TO: BJ Jones, CEO, BPCA, Martha Gallo, Interim-Chairperson, BPCA, (one of two local resident Governor appointees)

FROM: Battery Park City Neighborhood Association

CC: Senator Brian Kavanaugh, Emily Leung, Assembly Member Yuh-Line Niou, Assembly Member Charles Fall, Council Member Chris Marte, District Leader Vittoria Fariello, CB1 BPC Chair Justine Cuccia, CB1 Chair Tammy Meltzer, CB1 Vice Chair Alice Blank, Vice President of BPC Homeowner's Coalition Michael Waldorf, The Battery Alliance President Daniel Akkerman, The Battery Alliance Vice President John Dellaportas and Brian Robinson

DATE: July 8, 2022

Executive Summary

Thank you for your response, on June 29, 2022, to our inquiry regarding the efficacy of the Wagner Park resiliency effort. While this is a start, many important questions remain unanswered. We are awaiting detailed excel models, data, assumptions, documents, etc. included in our original request. Please see our letter dated, *June 14, 2022* for reference.

Regarding Section 1.0 Project Justification, you'll see from our detailed response from experts in the field that there are still many unanswered questions. One noteworthy item is BPCA's use of outdated and incorrect models to justify this project. In light of these substantial questions on Section 1.0, the failure for BPCA to fully address questions, and while we await Governor Hochul's vision and guiding principles for this $1B program, our position has not changed: we are calling for a pause and independent review.

Detailed Response on 1.0 Project Justification

Thank you for response on June 29, 2022 (one week later than promised publicly to the community) to the BPCNA correspondence, dated June 14, 2022. We will respond to each section individually starting with Section 1.0: Project Justification.

1.0 Project Justification
2.0 Project Design
3.0 Usable Green Space Measurements
4.0 Environmental Impacts
5.0 Project Timing
6.0 Project Funding
7.0 Federal Funding
8.0 Community Feedback

BPCNA Official Position

To reiterate our position: We fully support a smart and thoughtful resiliency plan that incorporates a design befitting the existing world class design of the entire BPC campus. The planned design does not meet that goal. We request a **PAUSE on the Wagner Park project** until the State Legislators' two June bills are reviewed by Governor Hochul. In line with this, Governor Hochul must have an opportunity to share her vision and guiding principles for this ~$1B program. We need to receive answers to our basic questions and to be provided the data we've requested. Until these conditions are met, our request for an independent review stands.

Ask

We are asking for a pause and an independent review as well as a meeting with the BPCA, AECOM and Dewberry Engineers technical experts to discuss their data, models and assumptions**.** A few questions we need answered are:

- Why were outdated 2013 FEMA models used rather than more recent models?
- What is the park height you are building towards?
- Can you describe any independent review on the models, data and assumptions?
- Where are the engineering alternatives for meeting the storm surge goals?
- Where can we find the data, model and assumptions that we requested in our letter on June 14th?
- The BPCA says "*Dewberry Engineers… provide[d] peer review services for SBPCR, verifying the adequacy, accuracy, efficacy, constructability, and cost effectiveness of the designs developed for the project at various stages of their advancement".* Where can we find and review the findings and analysis done by Dewberry Engineers?

BPCNA Summary Response - 1.0 Project Justification

BPCA did NOT provide the project data, models and assumptions requested by the BPCNA. It is the BPCNA's belief that they either do not exist or the BPCA is unwilling to share them with the public. The absence of the detailed files erodes confidence in the project's justification.

Based on the incomplete response provided, BPCA and AECOM are using the 2013 FEMA FIS model, which is a model that is both **outdated and incorrect. The post-Sandy FEMA model for this area was appealed by the city and was** *ruled in 2016 to be exaggerated and incorrect.* **The 2013 FEMA model "overestimate[s] the size of the 100-year floodplain and the height of the Base Flood Elevations". This finding was further corroborated by** *a 2016 study* **that shows that "Sandy's storm tide of 3.38 m was a 260 year (170-420) storm tide. […] Sandy's storm tide was the largest at NYH back to at least 1700."** Hence, the call for an **independent review of this project is not just a request, but an absolute necessity.** Furthermore, this project is designed to protect against the singular threat of climate change, defined as an elevated storm surge due to sea level rise. The project does not appear to address protection against other critical climate change related risks such as flooding caused by extreme rainfall, more intense wind and storms.

