:12 property [10] - 4:4, 26:24, 27:20, 28:24, 61:15, 62:23, 63:11, 64:4, 64:24, 71:17 Property [1] - 63:3 proposals [2] - 6:12, 63:25 proposed [1] - 64:5 protect [2] - 71:17, 73:18 protecting [1] - 70:22 Protection [1] - 69:5 protection [2] - 69:19, 69:20 prove [1] - 13:21 provide [6] - 3:1, 32:16, 33:4, 33:7, 64:17, 77:22 provided [4] - 22:10, 36:16, 47:12, 68:22 public [12] - 2:23, 7:23, 8:4, 15:4, 52:16, 72:23, 81:10, 85:17, 87:11, 87:12, 87:13, 94:1 Public [3] - 1:10, 39:5,</p>

<p>57:19 pull [2] - 52:23, 66:22 pump [3] - 92:23, 92:24, 93:3 pumping [2] - 57:21, 57:23 purposes [3] - 12:8, 43:15, 91:13 pursuant [1] - 26:25 pushed [1] - 34:7 put [18] - 14:11, 37:25, 46:16, 47:22, 54:7, 58:12, 59:17, 59:19, 60:5, 60:14, 68:4, 79:2, 79:23, 80:4, 81:7, 83:5, 85:4, 94:7 putting [6] - 5:18, 6:13, 60:8, 86:9, 86:24, 94:13</p>	<p>read [5] - 69:11, 69:12, 72:6, 73:20, 86:14 readily [2] - 30:8, 52:19 reading [1] - 76:12 real [1] - 88:20 realistic [1] - 59:7 really [19] - 9:16, 10:23, 11:16, 11:21, 13:15, 14:8, 19:23, 34:18, 34:19, 35:22, 37:7, 40:17, 41:17, 49:14, 57:10, 75:18, 79:1, 80:15, 81:25 reasonable [2] - 39:19, 41:8 reasons [1] - 80:13 rebate [1] - 89:1 rebates [1] - 89:9 rebuild [3] - 91:9, 91:11, 92:9 rebuilt [1] - 92:5 received [1] - 7:11 receiving [1] - 38:25 recent [1] - 23:19 recently [1] - 25:4 recognize [1] - 78:2 recommend [3] - 43:19, 50:23, 64:25 recommendation [7] - 29:18, 43:16, 48:24, 49:11, 49:23, 66:7, 67:23 recommendations [18] - 3:2, 5:19, 5:22, 6:13, 29:14, 47:22, 57:18, 59:21, 61:10, 62:8, 74:20, 75:10, 75:19, 75:23, 76:2, 76:4, 81:23, 87:3 recommending [1] - 82:1 record [7] - 24:11, 24:16, 24:19, 43:7, 45:20, 87:21, 95:9 recording [1] - 46:19 recs [1] - 35:4 red [1] - 14:9 redevelop [1] - 39:24 redevelopment [1] - 25:24 reduce [1] - 72:22 Reed [3] - 3:17, 60:20, 60:22 REED [8] - 1:19, 3:17, 60:22, 74:24, 76:17, 76:22, 79:6, 87:5 Reed's [1] - 88:12 reference [1] - 71:23</p>	<p>referred [2] - 10:22, 10:24 refers [3] - 63:23, 64:4, 64:12 reflects [1] - 29:19 regarding [4] - 3:2, 7:24, 8:19, 83:11 regular [1] - 88:4 regulation [1] - 7:25 regulations [16] - 61:23, 62:8, 62:17, 62:18, 62:19, 63:8, 70:11, 71:5, 71:13, 73:16, 77:23, 77:25, 78:4, 78:9, 78:16, 79:19 regulatory [3] - 3:5, 82:10, 84:17 reiterate [1] - 61:24 relate [1] - 14:8 related [9] - 3:6, 8:1, 51:3, 53:12, 61:2, 72:25, 85:20, 87:3, 89:11 Related [1] - 63:3 relates [1] - 61:22 relatively [1] - 16:19 relevant [6] - 18:18, 18:20, 19:22, 24:24, 38:14, 56:9 relies [1] - 71:21 relocation [1] - 70:2 remaining [1] - 76:21 remember [1] - 2:11 removal [1] - 70:1 remove [1] - 68:6 reoccurring [2] - 38:21, 39:15 report [12] - 69:7, 69:16, 69:18, 70:6, 71:12, 71:21, 75:2, 75:5, 75:15, 87:3, 89:13, 95:8 reporter [1] - 2:10 REPORTER [1] - 95:1 Reporter [1] - 95:6 reports [1] - 41:25 represents [2] - 11:17, 88:1 request [5] - 67:8, 67:14, 67:20, 68:6, 87:20 requests [3] - 62:24, 64:13, 66:8 require [1] - 71:13 required [1] - 53:15 requirements [2] - 71:10, 80:3 requires [1] - 65:19 research [2] - 51:1,</p>	<p>56:14 residential [14] - 63:16, 63:18, 63:19, 63:20, 65:13, 65:15, 67:10, 67:13, 74:9, 74:10, 76:12, 76:14, 82:24 resiliency [3] - 55:8, 75:3, 87:4 resilient [1] - 79:15 resolution [1] - 75:25 resource [1] - 69:7 respect [3] - 9:23, 24:10, 38:2 response [5] - 50:22, 85:14, 85:24, 93:24, 94:15 restricted [1] - 6:21 result [2] - 51:12, 89:1 results [1] - 11:12 retired [1] - 58:9 retreat [1] - 69:19 retreats [1] - 70:1 retrofit [3] - 77:1, 77:5, 81:24 retrofit-type [1] - 77:1 retrofitting [2] - 