

## Appendix A

Appendix B of the Central Sacramento County Groundwater Management Plan

## **Appendix B**

Summary of the development of Basin Management Objective #2 (Maintain specific groundwater elevations within all areas of the Central Basin consistent with the Water Forum solution).

## **Appendix B – Summary of the development of Basin Management Objective #2 (Maintain specific groundwater elevations within all areas of the Central Basin consistent with the Water Forum solution).**

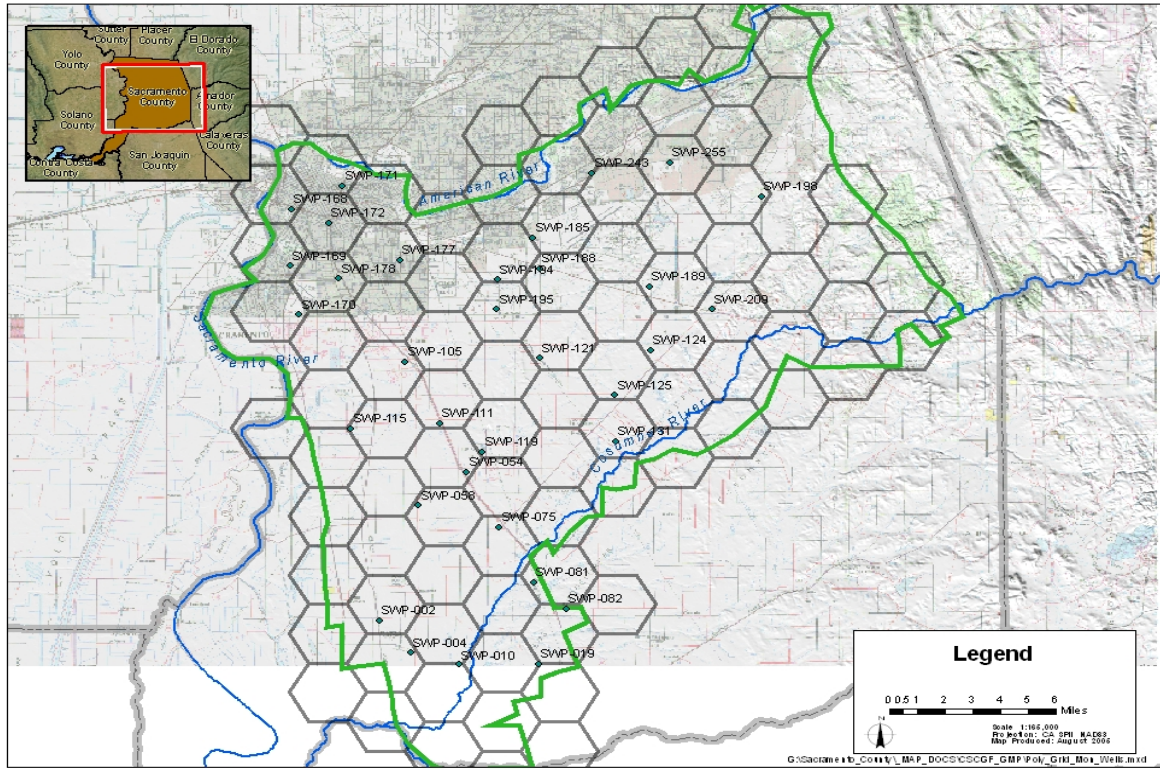
The following is a step-by-step description of how the Central Basin will develop and/or update groundwater elevation thresholds. Thresholds will be established for upper and lower groundwater elevations throughout the Central Basin. Specific thresholds are summarized in **Section 3.1.1.1** of the CSCGMP.

**Step 1.** Define a polygon grid over the Central Basin that can be used as surrogate areas for possible management regions. This is done first to assist in understanding the basin's behavior at a relatively high level of resolution prior to possible aggregation of the areas based on meeting the objectives above.

The polygon grid used for the Central Basin is an extension of a similar grid used in the SGA GMP. This was done intentionally to allow for combining the monitoring results for both north and south of the American River knowing that each has the same level of resolution. The polygon grid is shown in **Figure B-1**. Each polygon represents an area of 3200 acres or 5 square miles.

**Step 2.** Locate a State Monitoring Well to represent each grid area based on the period of measurement record and the quality of the data. The period of record should include 1977 to 2003. Gaps in data should not exceed 1 year in time with monitoring at least twice a year, spring and fall. If no well meets this criterion, the location and/or perhaps the construction of a monitoring well will be necessary in the future. The location of selected wells is shown in **Figure B-1**.

**Figure B-1. Polygons and Existing Monitoring Well Assignments**



**Step 3.** Using the Water Forum Solution dataset in the Integrated Groundwater Surface Water Model<sup>1</sup> (IGSM) for 2030 conditions (Water Forum build-out), extract from the model, the hydrograph at the center of each polygon area. This is done to determine the ultimate behavior of the aquifer and then to compare the ultimate condition relative to existing groundwater elevations.

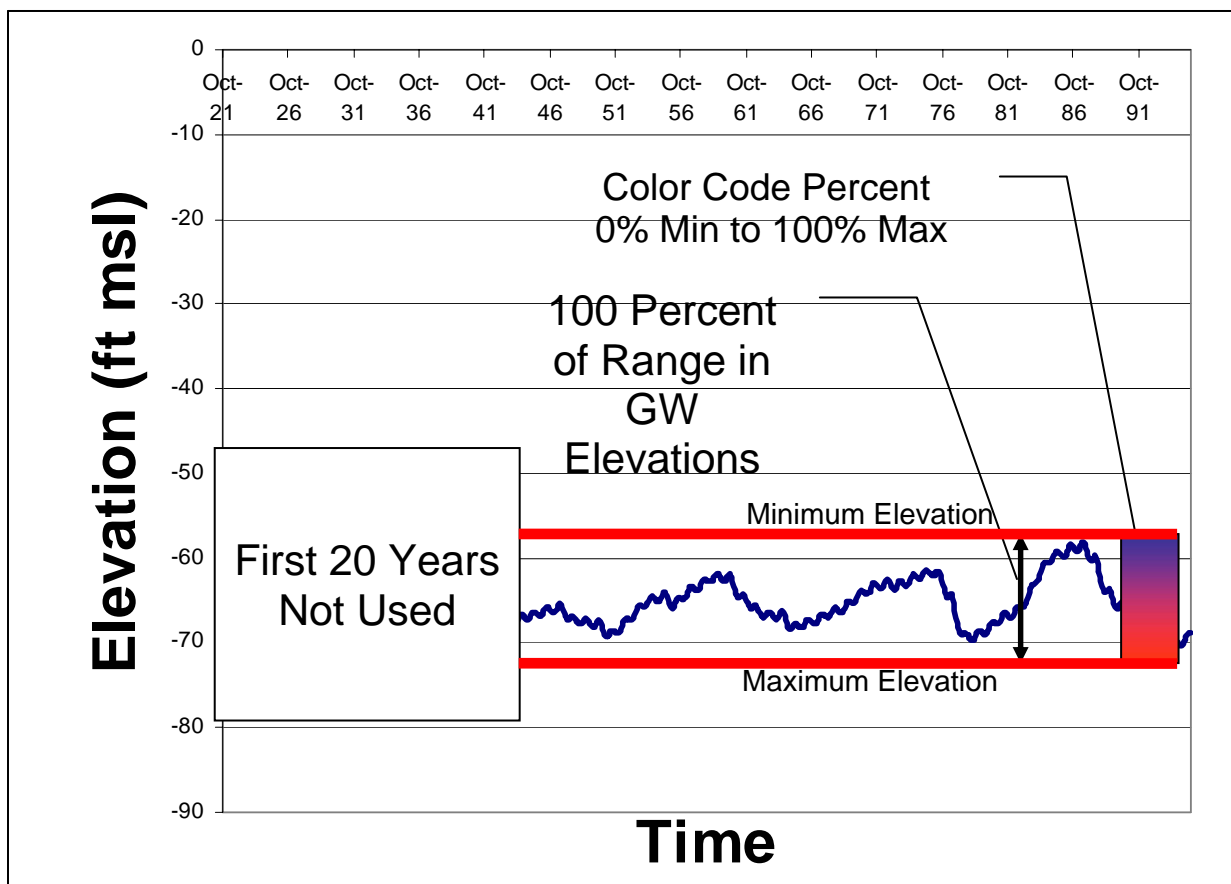
**Step 4.** Each of the real monitoring data hydrographs and model hydrographs will have a trace that shows groundwater elevations increasing in the wet months and decreasing in the dry months. The hydrographs also show the cumulative effect of multiple dry or wet years.

<sup>1</sup> The IGSM is a finite element, quasi three-dimensional, multi-layered model that integrates surface water and groundwater on a monthly time step. The IGSM was developed for use as a regional planning tool for large areas influenced by both surface water and groundwater. The tool is well-equipped to accommodate input and output of land use and water use data over large areas. Data input includes hydrogeologic parameters, land use, water demand, precipitation and other hydrologic parameters, boundary inflows, and historical water supply. For purposes of parameter definition and developing water budgets around physical and/or political boundaries, the IGSM divides Sacramento, Placer, Sutter, and San Joaquin counties into subregions. Each subregion is further divided into unique numbered elements varying from 200 to 800 acres in size. Overlying this grid is a coarse parametric grid utilized for specifying aquifer and other parameters.

For the model hydrographs, the maximum and minimum elevations are extracted from these hydrographs proceeding the first 20 years of model simulation to allow the groundwater basin to stabilize from initial conditions. The maximum and minimum values of model groundwater elevations are selected from each hydrograph. For instance, the lowest elevation may occur in the 1977 drought period and the maximum elevation may occur in the 1986 wet hydrology.

To normalize the data for the model data, the maximum and minimum elevation of each hydrograph are assumed to be equivalent to 100 percent of the operational range of the basin at that specific location within that polygon. This normalization is necessary to account for the fact that each polygon area has differing elevations due to the nature of the groundwater basin and the surface topography (i.e. the depth to groundwater in the eastern portion of the basin is less than the depth to groundwater in the southern Elk Grove portion of the basin). **Figure B-2** illustrates this process of defining the bandwidth of the model data and the percent rating using the high and low values. Five percent is added to the high elevation and subtracted from the low elevation to provide a small buffer that may show up in real-time monitoring but not in the model (e.g. monitoring wells located next to high producing wells that are running will be influenced by the localized cone of depression of the high producing wells showing a slight deviation from the actual regional groundwater elevation that is being measured).

**Figure B-2. Methodology of Bandwidth based on Model Hydrograph**



## Importance of Bandwidth in Describing BMO Objectives

The bandwidth concept is important from the standpoint of judging whether the aquifer is within a management range; understanding that groundwater elevations fluctuate from month to month and from year to year depending on groundwater use and hydrologic conditions. The percentage indicator within the bandwidth becomes the index of performance and in setting management goals. Within the bandwidth itself, there can be various levels of warning and actions that take place based on each increasing level of warning. This concept is explained in step 6 where a framework for the BMO is defined.

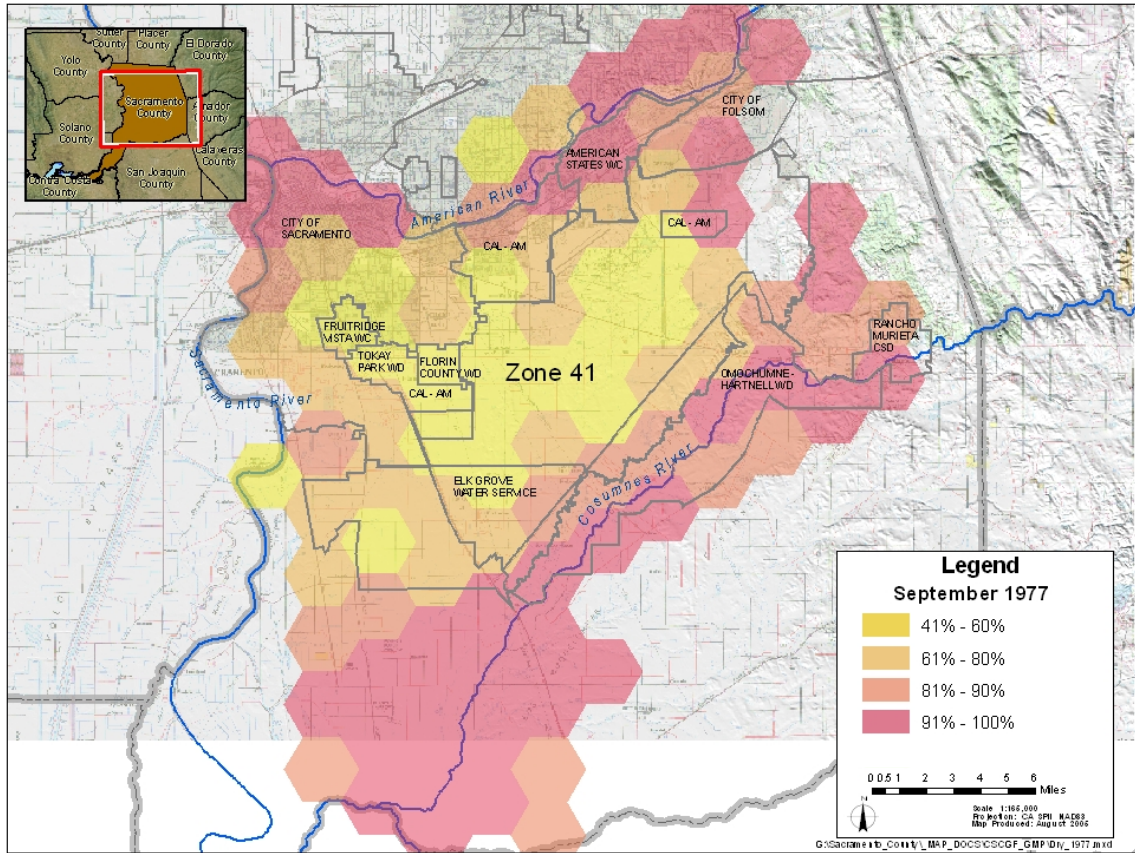
**Step 5.** Three periods in the historical record are selected to represent a worst, best, and average case of groundwater conditions; these are 1977 (critical dry year), 1983 (very wet year), and 1979 (average year following 2 years after the 1977 drought period), respectively. The significance of 1977 is the combined behavior of increased groundwater extractions, reduced recharge from rivers and deep percolation, and cumulative effects of back to back dry years.

Underlying this information is the time element of how quickly does the groundwater elevation change in one polygon area versus another. For example, a polygon close to the river is influenced significantly by the river's recharge and will be affected almost immediately based on high or low flow river stages. In the dry years, polygons closest to the rivers experience the highest percentage of groundwater decline relative to the total bandwidth. Whereas, an area removed from the major recharge sources will not feel the full impact due to the time that it takes for river recharge to migrate to these areas. Groundwater movement is typically not more than 700 feet a year in the unconfined aquifer.

If the information described above is translated into a figure in terms of percent of the maximum and minimum or "bandwidth" values (e.g., a value from 0 to 100 percent), it becomes apparent that there are areas of similar aquifer behavior as shown in **Figure B-3** for 1977 conditions. One preferred representation of what is termed, "management zones" is shown in **Figure B-4** by the green boundary lines. The delineation of management zones takes into consideration not only the aquifer behavior but also the land use and surface water and groundwater use taking place within the basin. Additional thought in developing the zones was given based on **Figures B-5** and **Figure B-6** (described more fully below).

Aggregation of similar areas to form management zones is for purposes of monitoring and maintaining a net benefit to groundwater users over time as use of groundwater and surface water change, and land uses change over time. Aggregation is also necessary to avoid creating a management program that is cumbersome, costly, and perhaps not fully understood by the future governance body.

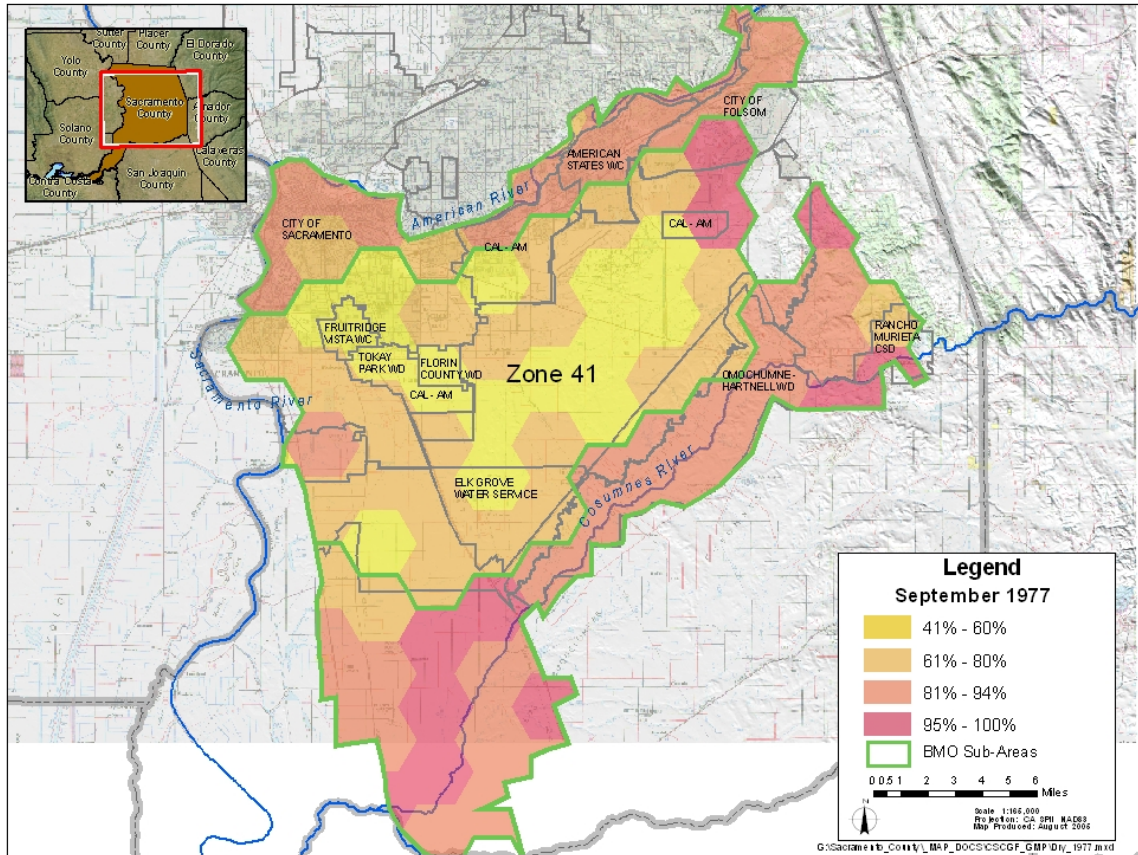
**Figure B-3. Percentage of Groundwater Model Elevation Depth for 1977 Hydrology**



**Figure B-4** suggests that within the Central Basin there be a north, central, and south management zone. The north and south zones are due to the obvious red polygons indicating areas with more sensitivity to drought conditions. The north zone is predominantly made up by the City of Sacramento, Cal-Am, and Golden State Water Company with both surface water and groundwater being used. Cal-Am is still dependent on groundwater and therefore is most affected by drought conditions.

The south zone is predominantly groundwater with agricultural and agricultural residential land uses with private wells and is deserving of being a focal point on groundwater management. Since this zone is also significantly affected by drought conditions, monitoring in this area is going to be extremely important to understand the full affect of changing conditions both in hydrology in the river recharge sources and land use changes both within the south zone and in the central zone.

**Figure B-4. Groundwater Management Zone Delineation based on 1977 Hydrology**

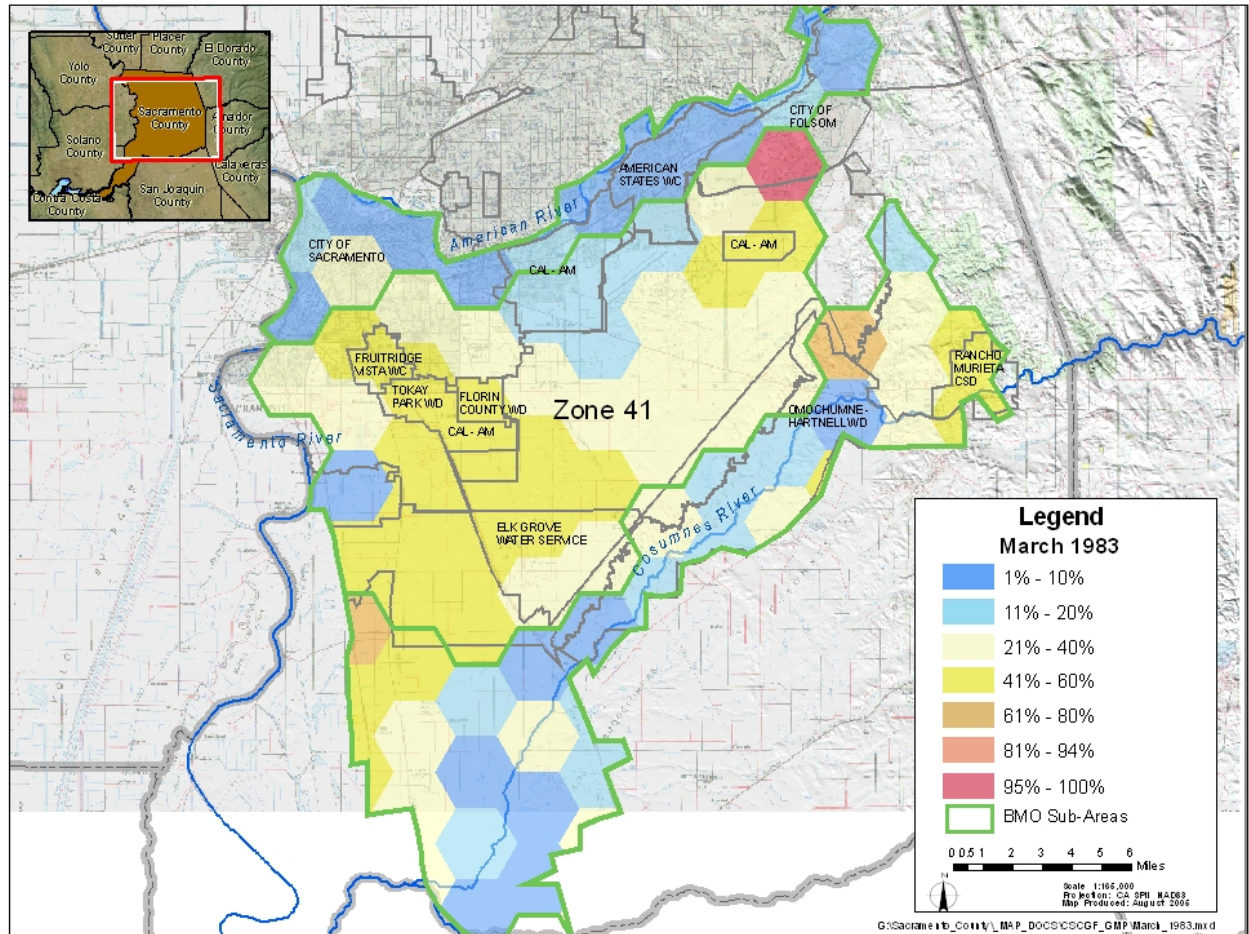


If **Figure B-4** (1977 critical year) is compared to **Figure B-5** (1983 wet year), a similar pattern of recharge is evident along the rivers except that now there is an increase in the percent of bandwidth. The darker blue in **Figure B-5** (1983 wet year) represents percentages closest to the upper elevation of bandwidth for each polygon. The same aggregation is represented in **Figure B-5** to illustrate the logical separation of management zones.

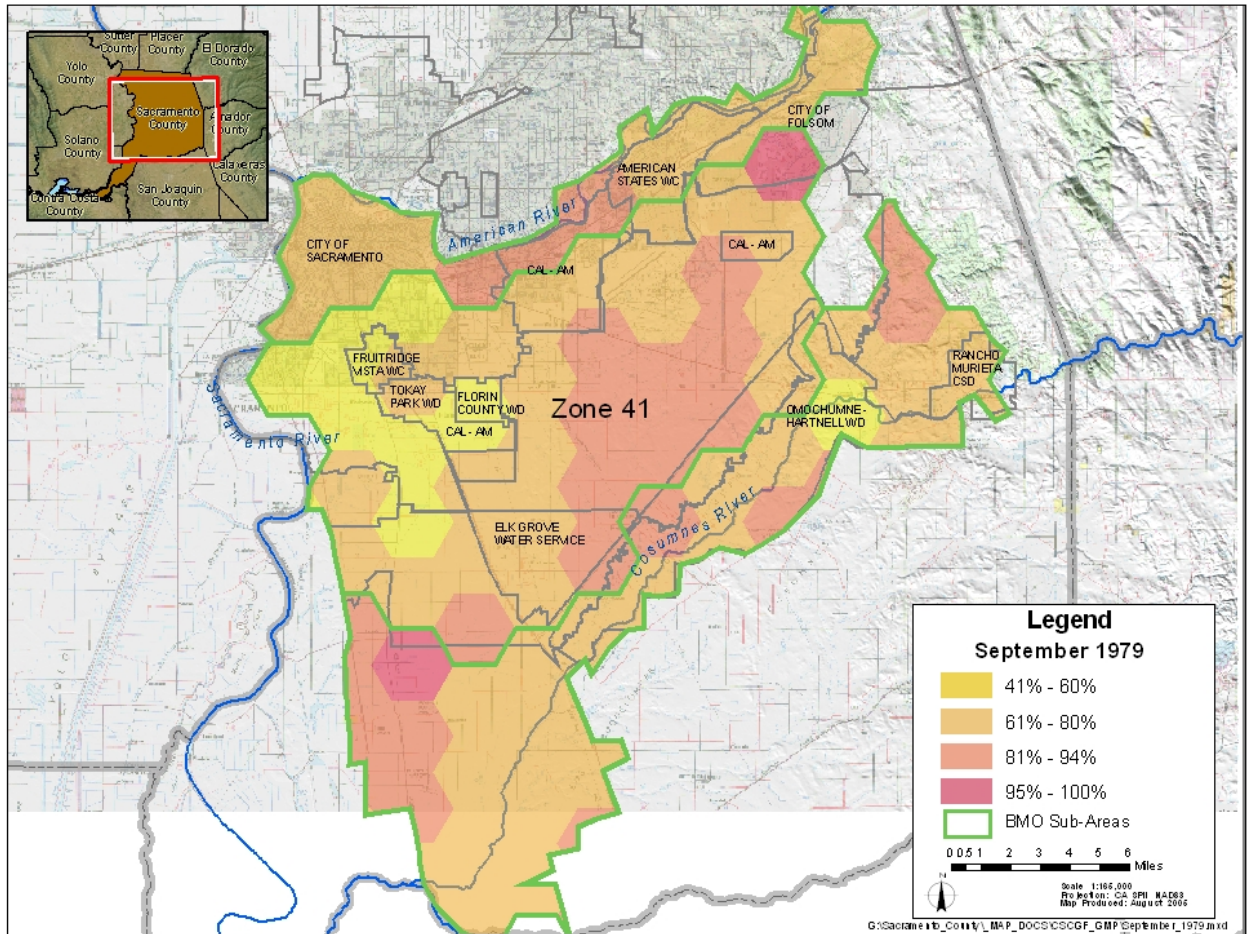
The central zone is perhaps the most interesting in terms of how it behaves. **Figure B-6** (normal year) represents 1979 average hydrologic conditions two years after the 1977 extended drought condition and just before the wet period into 1983. This figure combines the time element of how long it takes for the effect of drought conditions to fully establish itself at the cone and how long it takes to recover. The central zone maintains a residual effect of the drought by the darker yellow polygons not changing significantly from 1977 to 1979 indicating 50 percent of the bandwidth, and from 1979 to 1983 with a similar pattern near the cone of depression. This implies that the central zone takes more time to react and recover; whereas, the north and south zones react quickly to hydrologic conditions where the polygons reduce from 90 percent in 1977 to 60 to 80 percent in 1979 and 10 percent in 1983.



**Figure B-5. Percentage of Model Groundwater Elevation Depths for 1983 Hydrology**



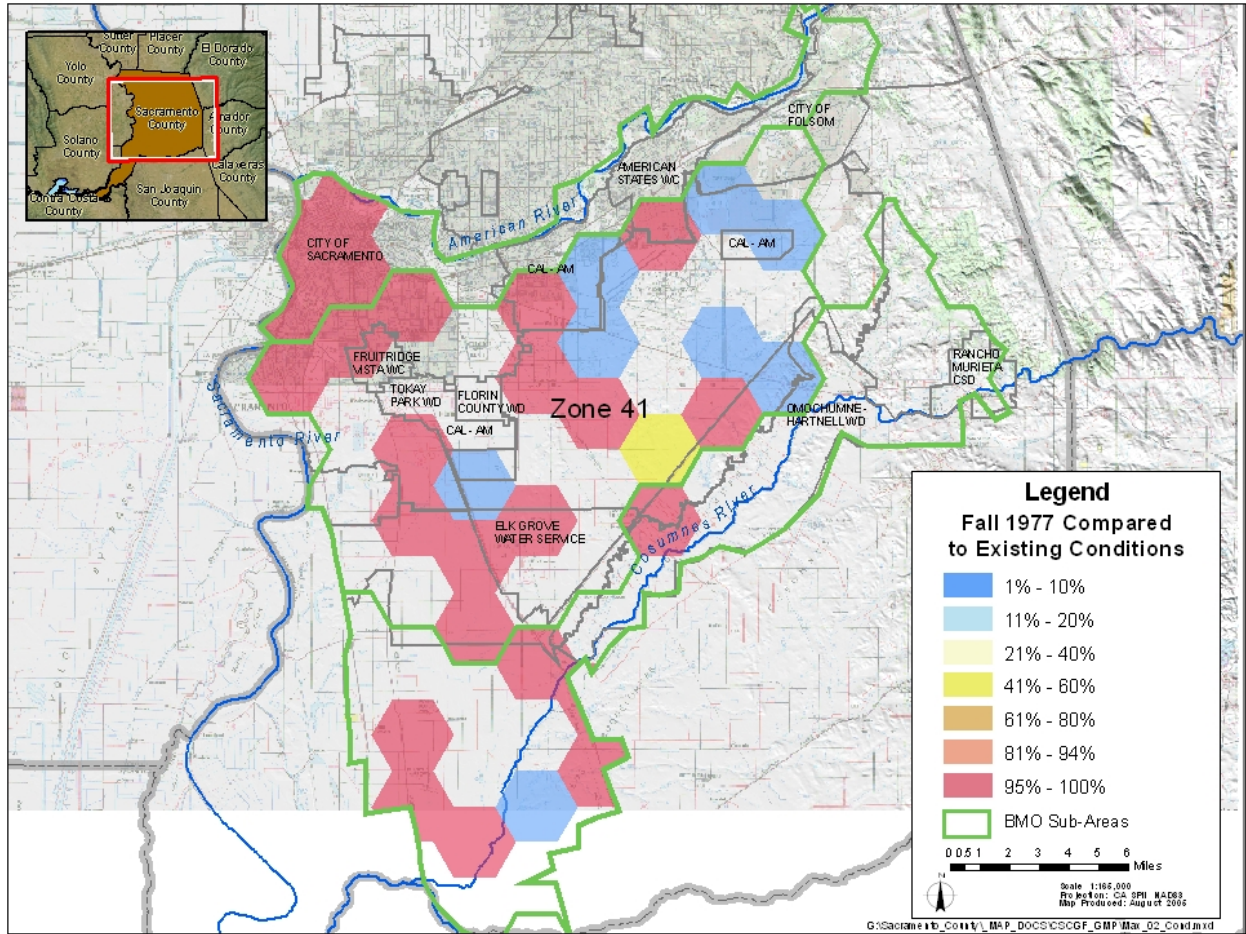
**Figure B-6. Percentage of Model Groundwater Elevation Depths for 1979 Hydrology**



**Step 6.** Ground-truthing the model data versus real data is necessary from the perspective of private well owners who currently realize a certain level of reliability in groundwater elevations and understand that during drought conditions there will be periods when groundwater elevations reach their lowest point with possible increase in energy costs and dewatering of wells. To achieve a sense of relative difference between the management objectives and current groundwater conditions, the bandwidth concept is applied to real monitoring data for the most recent measurement value as explained in Step 4 above.

**Figure B-7** provides a similar graph for 1977 conditions using real data to evaluate the lowest groundwater elevation relative to today’s bandwidth and **Figure B-8** positions the 1977 real data on the model data and contours the difference. The expectation is that under the Water Forum Solution groundwater elevations do not exceed what actually occurred in 1977. If accidence does occur, **Figure B-7** provides, at a glance, the areas where accidence may occur which then provides the basin governance body to begin to understand future programs to mitigate for this event.