1.0 Project Justification

The BPCNA and community requested the data and the actual model with the underlying input parameters (assumptions) for the Wagner Park Resiliency project. In the words of Dr. Klejda Bega, Science Lecturer at Columbia University, *"this is still not the data nor modeling inputs like we asked [for]."* Instead we received summaries of information and hence the request has **NOT** been met. The BPCNA considers this request outstanding.

The summary information that was shared included a document by AECOM providing the findings of a coastal modeling study. Based on this, our community of scientists believes that the data and assumptions underpinning the SBPCR project are outdated and incorrect. The sea level rise assumed in this project for the 2020s are 10 times higher than current trends, and the sea level rises predicted for the 2050s are 2 times higher than the 2022 NASA model for the Northeast Region.

1.0a Storm Surge

The Wagner Park Resiliency Project is based on an assumption of sea level rise and 100-year storm surge. Most notably, it is based on a 2013 FEMA model of storm surge even though a more recent FEMA model exists, which was published in 2015.

Even using the 2015 model would be considered outdated. According to the *National Resources Defense Council*, FEMA is required to update its maps every five years otherwise the flood risk is categorized as "unknown."

In reviewing the most recent FEMA model of the time, the Office of Homeland Security published a *report* in 2017 stating the FEMA models were outdated and insufficient.1.0a(i) FEMA Model Used to Estimate Storm Surge

1.0a(i) FEMA Model Used to Estimate Storm Surge

To emphasize, the Wagner Park Resiliency Project is based on the 2013 FEMA model which is outdated and has been proven to yield incorrect results. In 2013, FEMA published a flood map outlining flood risk for New York City. In 2015, *New York City appealed FEMA* claiming that they overestimated the flood risk for The Battery by 2.1 feet. On October 17, 2016, FEMA announced that the DeBlasio administration won its appeal of FEMA's 2015 Preliminary Flood Insurance Rate Maps (FIRMs) and also agreed to revise New York City's flood maps.

Hence, for The Battery, FEMA's 2013 estimate was 11.3 feet for a 1% storm surge. The City won the appeal that says the correct number is 9.2 feet (11.3 feet minus 9.2 feet equals an overestimation of 2.1 feet). The table below shows the estimates based on the city's independent 2015 model vs. the outdated 2013 FEMA model. The 2015 model has served as the prevailing source of truth.

New York City Preliminary FIRMs Appeal, June 2015

Table 1-3. 2015 PFIRMs and City Analysis percent-annual-chance stillwater elevations (feet, N gage stations.

Location	Analysis	10%	2%	1%	0.2%
The Battery	2015 PFIRMs	6.9	9.9	11.3	14.9
	City's Analysis	6.1	8.0	9.2	12.7
Kings Point	2015 PFIRMs	9.7	11.9	12.7	14.5
	City's Analysis	9.4	11.0	11.6	13.2
Willets Point	2015 PFIRMs	9.8	12.0	12.9	14.7
	City's Analysis	9.5	11.1	11.7	13.3
Sandy Hook	2015 PFIRMs	7.2	9.9	11.1	14.4
	City's Analysis	6.3	8.1	9.3	13.2
Atlantic City	2015 PFIRMs	5.9	7.9	8.8	12.1
	City's Analysis	5.5	6.9	7.9	12.1
Cape May	2015 PFIRMs	5.8	7.3	7.9	9.3
	City's Analysis	5.4	6.6	7.2	9.1

Source:*https://www1.nyc.gov/assets/floodmaps/images/content/pages/1-NYC%20FEMA%20Appeal%20FINAL%20with%20Appendices%20and%20Cover%20Letter%2006252015_web.pdf,* page 1-13

On page 27 of the AECOM Coastal Modeling Study that BPCA sent the BPCNA on June 29, 2022, it shows that AECOM is using the storm surge assumption from the 2013 FEMA model. To be clear, instead of using the 9.2 foot latest estimate, the project is based on the incorrect estimation of 11.3 feet: “From the model, SWEL elevations typically vary from about 11.2 to 11.3 ft NAVD88 from north to south along the project, respectively, which is consistent with the 100-year SWEL variation from the preliminary RAMPP study” (*SBPC Final Coastal Modeling Report,* page 27). Moreover, AECOM seems to be mistaking SWEL (Seawater Elevation Levels), the typical way that surges due to storms are reported, with storm tides, which corresponds to the NOAA recorded value that they report.