73:7, 82:11 return [1] - 73:22 review [12] - 59:13, 63:11, 64:5, 64:12, 64:18, 66:7, 67:15, 67:16, 68:9, 80:2, 86:5, 94:5 Review [1] - 74:17 reviewing [3] - 66:8, 66:15, 86:4 reviews [1] - 63:24 revisited [1] - 73:14 rezoning [1] - 64:1 rid [1] - 57:24 ridiculous [1] - 39:25 right-hand [2] - 10:17, 13:15 rights [5] - 64:23, 83:14, 84:15, 84:19 rise [53] - 9:8, 10:5, 12:16, 13:2, 13:3, 13:8, 13:10, 13:14, 13:22, 14:6, 14:13, 14:19, 14:21, 15:13, 15:19, 15:22, 16:22, 19:6, 20:14, 20:15, 20:21, 21:4, 22:6, 22:8, 25:22, 26:2, 26:6, 26:23, 28:2, 29:11, 29:16, 37:6, 37:14, 37:16, 38:2, 40:20, 41:3, 41:12, 41:20, 51:3, 54:1,</p>	<p>54:19, 69:9, 72:22, 72:24, 73:19, 79:12, 79:14, 90:1, 90:15, 91:25 Rise [1] - 69:1 rises [2] - 20:25, 63:21 rising [2] - 40:18, 69:22 risk [8] - 27:1, 27:13, 27:16, 27:18, 27:22, 72:22, 72:24, 79:11 Riva [1] - 39:6 river [43] - 6:25, 9:4, 11:2, 11:6, 11:13, 11:19, 12:13, 12:14, 12:17, 13:1, 16:20, 17:9, 17:17, 20:12, 21:21, 23:3, 23:5, 24:11, 29:8, 32:14, 34:6, 34:7, 34:15, 35:4, 35:18, 36:2, 43:11, 44:11, 44:14, 44:22, 45:24, 46:2, 49:6, 53:14, 53:19, 56:17, 57:9, 58:6, 58:18, 65:21, 66:3, 66:19, 67:1 River [10] - 10:19, 10:20, 12:8, 16:23, 18:12, 22:23, 23:14, 55:15, 66:18 rivering [6] - 22:25, 23:23, 55:22, 55:25, 56:1, 57:9 rivers [1] - 47:8 Riverside [14] - 9:3, 9:10, 9:13, 23:17, 46:23, 48:19, 48:25, 49:4, 49:13, 56:16, 59:1, 59:2, 83:8, 87:24 Riverside's [1] - 9:18 road [4] - 15:5, 54:25, 58:8, 58:10 robust [1] - 22:24 Rogers [1] - 4:1 roofing [2] - 89:1, 89:12 room [1] - 3:8 Room [1] - 1:8 rose [2] - 40:6, 54:12 round [1] - 28:21 routinely [1] - 7:21 RPC's [1] - 36:22 rubber [1] - 54:25 Rummell [2] - 38:6, 38:7 runoff [1] - 54:15 runs [1] - 35:5</p>
Q				
<p>Qs [1] - 31:4 quantity [2] - 17:13, 17:14 query [1] - 89:2 question's [1] - 90:23 questions [7] - 30:18, 44:7, 45:10, 74:12, 76:9, 81:9, 85:13 quick [6] - 2:8, 21:11, 81:12, 88:20, 93:7, 93:13 quickly [7] - 3:8, 20:6, 22:10, 28:8, 45:19, 49:8, 52:19 quite [2] - 59:1, 67:7 quorum [1] - 2:4 quoted [1] - 91:1</p>	<p>read [5] - 69:11, 69:12, 72:6, 73:20, 86:14 readily [2] - 30:8, 52:19 reading [1] - 76:12 real [1] - 88:20 realistic [1] - 59:7 really [19] - 9:16, 10:23, 11:16, 11:21, 13:15, 14:8, 19:23, 34:18, 34:19, 35:22, 37:7, 40:17, 41:17, 49:14, 57:10, 75:18, 79:1, 80:15, 81:25 reasonable [2] - 39:19, 41:8 reasons [1] - 80:13 rebate [1] - 89:1 rebates [1] - 89:9 rebuild [3] - 91:9, 91:11, 92:9 rebuilt [1] - 92:5 received [1] - 7:11 receiving [1] - 38:25 recent [1] - 23:19 recently [1] - 25:4 recognize [1] - 78:2 recommend [3] - 43:19, 50:23, 64:25 recommendation [7] - 29:18, 43:16, 48:24, 49:11, 49:23, 66:7, 67:23 recommendations [18] - 3:2, 5:19, 5:22, 6:13, 29:14, 47:22, 57:18, 59:21, 61:10, 62:8, 74:20, 75:10, 75:19, 75:23, 76:2, 76:4, 81:23, 87:3 recommending [1] - 82:1 record [7] - 24:11, 24:16, 24:19, 43:7, 45:20, 87:21, 95:9 recording [1] - 46:19 recs [1] - 35:4 red [1] - 14:9 redevelop [1] - 39:24 redevelopment [1] - 25:24 reduce [1] - 72:22 Reed [3] - 3:17, 60:20, 60:22 REED [8] - 1:19, 3:17, 60:22, 74:24, 76:17, 76:22, 79:6, 87:5 Reed's [1] - 88:12 reference [1] - 71:23</p>	<p>referred [2] - 10:22, 10:24 refers [3] - 63:23, 64:4, 64:12 reflects [1] - 29:19 regarding [4] - 3:2, 7:24, 8:19, 83:11 regular [1] - 88:4 regulation [1] - 7:25 regulations [16] - 61:23, 62:8, 62:17, 62:18, 62:19, 63:8, 70:11, 71:5, 71:13, 73:16, 77:23, 77:25, 78:4, 78:9, 78:16, 79:19 regulatory [3] - 3:5, 82:10, 84:17 reiterate [1] - 61:24 relate [1] - 14:8 related [9] - 3:6, 8:1, 51:3, 53:12, 61:2, 