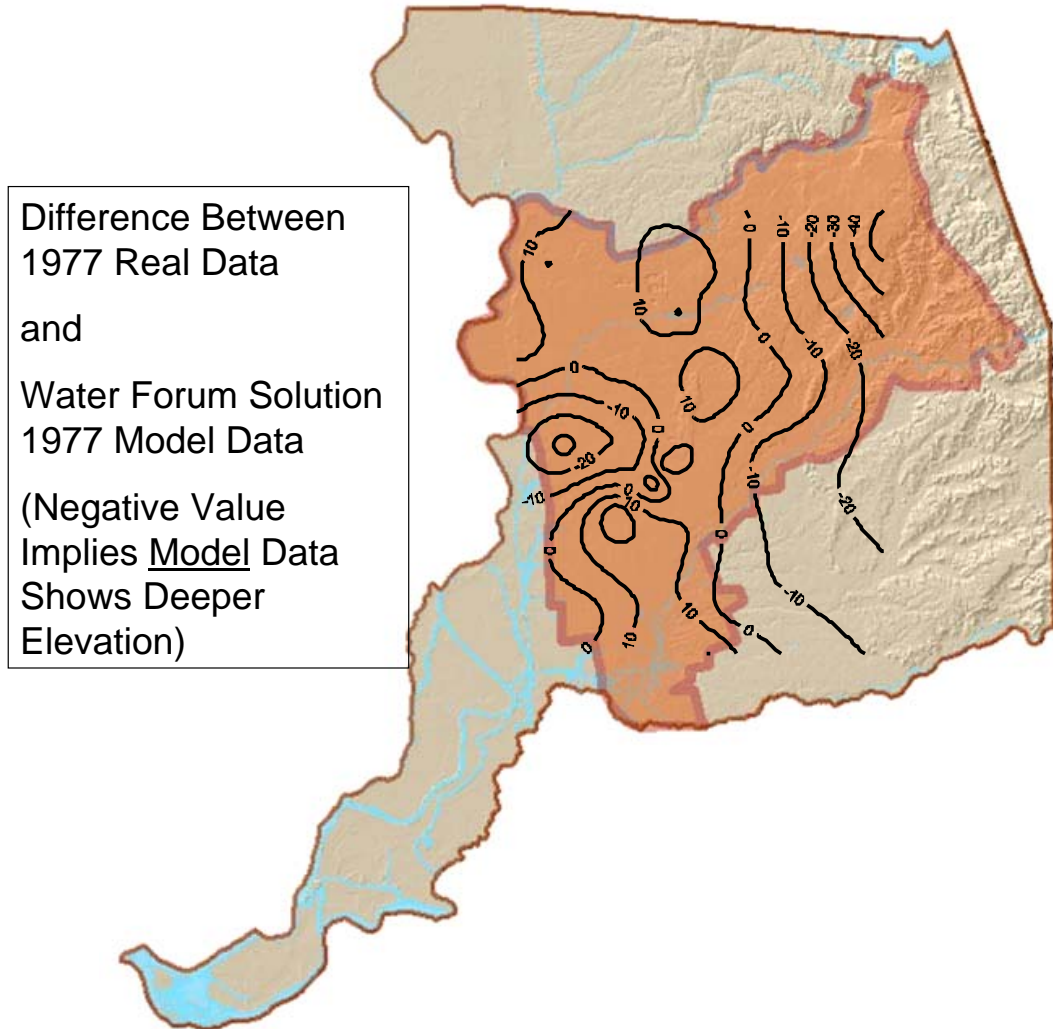
**Figure B-7. Percentage of Real Groundwater Elevation Depths for 1977 Hydrology**



Lastly, to look at the difference between the 1993 real data and the 1993 model data in a more absolute manner, a difference contour map is generated that indicates the probable increase or decrease that might be expected from the 2030 Water Forum Solution in the three management zones. Positive values in **Figure B-8** indicate a positive effect or higher groundwater elevation and a negative contour represents an area that may be impacted by the Water Forum Solution.

**Figure B-8. Groundwater Elevation Difference Contours between Model and Real Data for 1977 Hydrology**

Groundwater Elevation Contours (ft msl)



**Step 7.** The next step is the development of a framework for monitoring and management of groundwater elevations for each management zone. The fundamental requirements of the framework are listed as follows:

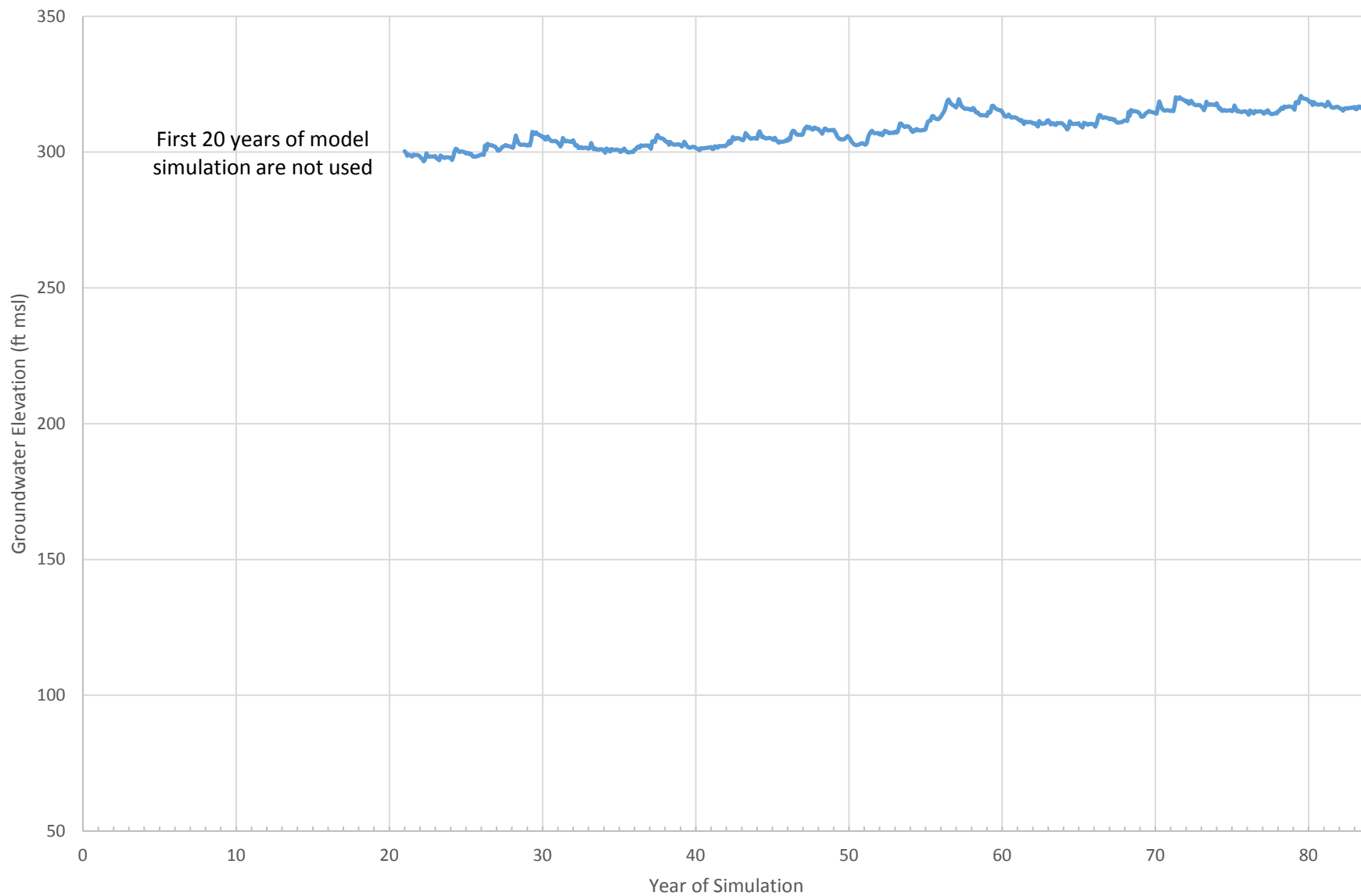
- Provides for simple implementation;
- Allows for adaptive changes based on monitored data;
- Keeps the presentation of the data in a form that can be understood by all stakeholders;
- Allows for differing stages of attention requiring specific actions;
- The details of this framework are provided in **Section 4** (Plan Implementation) of the CSCGMP.

## Appendix B

SacIWRM Future Conditions Baseline Groundwater Hydrographs at the Center of Each Polygon

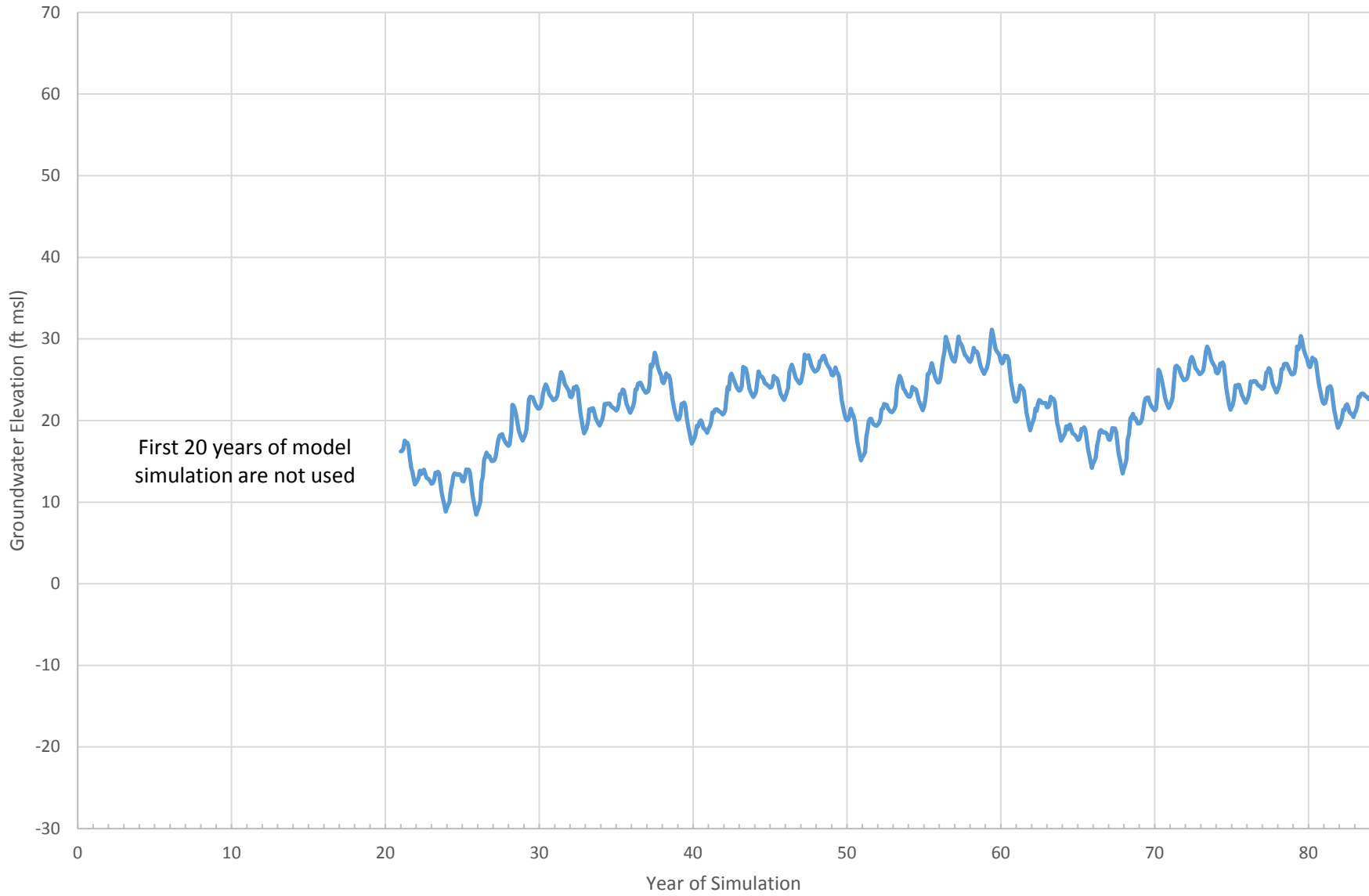
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Future Conditions Baseline Simulation



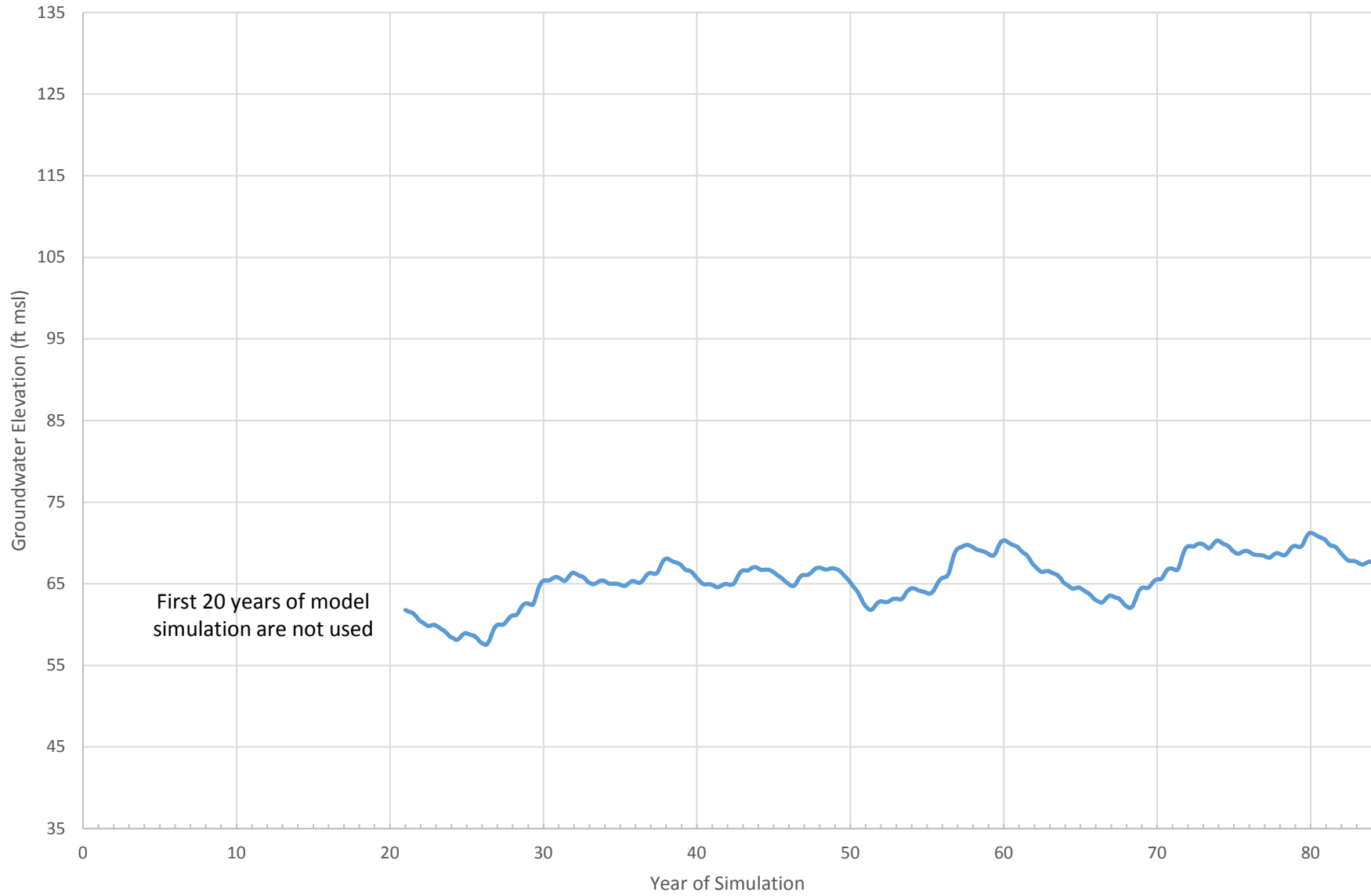
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— Future Conditions Baseline Simulation



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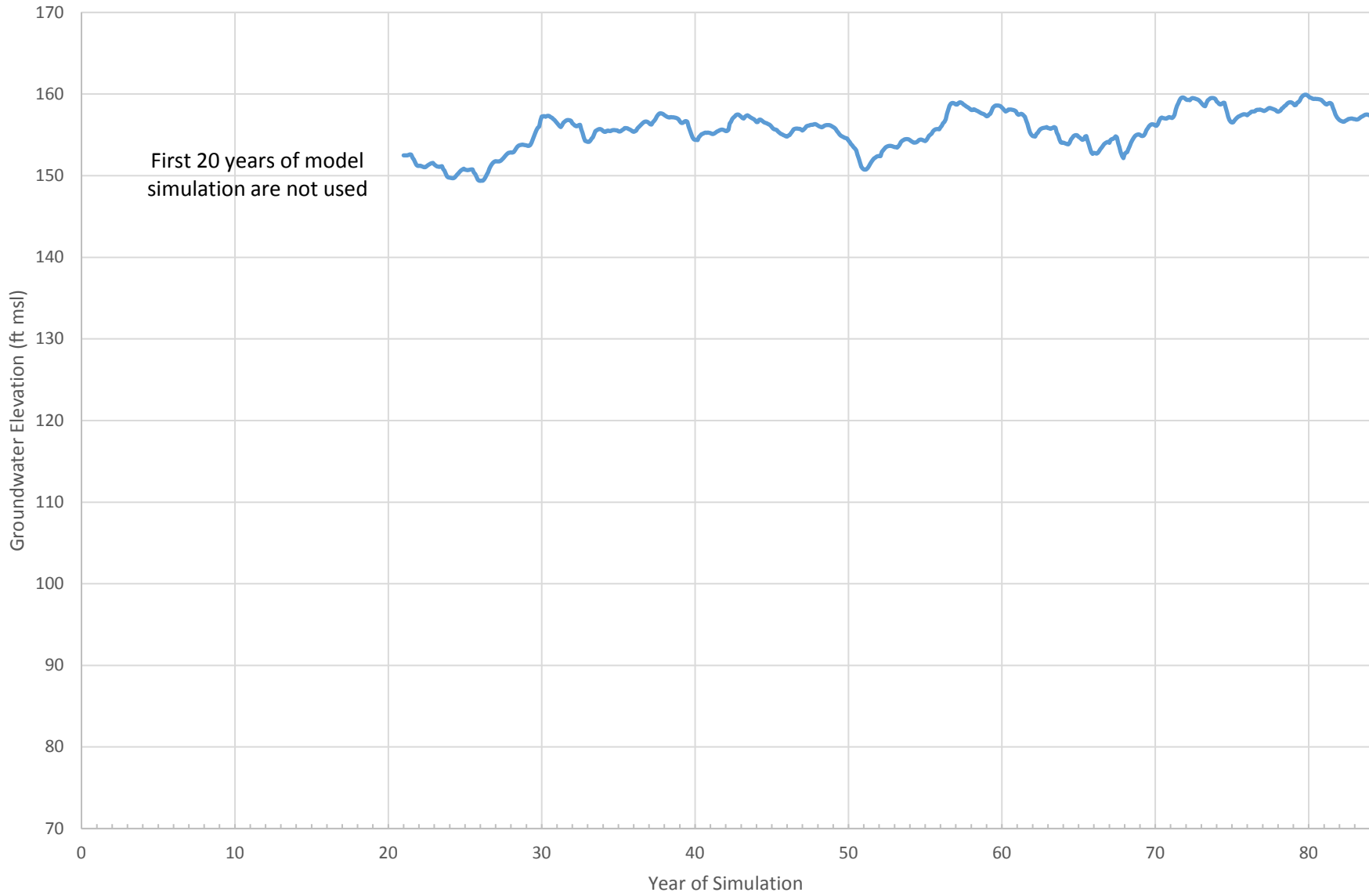
— Future Conditions Baseline Simulation





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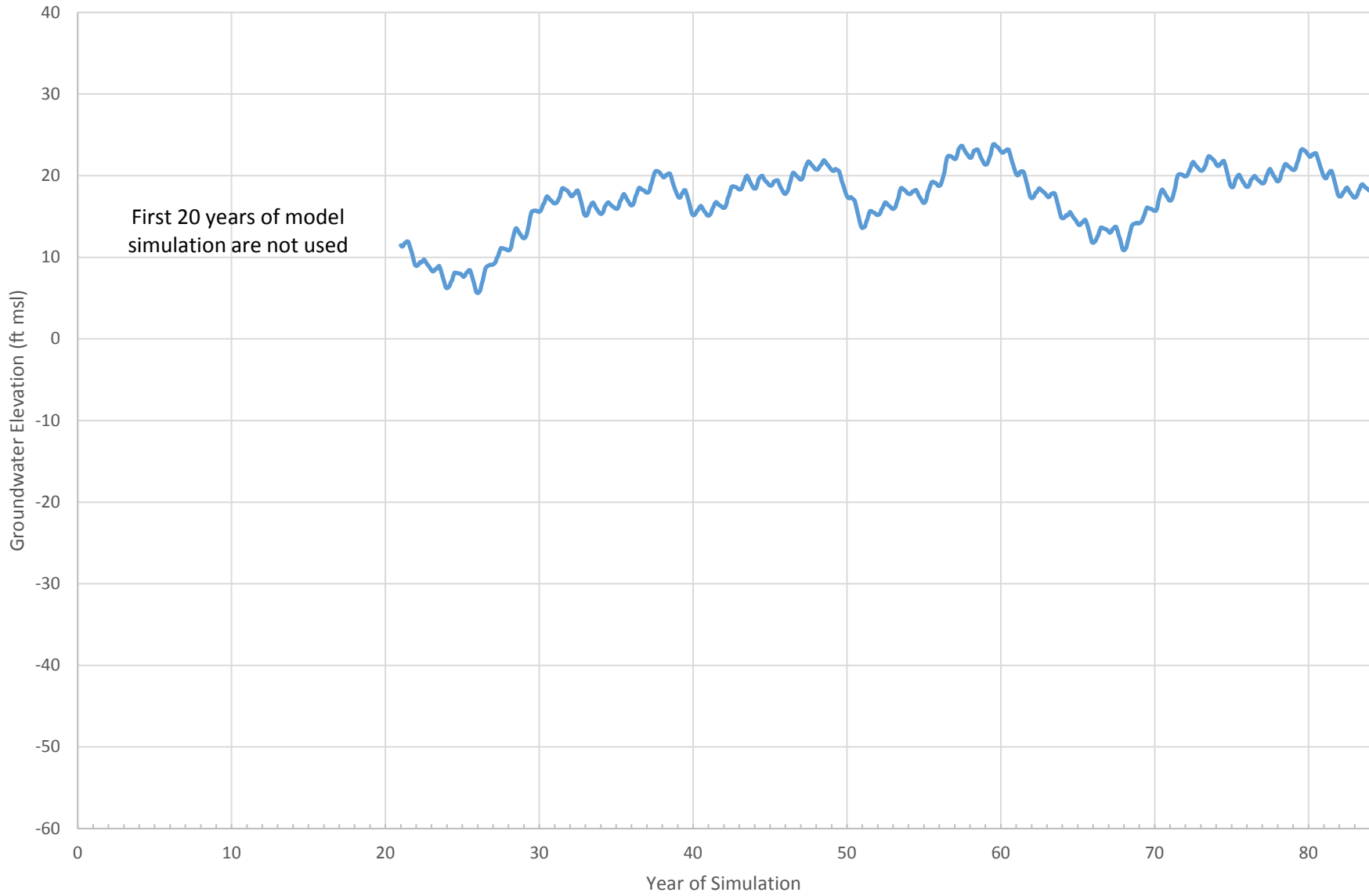
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

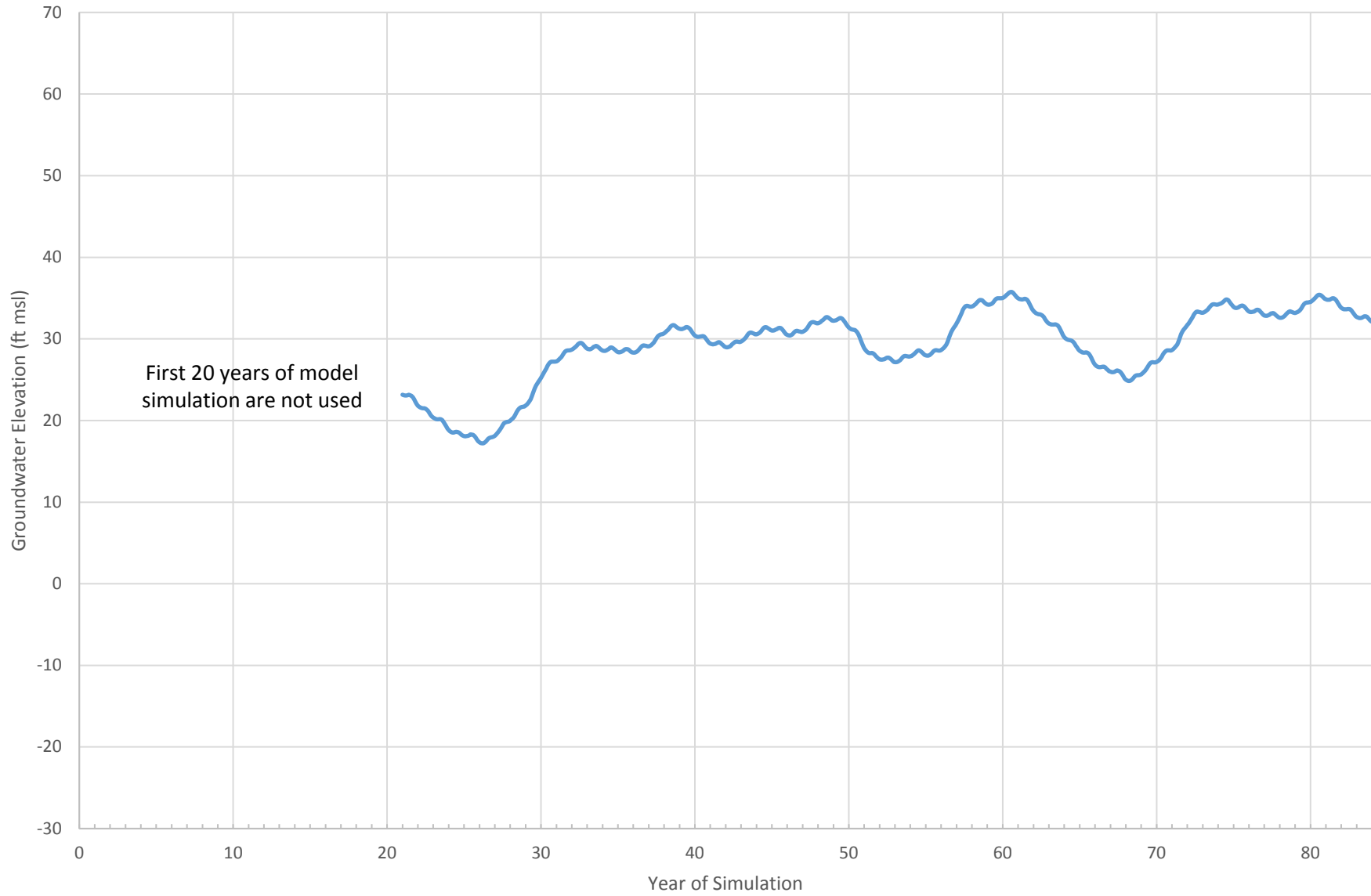
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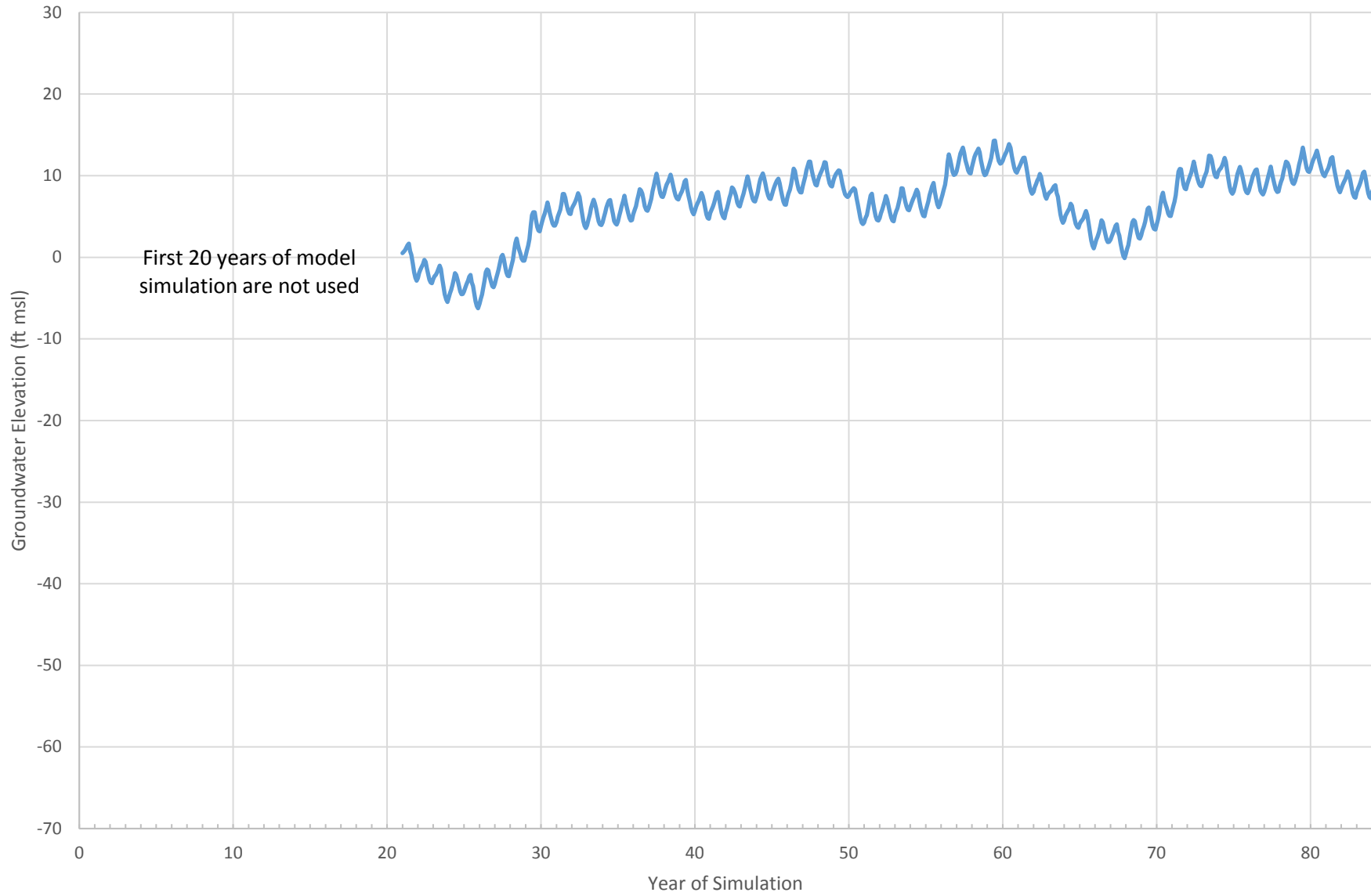
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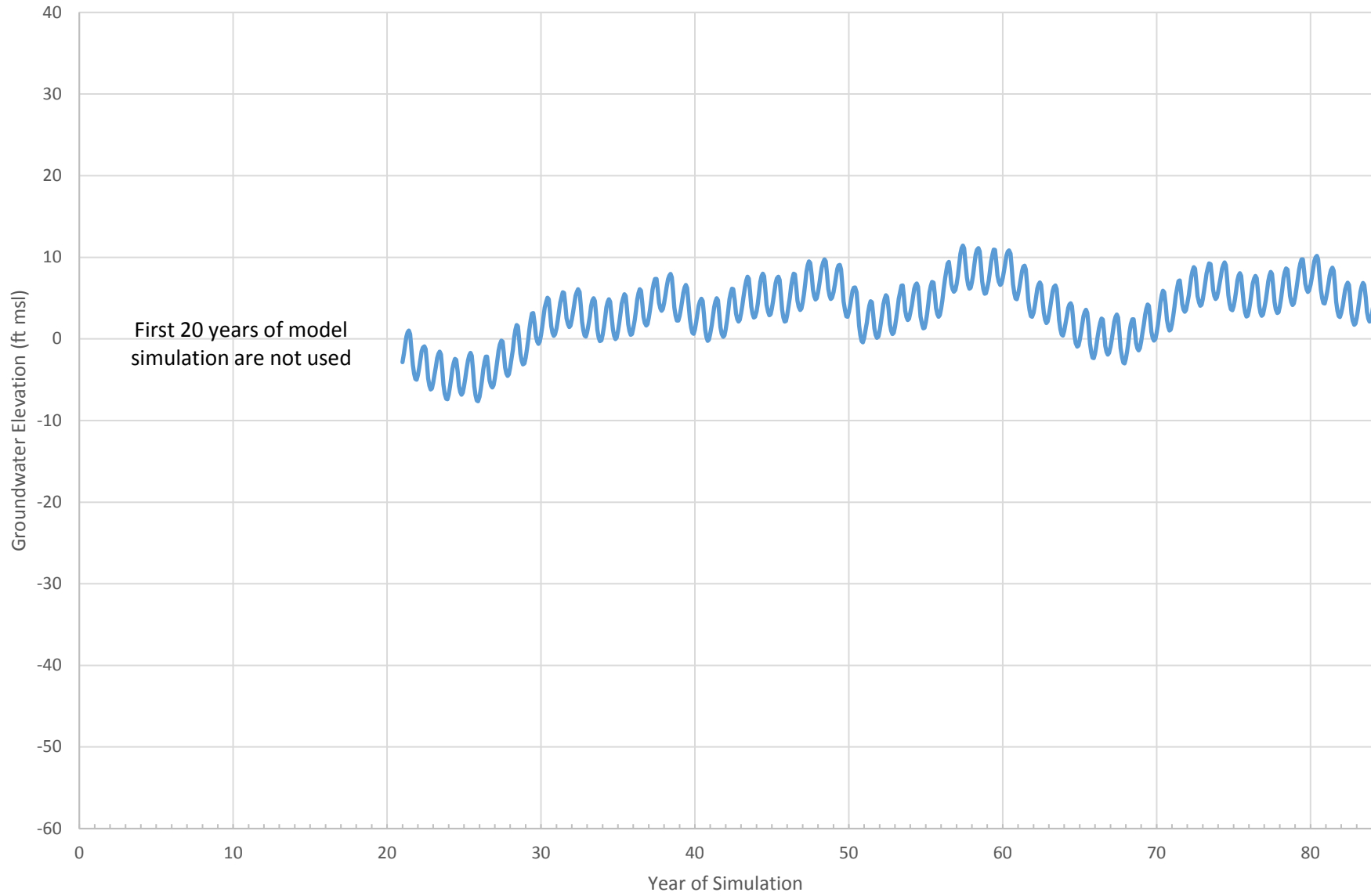
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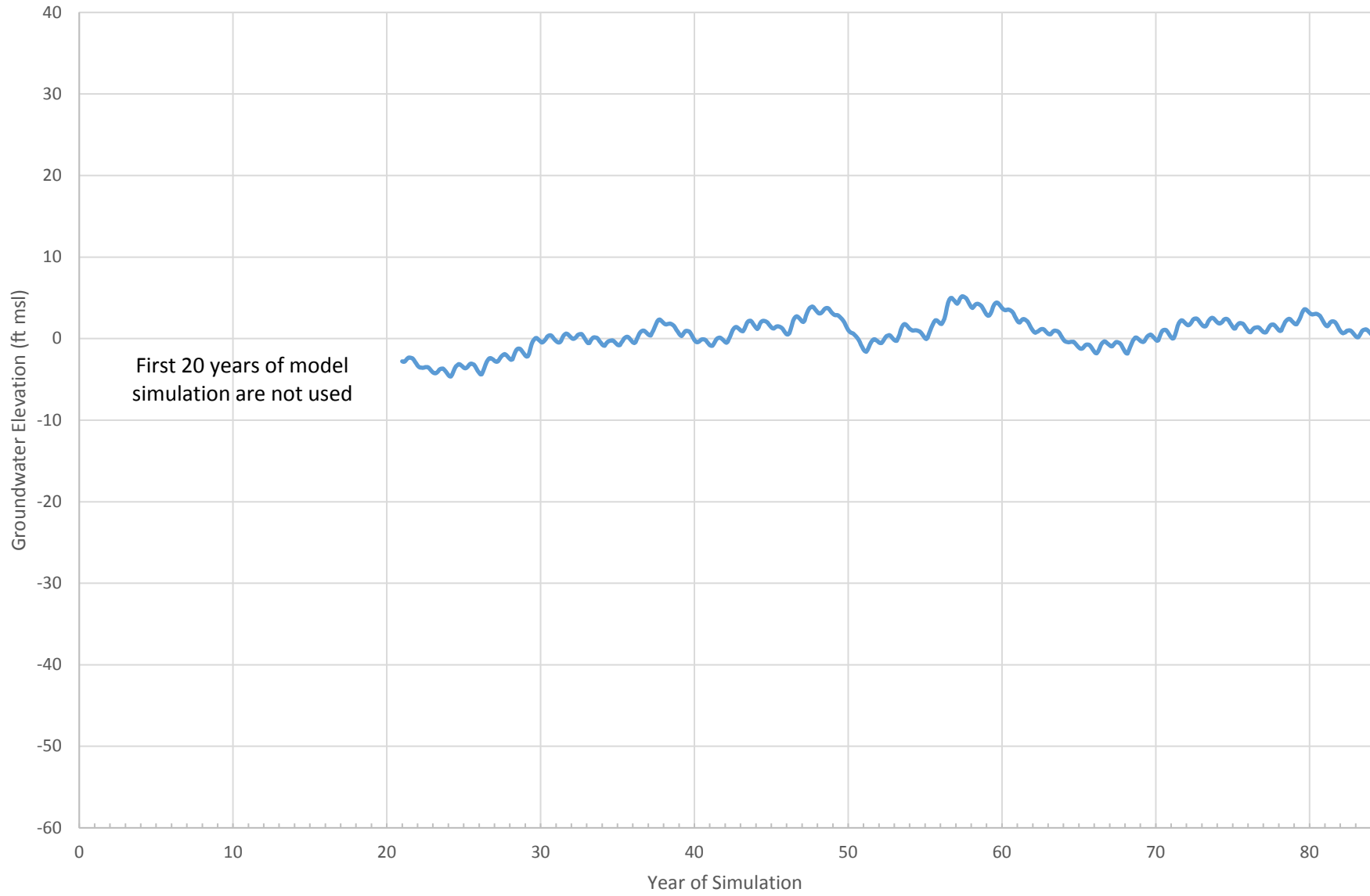
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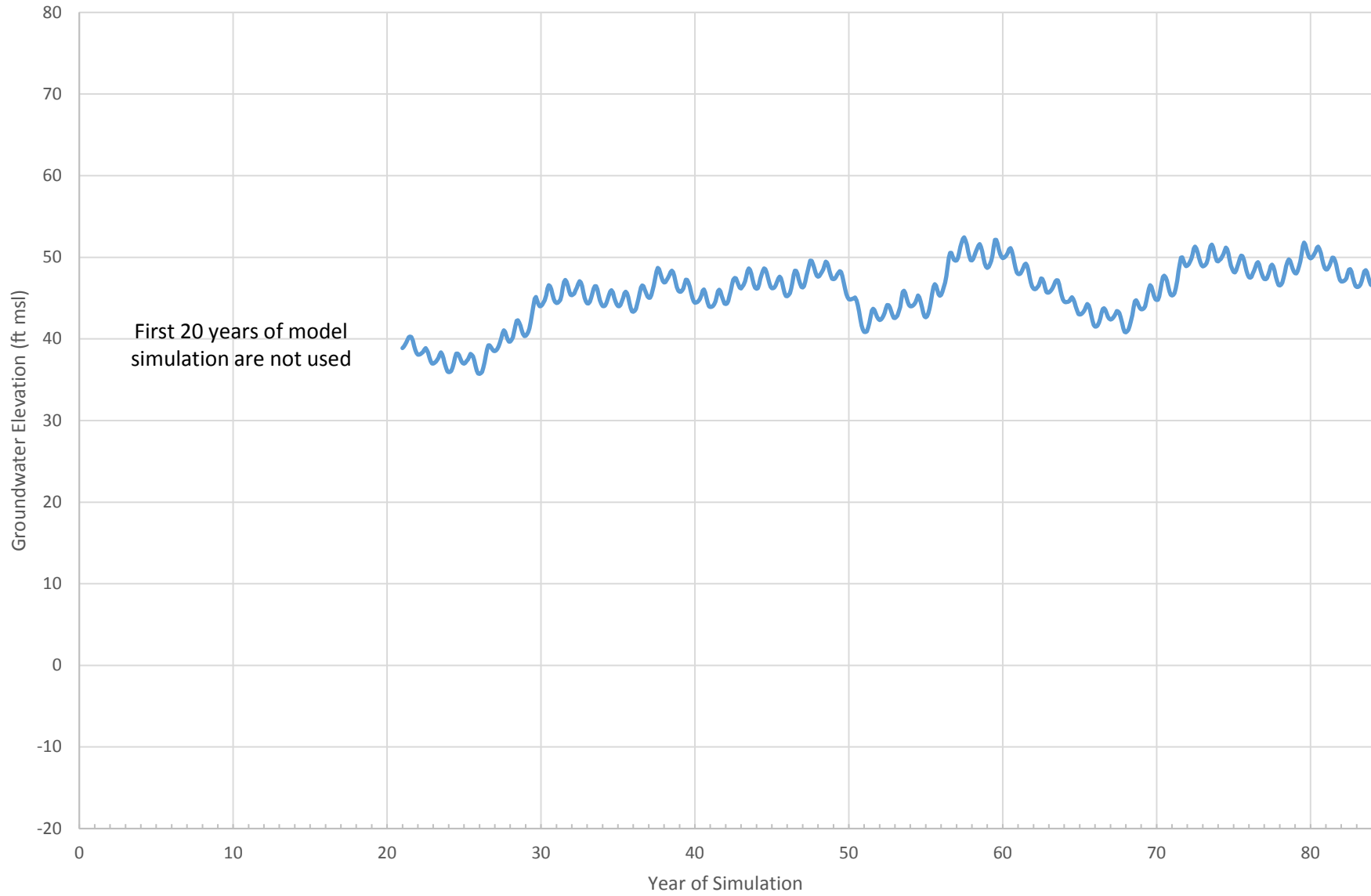
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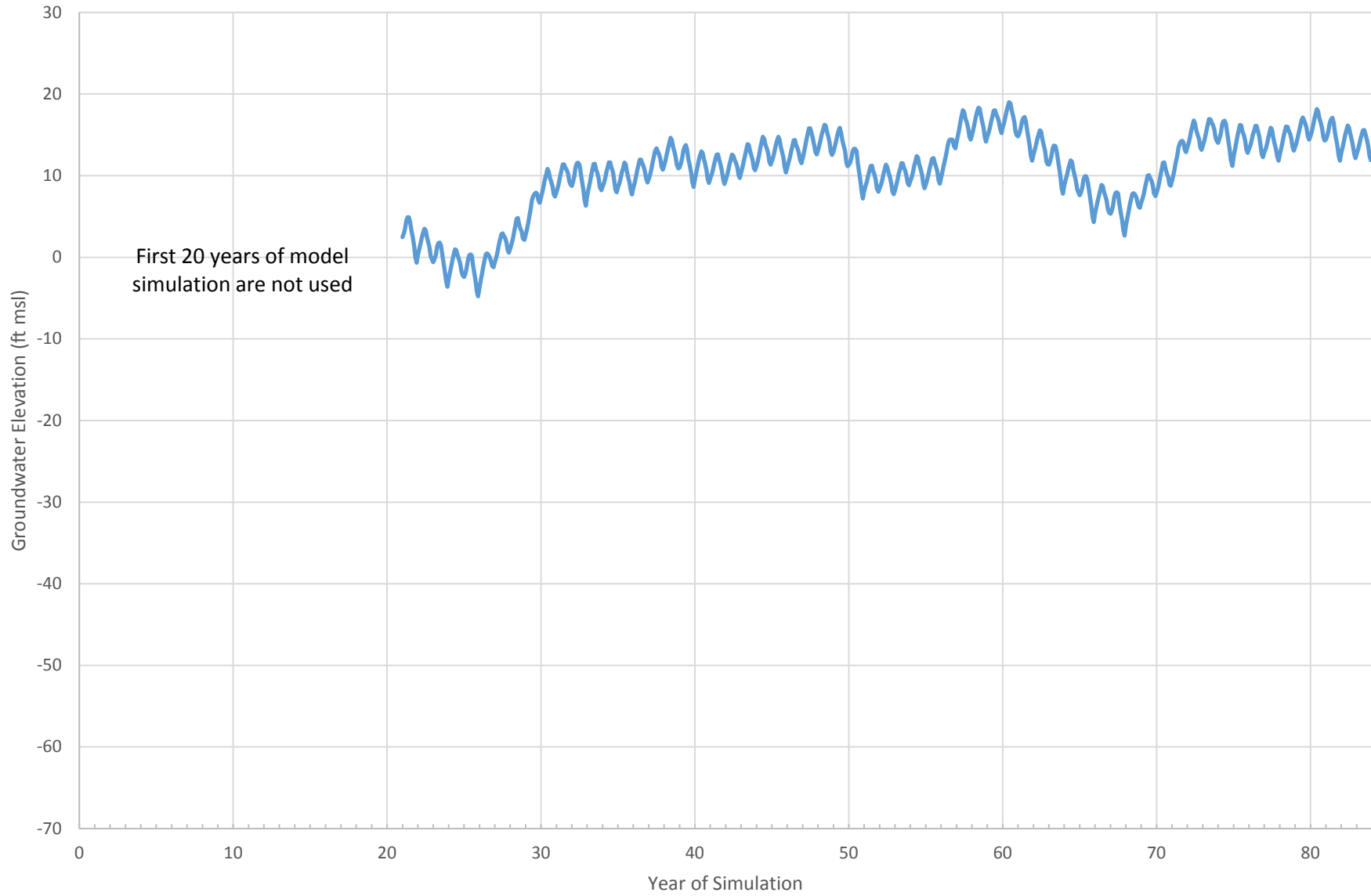
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First 20 years of model simulation are not used