Battery Park City Authority AECOM

3.0 COASTAL FLOOD ASSESSMENT FOR EXISTING CONDITION

3.1 Identification of Coastal Storm

The coastal storm for the design of the proposed flood alignment system is based on the 100-year return period (or 1% annual exceedance probability (AEP) probability event). A coastal storm event which generates a 100-year storm surge stillwater elevation (SWEL) was initially considered as the 100-year coastal storm event for the site. The local 100-year SWEL in the project area is about 11.3 ft NAVD88, based on the preliminary FEMA FIS Report (2013), and which also corresponds to the highest water level recorded at NOAA's "The Battery" tide station of 11.27 ft NAVD88 which occurred during Hurricane Sandy. One storm from the RAMPP study report for the FEMA preliminary FIS, NJb_0003_010, was identified for modeling the 100-year SWEL storm event. From the model, SWEL elevations typically vary from about 11.2 to 11.3 ft NAVD88 from north to south along the project, respectively, which is consistent with the 100-year SWEL variation from the preliminary RAMPP study. Given the close comparison, this storm was used for the model for preliminary design assessments. A constant SWEL of 11.3 ft NAVD88 was used for the transect analysis for determination of wave runup and overtopping. The RAMPP determined SWEL values were also used for the 10-year, 50-year and 500-year return periods. For reference, the 10, 50 and 500-year SWEL are 6.9 ft, 9.9 ft and 14.9 ft NAVD88, respectively at FEMA transect NY-18.

In summary, the procedures for the identification of a coastal storm event for the 100-year SWEL were based on the following:

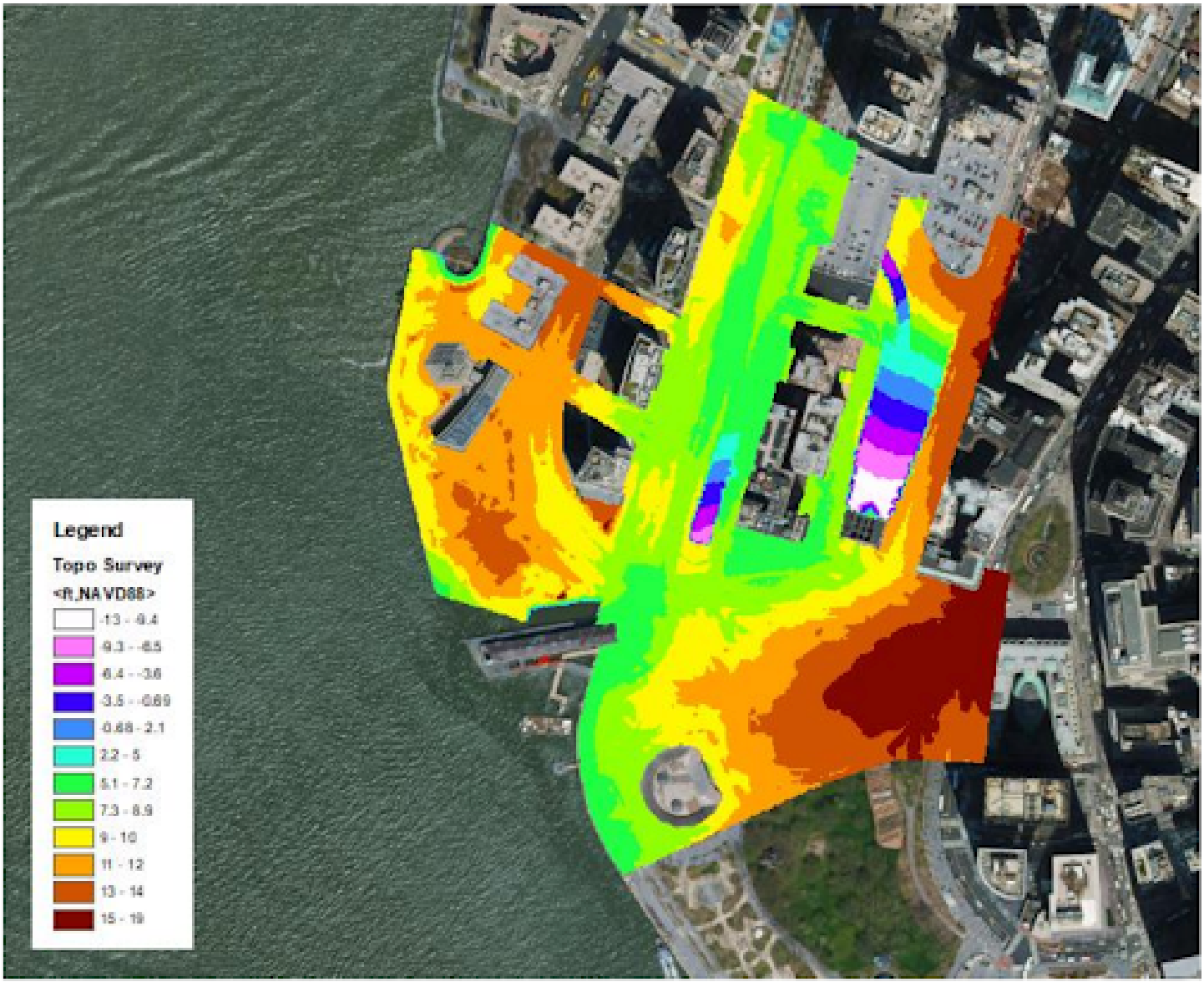
- FEMA flood study (RAMPP, 2014) at South Battery Park City
- A previous storm model simulation from the preliminary FEMA FIS that generates water elevations similar to the 100-year return period
- wind and pressure fields for the identified storm event were extracted, and
- a simulation of storm surge was performed using the driving forces extracted from the identified storm, with and without sea level rise added to the water level.