72:25, 85:20, 87:3, 89:11 Related [1] - 63:3 relates [1] - 61:22 relatively [1] - 16:19 relevant [6] - 18:18, 18:20, 19:22, 24:24, 38:14, 56:9 relies [1] - 71:21 relocation [1] - 70:2 remaining [1] - 76:21 remember [1] - 2:11 removal [1] - 70:1 remove [1] - 68:6 reoccurring [2] - 38:21, 39:15 report [12] - 69:7, 69:16, 69:18, 70:6, 71:12, 71:21, 75:2, 75:5, 75:15, 87:3, 89:13, 95:8 reporter [1] - 2:10 REPORTER [1] - 95:1 Reporter [1] - 95:6 reports [1] - 41:25 represents [2] - 11:17, 88:1 request [5] - 67:8, 67:14, 67:20, 68:6, 87:20 requests [3] - 62:24, 64:13, 66:8 require [1] - 71:13 required [1] - 53:15 requirements [2] - 71:10, 80:3 requires [1] - 65:19 research [2] - 51:1,</p>	<p>56:14 residential [14] - 63:16, 63:18, 63:19, 63:20, 65:13, 65:15, 67:10, 67:13, 74:9, 74:10, 76:12, 76:14, 82:24 resiliency [3] - 55:8, 75:3, 87:4 resilient [1] - 79:15 resolution [1] - 75:25 resource [1] - 69:7 respect [3] - 9:23, 24:10, 38:2 response [5] - 50:22, 85:14, 85:24, 93:24, 94:15 restricted [1] - 6:21 result [2] - 51:12, 89:1 results [1] - 11:12 retired [1] - 58:9 retreat [1] - 69:19 retreats [1] - 70:1 retrofit [3] - 77:1, 77:5, 81:24 retrofit-type [1] - 77:1 retrofitting [2] - 73:7, 82:11 return [1] - 73:22 review [12] - 59:13, 63:11, 64:5, 64:12, 64:18, 66:7, 67:15, 67:16, 68:9, 80:2, 86:5, 94:5 Review [1] - 74:17 reviewing [3] - 66:8, 66:15, 86:4 reviews [1] - 63:24 revisited [1] - 73:14 rezoning [1] - 64:1 rid [1] - 57:24 ridiculous [1] - 39:25 right-hand [2] - 10:17, 13:15 rights [5] - 64:23, 83:14, 84:15, 84:19 rise [53] - 9:8, 10:5, 12:16, 13:2, 13:3, 13:8, 13:10, 13:14, 13:22, 14:6, 14:13, 14:19, 14:21, 15:13, 15:19, 15:22, 16:22, 19:6, 20:14, 20:15, 20:21, 21:4, 22:6, 22:8, 25:22, 26:2, 26:6, 26:23, 28:2, 29:11, 29:16, 37:6, 37:14, 37:16, 38:2, 40:20, 41:3, 41:12, 41:20, 51:3, 54:1,</p>	<p>54:19, 69:9, 72:22, 72:24, 73:19, 79:12, 79:14, 90:1, 90:15, 91:25 Rise [1] - 69:1 rises [2] - 20:25, 63:21 rising [2] - 40:18, 69:22 risk [8] - 27:1, 27:13, 27:16, 27:18, 27:22, 72:22, 72:24, 79:11 Riva [1] - 39:6 river [43] - 6:25, 9:4, 11:2, 11:6, 11:13, 11:19, 12:13, 12:14, 12:17, 13:1, 16:20, 17:9, 17:17, 20:12, 21:21, 23:3, 23:5, 24:11, 29:8, 32:14, 34:6, 34:7, 34:15, 35:4, 35:18, 36:2, 43:11, 44:11, 44:14, 44:22, 45:24, 46:2, 49:6, 53:14, 53:19, 56:17, 57:9, 58:6, 58:18, 65:21, 66:3, 66:19, 67:1 River [10] - 10:19, 10:20, 12:8, 16:23, 18:12, 22:23, 23:14, 55:15, 66:18 rivering [6] - 22:25, 23:23, 55:22, 55:25, 56:1, 57:9 rivers [1] - 47:8 Riverside [14] - 9:3, 9:10, 9:13, 23:17, 46:23, 48:19, 48:25, 49:4, 49:13, 56:16, 59:1, 59:2, 83:8, 87:24 Riverside's [1] - 9:18 road [4] - 15:5, 54:25, 58:8, 58:10 robust [1] - 22:24 Rogers [1] - 4:1 roofing [2] - 89:1, 89:12 room [1] - 3:8 Room [1] - 1:8 rose [2] - 40:6, 54:12 round [1] - 28:21 routinely [1] - 7:21 RPC's [1] - 36:22 rubber [1] - 54:25 Rummell [2] - 38:6, 38:7 runoff [1] - 54:15 runs [1] - 35:5</p>
R				
<p>rain [2] - 39:9, 39:10 rainfall [9] - 44:25, 46:1, 49:13, 56:14, 56:22, 56:25, 58:7, 58:14, 93:1 rainwater [4] - 32:1, 32:6, 58:17, 58:24 raised [1] - 92:9 range [2] - 10:11, 12:3 RAP [1] - 88:2 rapidly [1] - 59:16 rare [1] - 43:13 rate [2] - 14:8, 37:6 rates [2] - 27:5, 27:15 rather [2] - 38:2, 71:3 RAY [2] - 88:10, 88:19 Ray [1] - 88:10</p>	<p>read [5] - 69:11, 69:12, 72:6, 73:20, 86:14 readily [2] - 30:8, 52:19 reading [1] - 76:12 real [1] - 88:20 realistic [1] - 59:7 really [19] - 9:16, 10:23, 11:16, 11:21, 13:15, 14:8, 19:23, 34:18, 34:19, 35:22, 37:7, 40:17, 41:17, 49:14, 57:10, 75:18, 79:1, 80:15, 81:25 reasonable [2] - 39:19, 41:8 reasons [1] - 80:13 rebate [1] - 89:1 rebates [1] - 89:9 rebuild [3] - 91:9, 91:11, 92:9 rebuilt [1] - 92:5 received [1] - 7:11 receiving [1] - 38:25 recent [1] - 23:19 recently [1] - 25:4 recognize [1] - 78:2 recommend [3] - 43:19, 50:23, 64:25 recommendation [7] - 29:18, 43:16, 48:24, 49:11, 49:23, 66:7, 67:23 recommendations [18] - 3:2, 5:19, 5:22, 6:13, 29:14, 47:22, 57:18, 59:21, 61:10, 62:8, 74:20, 75:10, 75:19, 75:23, 76:2, 76:4, 81:23, 87:3 recommending [1] - 82:1 record [7] - 24:11, 24:16, 24:19, 43:7, 45:20, 87:21, 95:9 recording [1] - 46:19 recs [1] - 35:4 red [1] - 14:9 redevelop [1] - 39:24 redevelopment [1] - 25:24 reduce [1] - 72:22 Reed [3] - 3:17, 60:20, 60:22 REED [8] - 1:19, 3:17, 60:22, 74:24, 76:17, 76:22, 79:6, 87:5 Reed's [1] - 88:12 reference [1] - 71:23</p>	<p>referred [2] - 10:22, 10:24 refers [3] - 63:23, 64:4, 64:12 reflects [1] - 29:19 regarding [4] - 3:2, 7:24, 8:19, 83:11 regular [1] - 88:4 regulation [1] - 7:25 regulations [16] - 61:23, 62:8, 62:17, 62:18, 62:19, 63:8, 70:11, 71:5, 71:13, 73:16, 77:23, 77:25, 78:4, 78:9, 78:16, 79:19 regulatory [3] - 3:5, 82:10, 84:17 reiterate [1] - 61:24 relate [1] - 14:8 related [9] - 3:6, 8:1, 51:3, 53:12, 61:2, 72:25, 85:20, 87:3, 89:11 Related [1] - 63:3 relates [1] - 61:22 relatively [1] - 16:19 relevant [6] - 18:18, 18:20, 19:22, 24:24, 38:14, 56:9 relies [1] - 71:21 relocation [1] - 70:2 remaining [1] - 76:21 remember [1] - 2:11 removal [1] - 70:1 remove [1] - 68:6 reoccurring [2] - 38:21, 39:15 report [12] - 69:7, 69:16, 69:18, 70:6, 71:12, 71:21, 75:2, 75:5, 75:15, 87:3, 89:13, 95:8 reporter [1] - 2:10 REPORTER [1] - 95:1 Reporter [1] - 95:6 reports [1] - 41:25 represents [2] - 11:17, 88:1 request [5] - 67:8, 67:14, 67:20, 68:6, 87:20 requests [3] - 62:24, 64:13, 66:8 require [1] - 71:13 required [1] - 53:15 requirements [2] - 71:10, 80:3 requires [1] - 65:19 research [2] - 51:1,</p>	<p>56:14 residential [14] - 63:16, 63:18, 63:19, 63:20, 65:13, 65:15, 67:10, 67:13, 74:9, 74:10, 76:12, 76:14, 82:24 resiliency [3] - 55:8, 75:3, 87:4 resilient [1] - 79:15 resolution [1] - 75:25 resource [1] - 69:7 respect [3] - 9:23, 24:10, 38:2 response [5] - 50:22, 85:14, 85:24, 93:24, 94:15 restricted [1] - 6:21 result [2] - 51:12, 89:1 results [1] - 11:12 retired [1] - 58:9 retreat [1] - 69:19 retreats [1] - 70:1 retrofit [3] - 77:1, 77:5, 81</p>	

S				
<p>S-a-n-d-r-i-k [1] - 93:12 safe [2] - 21:16, 22:2 safeguards [1] - 38:1 salient [1] - 8:23 saline [1] - 31:24 salinity [3] - 31:21, 32:4, 58:22 SAM [1] - 1:16 sam [1] - 3:24 sample [2] - 33:7, 45:8 samples [1] - 31:21 San [26] - 9:2, 9:19, 9:21, 12:24, 16:17, 17:6, 18:8, 18:16, 18:20, 19:10, 23:15, 31:9, 31:11, 31:21, 32:6, 32:9, 32:13, 33:23, 34:3, 34:8, 35:15, 49:5, 52:24, 58:15, 58:25, 59:2 SANDRIK [25] - 30:20, 30:25, 31:14, 32:15, 32:21, 33:6, 33:17, 33:20, 35:2, 35:10, 35:25, 36:4, 36:11, 44:20, 45:6, 45:14, 45:18, 46:9, 46:14, 53:24, 57:5, 58:2, 59:7, 93:7, 93:11 Sandrik [2] - 30:20, 93:11 sat [2] - 51:25 satellite [1] - 14:20 satellites [1] - 14:4 saw [2] - 24:22, 93:2 scenario [1] - 54:19 scenarios [2] - 44:5, 54:3 scheme [1] - 10:9 Science [1] - 7:12 science [1] - 59:15 scientific [1] - 11:22 scream [1] - 2:14 Sea [1] - 69:1 sea [54] - 9:8, 10:5, 12:16, 13:2, 13:3, 13:8, 13:10, 13:13, 13:21, 14:3, 14:6, 14:12, 14:19, 14:21, 15:13, 15:19, 15:22, 16:12, 19:6, 20:14, 20:16, 20:21, 20:25, 21:4, 22:6, 22:8, 25:16, 25:21, 25:22, 26:2, 26:6, 26:23, 28:1, 29:11, 29:16, 37:6, 37:14, 37:16,</p>	<p>38:2, 41:3, 41:12, 41:19, 51:3, 