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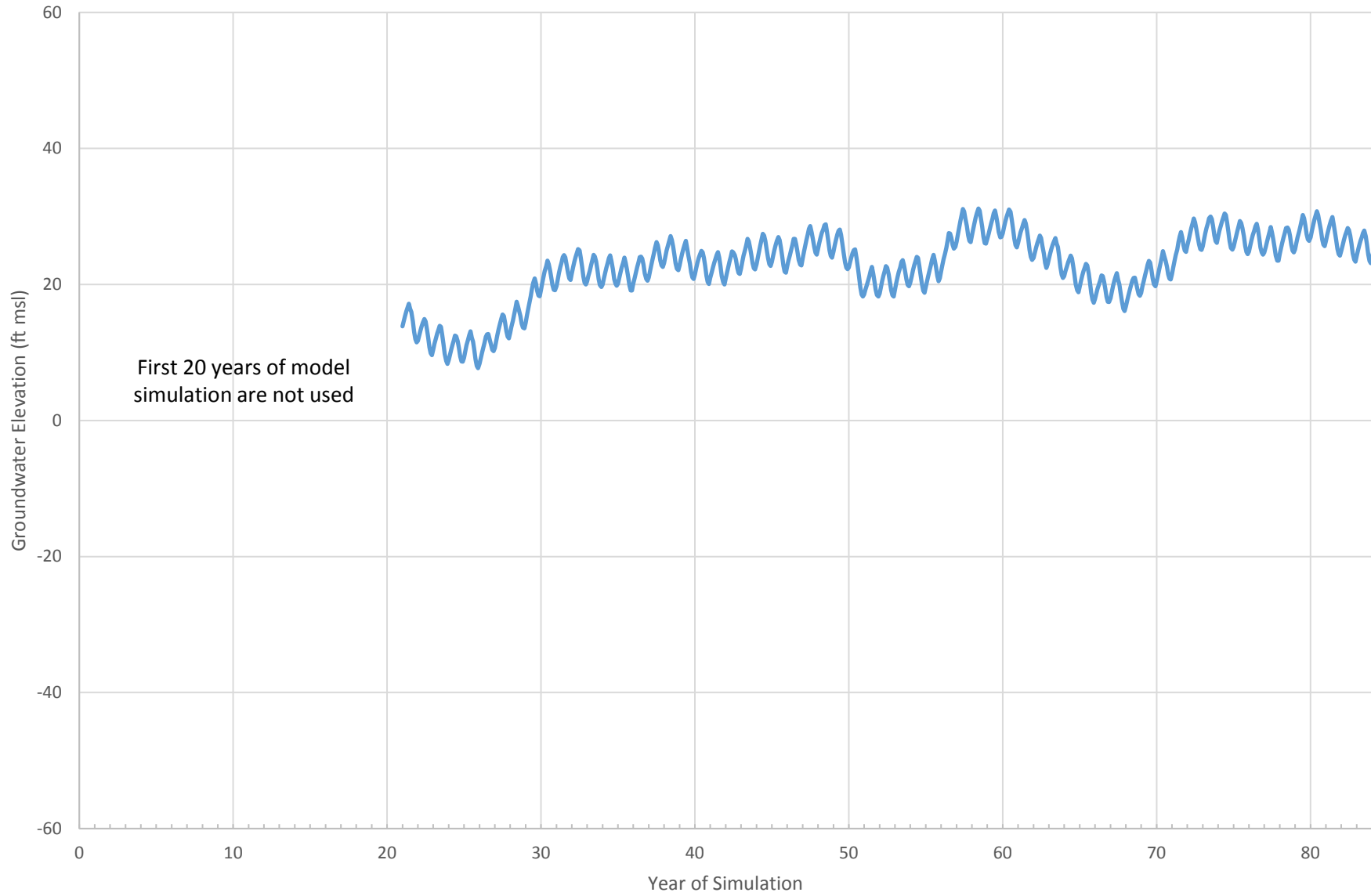