Source: *https://bpca.ny.gov/wp-content/uploads/2022/06/SBPC-Final-Coastal-Modeling-Report.pdf*, Page 27

The Jewish Museum

The below topography chart (page 5) shows that the Jewish Museum's height is 11 to 12 feet. Hence in using the latest FEMA model for storm surge, the Jewish Museum is already at an elevation to withstand a 100 year storm.

Elevation of South Battery Park City



Source: *https://bpca.ny.gov/wp-content/uploads/2022/06/SBPC-Final-Coastal-Modeling-Report.pdf*, page 5

As BPCA has stated that an independent review was done by Dewberry Engineers, BPCNA would like to see the details on their reviews of the 2013 FEMA storm surge models used and analysis on alternative models considered with justification on why those were not used.

1.0b Modeling the Storms: Calibration and Validation

AECOM uses two models for regional- and local-scale storm surge: ADCIRC and MIKE 21, respectively. MIKE 21 outputs were ultimately used to determine the storm surge levels in the project site. After being calibrated against the 1984 Nor'easter, both models were only validated against a single storm - Sandy. We believe this amount of validation is grossly insufficient, especially for such low frequency events, such as storms of Sandy's magnitude. For comparison, the city's independent analysis validated their model against all 30 Extratropical storms on record that have hit this region. In particular, the AECOM model performs poorly at fitting peak storm surges, which is precisely what we would expect such models to do well. For both the calibration and the validation, MIKE 22 predicts a storm surge 1.66 feet higher than what really happened, as shown in the figures below (page 18 and 21 in the report, respectively):

Battery Park City Authority

AECOM

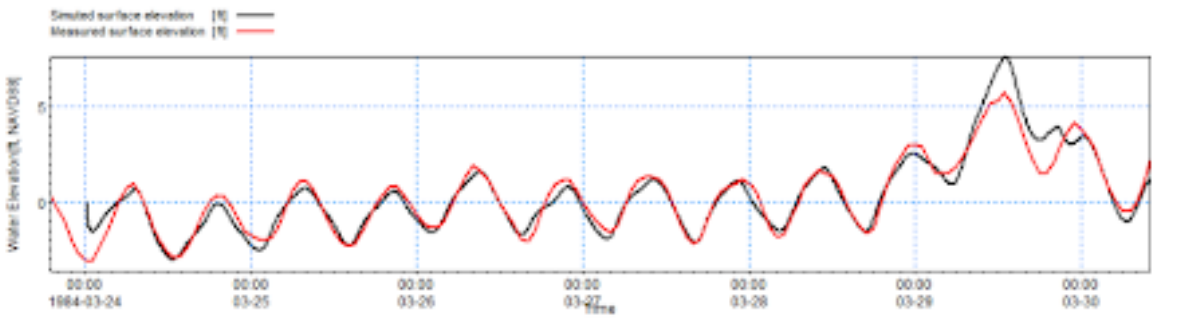


Figure 2-16 MIKE 21 HD FM Model: Calibration with 1984 Nor'easter at NOAA The Battery Station

Table 2-6 Summary statistics of the MIKE 21 HD FM Model Calibration with 1984 Nor'easter

	The Battery
Mean Absolute Error [feet]	0.47
Root Mean Square Error [feet]	0.61
R^2	0.92
Peak Difference, Model minus Measured (feet)	1.66