53:25, 69:9, 72:22, 72:24, 73:19, 79:11, 79:13, 89:25, 90:14, 91:25 seas [1] - 69:22 season [1] - 11:6 seasonally [1] - 11:3 SEAT [1] - 48:14 seated [1] - 8:17 seating [1] - 8:10 Seaton [2] - 46:22, 56:12 SEATON [2] - 48:1, 56:12 seawall [11] - 17:12, 20:10, 20:11, 20:16, 29:10, 31:3, 31:20, 33:10, 33:11, 58:20, 91:6 seawalls [3] - 71:19, 91:7, 91:19 second [5] - 4:20, 4:22, 27:17, 47:3, 50:10 section [4] - 11:18, 53:14, 68:19, 94:8 sector [1] - 7:23 see [40] - 4:22, 5:10, 5:23, 9:12, 11:15, 13:13, 14:5, 17:20, 19:10, 20:10, 20:16, 34:16, 35:6, 37:4, 41:3, 41:11, 41:23, 43:9, 47:8, 48:10, 48:11, 49:1, 50:11, 50:24, 51:24, 60:14, 63:22, 66:19, 69:4, 74:5, 78:18, 81:14, 85:19, 87:4, 89:7, 90:14, 91:14, 91:25, 92:1, 92:14 seeing [4] - 31:8, 49:12, 90:15, 93:25 seek [1] - 81:6 seem [1] - 56:21 seiche [4] - 35:4, 35:20, 46:2, 58:6 seminar [1] - 8:2 sense [3] - 46:25, 48:22, 78:20 sensitive [4] - 65:2, 65:8, 65:23, 66:4 separately [1] - 72:15 separating [1] - 46:4 septic [1] - 65:21 series [3] - 12:11, 13:18, 20:13 Service [1] - 30:21 Services [2] - 53:24,</p>	<p>89:21 set [3] - 49:24, 62:2, 75:18 setbacks [3] - 64:25, 70:12, 71:7 seven [1] - 67:11 several [1] - 57:22 severely [1] - 9:5 shall [2] - 73:3, 79:10 Shannon [3] - 4:12, 42:9, 74:15 SHANNON [2] - 1:14, 1:20 sheet [1] - 86:2 shoreline [1] - 71:18 shortcoming [1] - 53:19 shot [1] - 49:2 shots [1] - 16:6 show [8] - 4:23, 7:4, 13:24, 44:16, 45:22, 46:10, 46:17, 50:11 showed [1] - 44:10 showing [1] - 77:3 shows [1] - 66:16 side [3] - 10:17, 13:15, 83:23 significant [9] - 9:20, 10:12, 25:19, 27:1, 27:12, 57:1, 57:12, 58:24, 90:16 significantly [3] - 13:17, 14:4, 14:15 signs [1] - 87:14 similar [4] - 54:23, 71:1, 72:16, 80:1 similarly [3] - 7:23, 27:25, 48:13 single [3] - 35:5, 63:21, 67:10 single-family [1] - 67:10 single-storm [1] - 35:5 site [10] - 38:10, 38:20, 63:10, 63:23, 63:24, 64:1, 64:3, 68:9, 68:11 sites [3] - 45:7, 45:8, 45:9 sitings [1] - 38:3 sitting [1] - 54:16 situated [1] - 48:13 situation [4] - 10:11, 32:5, 35:17, 83:19 situations [1] - 77:1 six [1] - 35:6 six-minute [1] - 35:6 slide [6] - 10:17, 11:17, 13:15, 21:7,</p>	<p>21:23, 25:12 slides [1] - 30:18 slightly [2] - 25:8, 76:19 SLOSH [9] - 22:13, 22:21, 23:8, 23:19, 23:21, 34:20, 35:3, 43:2 small [1] - 92:23 smart [1] - 92:16 sneak [1] - 80:14 societies [1] - 8:4 soft [5] - 69:20, 70:12, 71:16, 78:11, 78:17 someone [2] - 66:1, 66:24 sometimes [1] - 83:19 somewhat [1] - 23:2 somewhere [3] - 17:12, 31:24, 32:3 soon [1] - 18:14 sophisticated [1] - 22:16 sorry [3] - 5:2, 5:25, 36:11 sort [8] - 12:20, 24:2, 34:9, 42:12, 57:25, 74:17, 77:10, 77:11 sounds [2] - 54:23, 70:3 south [5] - 9:1, 15:18, 19:21, 23:4, 66:19 South [3] - 15:21, 15:23, 43:24 southeast [1] - 43:12 southward [2] - 23:24, 30:14 space [2] - 65:1, 71:10 speaker [2] - 7:10, 60:19 special [1] - 7:17 specific [7] - 64:8, 71:4, 72:19, 73:16, 79:7, 79:24, 82:25 specifically [2] - 63:6, 65:12 specificity [1] - 80:5 spend [1] - 86:16 spreadation [1] - 58:22 spring [4] - 10:18, 10:24, 11:24, 15:16 St [11] - 10:19, 10:20, 12:8, 16:23, 18:12, 22:23, 23:14, 33:11, 33:12, 33:13, 33:16 stabilization [1] - 12:7 stack [1] - 5:9 staff [16] - 5:11, 23:20, 47:6, 47:12, 50:16,</p>	<p>50:20, 51:23, 56:11, 80:22, 85:4, 85:19, 86:11, 86:19, 86:21, 87:17, 88:21 staff's [1] - 5:11 standard [1] - 80:8 standards [3] - 39:14, 53:22, 71:8 standing [1] - 58:17 standpoint [1] - 28:4 Stantec [1] - 89:20 start [10] - 3:12, 4:21, 6:10, 6:12, 47:19, 86:3, 86:8, 86:9, 94:8, 94:11 started [1] - 2:5 starting [3] - 61:4, 78:5, 