First 20 years of model simulation are not used



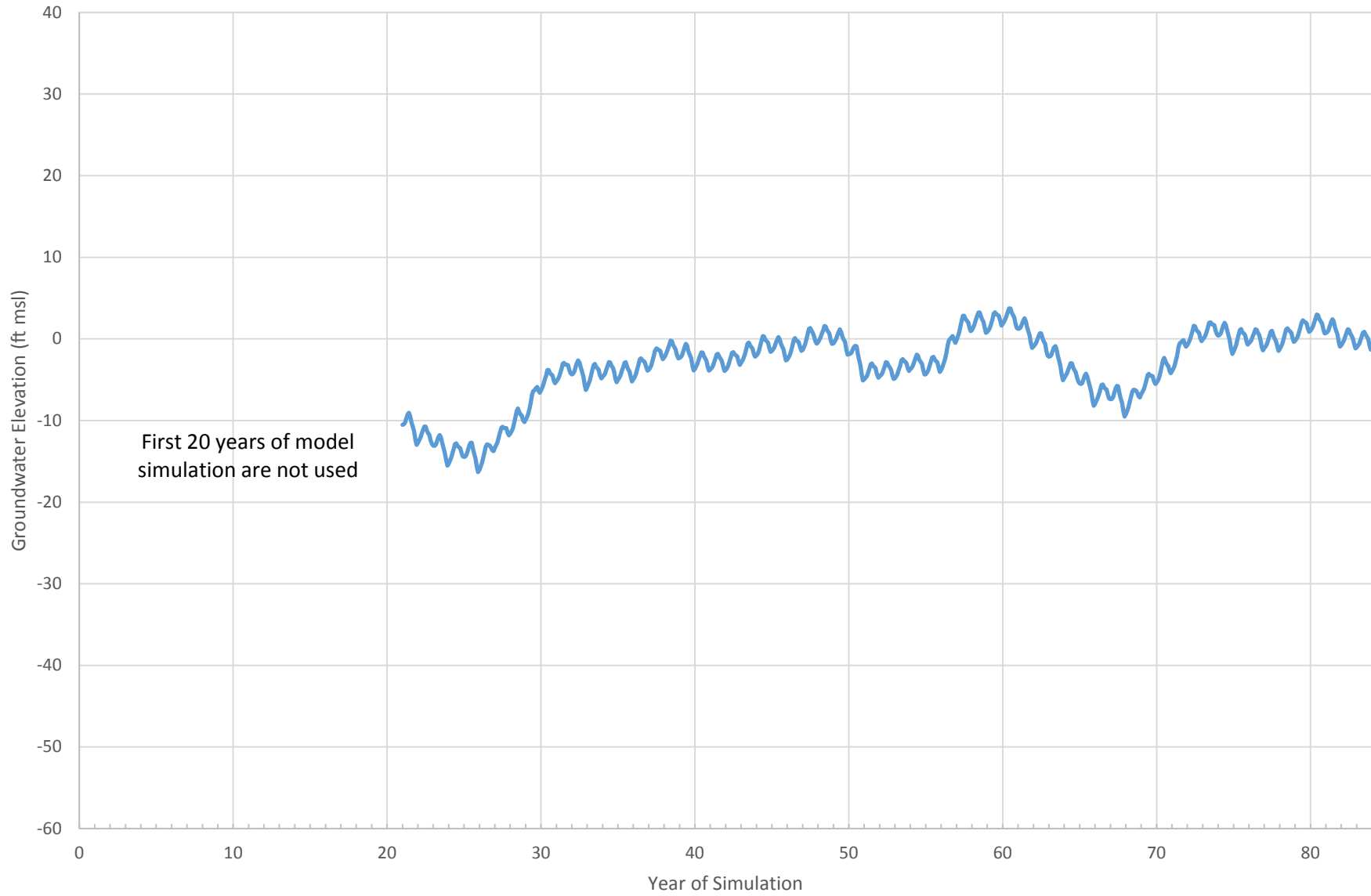
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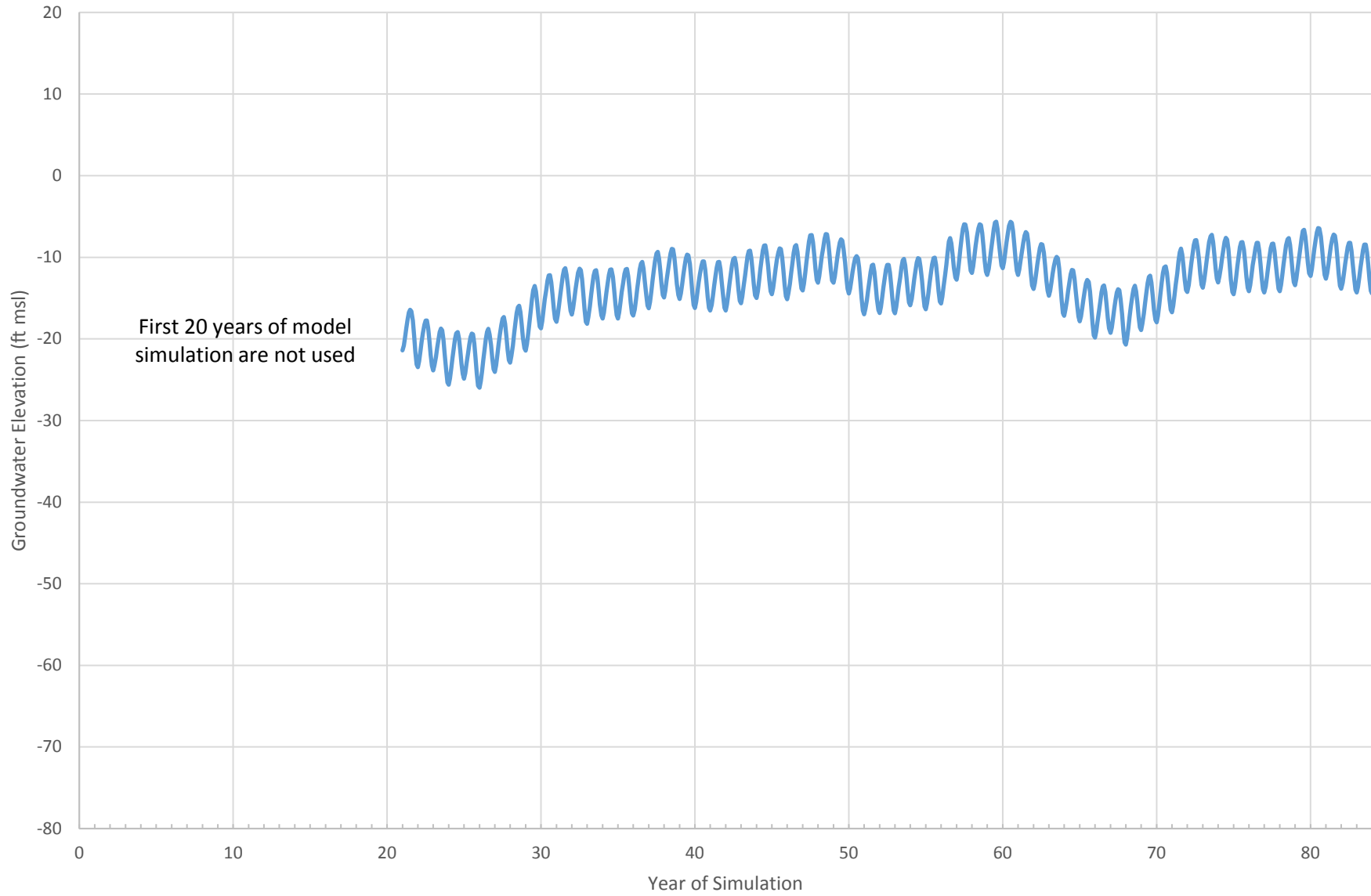
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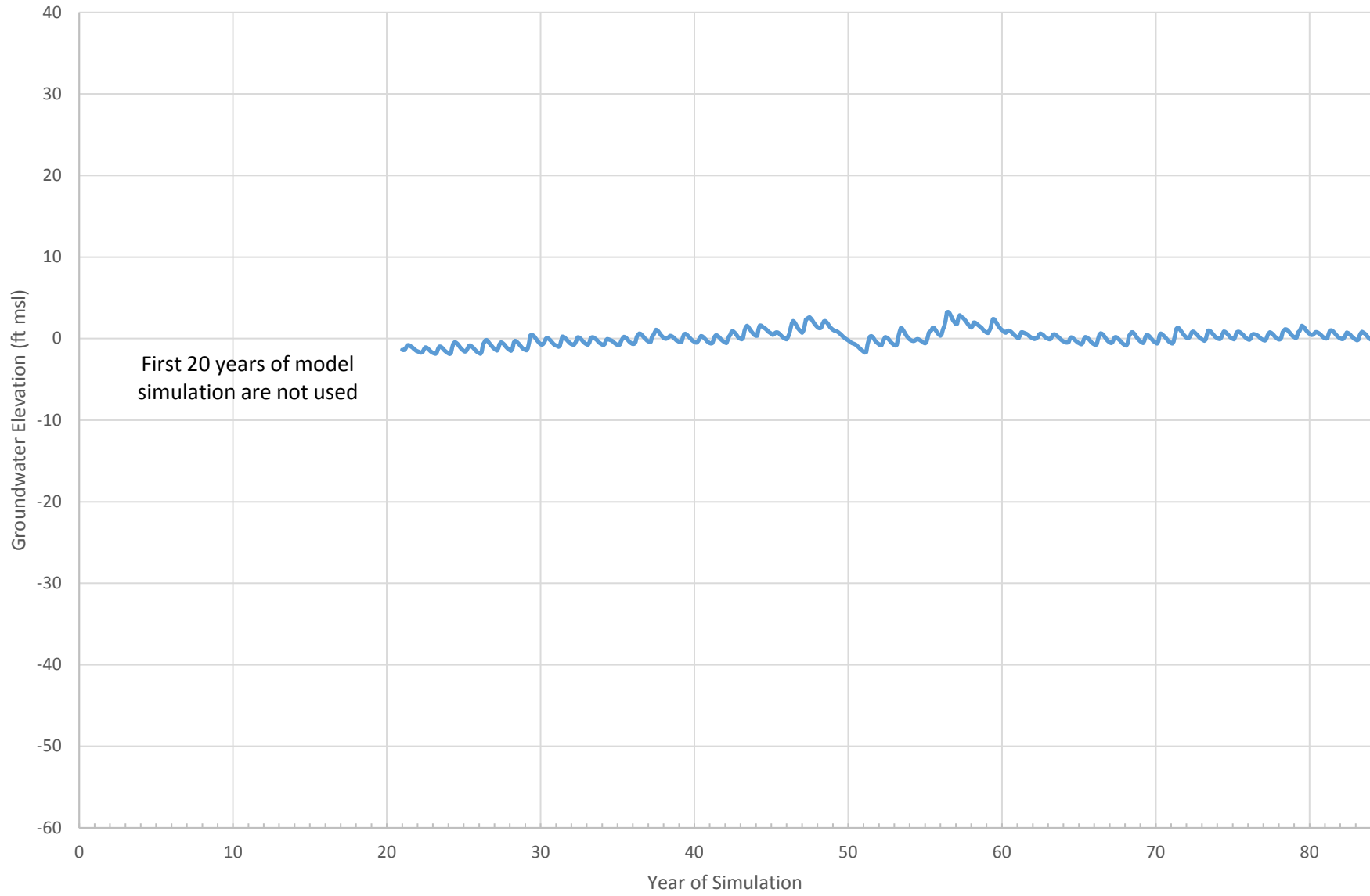
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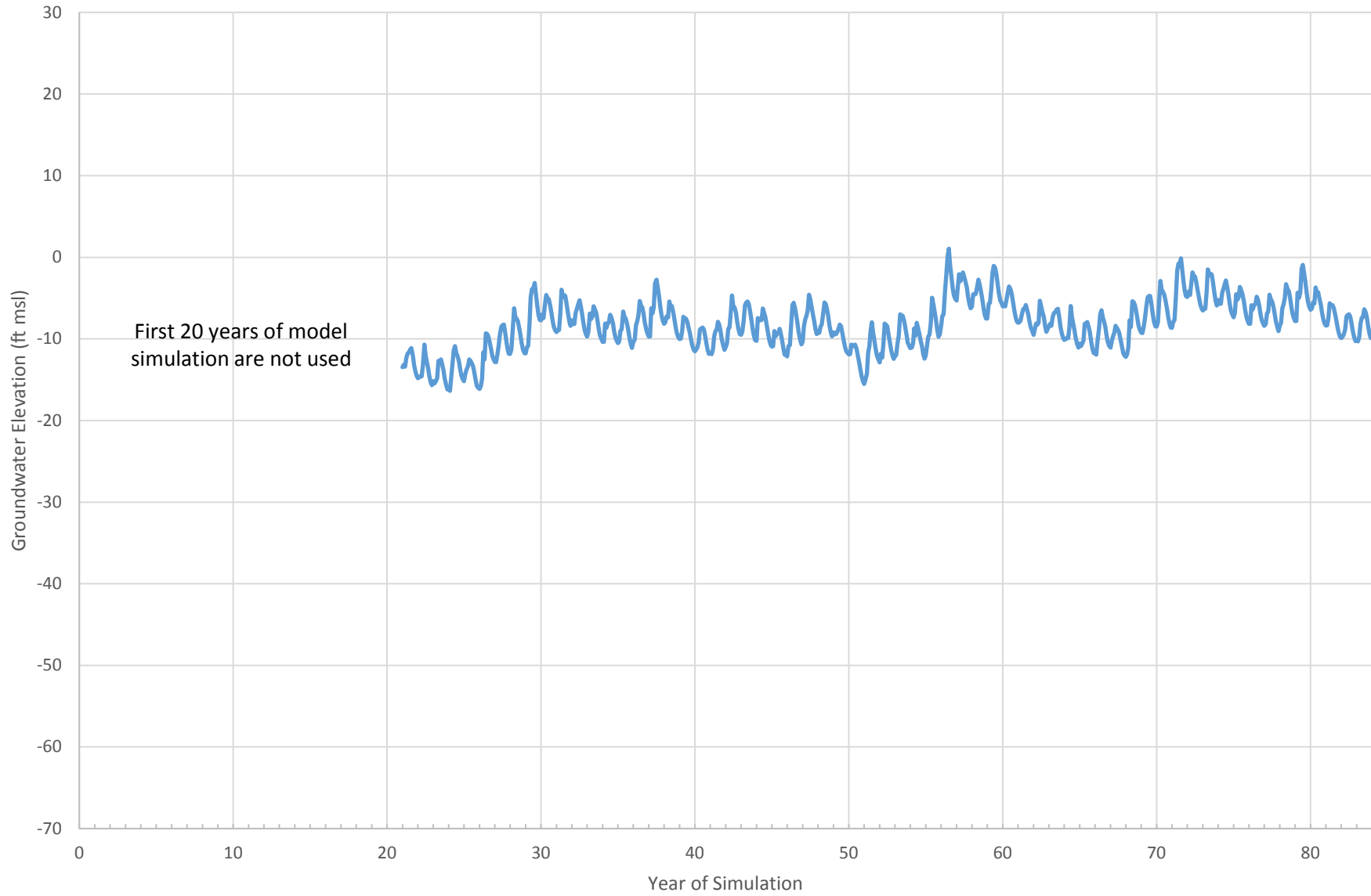
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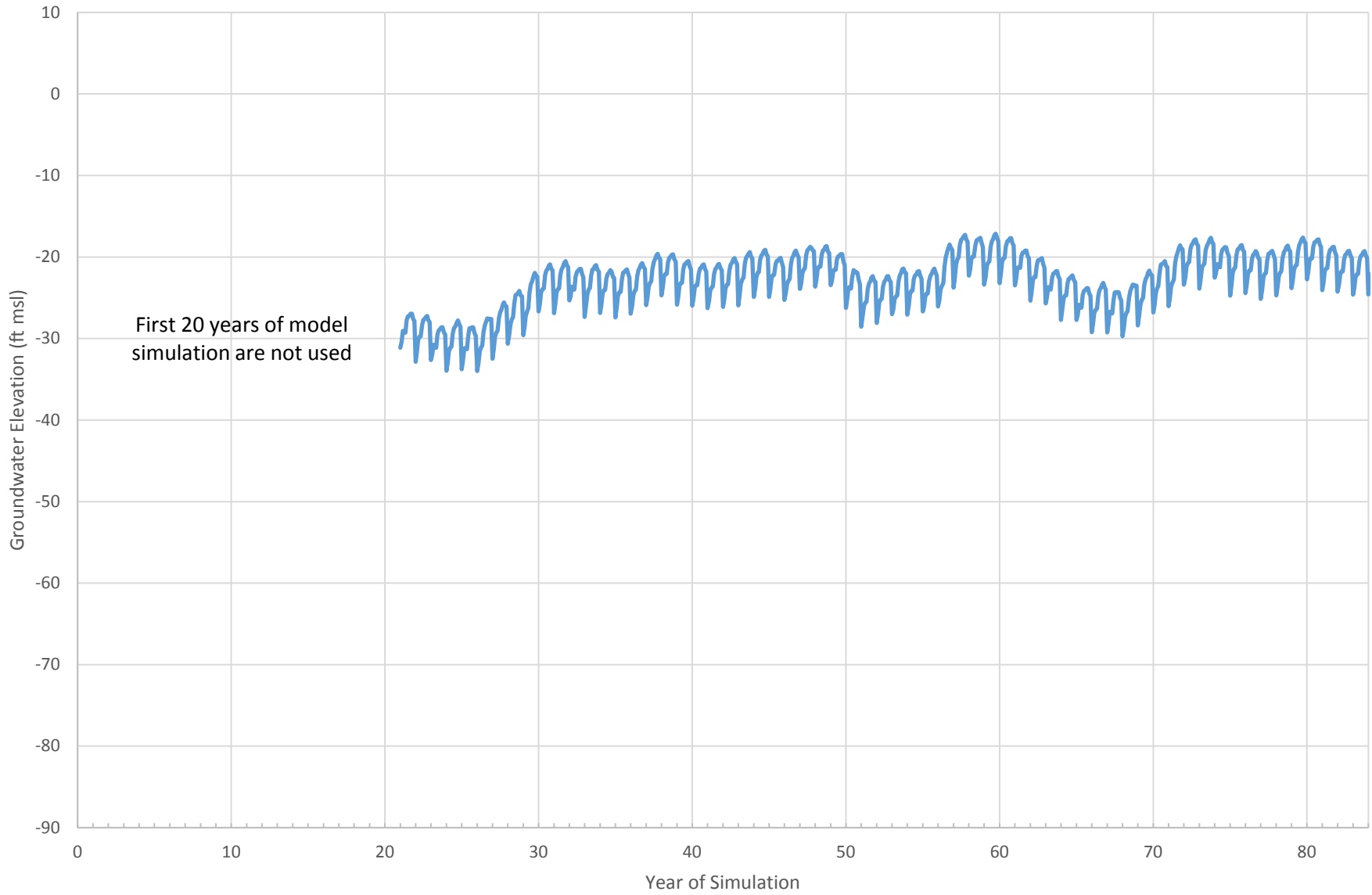
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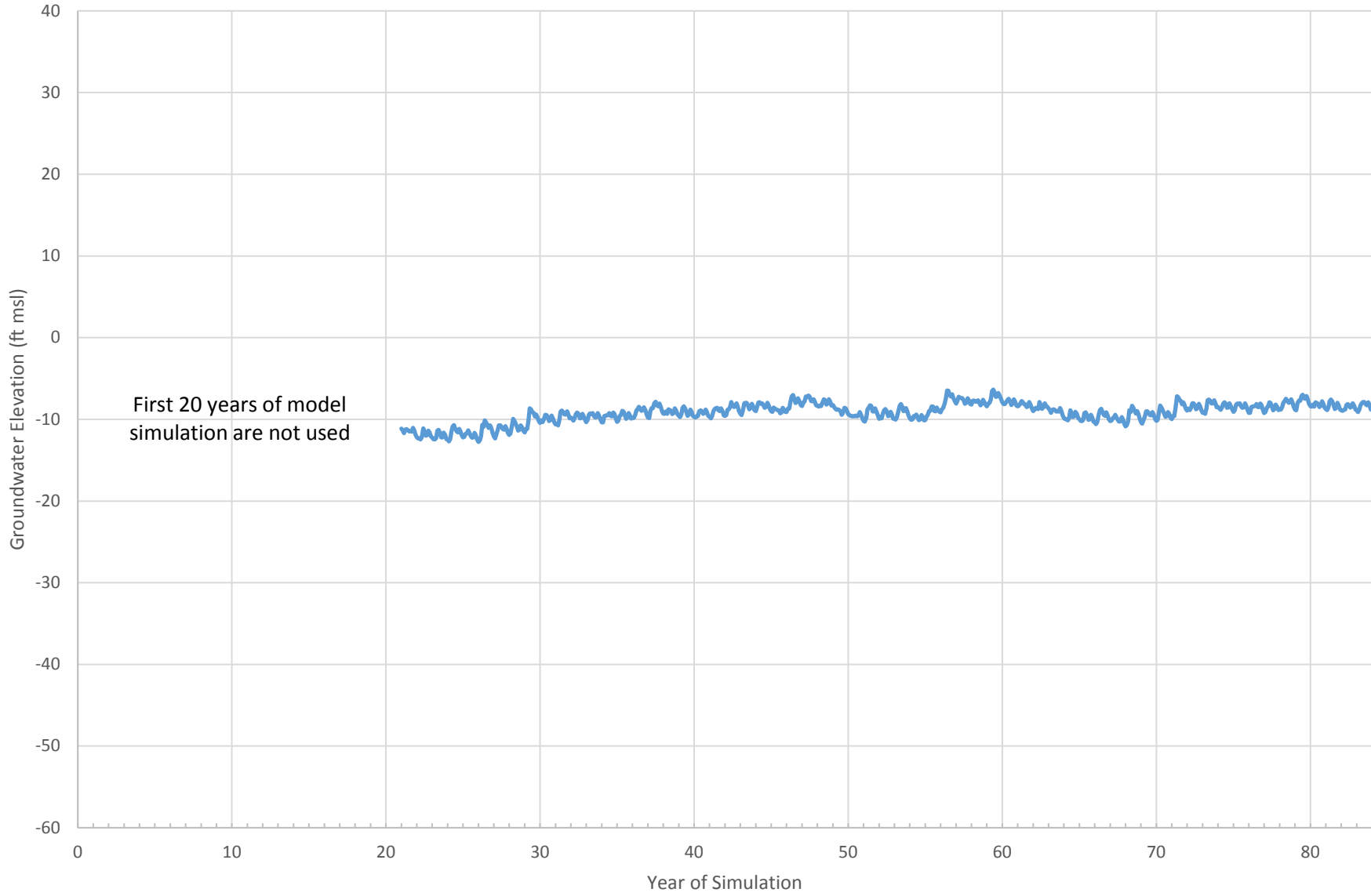
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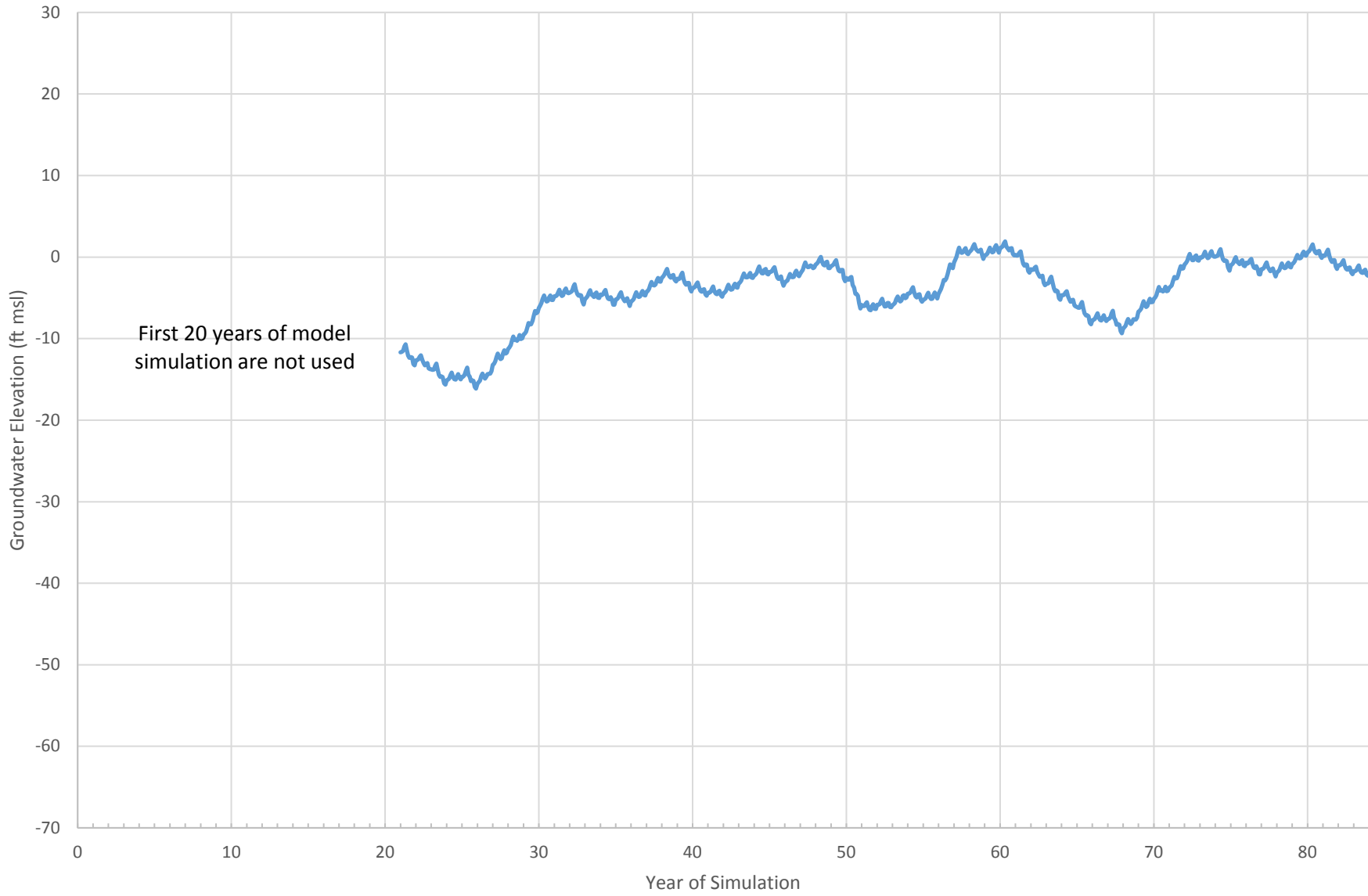
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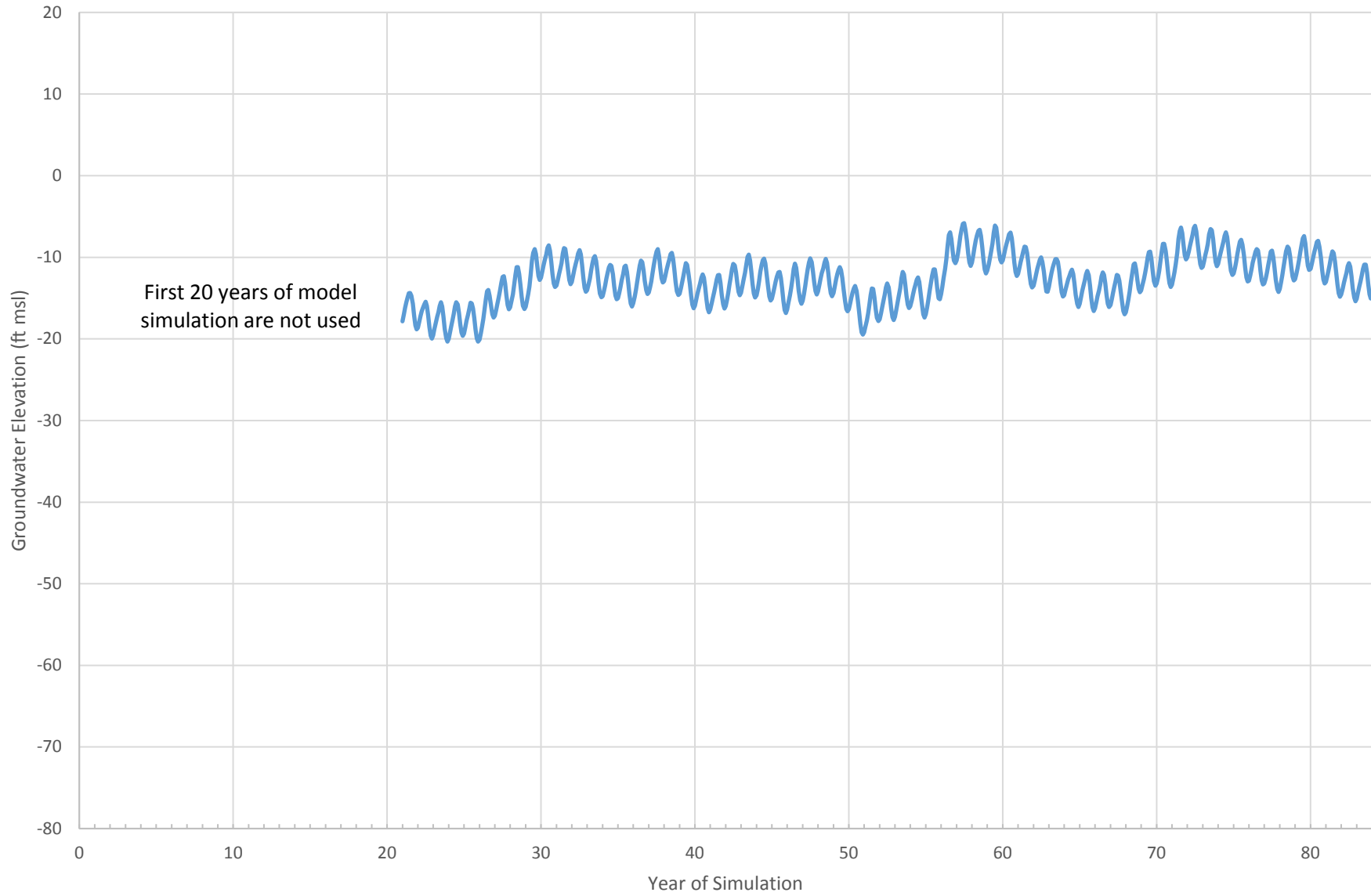
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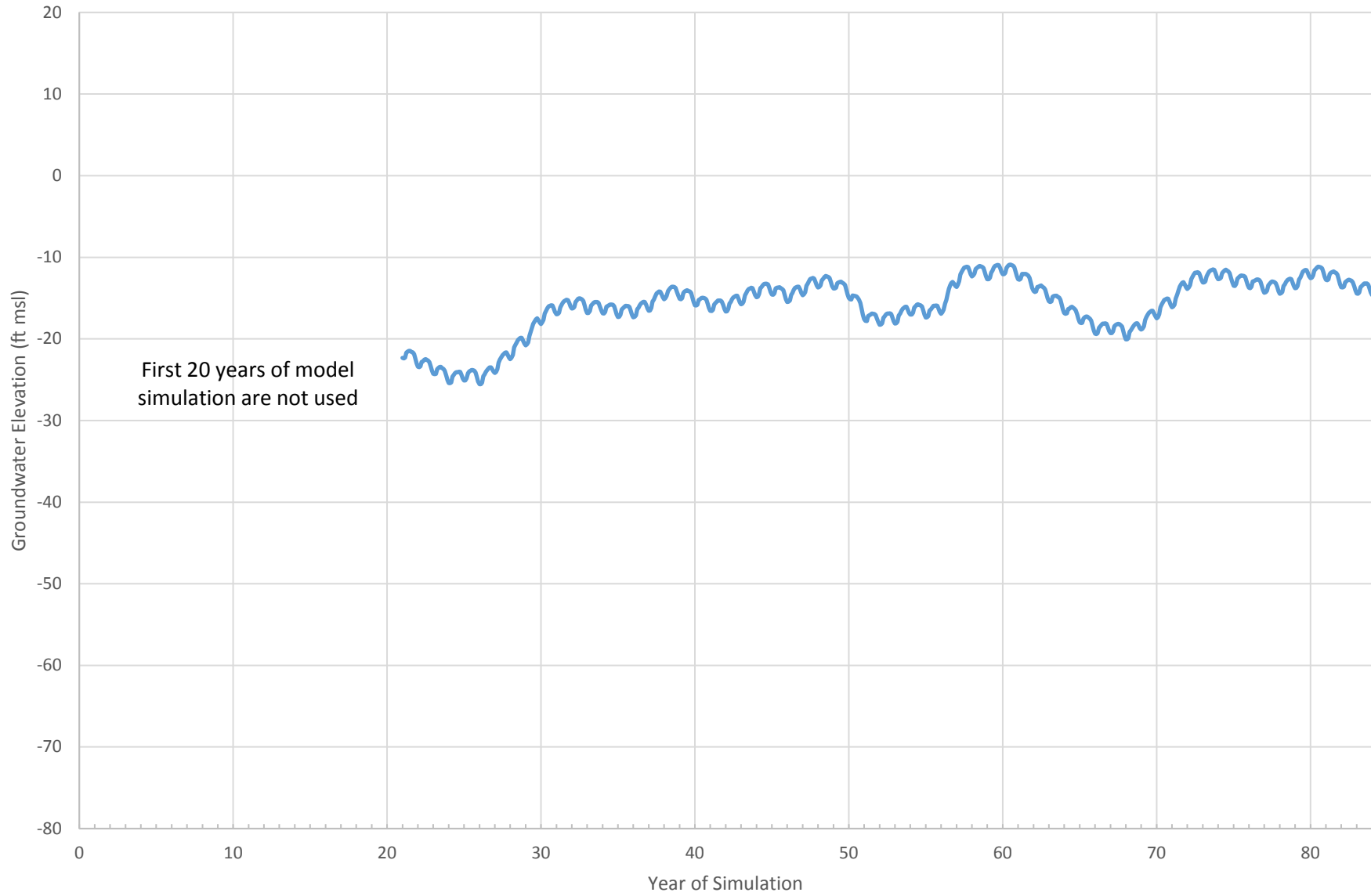
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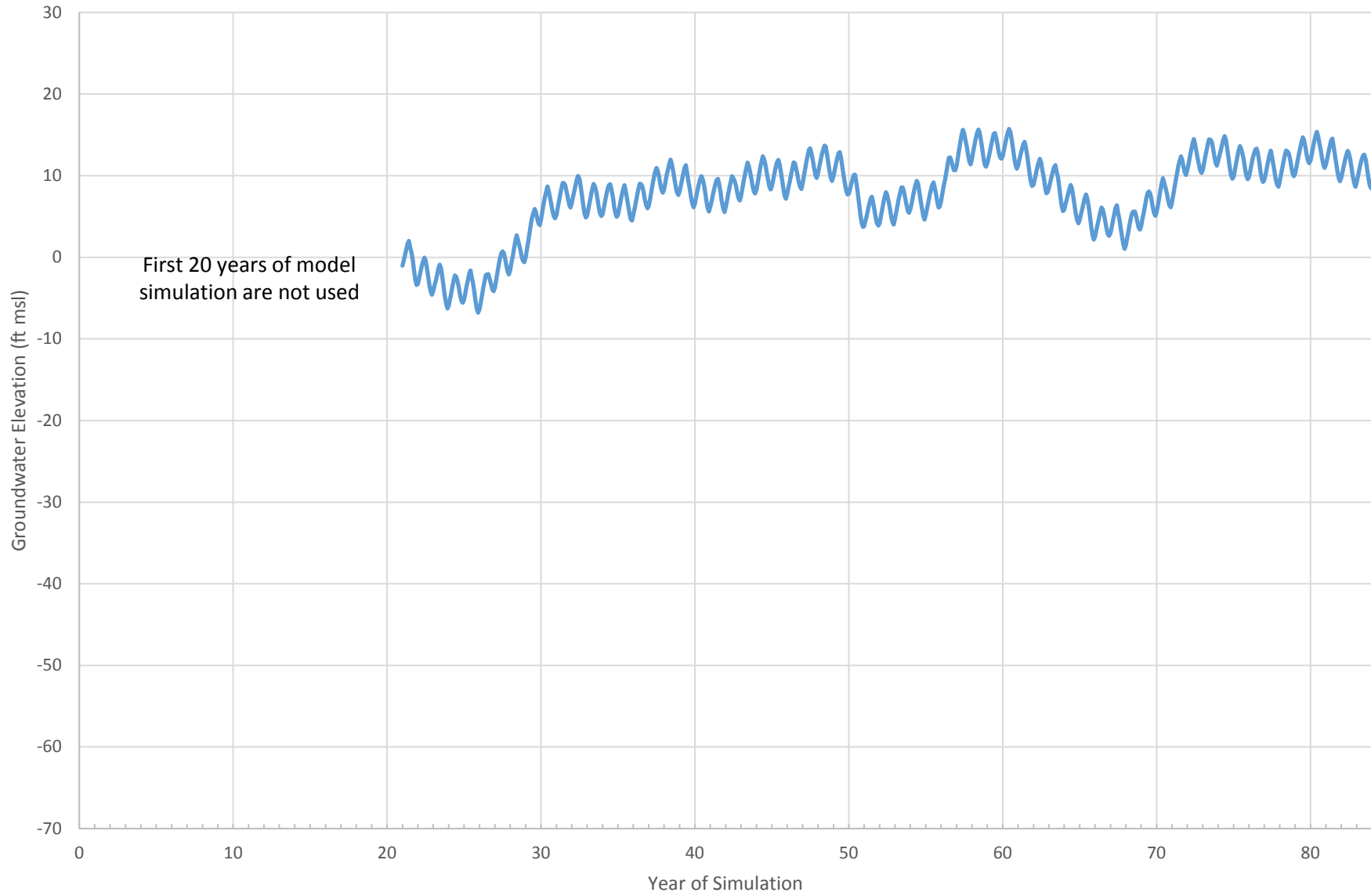
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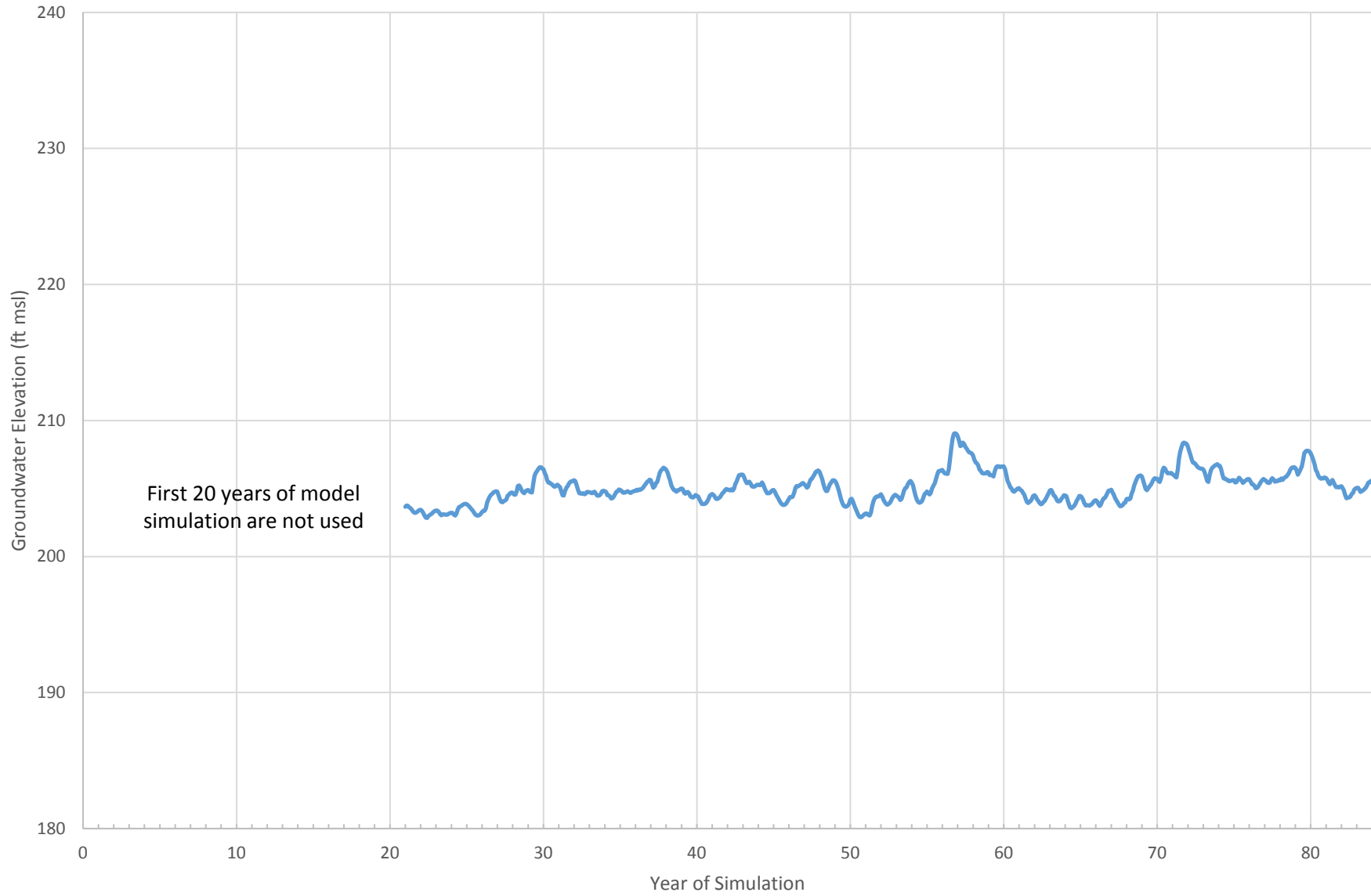
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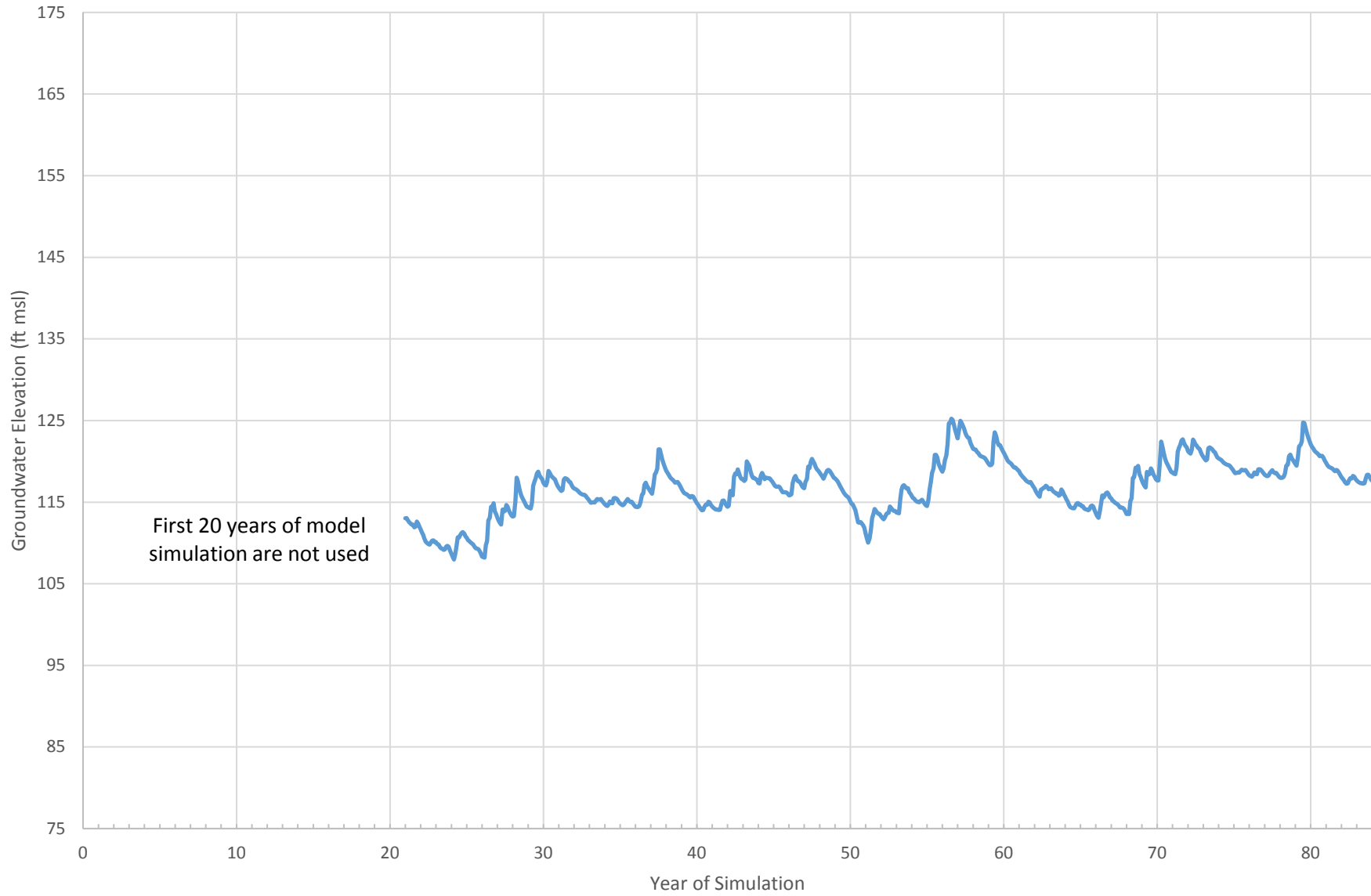
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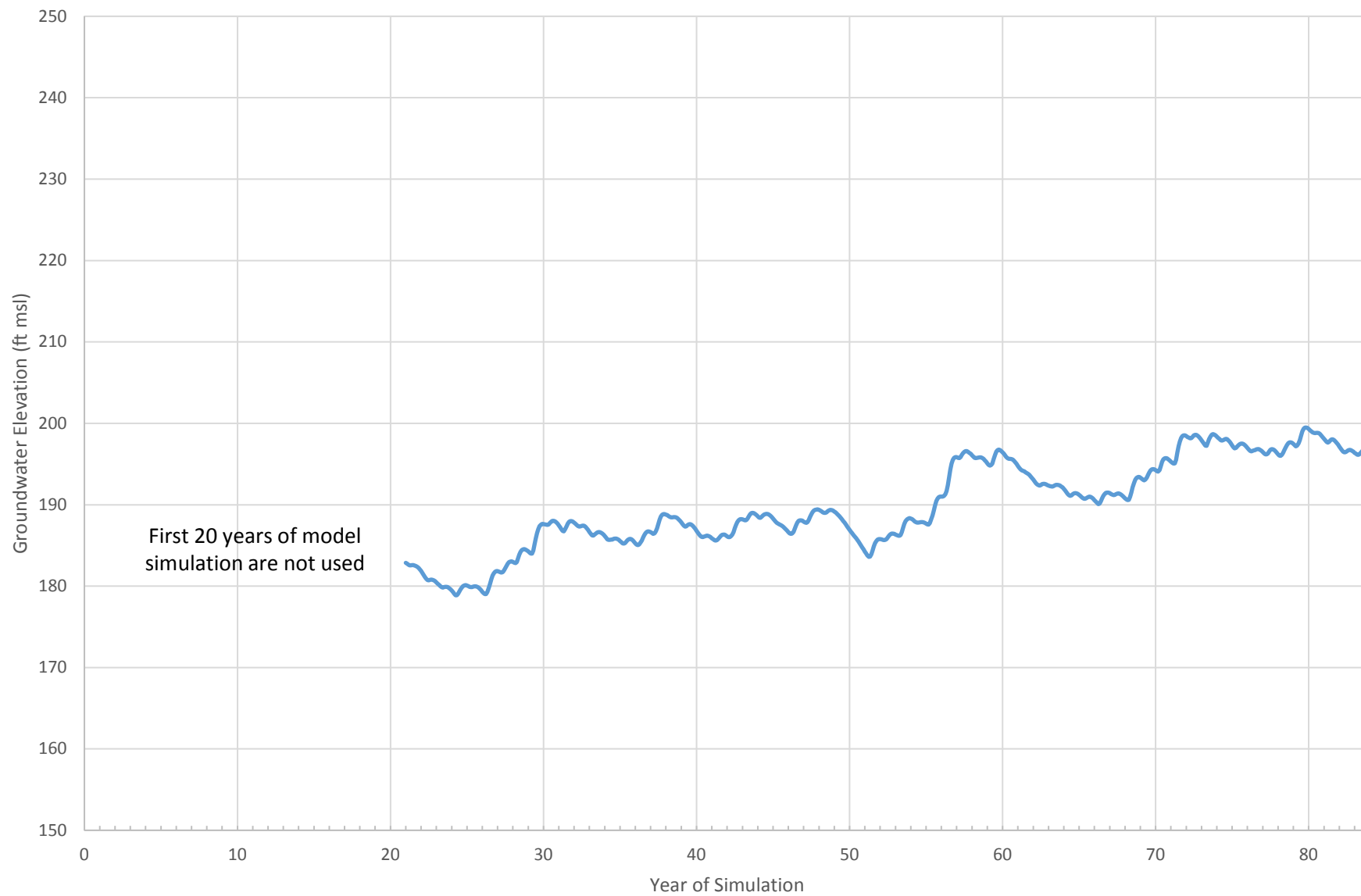
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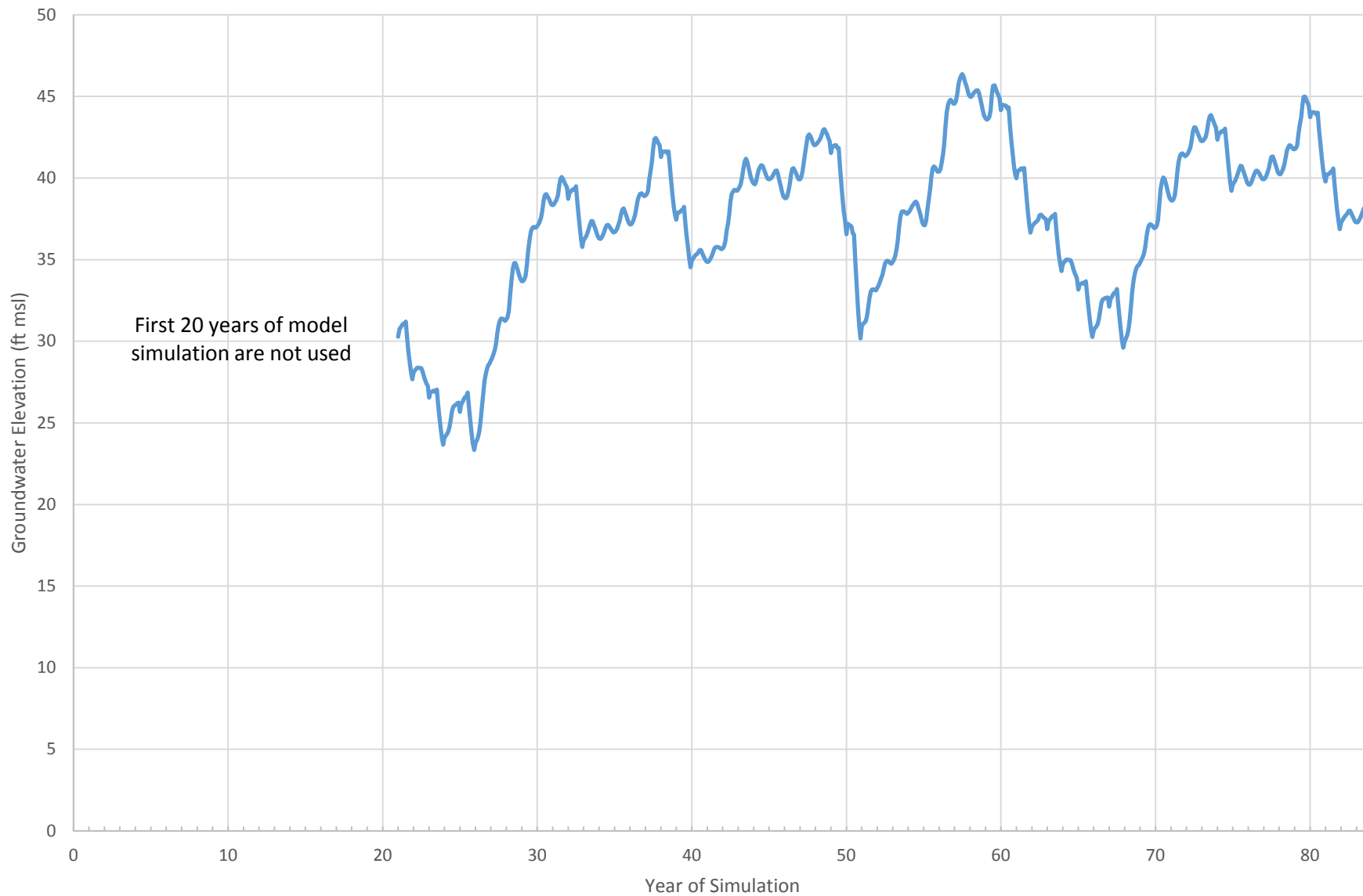
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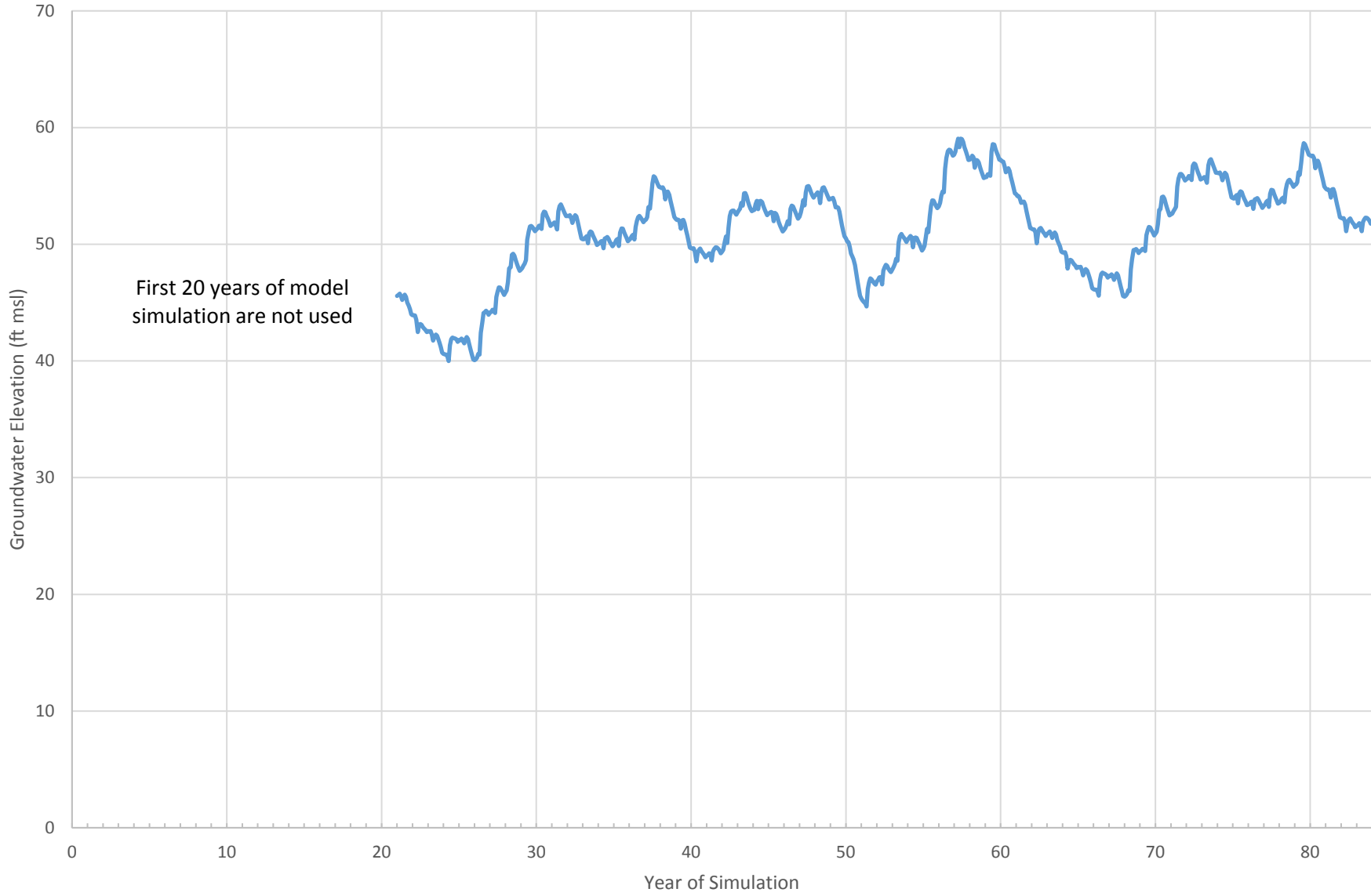
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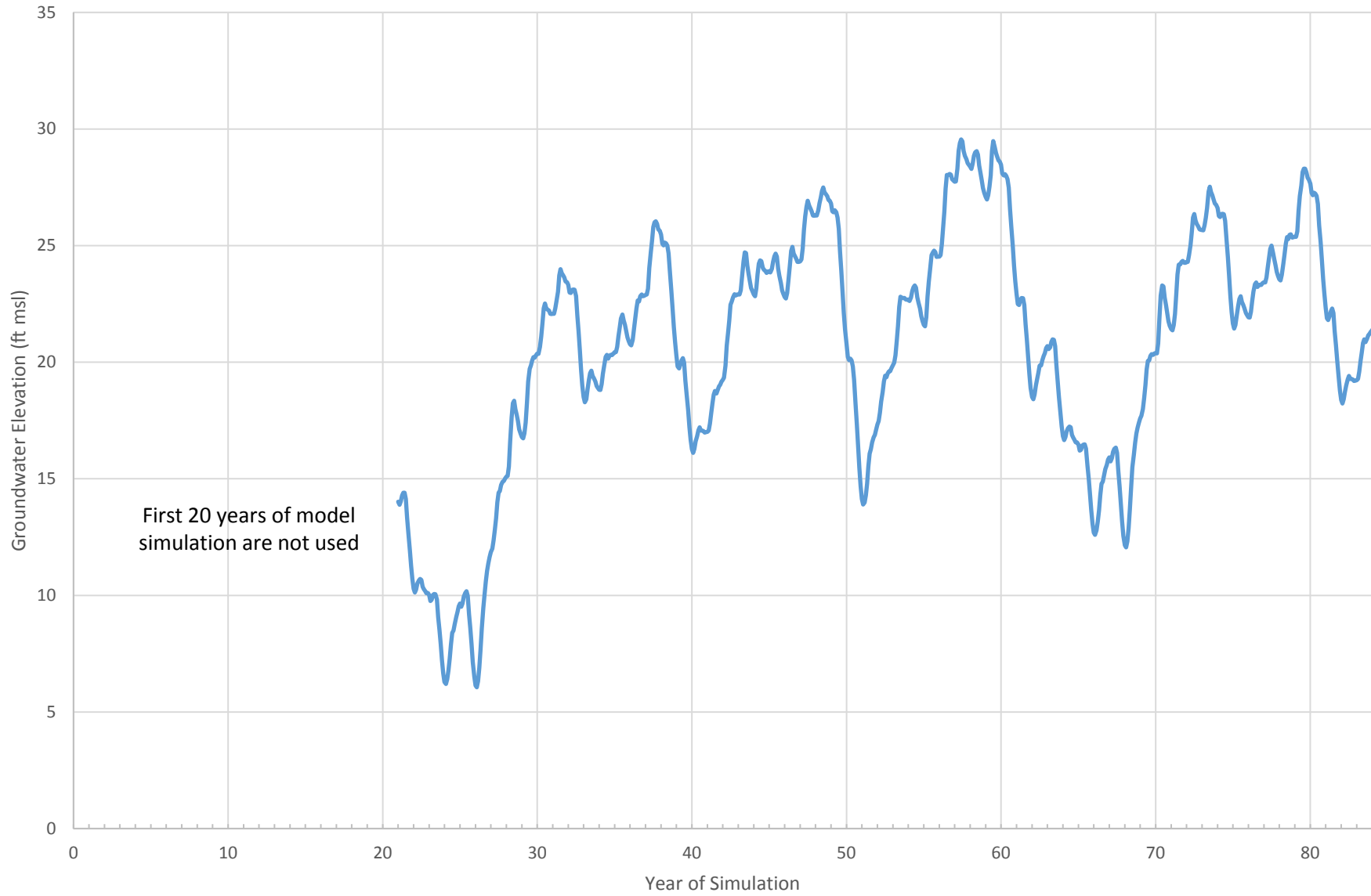
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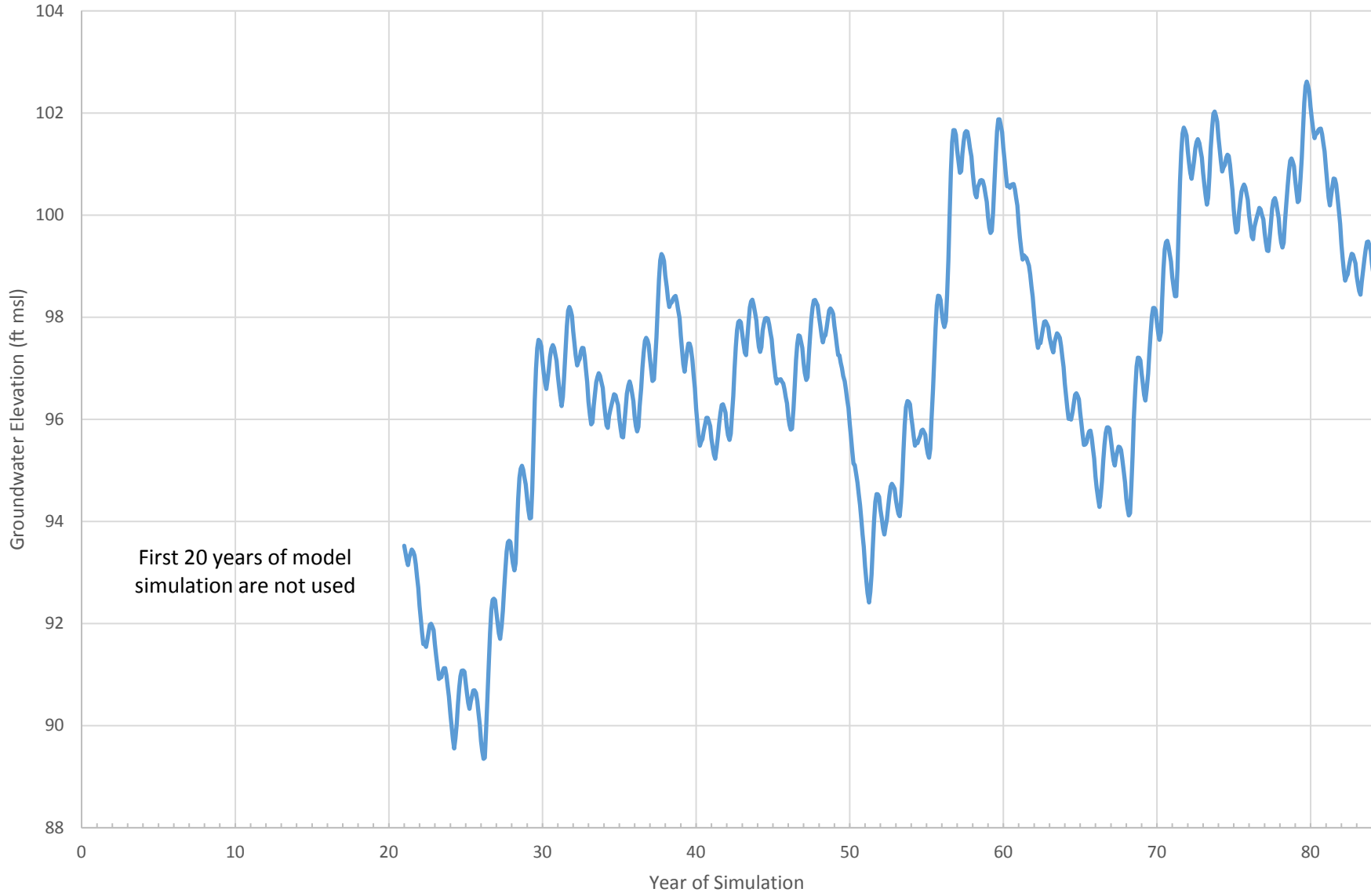
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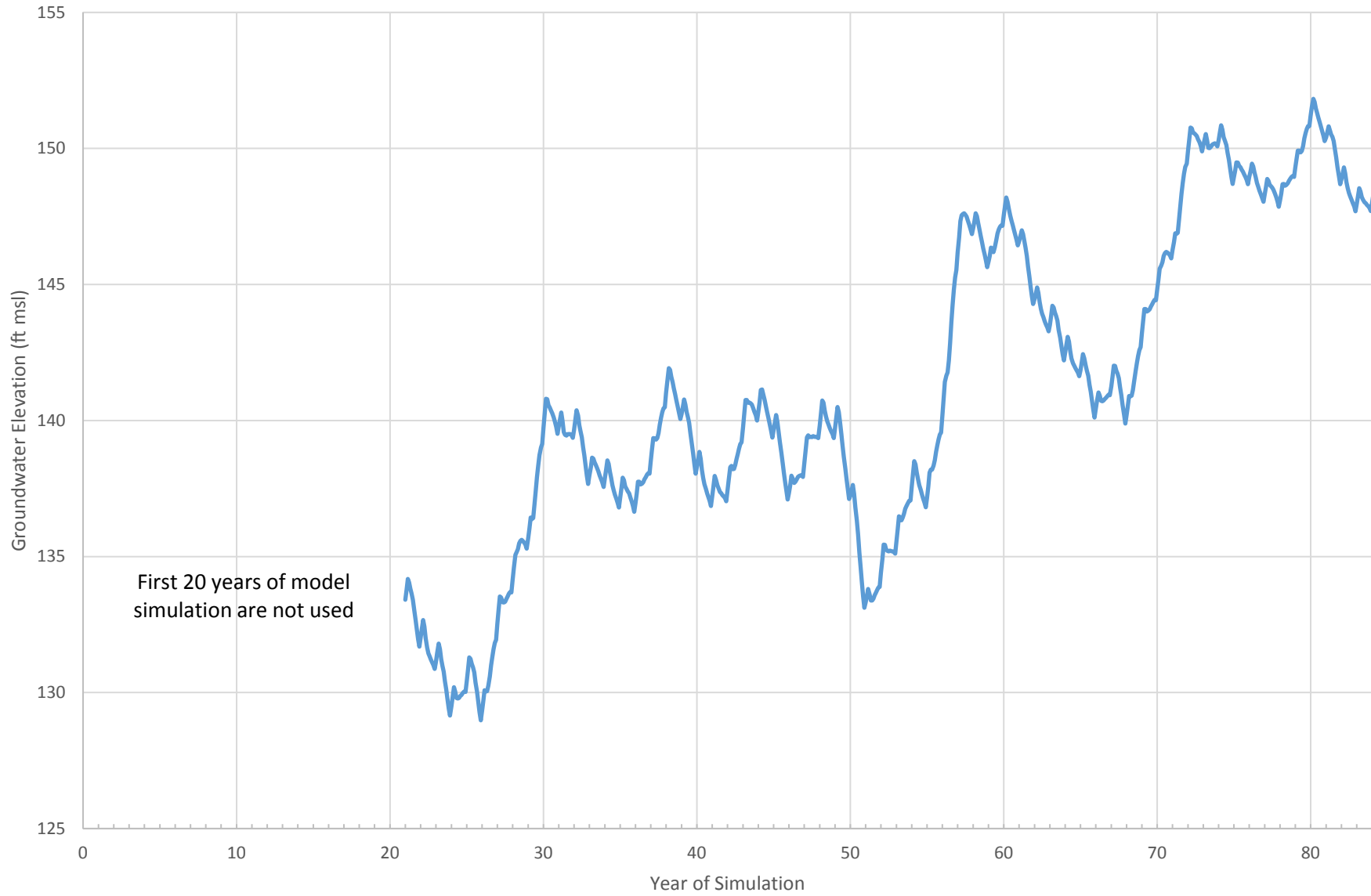
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