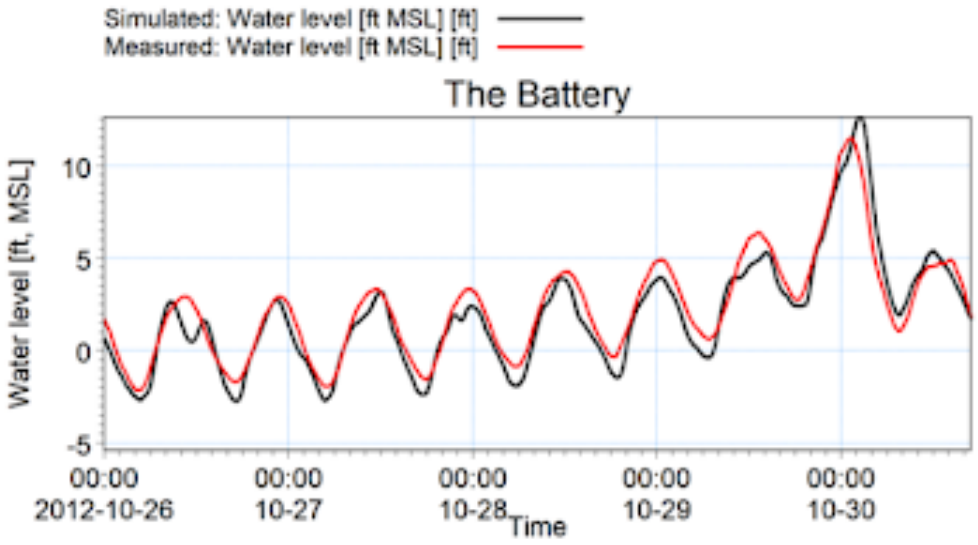


Figure 2-20 MIKE 21 HD FM Model Validation at NOAA The Battery Tidal Station

Table 2-8 Summary Statistics of the MIKE 21 HD FM Model Validation with Hurricane Sandy

	The Battery
Mean Absolute Error [feet]	0.86
Root Mean Square Error [feet]	1.02
R^2	0.91
Peak Difference, Model minus Measured (feet)	1.66

This overprediction of peaks is something that even AECOM admits. From page 15: "*It should be noted that although the peak water levels at the tidal stations during the 1984 Nor'easter are overpredicted, the time series of the simulated water levels are identical to the modeled water levels reported in FEMA's calibration and validation of the ADCIRC model (RAMPP, Region II Storm Surge Project – Model Calibration and Validation, 2014). Generally, given the close comparisons between the study modeling and the RAMPP modeling for FEMA, and that FEMA has used these results previously where rigorous calibration and validation was performed, either set of data would be suitable for application to this study without further adjustment*."

The BPCNA and scientists in the community reject this line of reasoning since, as was shown above, the FEMA model they compare against was itself not properly validated and it overestimated storm peak surges. In page 20 AECOM notes: "*The peak difference is similar over-prediction as observed with the ADCIRC model. Overall, given the acceptable mean error and RMSE calculated between the model and measured water levels, the model is considered successfully validated for simulation of Hurricane Sandy and all model inputs have been finalized*." This line of reasoning is not scientifically and statistically justifiable. The R2 and RMSE (Root Mean Square Error) mainly reflect how well the model fits water levels during normal conditions before the storm hits, which dominate the sample of data points in the graph, thus playing an outsize role on the determination of R2 and RMSE. However, the purpose of this model should be to fit the extremes and not the normal conditions. As we have shown, the model overpredicts the peak storm surges in every instance and thus it is not suitable.

Another example of how AECOM MIKE 21 model overestimates 100-year storm surges is given in page 22. We were not provided with the numbers for the sizes of flooded areas (actual vs. predicted). However, one can discern even by eye that the AECOM model shows larger flood areas in the project site than what happened during Sandy.