86:17 state [5] - 55:23, 59:25, 68:21, 79:3, 93:9 State [4] - 1:10, 8:1, 69:2, 83:13 STATE [1] - 95:3 state-mandated [1] - 79:3 statements [1] - 62:14 States [1] - 12:21 states [1] - 7:19 stations [3] - 92:23, 92:24, 93:3 stay [4] - 82:17, 83:8, 85:5, 90:25 stayed [1] - 92:18 stenographic [1] - 95:10 stenographically [1] - 95:8 steps [4] - 3:3, 59:25, 60:8, 60:17 still [16] - 14:10, 21:19, 21:23, 25:6, 28:23, 35:22, 40:21, 46:15, 54:16, 68:14, 70:21, 77:12, 77:18, 78:24, 93:19, 94:2 Stockton [8] - 9:15, 44:22, 44:24, 49:14, 56:17, 56:19, 57:14, 57:20 stop [1] - 29:9 stopped [1] - 44:23 storm [45] - 15:5, 15:16, 24:5, 24:6, 24:9, 25:13, 25:14, 25:15, 25:16, 26:8, 26:17, 29:16, 30:3, 30:4, 30:6, 31:15, 32:22, 33:23, 34:5, 34:11, 34:14, 34:18,</p>

<p>34:19, 35:5, 35:8, 35:9, 35:10, 35:12, 36:2, 42:19, 42:24, 43:6, 51:7, 52:25, 53:15, 57:13, 58:5, 60:10, 69:25, 89:1, 89:11</p> <p>storm-by-storm [1] - 35:8</p> <p>storm-related [1] - 89:11</p> <p>storms [10] - 9:25, 24:8, 24:19, 24:20, 43:1, 43:3, 43:5, 43:8, 43:14, 44:15</p> <p>strategies [12] - 63:10, 64:15, 66:14, 69:8, 69:17, 69:18, 70:17, 72:4, 73:18, 78:10, 79:17, 82:13</p> <p>strategy [1] - 63:23</p> <p>street [1] - 9:16</p> <p>Street [5] - 1:8, 9:15, 44:24, 57:14, 57:21</p> <p>streets [3] - 58:17, 58:23, 91:20</p> <p>stricter [1] - 71:8</p> <p>strictly [1] - 11:10</p> <p>strong [1] - 84:2</p> <p>strongly [2] - 69:10, 72:6</p> <p>struck [1] - 13:20</p> <p>structural [1] - 71:14</p> <p>structurally [1] - 69:21</p> <p>structure [1] - 28:18</p> <p>structures [6] - 16:13, 71:6, 71:7, 71:17, 71:19, 92:13</p> <p>structuring [1] - 43:23</p> <p>struggle [1] - 77:12</p> <p>struggling [3] - 16:8, 77:18, 80:17</p> <p>student [1] - 20:2</p> <p>studies [2] - 3:4, 41:22</p> <p>study [4] - 25:5, 29:14, 37:12, 49:17</p> <p>stuff [1] - 48:3</p> <p>sub [1] - 39:16</p> <p>sub-issue [1] - 39:16</p> <p>subdivision [2] - 44:2, 62:19</p> <p>submitted [1] - 87:25</p> <p>subsequent [1] - 12:10</p> <p>subset [1] - 89:9</p> <p>sudden [2] - 18:2, 28:25</p> <p>suffer [2] - 10:3, 10:4</p> <p>suffered [1] - 34:4</p>	<p>suggest [2] - 37:25, 38:13</p> <p>suggesting [2] - 38:13, 42:13</p> <p>suggestion [2] - 42:11, 88:18</p> <p>suggestions [1] - 47:20</p> <p>suitable [2] - 23:22, 78:14</p> <p>summary [1] - 21:12</p> <p>Sunshine [1] - 2:24</p> <p>super [7] - 11:6, 18:2, 21:2, 21:25, 38:18, 41:8, 41:23</p> <p>supercharge [1] - 32:11</p> <p>support [3] - 48:23, 49:10, 72:20</p> <p>supports [1] - 50:12</p> <p>supposed [1] - 40:9</p> <p>surface [2] - 14:17, 65:25</p> <p>surge [14] - 22:19, 22:20, 25:25, 26:1, 29:17, 31:15, 45:24, 53:9, 53:15, 53:17, 53:18, 58:5</p> <p>surveys [2] - 32:22, 45:21</p> <p>Susan [4] - 3:12, 3:13, 85:20, 86:2</p> <p>SUSAN [1] - 1:19</p> <p>susceptible [1] - 26:10</p> <p>suspect [2] - 38:5, 54:21</p> <p>sustainable [1] - 72:20</p> <p>sweep [1] - 43:8</p> <p>swimming [1] - 54:17</p> <p>switch [2] - 54:5, 60:18</p> <p>synonymous [1] - 11:24</p> <p>system [12] - 17:6, 17:11, 22:25, 23:23, 32:11, 55:21, 55:22, 55:25, 56:1, 57:21, 57:23, 58:20</p> <p>systems [2] - 53:20, 65:22</p>	<p>TAPPOUNI [8] - 1:13, 4:3, 44:9, 50:3, 50:7, 55:13, 87:1, 87:9</p> <p>Tappouni [3] - 4:3, 17:3, 17:18</p> <p>tasking [1] - 92:3</p> <p>tectonic [1] - 14:17</p> <p>telemetry [1] - 14:21</p> <p>temper [1] - 41:12</p> <p>ten [1] - 53:1</p> <p>tenths [6] - 18:12, 19:2, 19:13, 21:1, 21:2, 42:7</p> <p>term [6] - 11:22, 12:5, 12:16, 15:13, 36:17, 62:14</p> <p>terms [4] - 60:15, 80:24, 82:8, 83:13</p> <p>tertiary [1] - 57:25</p> <p>text [1] - 75:14</p> <p>THE [67] - 2:4, 3:21, 4:1, 4:14, 4:21, 5:3, 5:16, 6:2, 6:5, 8:14, 28:7, 29:2, 32:18, 32:25, 33:9, 33:21, 36:9, 36:12, 39:18, 40:2, 42:9, 43:15, 44:7, 45:10, 46:21, 47:2, 48:4, 48:15, 48:17, 49:19, 50:6, 50:11, 50:23, 51:21, 51:23, 52:13, 53:23, 55:6, 55:11, 56:3, 56:10, 57:4, 58:1, 59:3, 59:9, 73:24, 75:16, 76:7, 79:25, 81:18, 82:14, 83:25, 84:24, 85:15, 85:25, 87:10, 87:23, 88:9, 88:17, 88:20, 89:4, 89:16, 93:6, 93:9, 93:21, 93:25, 94:16</p> <p>themselves [2] - 3:9, 8:20</p> <p>therefore [1] - 80:9</p> <p>they've [5] - 13:12, 15:12, 25:2, 59:19, 87:17</p> <p>thinking [5] - 5:21, 48:23, 60:13, 60:15, 93:16</p> <p>third [2] - 40:4, 47:4</p> <p>thoughts [2] - 72:7, 74:20</p> <p>thousand [1] - 32:4</p> <p>three [10] - 9:22, 13:22, 23:11, 63:9, 65:13, 66:15, 87:13, 87:16, 88:5, 93:3</p> <p>throw [2] - 56:24, 79:6</p>	<p>thunderstorm [1] - 16:19</p> <p>thunderstorms [2] - 12:5, 57:16</p> <p>tidal [5] - 12:6, 19:21, 38:24, 44:21, 90:5</p> <p>tide [9] - 10:10, 10:11, 11:1, 11:20, 11:25, 12:2, 13:17, 44:22, 46:2</p> <p>tides [16] - 10:13, 10:16, 10:18, 10:22, 10:24, 11:4, 11:10, 11:21, 12:1, 15:15, 15:16, 31:7, 35:17, 58:5</p> <p>tie [1] - 55:4</p> <p>tier [1] - 62:21</p> <p>timeframe [1] - 81:6</p> <p>timeline [1] - 75:13</p> <p>timer [1] - 92:21</p> <p>timing [2] - 26:19</p> <p>Today [1] - 67:25</p> <p>today [18] - 6:8, 6:16, 12:7, 18:18, 25:18, 26:1, 26:12, 26:24, 28:1, 38:4, 42:6, 60:25, 61:11, 80:25, 86:15, 89:6, 89:23, 94:6</p> <p>today's [6] - 24:25, 26:17, 26:25, 29:16, 30:2, 42:4</p> <p>together [7] - 5:18, 6:13, 54:7, 59:17, 76:5, 86:9, 94:13</p> <p>Tom [2] - 89:7, 89:17</p> <p>Tom's [1] - 89:6</p> <p>took [2] - 33:8, 45:6</p> <p>tool [6] - 5:19, 6:6, 23:10, 45:19, 61:6, 84:14</p> <p>toolkit [2] - 68:23, 71:23</p> <p>tools [5] - 70:7, 71:12, 81:2, 83:15, 84:22</p> <p>top [4] - 11:11, 21:7, 32:1, 62:21</p> <p>top-tier [1] - 62:21</p> <p>topic [4] - 6:16, 8:6, 8:19, 8:23</p> <p>topics [4] - 7:5, 7:22, 9:22, 61:19</p> <p>total [6] - 32:15, 45:24, 46:5, 58:3, 82:23</p> <p>touched [1] - 6:18</p> <p>tough [1] - 77:4</p> <p>toward [1] - 34:15</p> <p>towards [2] - 63:6,</p>	<p>82:23</p> <p>Towers [1] - 4:2</p> <p>Town [1] - 38:7</p> <p>track [1] - 89:8</p> <p>tracks [1] - 53:16</p> <p>traditional [1] - 40:22</p> <p>transcript [2] - 4:18, 95:9</p> <p>transfer [3] - 64:22, 84:14, 84:19</p> <p>transferred [1] - 83:14</p> <p>trap [3] - 35:17, 46:2, 58:5</p> <p>trend [4] - 13:2, 13:19, 40:22, 90:11</p> <p>triangular [1] - 66:17</p> <p>tributaries [1] - 65:21</p> <p>trivial [1] - 10:6</p> <p>tropical [1] - 9:25</p> <p>Trout [1] - 66:18</p> <p>true [3] - 30:5, 31:10, 95:9</p> <p>try [2] - 13:21, 67:19</p> <p>trying [5] - 42:14, 49:5, 58:3, 59:17, 77:15</p> <p>turn [1] - 47:21</p> <p>turned [1] - 48:11</p> <p>two [22] - 13:8, 16:10, 18:12, 19:2, 19:13, 21:1, 21:2, 21:12, 22:7, 30:10, 34:25, 42:7, 44:11, 44:12, 65:12, 68:22, 76:8, 81:1, 86:17, 88:22, 93:2</p> <p>two-tenths [6] - 18:12, 19:2, 19:13, 21:1, 21:2, 42:7</p> <p>type [16] - 19:12, 21:20, 21:24, 21:25, 23:5, 24:8, 24:11, 34:19, 35:18, 39:9, 63:15, 68:10, 77:1, 77:6, 91:4, 92:2</p> <p>types [9] - 16:10, 22:14, 30:7, 55:18, 60:13, 65:18, 68:18, 69:13, 84:22</p> <p>typically [5] - 53:13, 62:23, 64:16, 67:23, 83:21</p>
	<p>T</p>			<p>U</p>
	<p>table [2] - 12:12, 25:6</p> <p>talks [2] - 72:8, 72:22</p> <p>tangible [1] - 77:6</p> <p>tangible-type [1] - 77:6</p>			<p>ugly [1] - 2:15</p> <p>ultimately [1] - 3:1</p> <p>unanimous [2] - 5:4, 50:13</p> <p>under [4] - 13:4,</p>