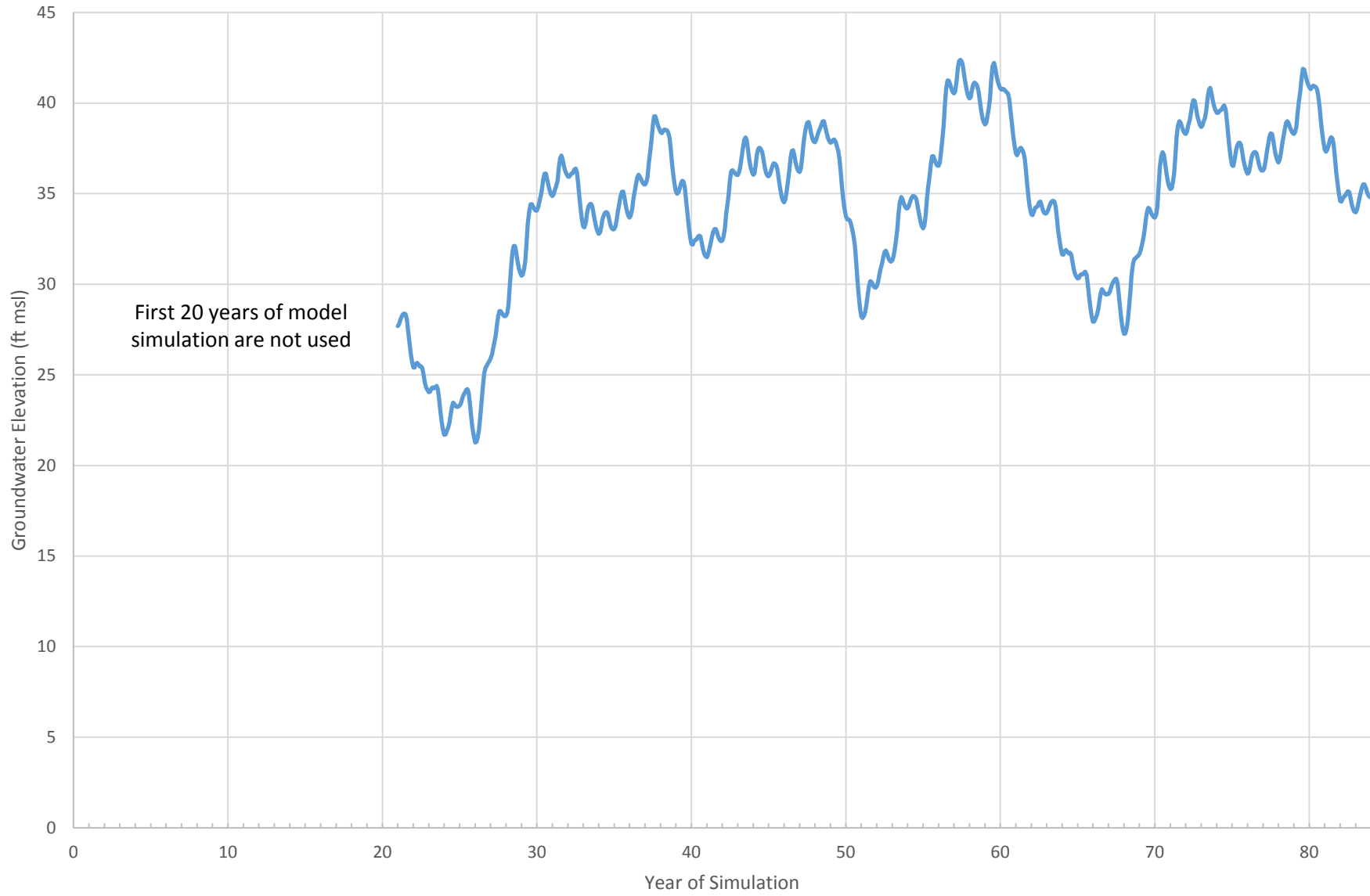
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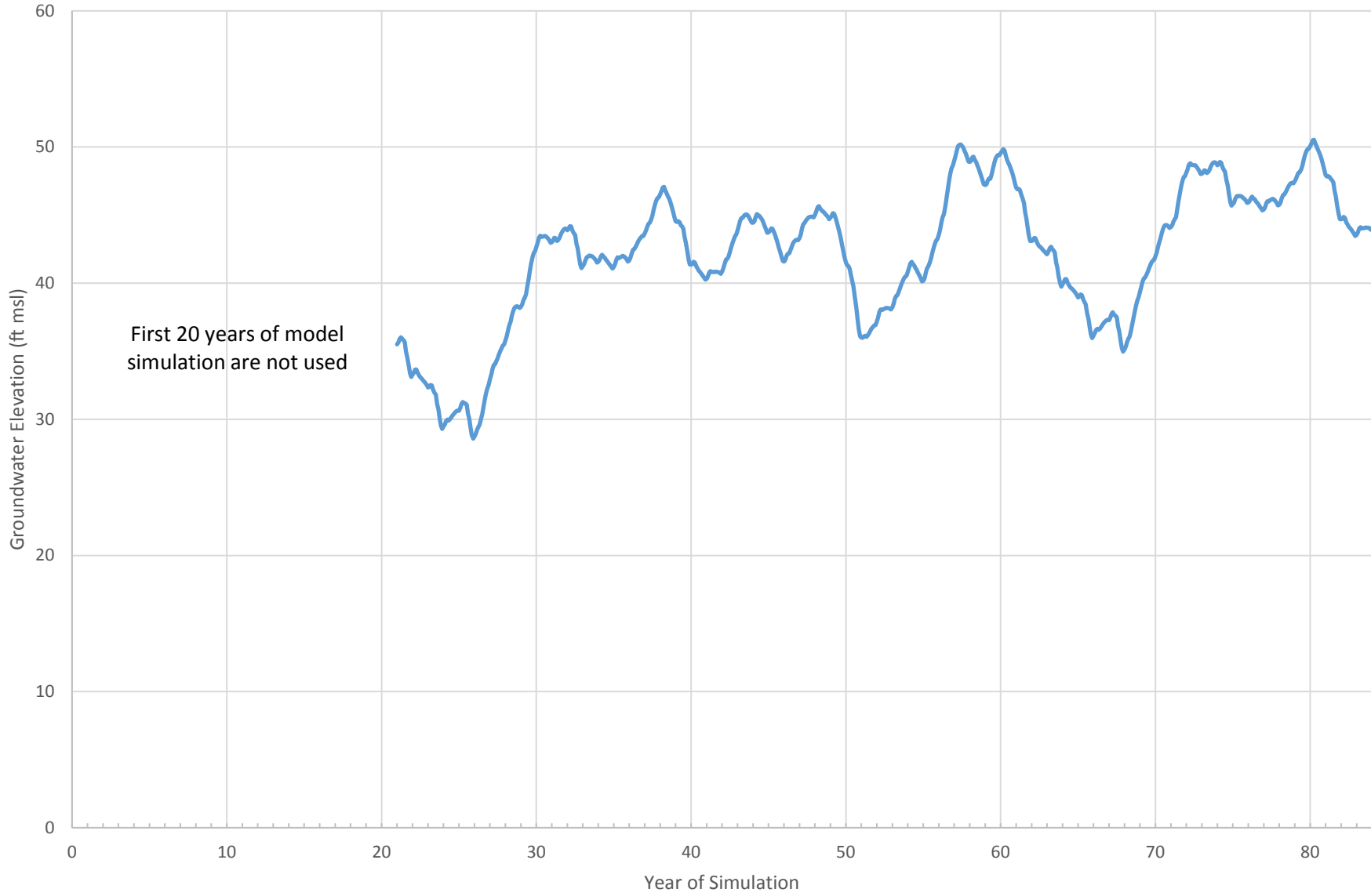
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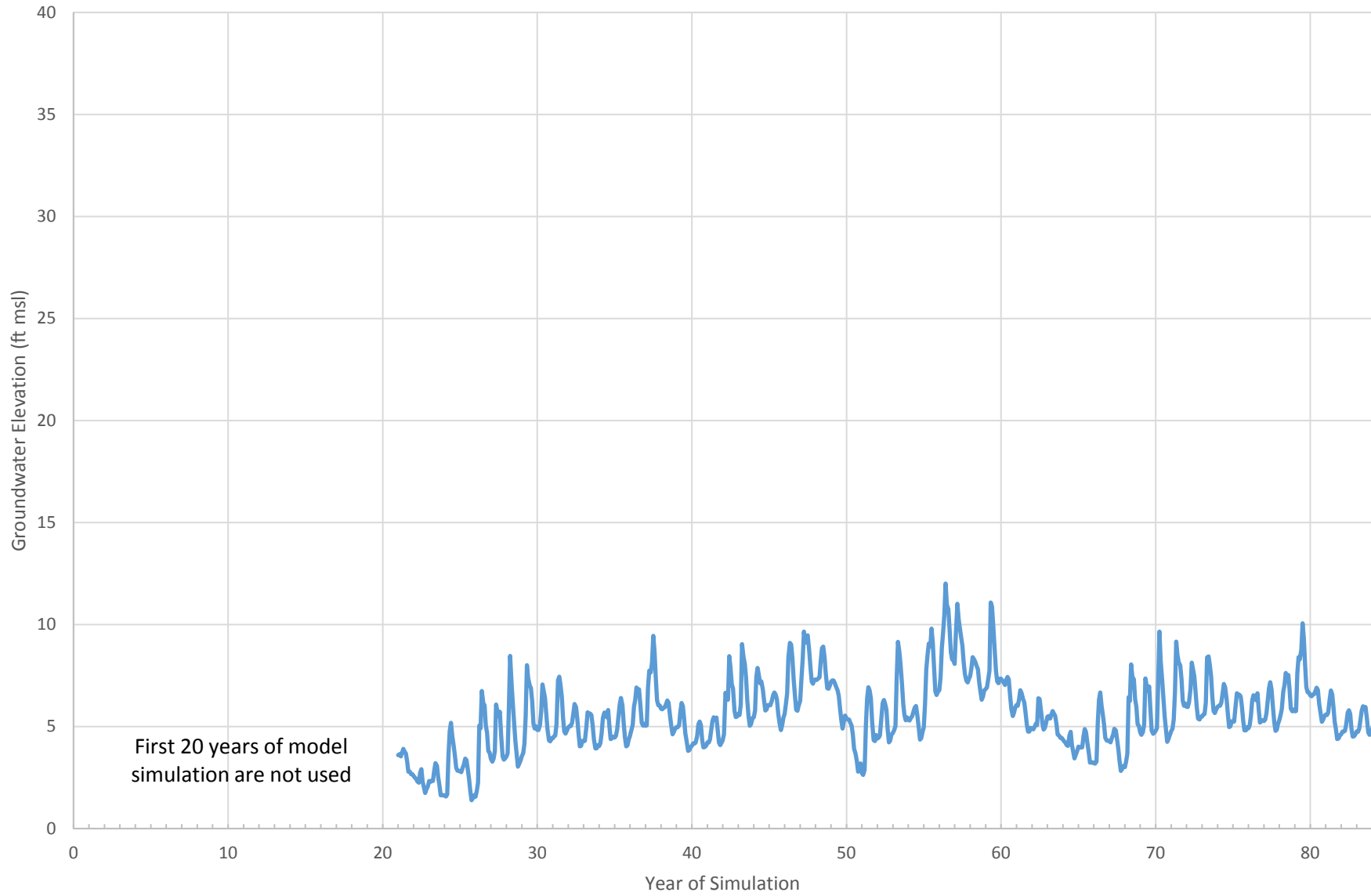
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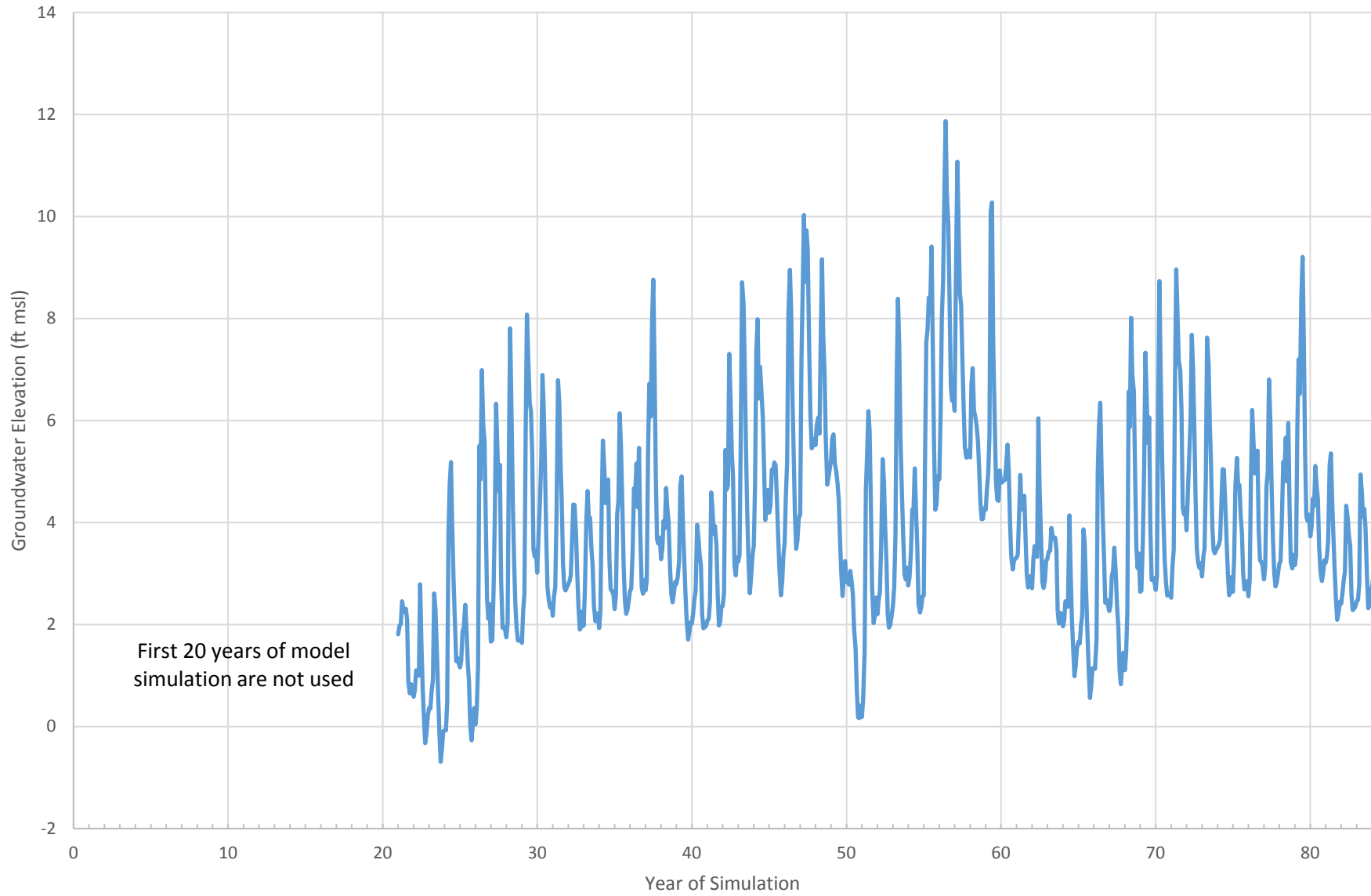
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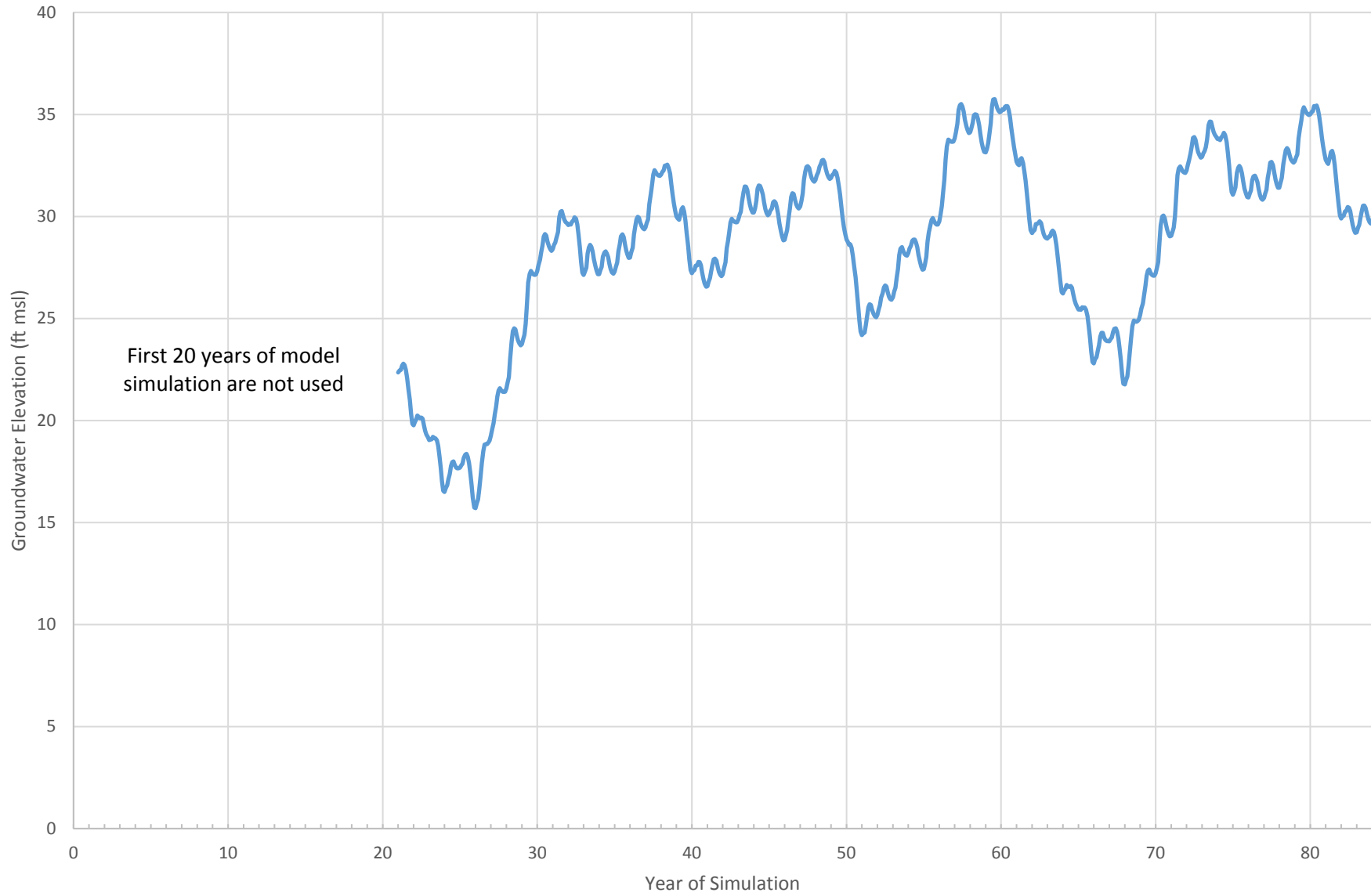
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First 20 years of model simulation are not used