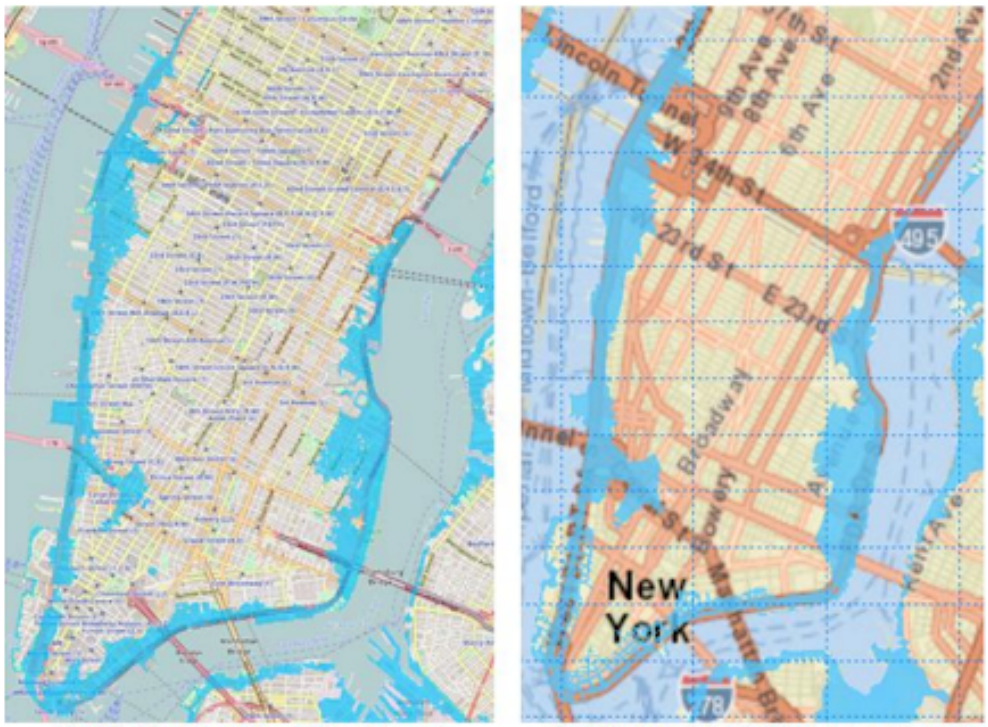


Figure 2-21 Comparison of Field Verified and Modeled Hurricane Sandy flood Extents (left) Field Verified Flood Map, (right) Flood Map Simulated by MIKE 21 HD FM Model

As BPCA has stated that an independent review was done by Dewberry Engineers and hence BPCNA would like to see the details on their reviews of storm modeling used and analysis on alternative models considered with justification on why those were not used.

1.0c Wave Runup and Overtopping

The AECOM document provides no information regarding the wind drag coefficients and wind speed multipliers used. This is important, since the inappropriate selection may lead to biases in determining water levels. All the model predictions for wave runup and overtopping were performed for how the project area will look like in the future, under the proposed design (and assuming the overestimated 100-year storm surge heights, as explained above). However, these calculations should have also been performed under current conditions, so that one can determine how the current conditions compare to the proposal and how well the current conditions can withstand the 100-year storm.

BPCA has stated that an independent review was done by Dewberry Engineers, so the BPCNA would like to see the details on their reviews of wave runup and overtopping data and assumptions used as well as details on the analysis of alternative models considered with justification as to why those were not used.

1.0d Sea Level Rise

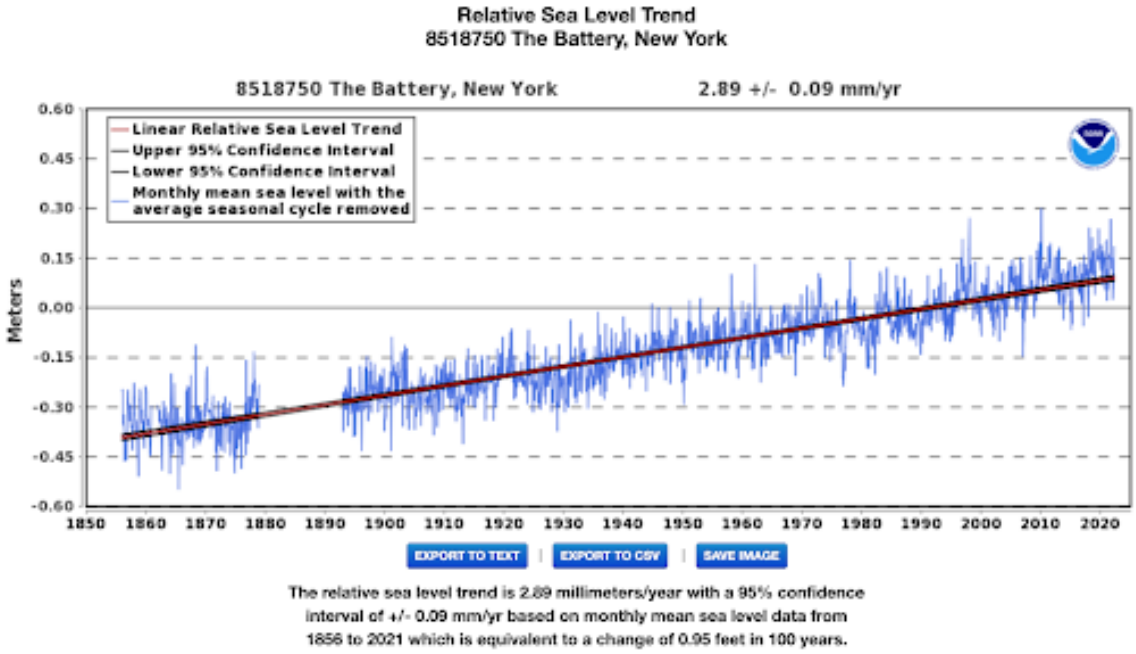
The BPCA says that “The sea level rise projections utilized for the BPC projects are consistent with projections published by the New York City Panel on Climate Change in its periodic climate change reports, most recently updated in the 2019 Report (NPCC3).” In being analyzed by scientists in our Battery Park City community, we find that the assumptions being used are extreme, as analysis from Dr. Klejda Bega illustrates below:
Here are the Sea Level Projections used by AECOM, page 28:

Table 3-1 Sea Level Rise Projections for New York City

Time Interval	Low Projection [inches]	Low Medium Projection [inches]	Medium Projection [inches]	High Medium Projection [inches]	High Projection [inches]
2020s	2	4	6	8	10
2050s	8	11	16	21	30
2080s	13	18	29	39	58
2100s	15	22	36	50	75

In the design phase of this project, the NPCC sea level rise (SLR) of 30 inches (2.5 feet) for the year 2050s with 90th percentile (High Projection from Table 3-1) was used.

The AECOM report is using the High Projection (90th percentile and the most extreme) sea level rise from the NPCC3 report. Those projections are up to 30 times higher than what we are currently experiencing in sea level rise. Given that we are presently in the decade of the 2020s, we can already reject the 90th percentile projection path that AECOM selected. Here are the current sea level rise trends at *the Battery, as measured by NOAA:*



The actual measured trend of 2.89 mm/year corresponds to 0.11 inches per year, or ~ 1 inch per decade, which is 10 times smaller than the High Projections (90th percentile) sea level rise for the 2020s that ACOM is using (1 inch vs. 10 inches per decade). If we extend that to the 2050s the measured trend becomes 30 times smaller (1 inch vs. 30 inches per decade). Even allowing for some acceleration in the future rates of sea level rise, there is no natural process that would result in such sudden rate increases.

Another reason we can reject the 90th percentile projection trajectories of sea level rise is because these values are also much higher than the future sea level projections predicted by *NASA for the Northeast Coast*, utilizing the latest IPCC report (2022). NASA uses five different scenarios: Low, Intermediate-Low, Intermediate, Intermediate-High, and High. As they explain: "A goal of the 2022 Technical Report is to examine the full range of plausible amounts of future global sea level rise, not just those rise amounts considered 'likely'". As a result, they include "an additional low confidence range of future sea level rise that is intended to represent the potential contribution from uncertain physical processes under high-emissions scenarios." In NASA's words, *"For the Technical Report, low confidence processes contribute significantly to the Intermediate, Intermediate-High and High scenarios."*

Here is the table with the NASA sea level rise predictions for different scenarios:

Values in meters

	Observation Extrapolation	Low	Intermediate Low	Intermediate	Intermediate High	High
Total (2030)	0.20	0.21	0.22	0.23	0.24	0.24
Total (2040)	0.29	0.29	0.31	0.33	0.36	0.37
Total (2050)	0.39	0.36	0.40	0.43	0.49	0.53
Total (2060)	—	0.42	0.48	0.55	0.66	0.76
Total (2070)	—	0.47	0.57	0.69	0.86	1.04
Total (2080)	—	0.51	0.65	0.84	1.09	1.37
Total (2090)	—	0.56	0.72	1.04	1.35	1.72
Total (2100)	—	0.61	0.80	1.25	1.62	2.09

Note that the observation extrapolation numbers (based just on extrapolation of current tide gauge data) match well Low and Intermediate Low scenarios and are 2 times less than that 30" value by 2050s that AECOM uses (30" = 0.76 m). Even the High number (which would correspond to the lowest confidence scenario) is 2/3 of the value used by AECOM.

Based on what we currently observe and what the NASA data shows, any significant sea level rise that may affect BPC will take place after 2050 (and even that has low confidence), so it is not urgent to act upon it immediately. It would be most prudent then to wait a few decades and see how these scenarios will pan out before we start tearing up the existing park and building a cliff-on-the-Hudson. The most urgent course of action we can currently take would be to fix the pinch points that flooded during Sandy first.