<p>44:24, 64:16, 81:5 unfortunately [1] - 31:6 unique [2] - 34:17, 34:18 United [1] - 12:21 units [2] - 67:12, 82:24 University [2] - 4:9, 7:13 unless [1] - 20:10 unlike [1] - 83:15 up [44] - 3:10, 11:15, 14:22, 15:17, 16:5, 16:16, 21:1, 23:5, 24:10, 32:2, 33:2, 34:5, 34:7, 34:14, 36:2, 39:11, 40:1, 42:2, 42:3, 44:16, 44:21, 44:24, 46:2, 52:6, 52:23, 53:15, 53:18, 54:3, 55:17, 58:19, 61:19, 62:8, 66:22, 67:11, 72:17, 75:13, 77:15, 78:1, 83:4, 87:16, 91:2, 91:12, 92:22, 93:15 upcoming [1] - 72:8 update [3] - 72:25, 79:2, 79:3 updated [2] - 75:11, 79:20 updating [1] - 85:8 upland [4] - 12:23, 15:24, 16:15, 17:15 uplands [2] - 83:3, 90:24 urban [3] - 23:11, 30:15, 44:12 useful [1] - 72:4 users [1] - 22:19 uses [7] - 22:14, 63:17, 64:5, 64:8, 65:13, 65:18, 68:18 USGS [1] - 45:5 utilizing [2] - 23:21, 40:13</p>	<p>16:25, 20:8, 21:14, 22:14, 24:8, 38:24, 63:12 various-type [1] - 24:8 vastly [1] - 90:21 Venice [1] - 15:10 vernacular [2] - 10:22, 11:25 versus [4] - 40:13, 42:25, 77:8, 85:9 vertical [1] - 91:4 Vice [1] - 1:13 vicinity [2] - 9:14, 21:9 view [2] - 9:10, 74:6 viewer [1] - 54:1 Villa [1] - 39:6 Vincent's [4] - 33:11, 33:12, 33:13, 33:16 visual [1] - 21:12 visualization [1] - 54:18 vote [3] - 49:21, 50:14, 81:3 vulnerability [2] - 9:23, 24:8</p>	<p>33:16 wants [1] - 87:20 warn [1] - 54:11 Warren [3] - 30:13, 48:18, 87:23 Warren's [1] - 88:4 water [63] - 11:2, 15:16, 16:11, 16:14, 16:16, 16:19, 16:23, 17:9, 17:16, 17:21, 17:22, 17:24, 18:2, 18:7, 18:11, 20:9, 20:12, 20:19, 21:8, 21:18, 21:19, 21:23, 22:21, 23:1, 24:10, 25:12, 31:5, 31:9, 31:20, 31:22, 31:24, 32:7, 33:13, 33:25, 34:4, 34:7, 38:10, 38:19, 38:22, 38:25, 39:11, 41:9, 42:4, 45:24, 46:5, 46:6, 46:14, 51:19, 54:3, 54:4, 54:9, 54:12, 54:16, 55:3, 56:17, 57:24, 58:3, 58:4, 58:18, 58:19, 58:22, 69:25, 91:14 Water [2] - 33:18, 38:11 waterfront [3] - 26:9, 26:24, 27:25 waters [2] - 11:12, 19:15 Waterway [1] - 41:20 Waterways [4] - 66:6, 67:15, 67:24, 68:13 wave [7] - 21:24, 28:12, 28:16, 28:17, 28:20, 28:24, 54:15 wave-type [1] - 21:24 waves [4] - 21:20, 22:1, 28:13, 33:15 waving [1] - 2:10 ways [4] - 27:15, 27:18, 61:9, 64:18 Weather [1] - 30:21 weaved [1] - 76:5 web [1] - 5:14 website [1] - 52:21 week [4] - 6:24, 21:12, 85:23, 86:1 weeks [4] - 75:6, 81:1, 86:17, 88:22 welcome [3] - 2:6, 3:21, 8:7 west [2] - 41:17, 42:3 westerly [1] - 35:11 westward [1] - 34:5 wet [1] - 90:24</p>	<p>wetlands [13] - 63:7, 64:21, 65:11, 65:12, 65:22, 66:5, 66:21, 67:2, 67:19, 82:18, 84:5, 90:21 white [2] - 8:21, 86:16 widely [1] - 27:7 willing [1] - 68:3 wind [5] - 21:20, 21:25, 23:4, 34:6, 54:14 winds [1] - 23:5 witness [1] - 7:21 WORKING [1] - 1:2 Works [2] - 39:5, 57:19 works [1] - 8:14 worldwide [1] - 14:5 worried [1] - 14:15 worst [2] - 42:1, 42:6 worth [1] - 83:22</p>
W		Y	
V		<p>year [8] - 10:14, 11:4, 13:23, 14:23, 20:8, 20:19, 25:4, 76:1 years [19] - 19:7, 25:10, 28:15, 40:23, 53:1, 58:8, 58:9, 58:10, 59:6, 59:14, 60:24, 73:1, 79:12, 90:2, 90:4, 90:9, 91:10, 92:15 yell [1] - 2:14 yelled [1] - 36:13 yourself [2] - 13:21, 60:21</p>	
<p>vague [1] - 77:14 valuable [3] - 65:11, 66:4, 67:1 value [1] - 55:14 variations [1] - 38:24 varies [6] - 11:2, 13:17, 14:4, 14:15, 17:14, 19:12 variety [1] - 72:10 various [8] - 10:16,</p>		Z	
		<p>zone [16] - 23:16, 27:21, 28:1, 28:3, 28:8, 28:9, 28:10, 28:14, 28:20, 28:21, 28:23, 29:1, 29:3, 29:9, 30:11 zones [10] - 9:7, 29:13, 29:22, 64:25, 65:24, 67:3, 67:4, 70:18, 71:16, 79:22 zoning [18] - 48:5, 62:18, 62:25, 63:13, 64:6, 64:11, 65:3, 65:9, 68:10, 68:16, 70:10, 70:24, 71:3, 77:12, 80:4, 80:21, 91:13 Zoning [1] - 48:6 zonings [1] - 68:12</p>	