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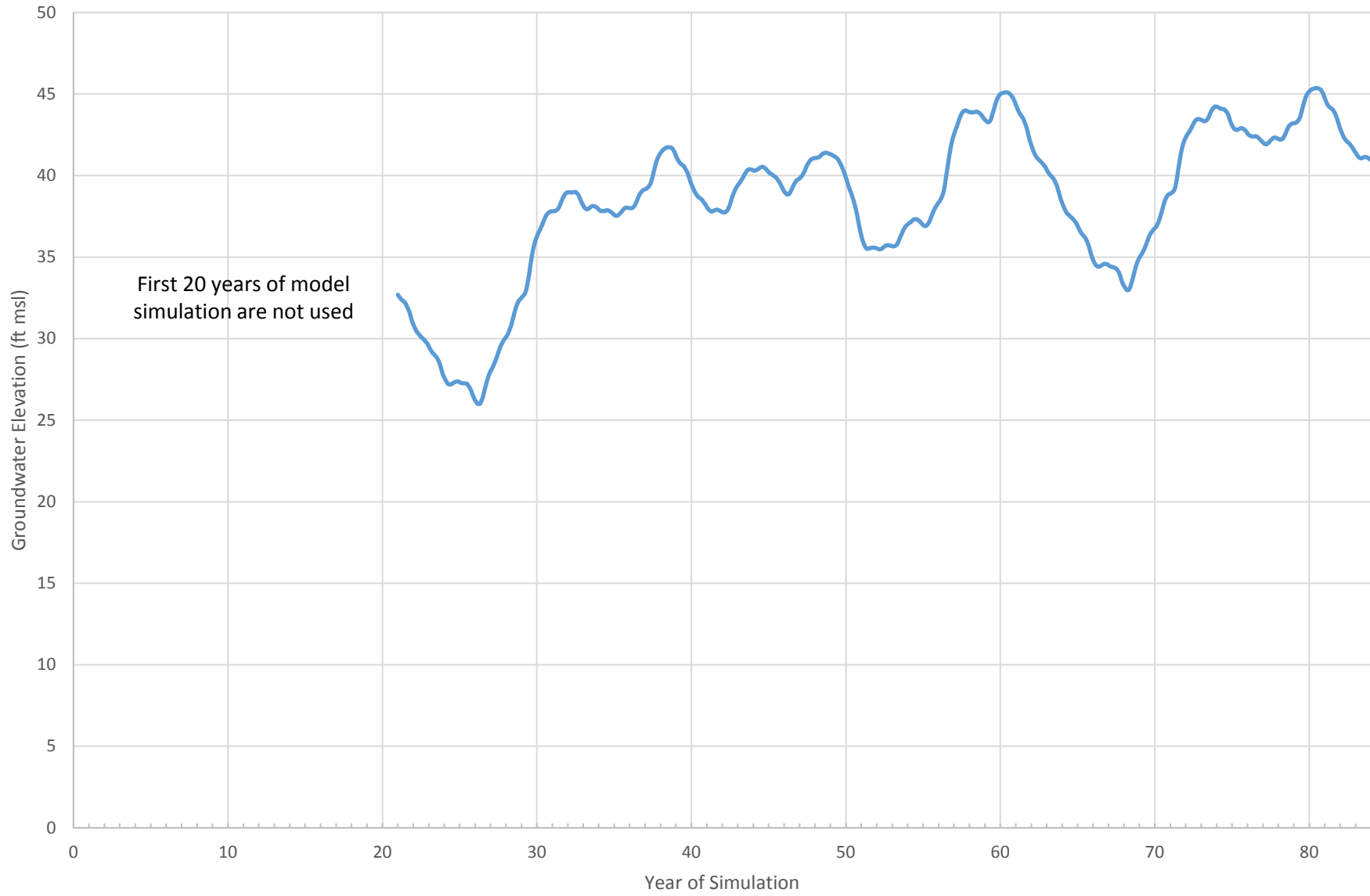
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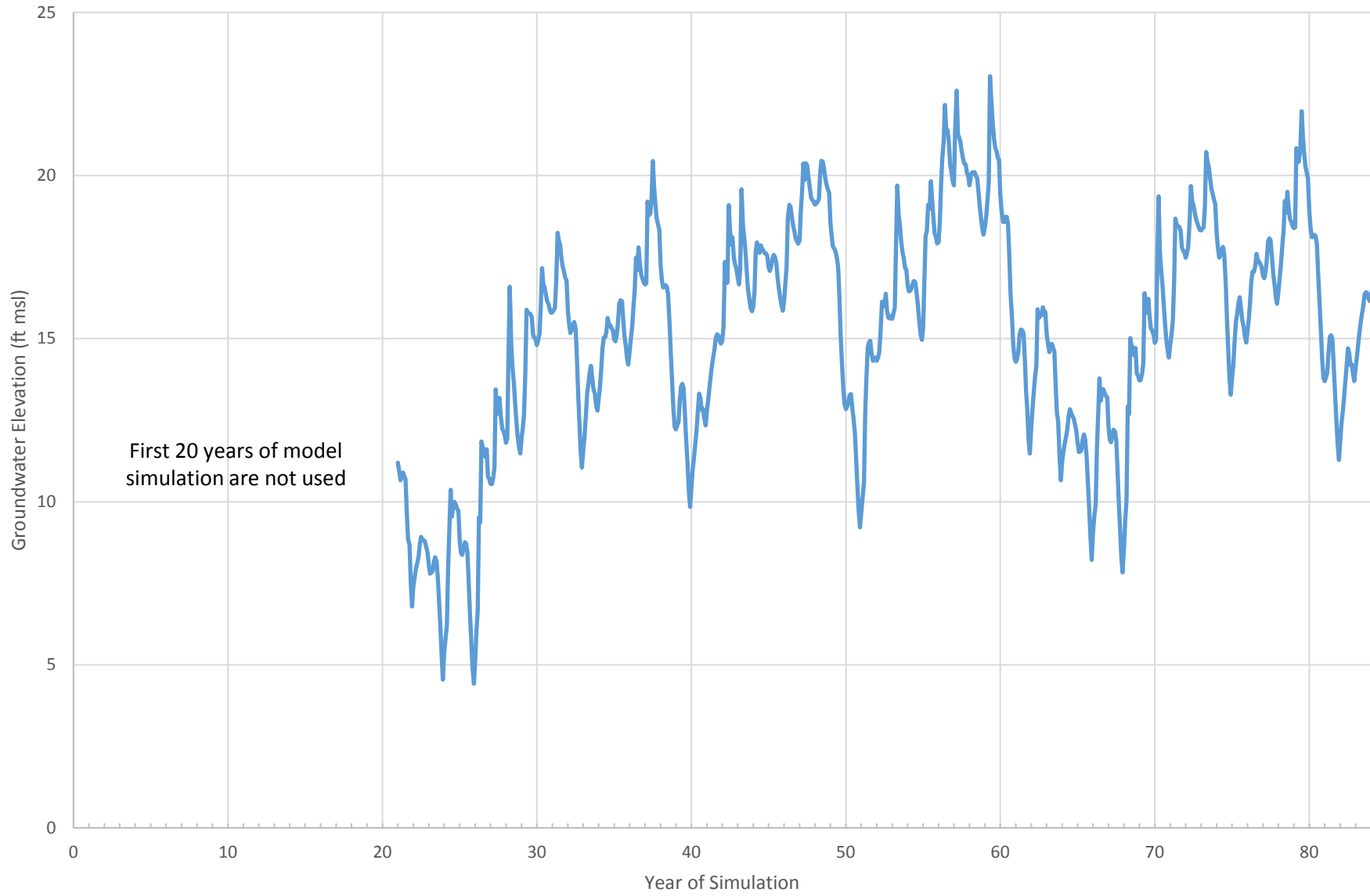
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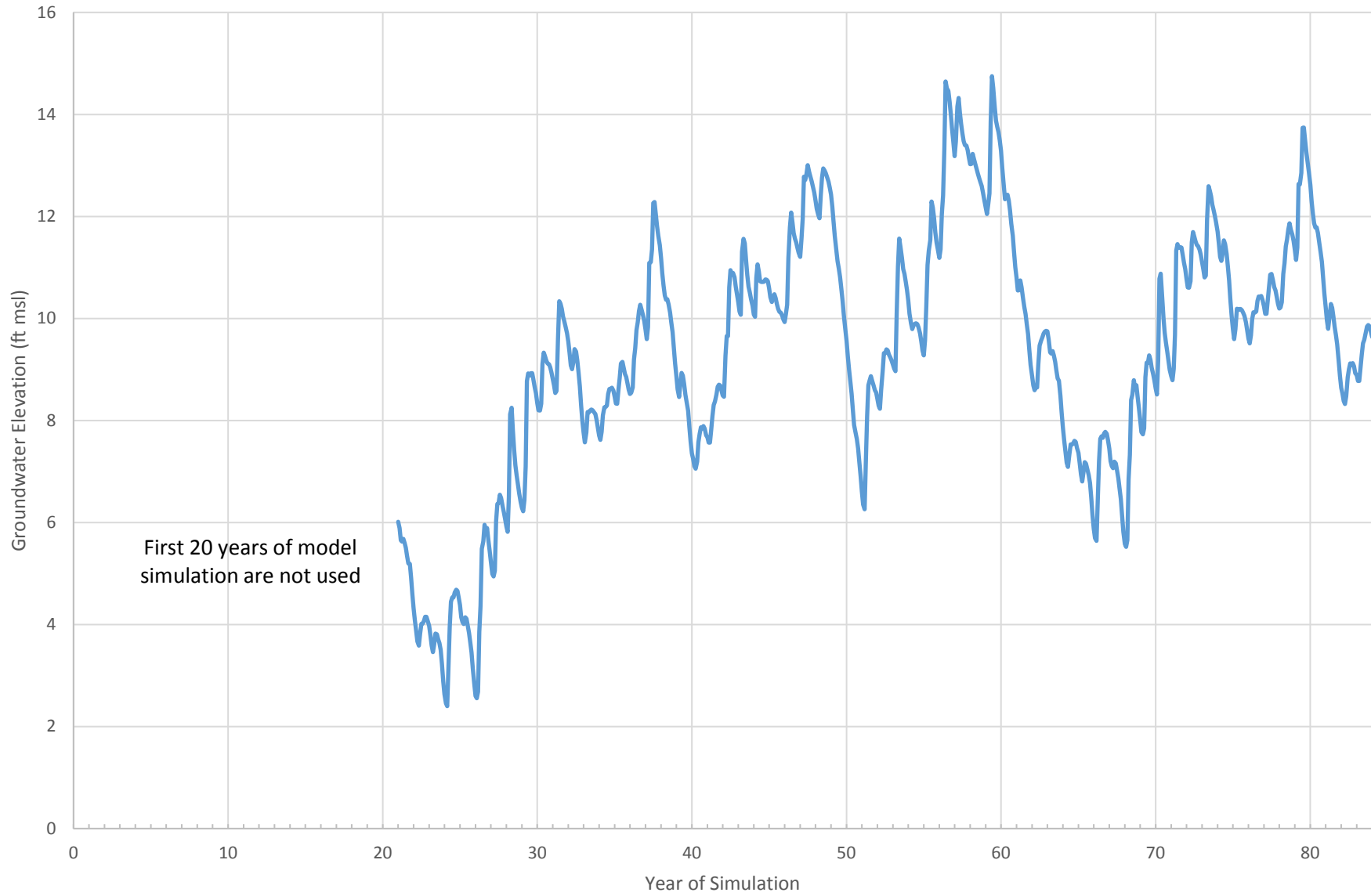
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First 20 years of model simulation are not used

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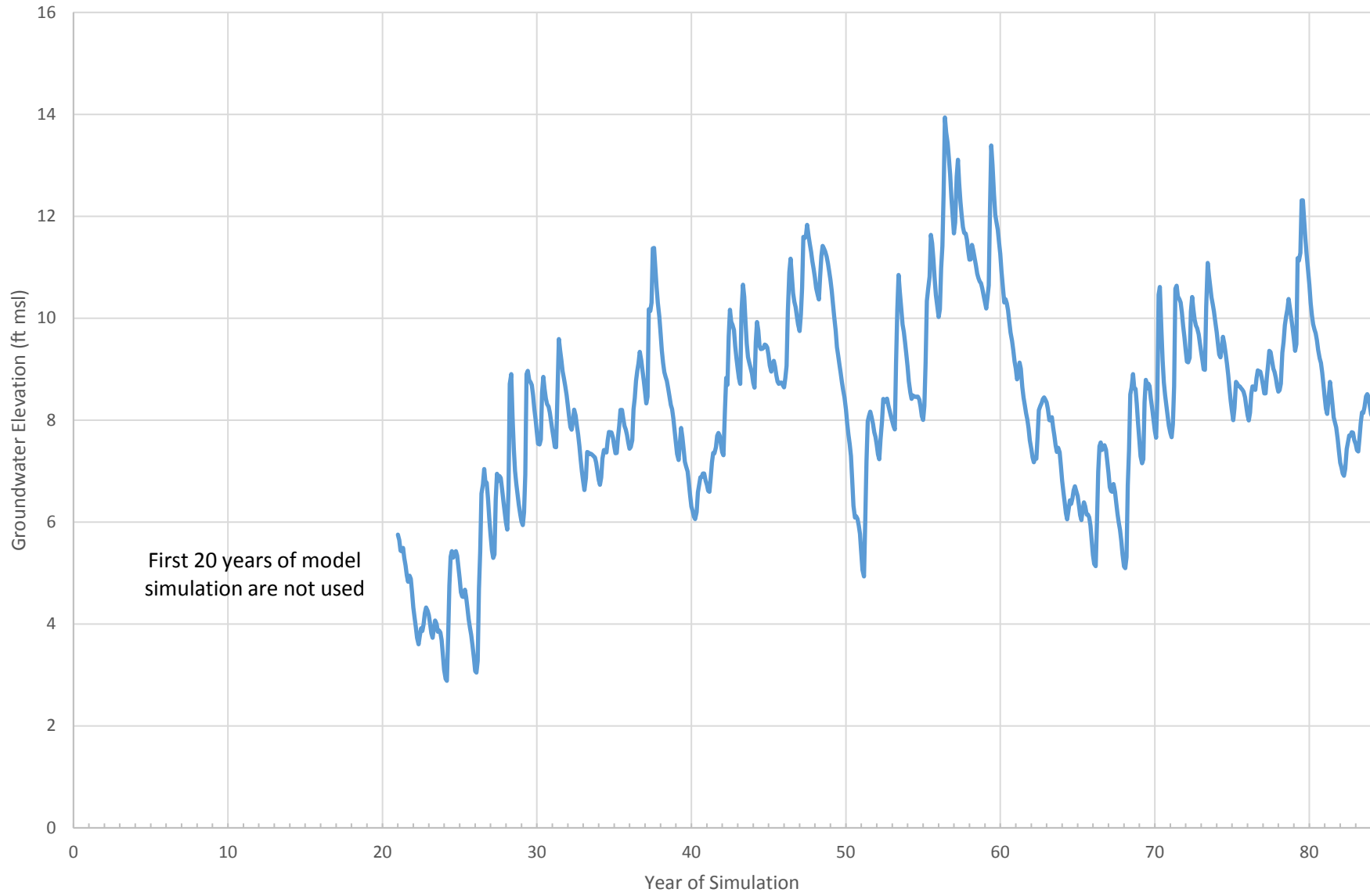
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First 20 years of model simulation are not used

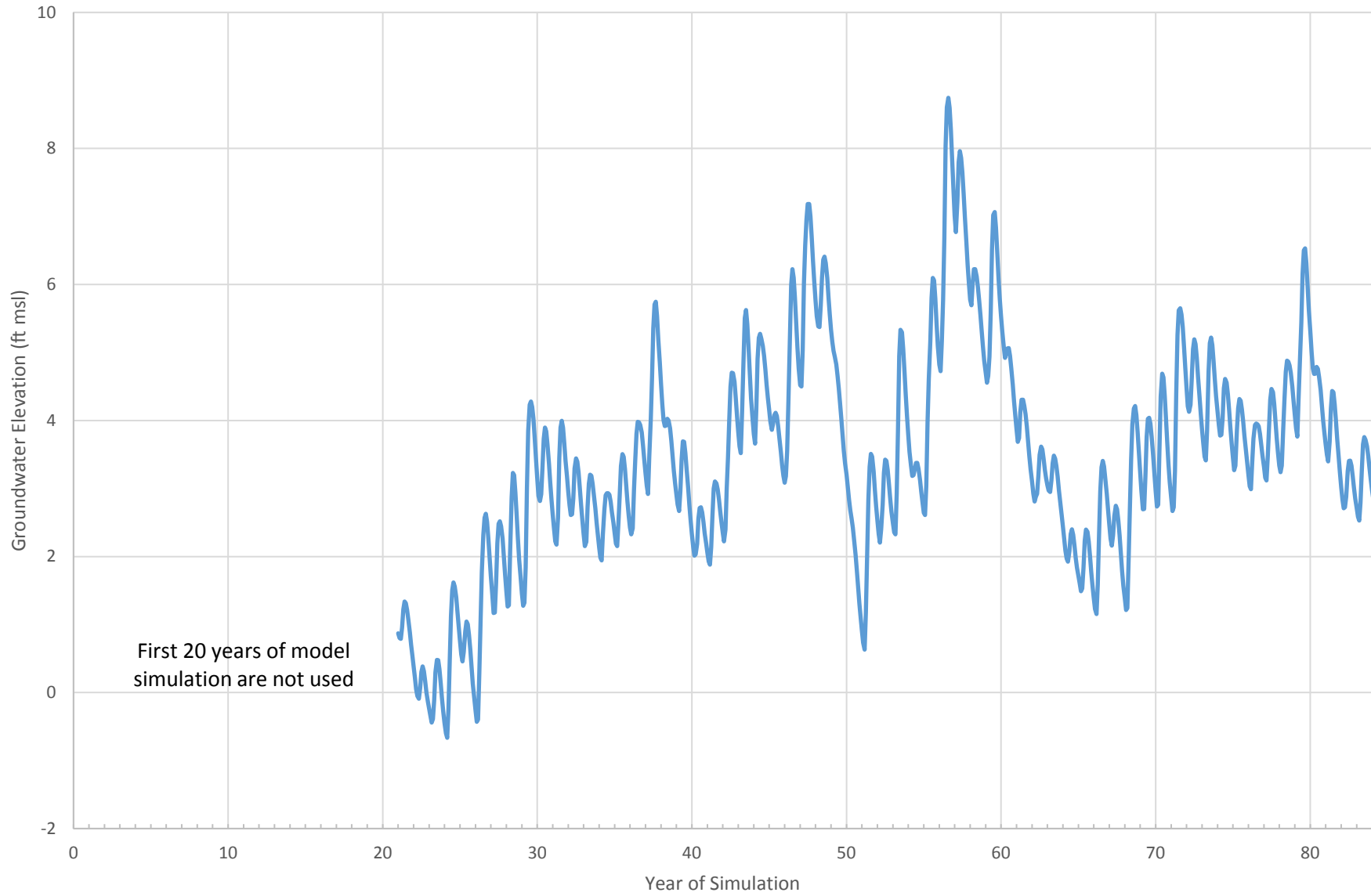
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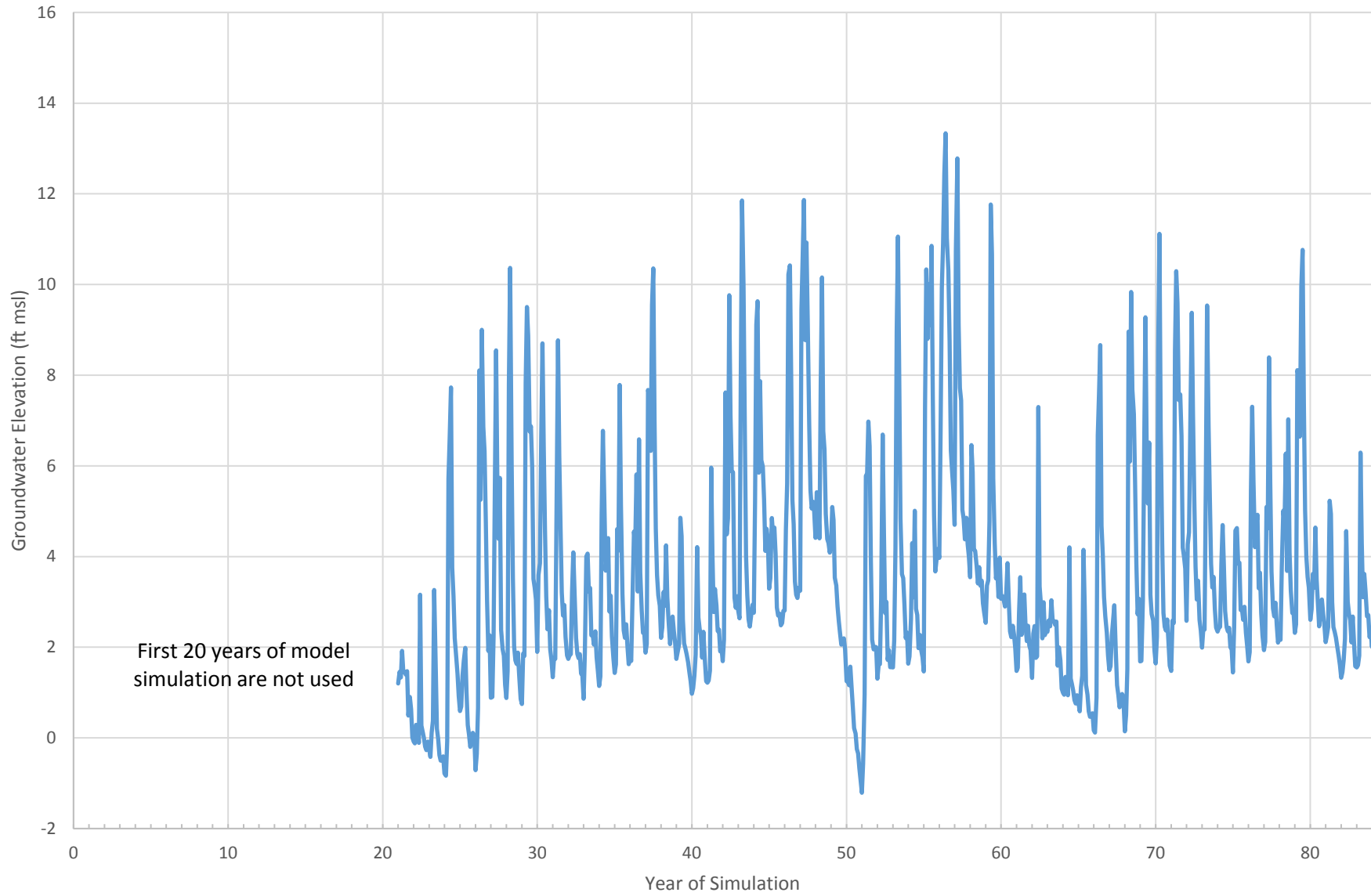
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First 20 years of model simulation are not used

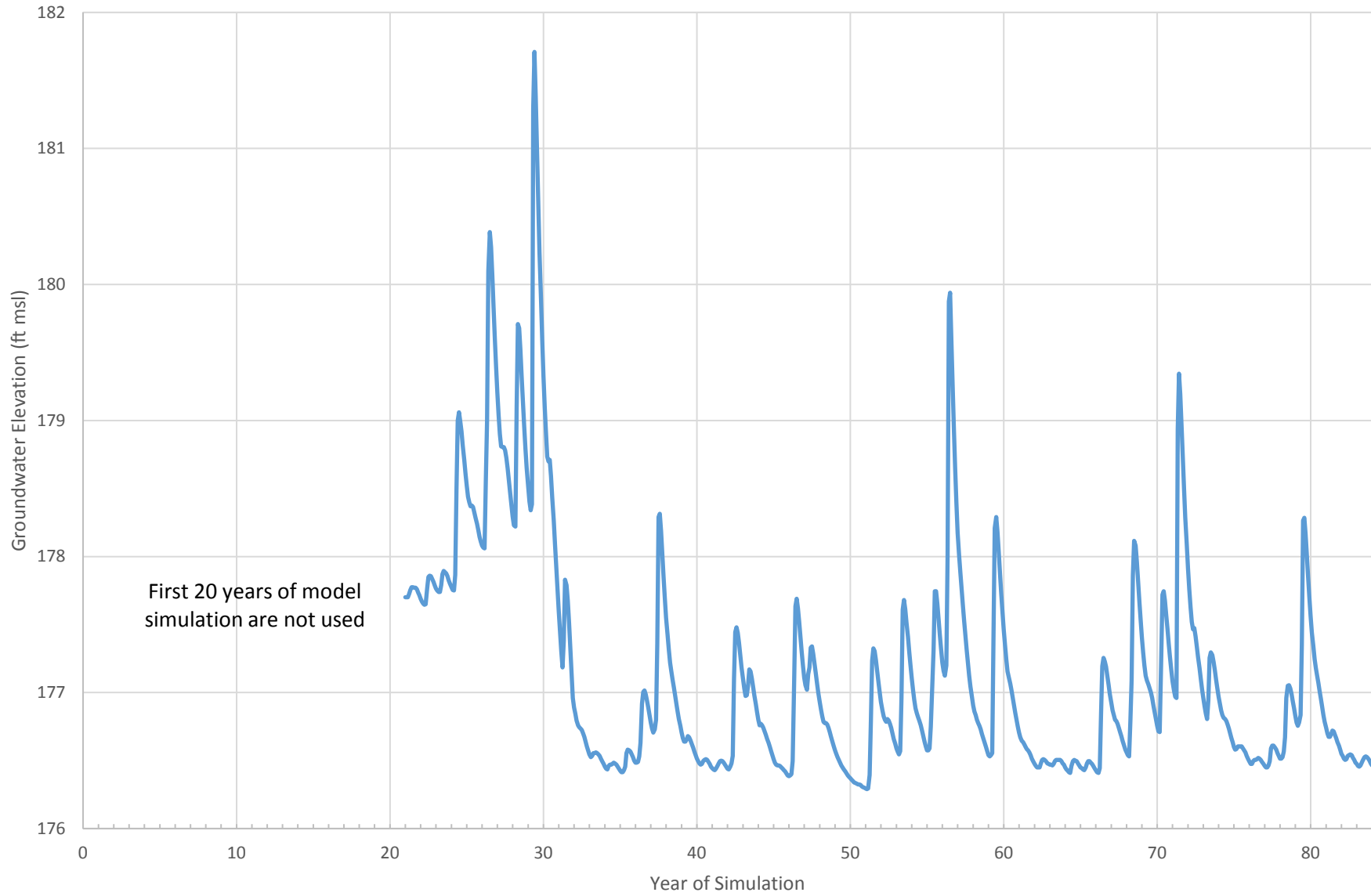
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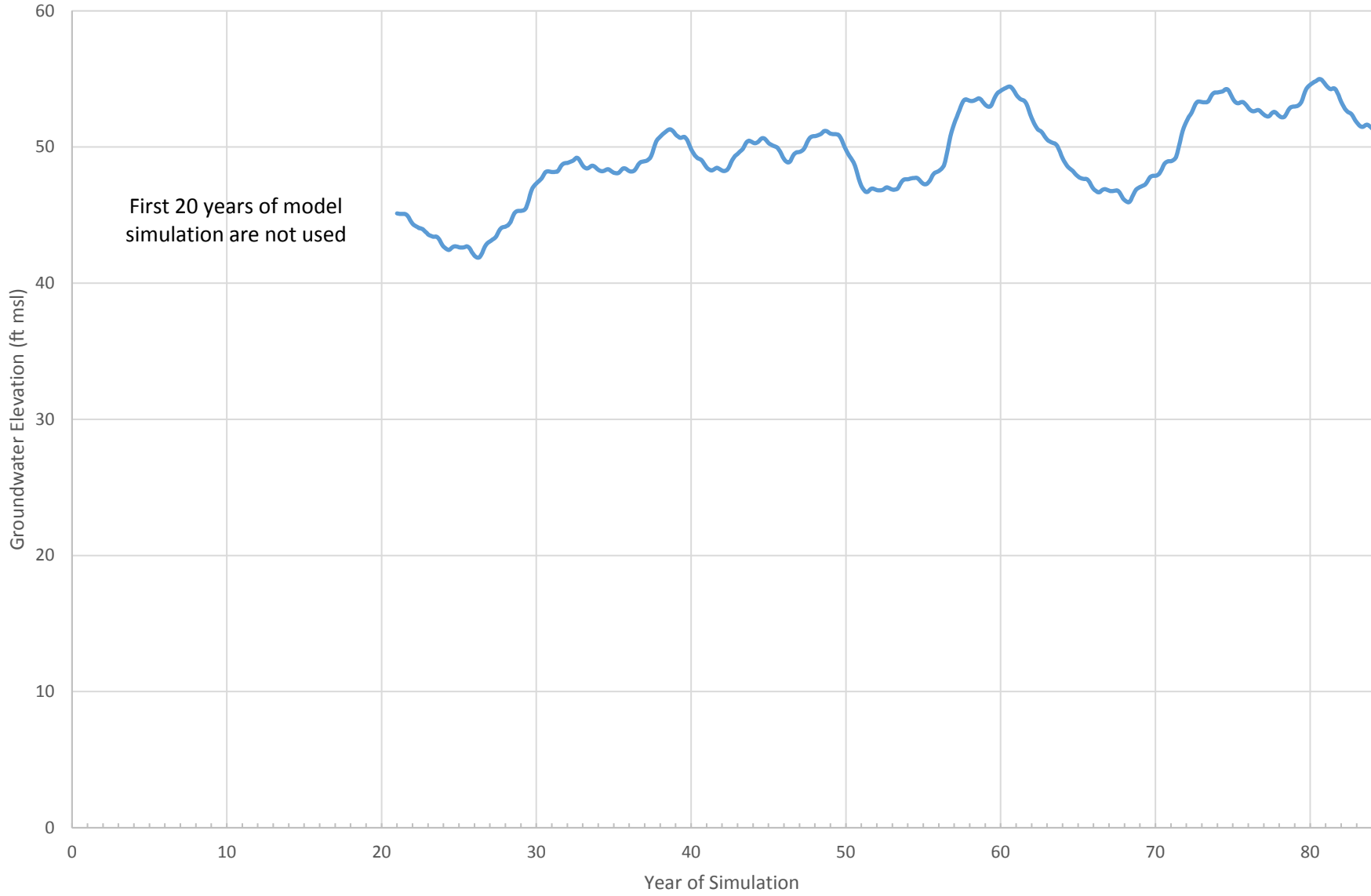
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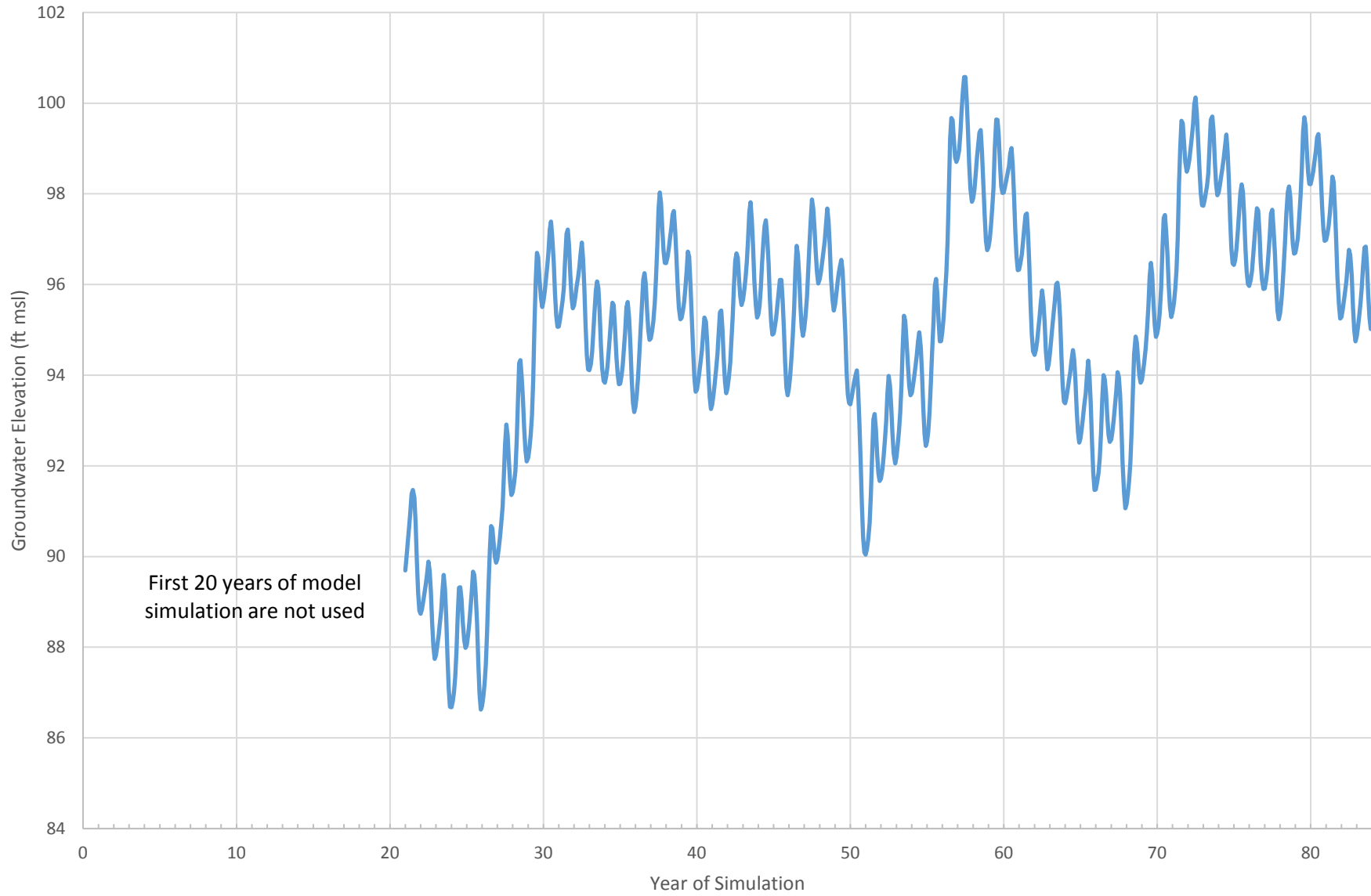
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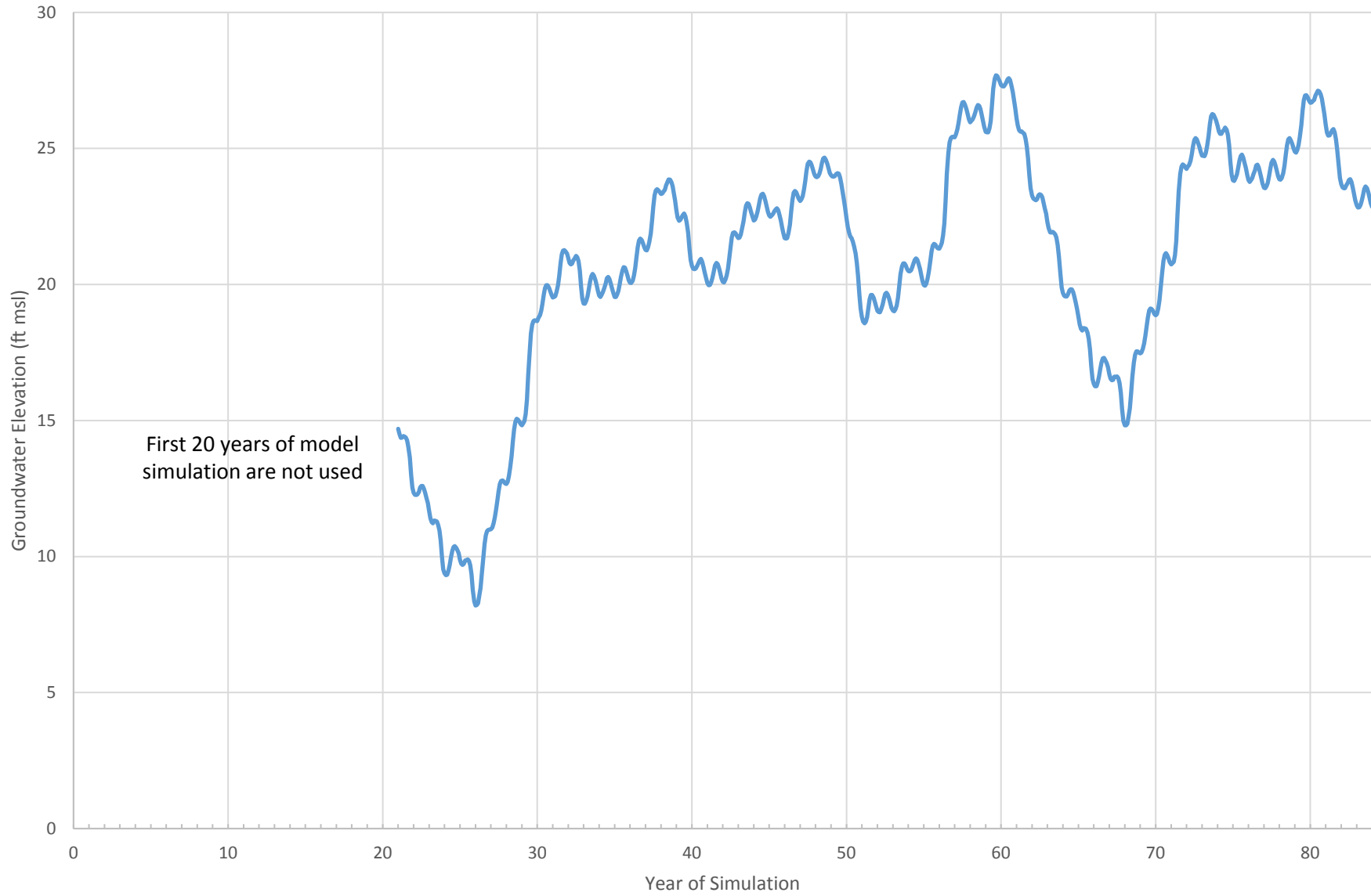
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First 20 years of model simulation are not used