To summarize: At every step the AECOM model overestimates sea levels and storm surge heights. A foot here and a foot there add up. All the models in the world do not make up for real data. Nature has provided us with a real data point, Hurricane Sandy, and also with the answer on whether the current park design is suitable: *Wagner Park was designed to withstand the 100-year storm and it did.*

1.0e Rainfall

More frequent and extreme rainfall is also a result of climate change as New York has seen as recently as Hurricane Ida. Flooding is not only expected to come from the river and sea, but increasingly to come from the sky.

The Wagner Park Resiliency Project appears to do nothing to address increased rainfall. To the contrary, if you make already high ground higher without building new, innovative ways for the water to drain, the result could trap water inside Lower Manhattan exacerbating damage to people, property and infrastructure caused by rain.

Speaking about Hurricane Ida's impact, then-mayor Bill DeBlasio said in an *appearance on MSNBC*. "The lives weren't lost in the coastal areas, which is where Sandy hit. Lives were lost in places far away from any seashore because of stunning amounts of water coming down so quickly, flooding basements and catching people unaware."

An independent review is needed to analyze the impacts of rainfall as it relates to this project and the impact(s) to inland areas as a result of this project. Like the other sections, BPCNA would like to see the details on Dewberry Engineers' reviews of data and assumptions used on how this project will protect against increased rainfall and flooding as a result of rainfall.

1.0f Impacts and Damage from Hurricane Sandy

The BPCA has stated "Regarding damage and repairs during Superstorm Sandy (a storm that created storm surge levels significantly below the predicted levels forming the design basis for current Lower Manhattan resiliency projects)… [a] storm event, which also took the lives of 44 New York City residents."

The BPCNA wants to ensure that the community knows the facts and that people are clearly stating risks. We need to be careful about this. Not one person died during Sandy as a result of Wagner Park and South Battery Park. In Lower Manhattan, two people did tragically pass. One person was from FiDi/Seaport (an area that is one of the most vulnerable areas and still at risk) and the other person from water coming in directly north of Battery Park City from over the Hudson flooding Tribeca. We urge the BPCA to be fact based in their communications about this and be cognizant of fear mongering. Here is a *NY Times tool* that maps all loss of life by location from Sandy.

In Summary: there were zero deaths as a result of flooding nor storm surge from South Battery Park.

1.0g Process related to Project Justification

From a democratic and scientific perspective, an independent review by a body of impartial experts is a generally accepted and time-honored process to evaluate information, enhance quality, consider competing perspectives, incorporate stakeholder's values and needs, and garner public support, especially for $1 billion dollar project that will, both, prohibit people's use of the parks for years and permanently alter their character.

In 2017, the Cultural Landscape Foundation published an *article* which quoted Wagner Park's original designers who confirmed that Wagner Park was built in the mid-1990s to weather a 100-year storm. The article says "*while water did reach the lawns, the buildings at Wagner Park did not flood during Hurricane Sandy because the park was built to withstand a 100-year flood – it did the job it was designed to do. In a recent email, Laure Olin wrote: 'When we did the actual design and construction for even the first phase of BPC following our 1979 master plan with Alexander Cooper we raised the entire site above what we understood the 100 year storm to be plus we added a surcharge (additional height) for storms and high tides.'*"

Laurie Olin, one of those original designers continued in this *article* to say: "*Wagner Park in the form it is in at this moment is a highly successful social space contributing greatly to the life of thousands in the city; to destroy it on the premise that it will solve the impact of climate change on lower Manhattan when all the streets and every building for a mile or more around it remain lower than it is dishonest.*"

As noted throughout the current process, this project has had no meaningful engineering alternatives solutions to storm surge requirements. Before any design considerations of form are reviewed, engineering alternatives of function need to be considered. This is especially crucial as this project is first and foremost an physical flood insurance project against an unlikely but potentially catastrophic event as opposed to a park improvement project that incorporates resiliency protection elements.

Regarding Wagner Park, there are significant issues regarding the climate models and opposition dating back to the start of these plans. Before destroying a world class park and spending $250 million dollars to raise it, we should analyze information among those with experience and expertise — by a body that does not seek to benefit from a large project moving forward. Hence these issues need to be further considered, discussed and resolved by a more robust process.

The solution is a democratic one that requires the Governor to provide the community with a PAUSE and independent review on all aspects such as the models, data and assumptions by a group of subject matter experts and community stakeholders.