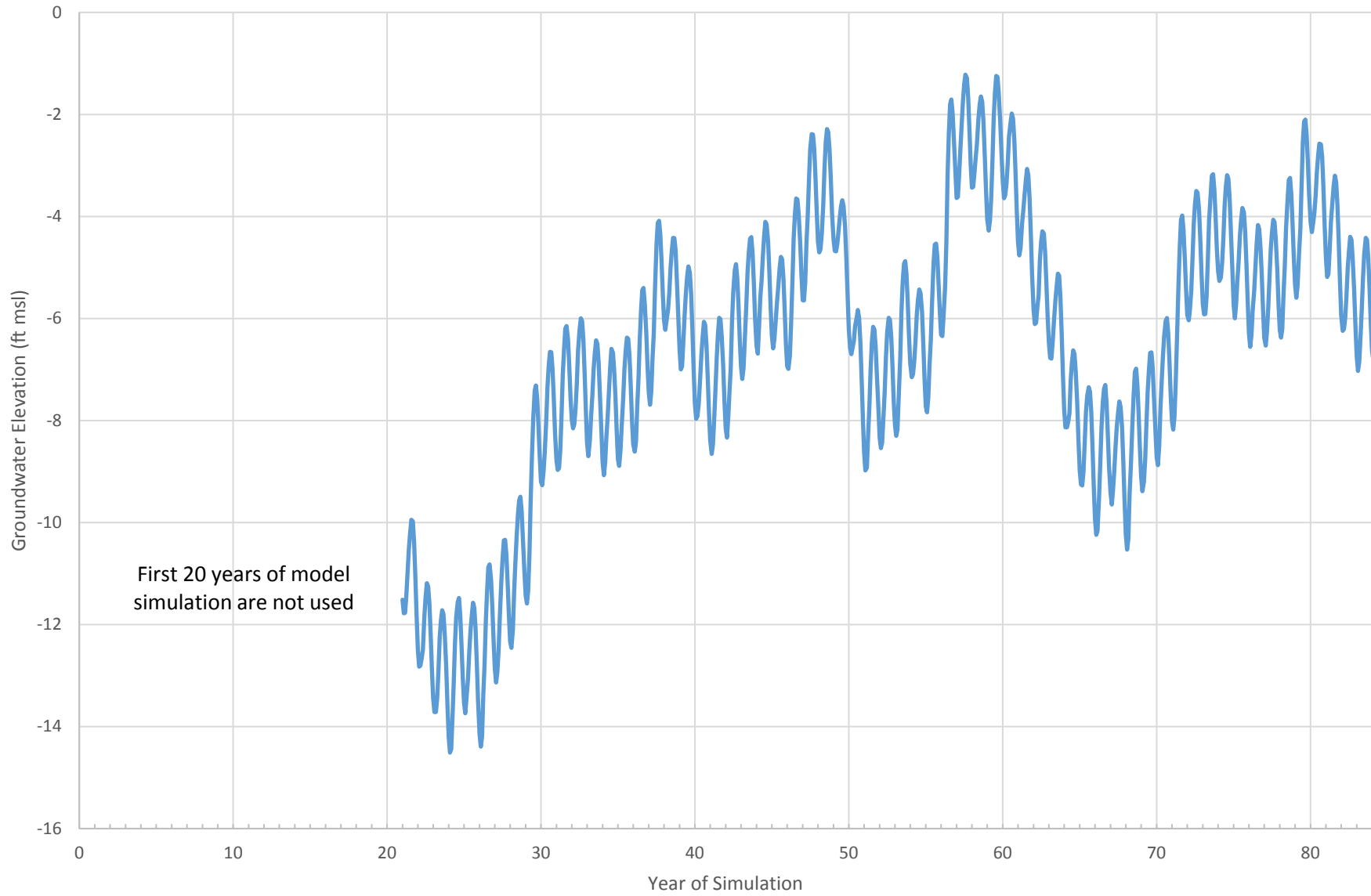
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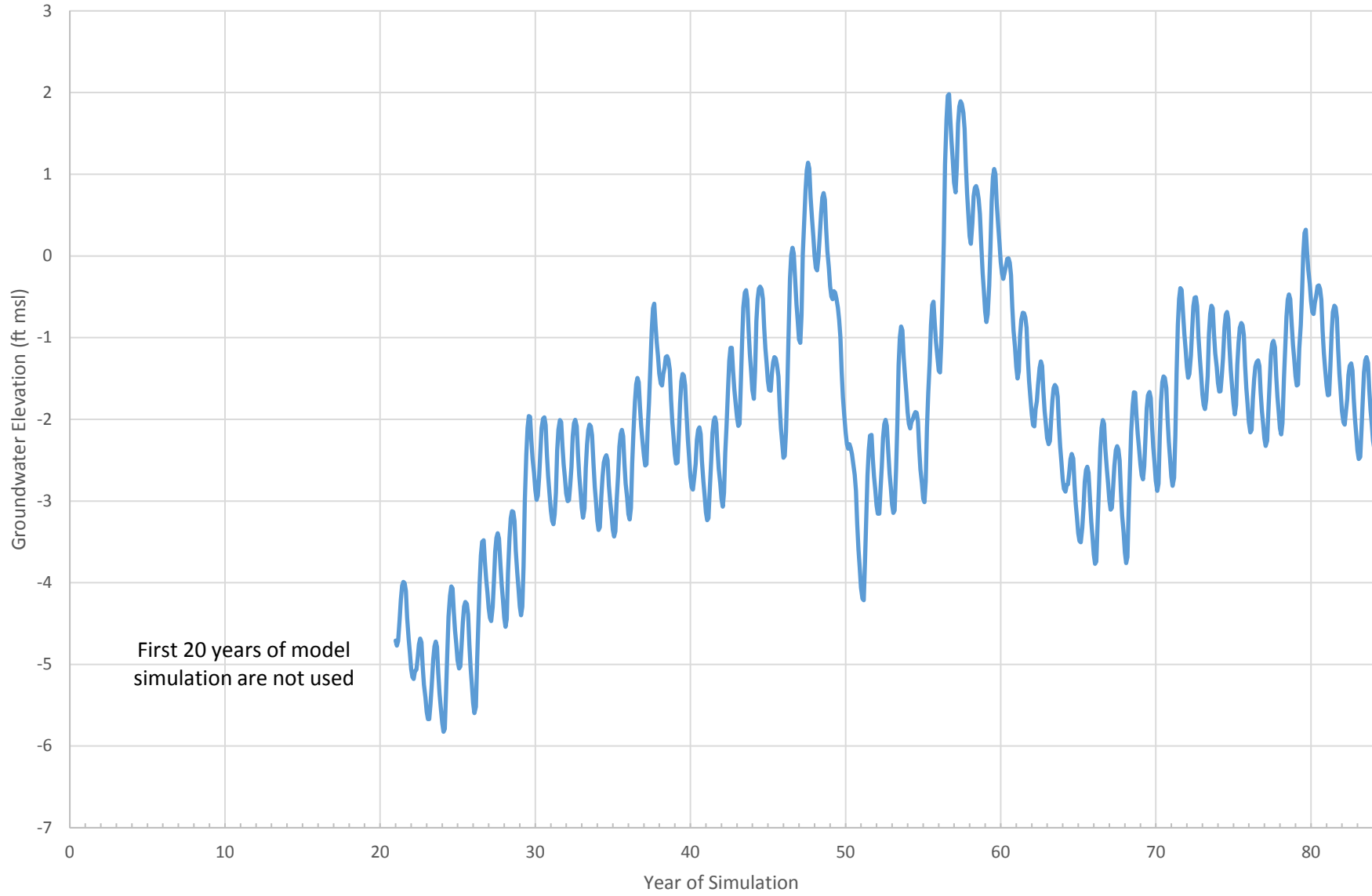
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— Future Conditions Baseline Simulation



# Polygon 157

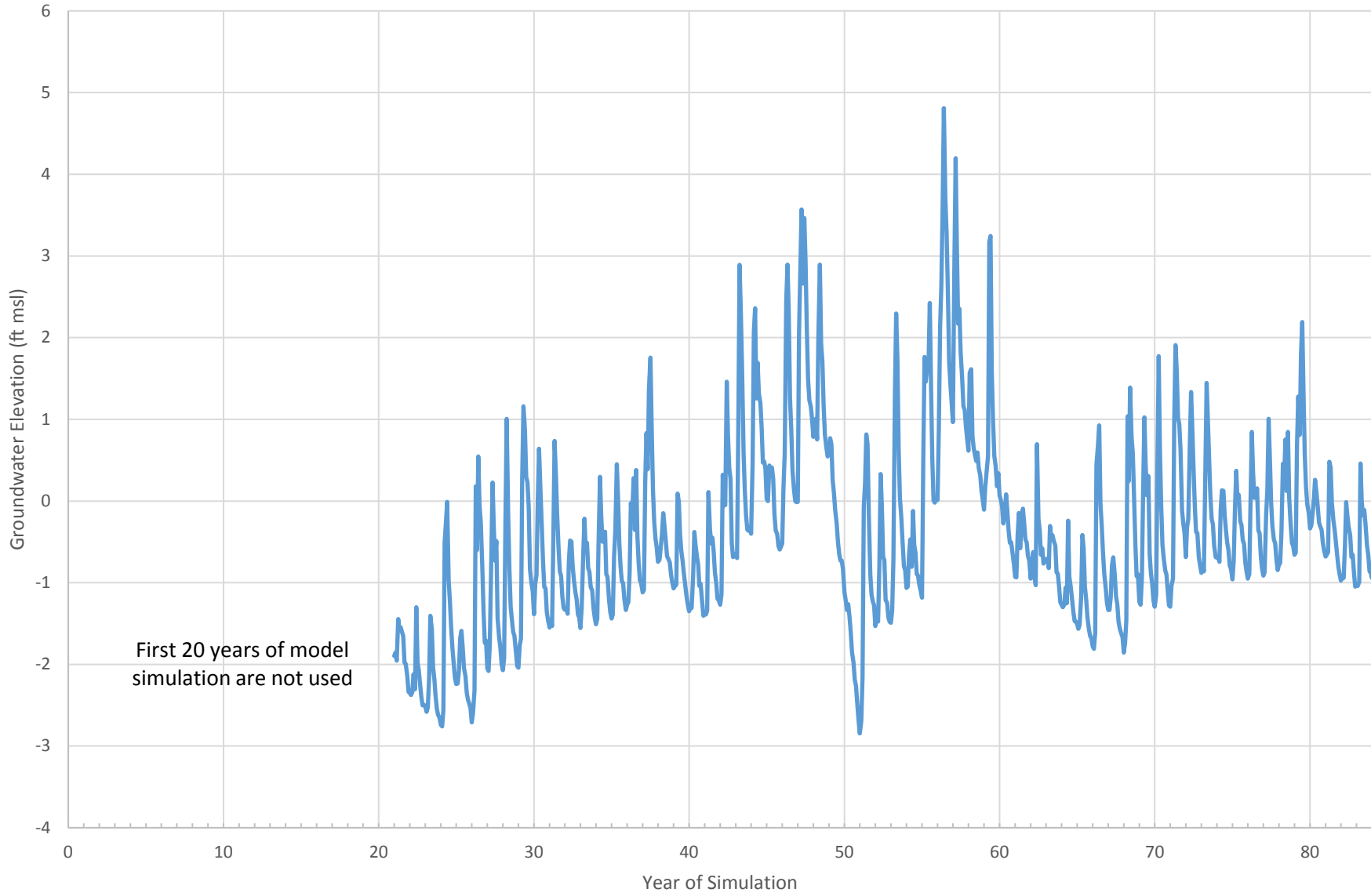
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 158

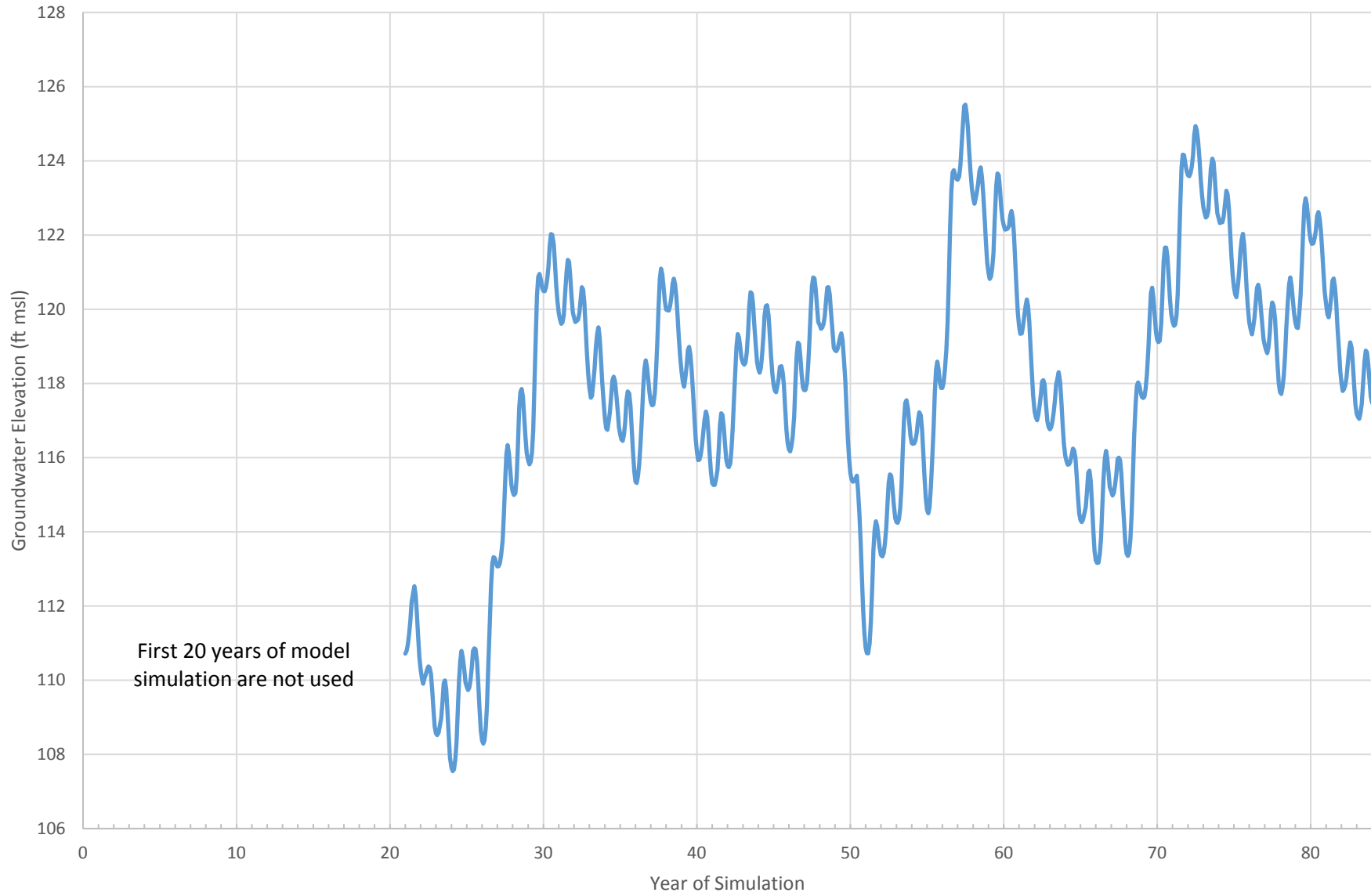
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

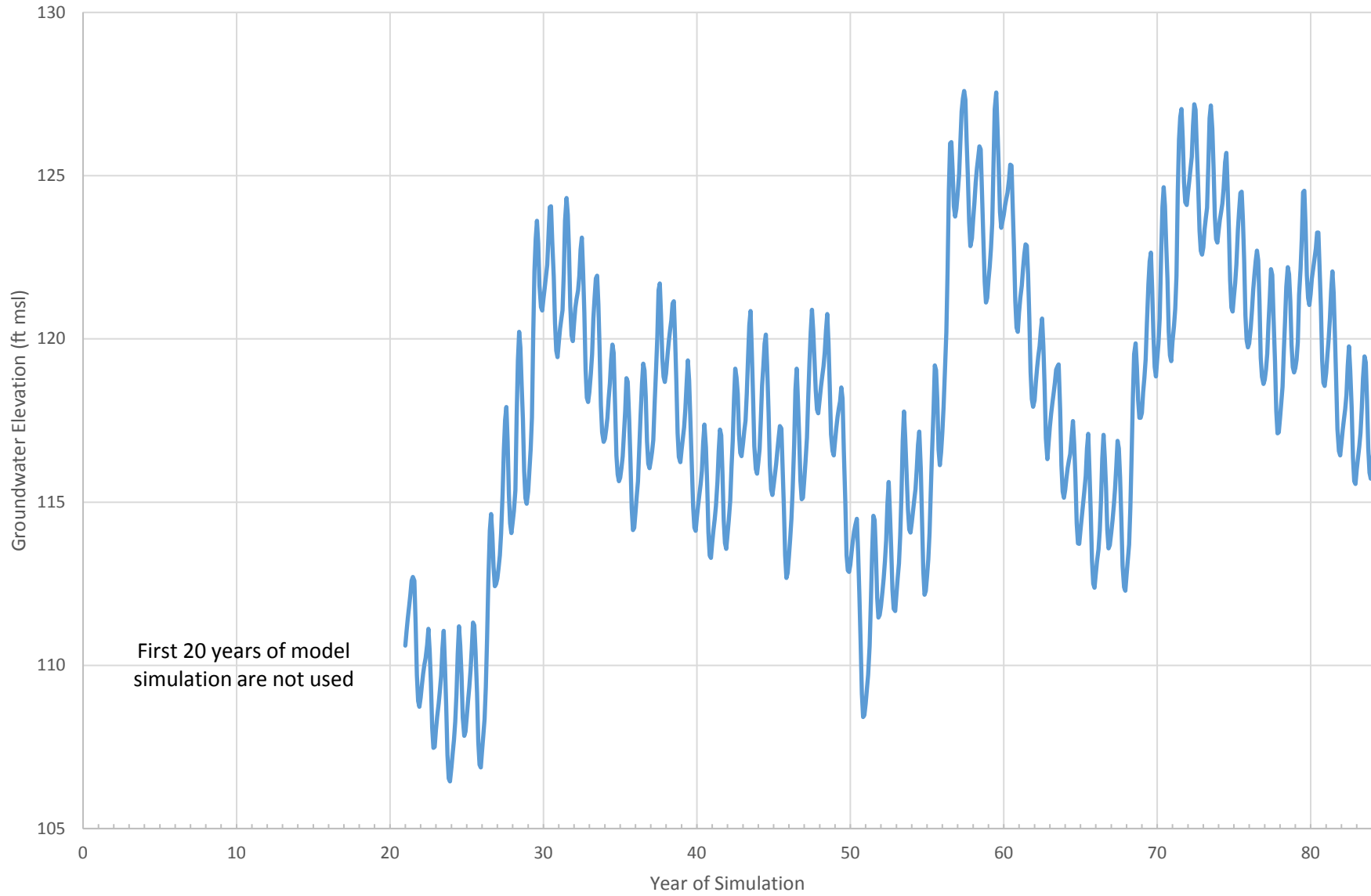
# Polygon 165

— Future Conditions Baseline Simulation



# Polygon 166

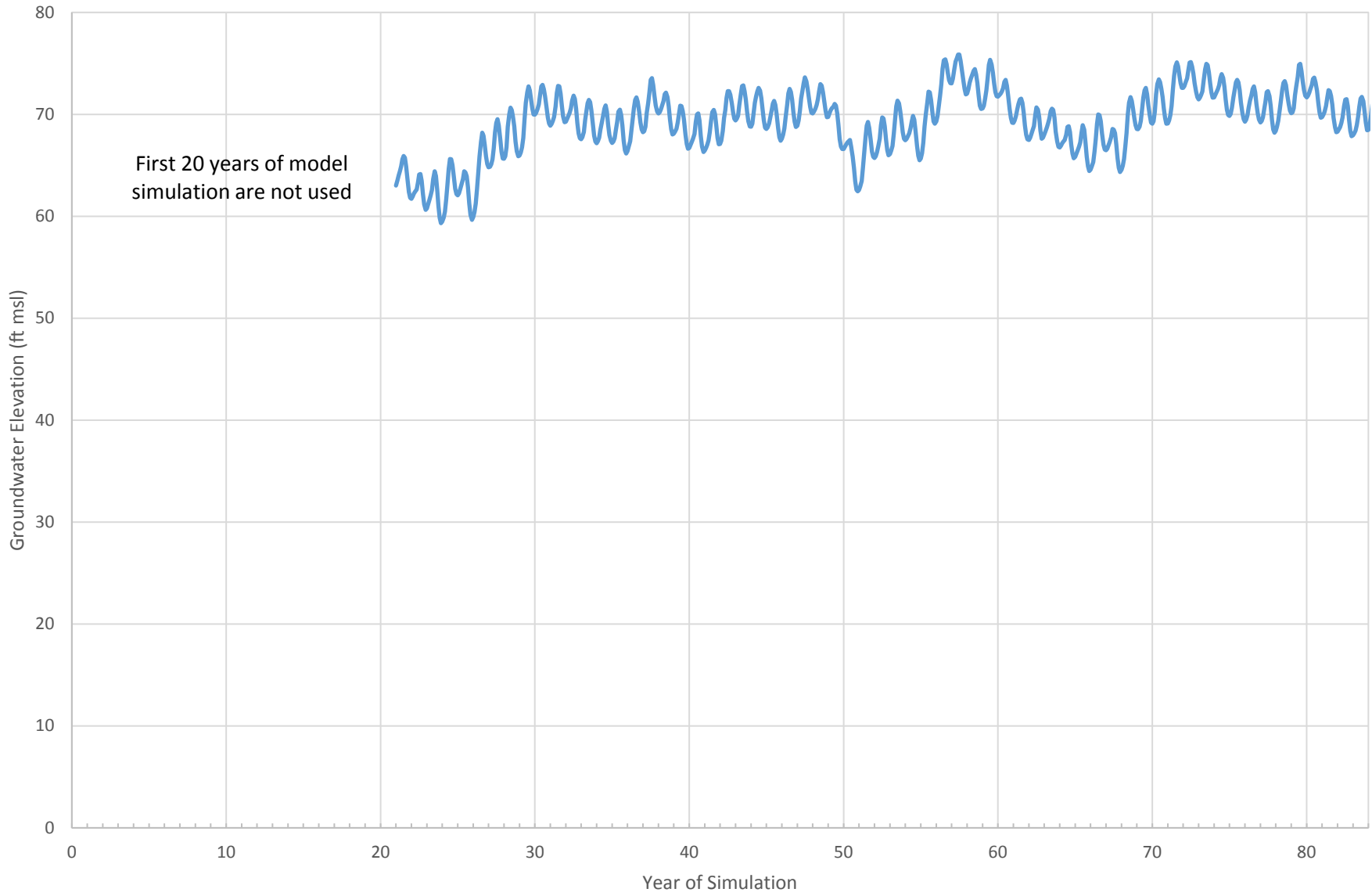
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 168

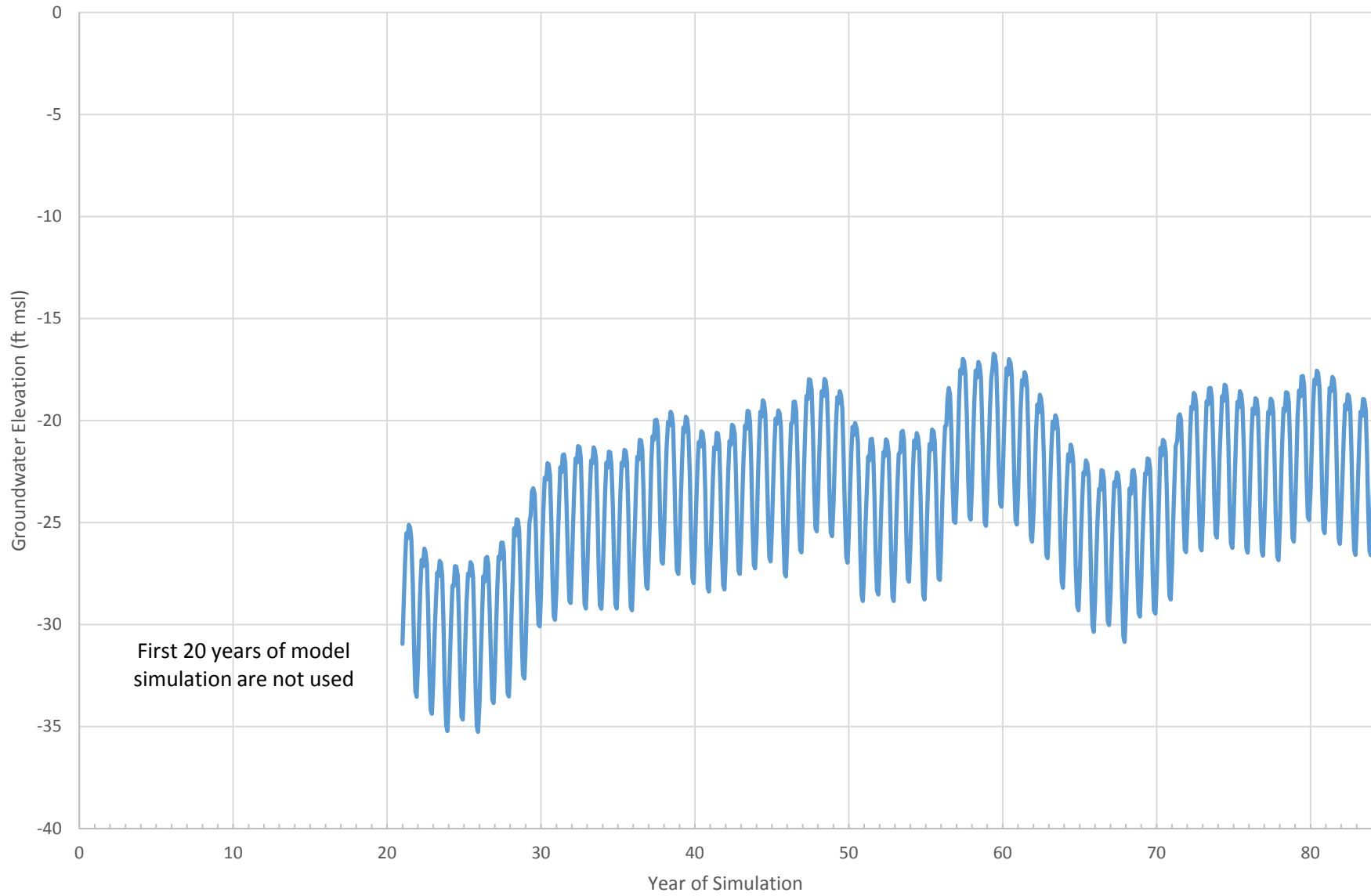
— Future Conditions Baseline Simulation





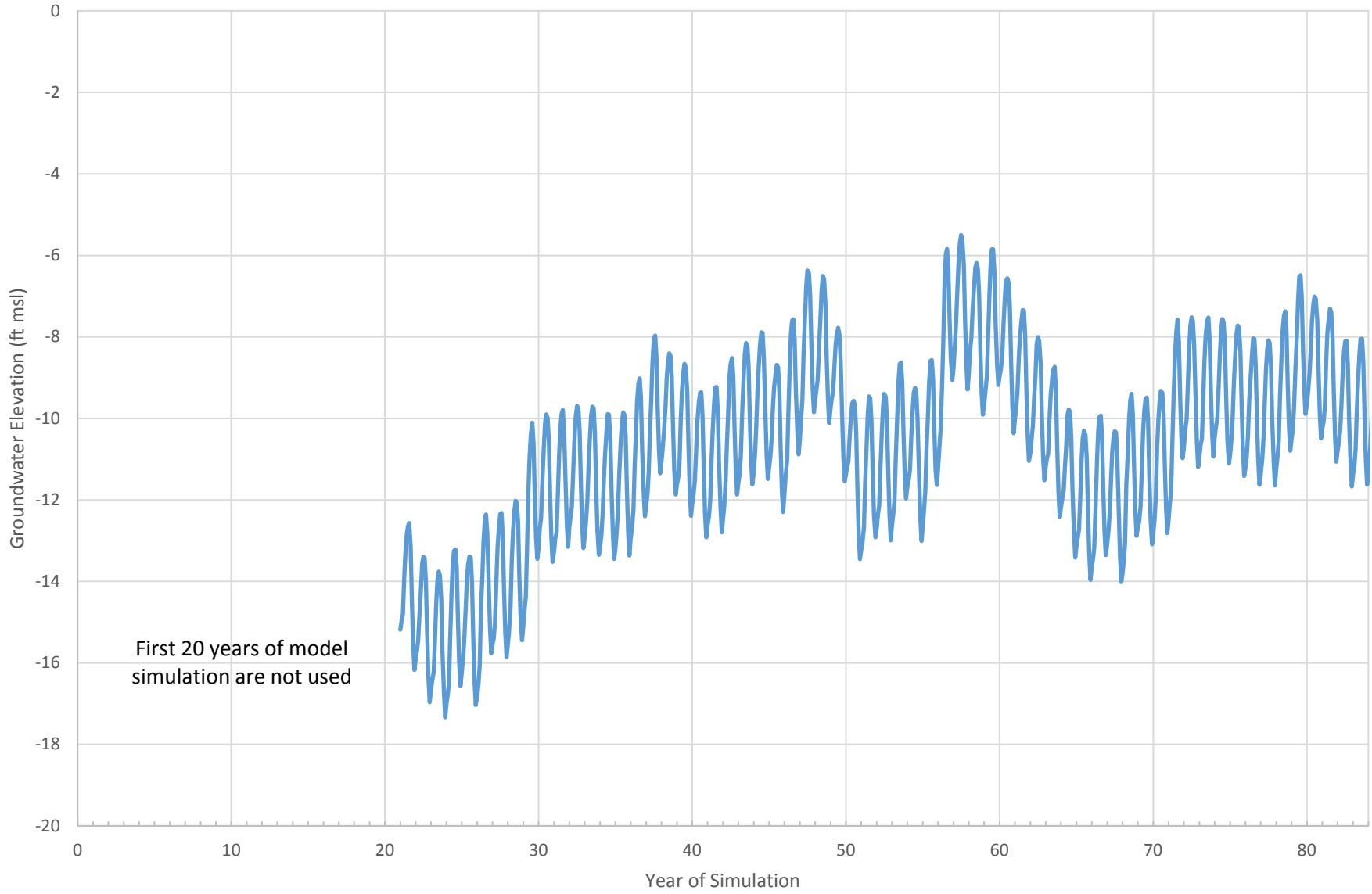
# Polygon 173

— Future Conditions Baseline Simulation



# Polygon 174

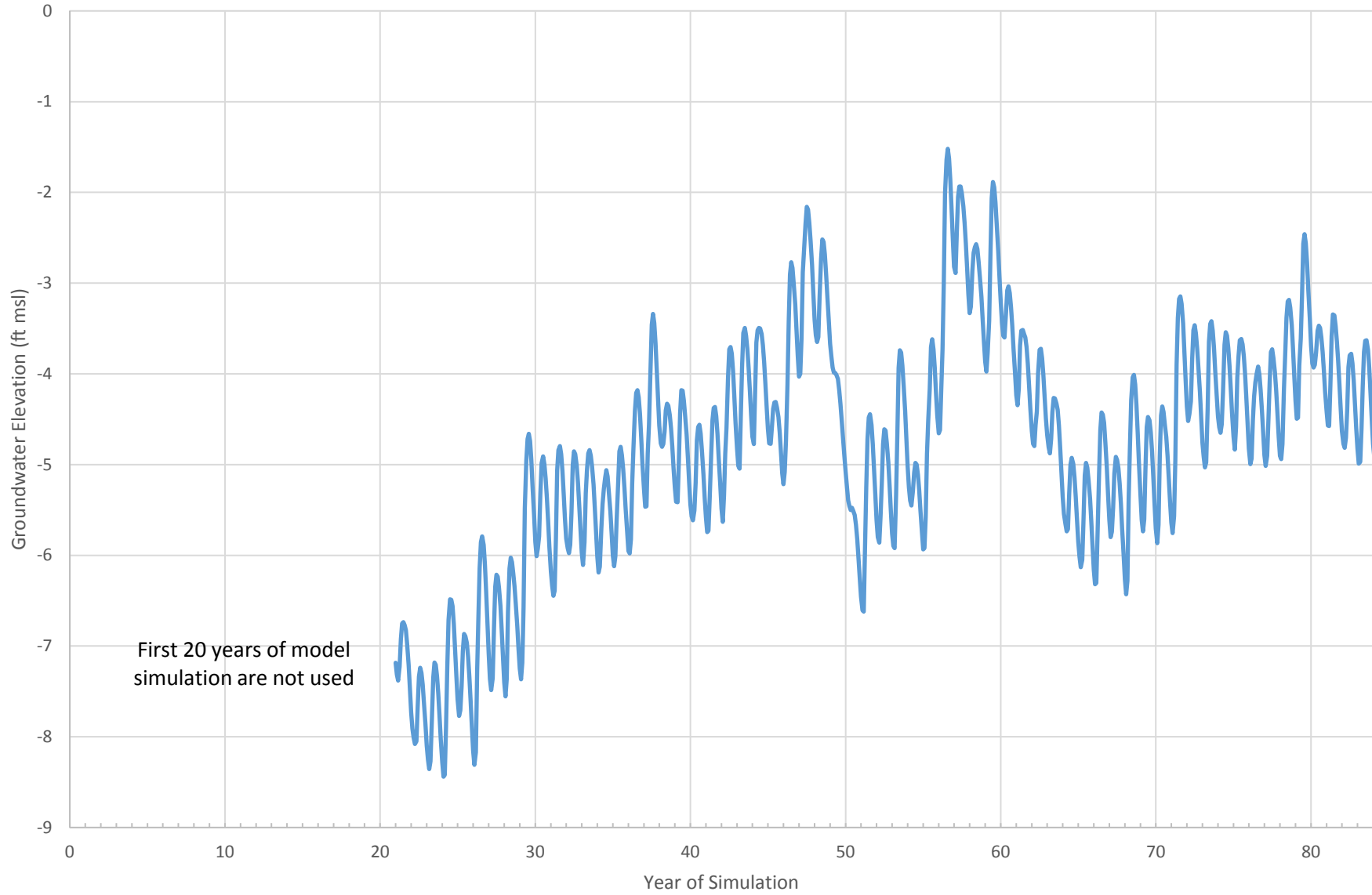
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 175

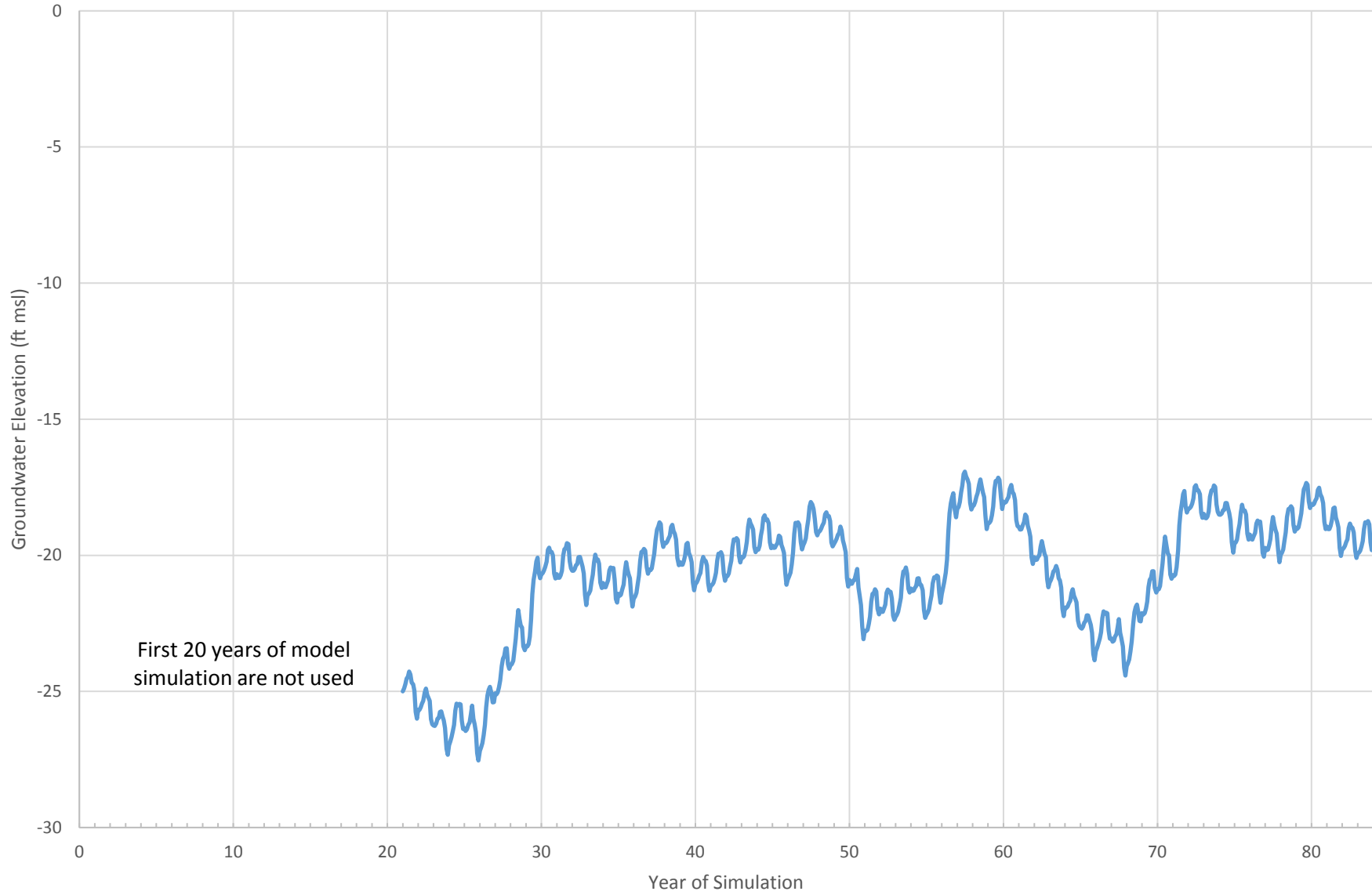
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

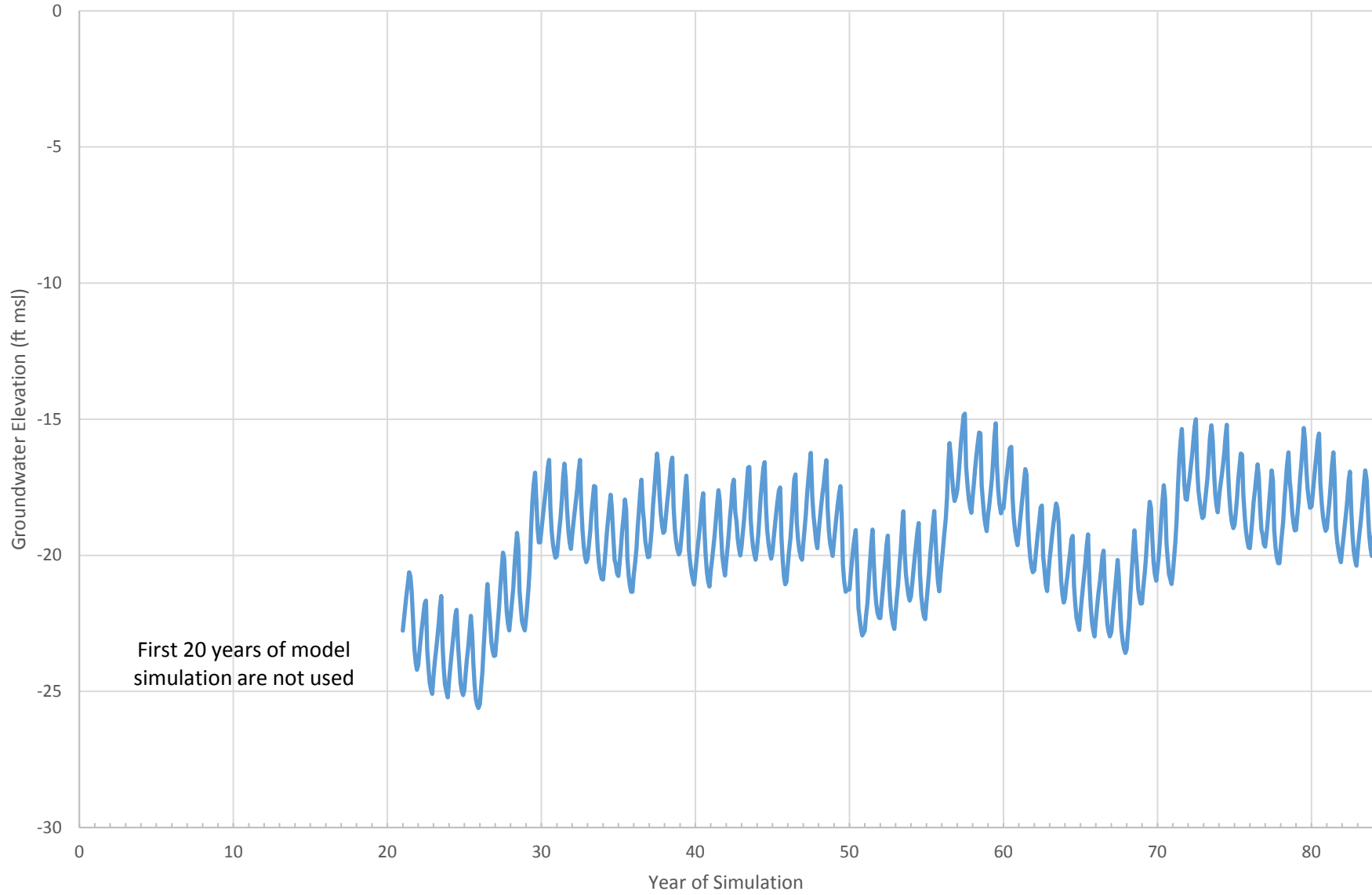
# Polygon 182

— Future Conditions Baseline Simulation



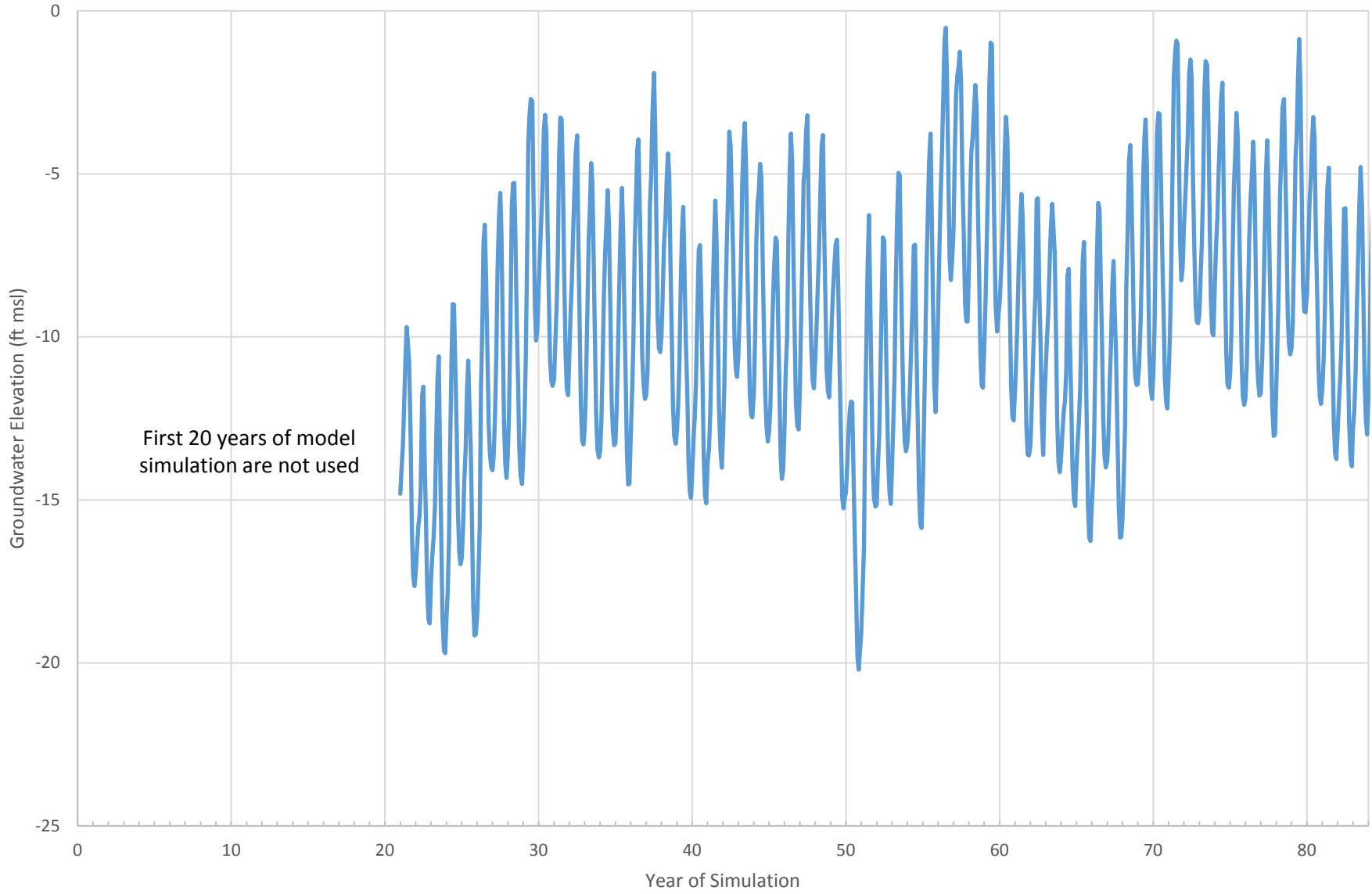
# Polygon 186

Future Conditions Baseline Simulation



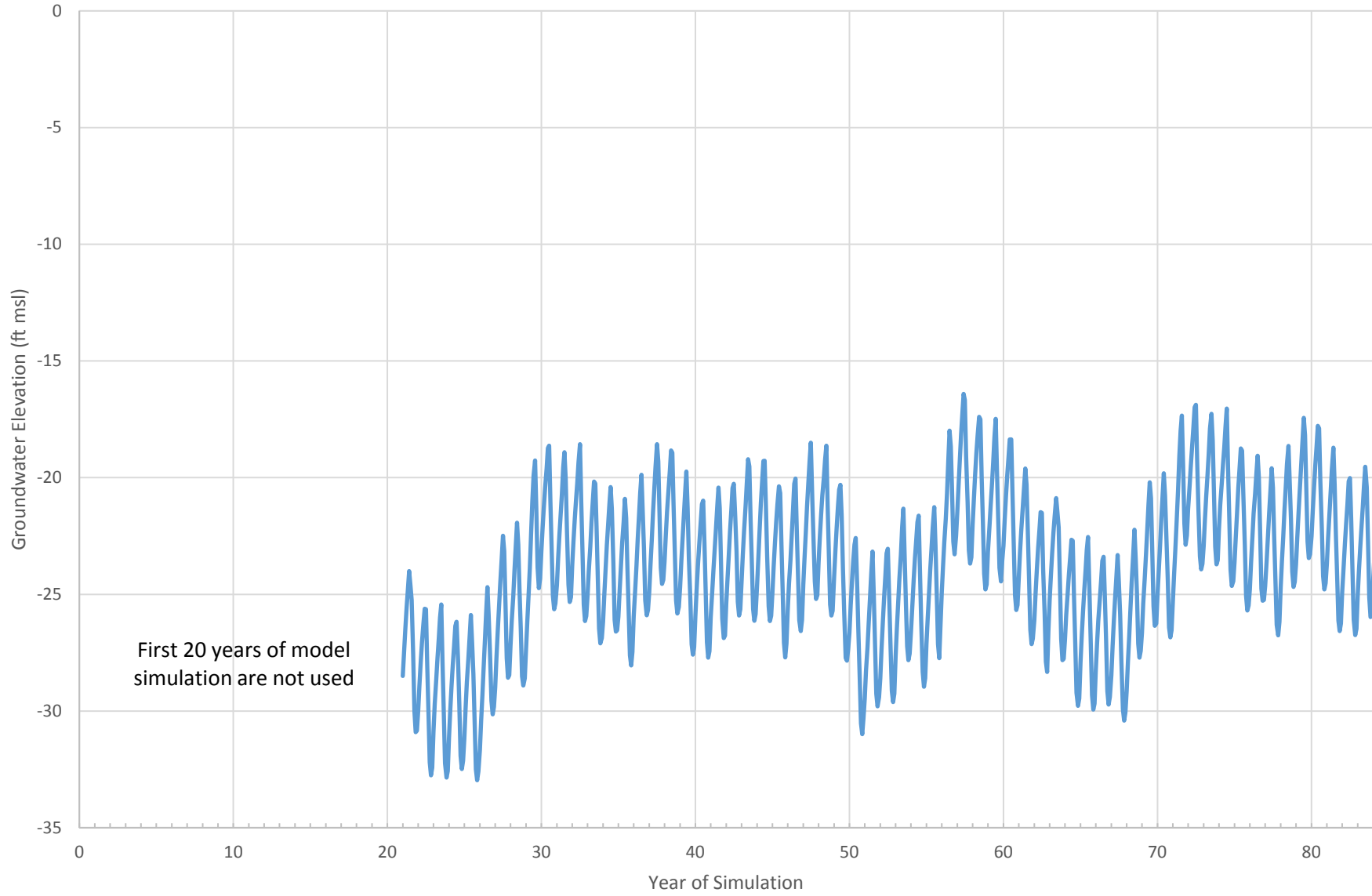
# Polygon 190

— Future Conditions Baseline Simulation



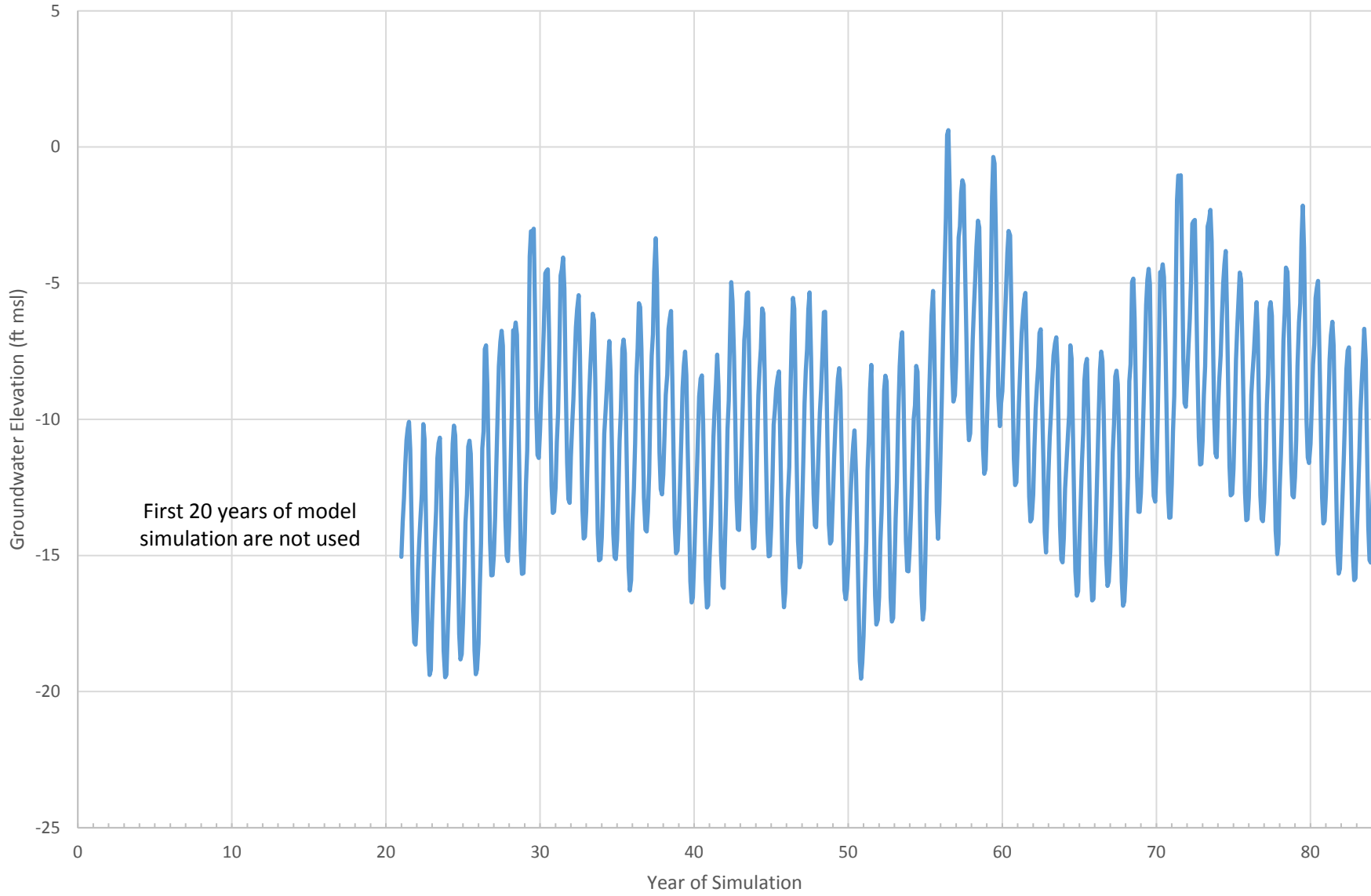
# Polygon 194

— Future Conditions Baseline Simulation



# Polygon 195

— Future Conditions Baseline Simulation

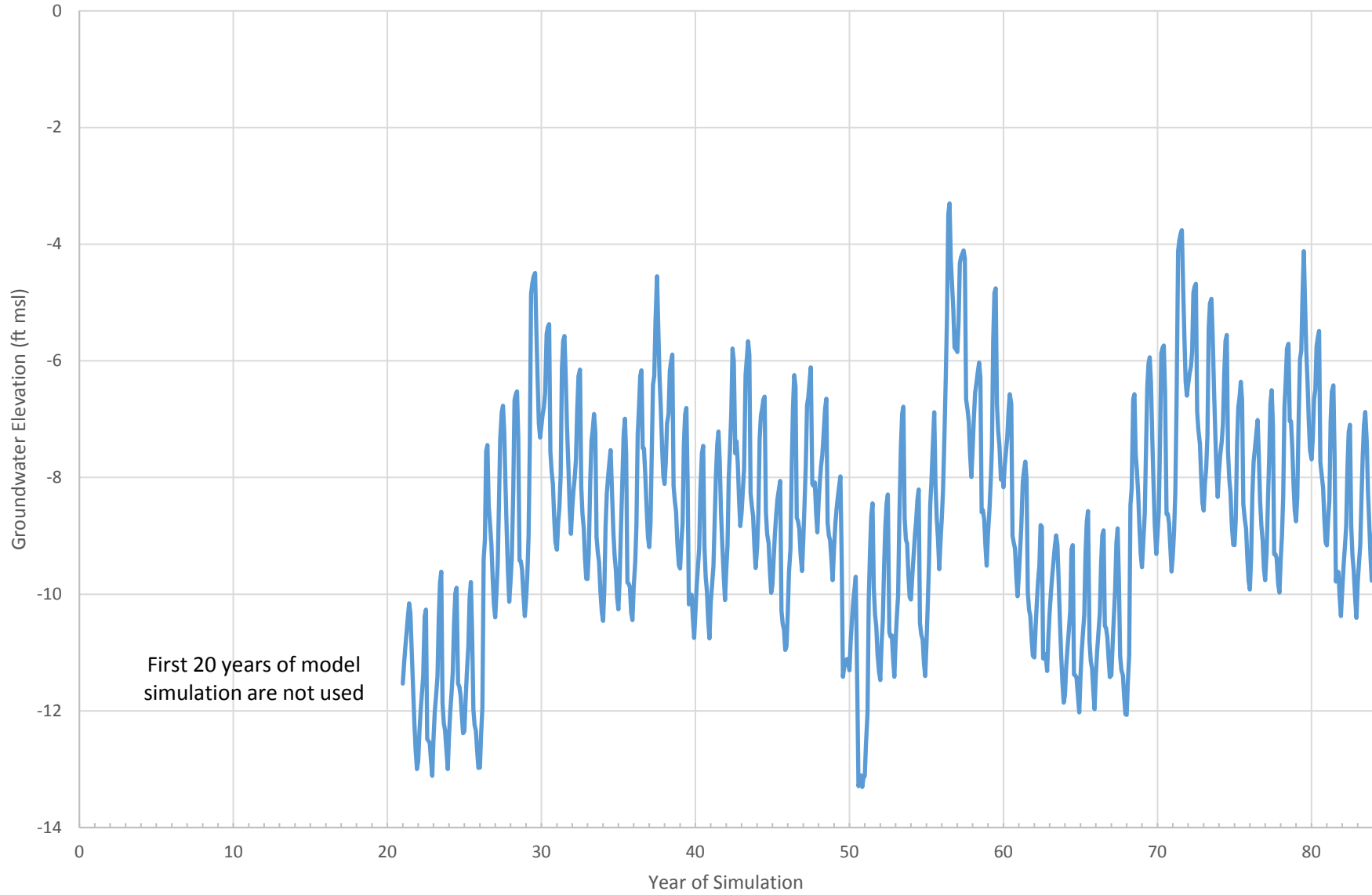


First 20 years of model simulation are not used



# Polygon 196

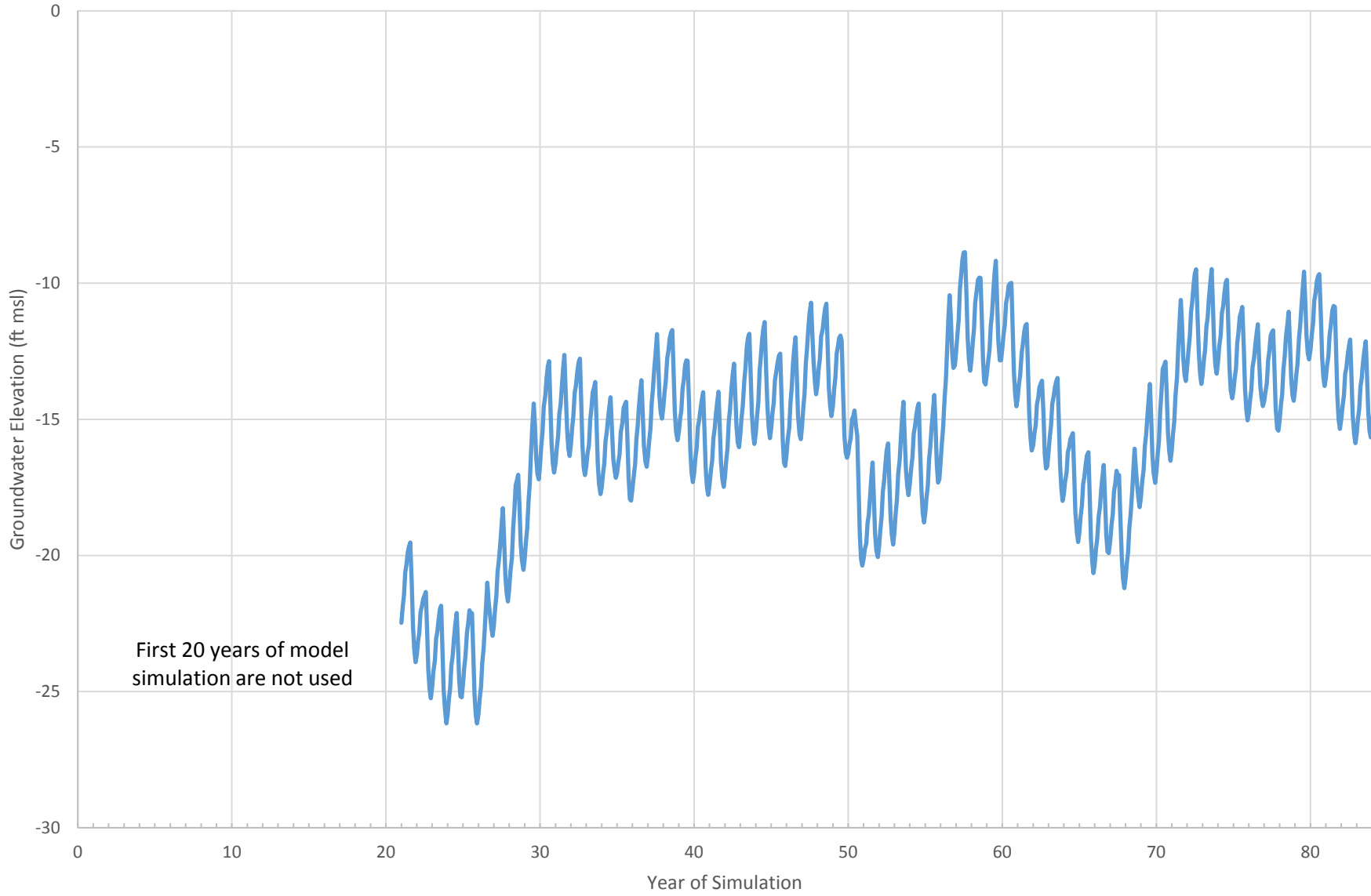
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 197

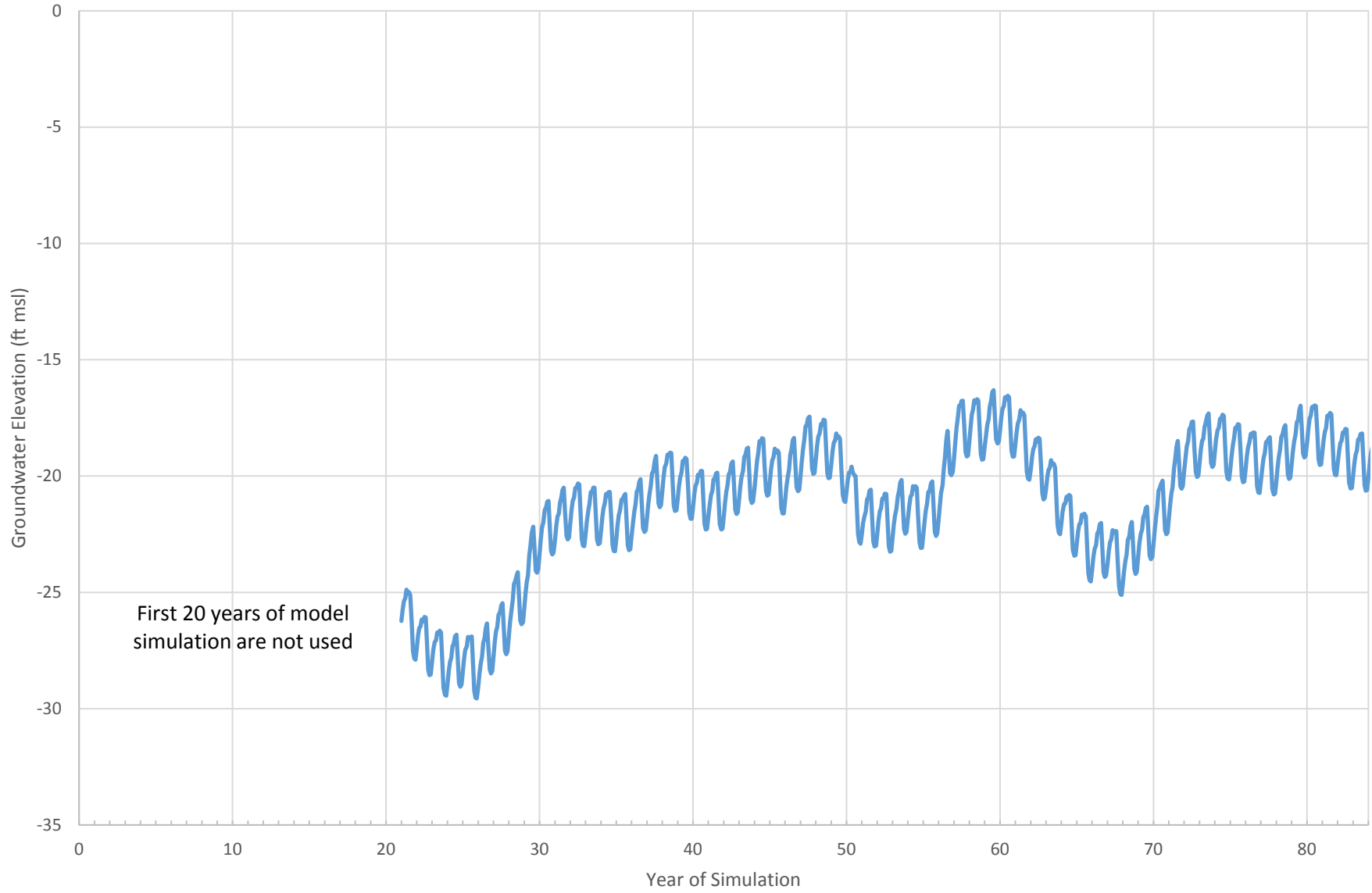
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

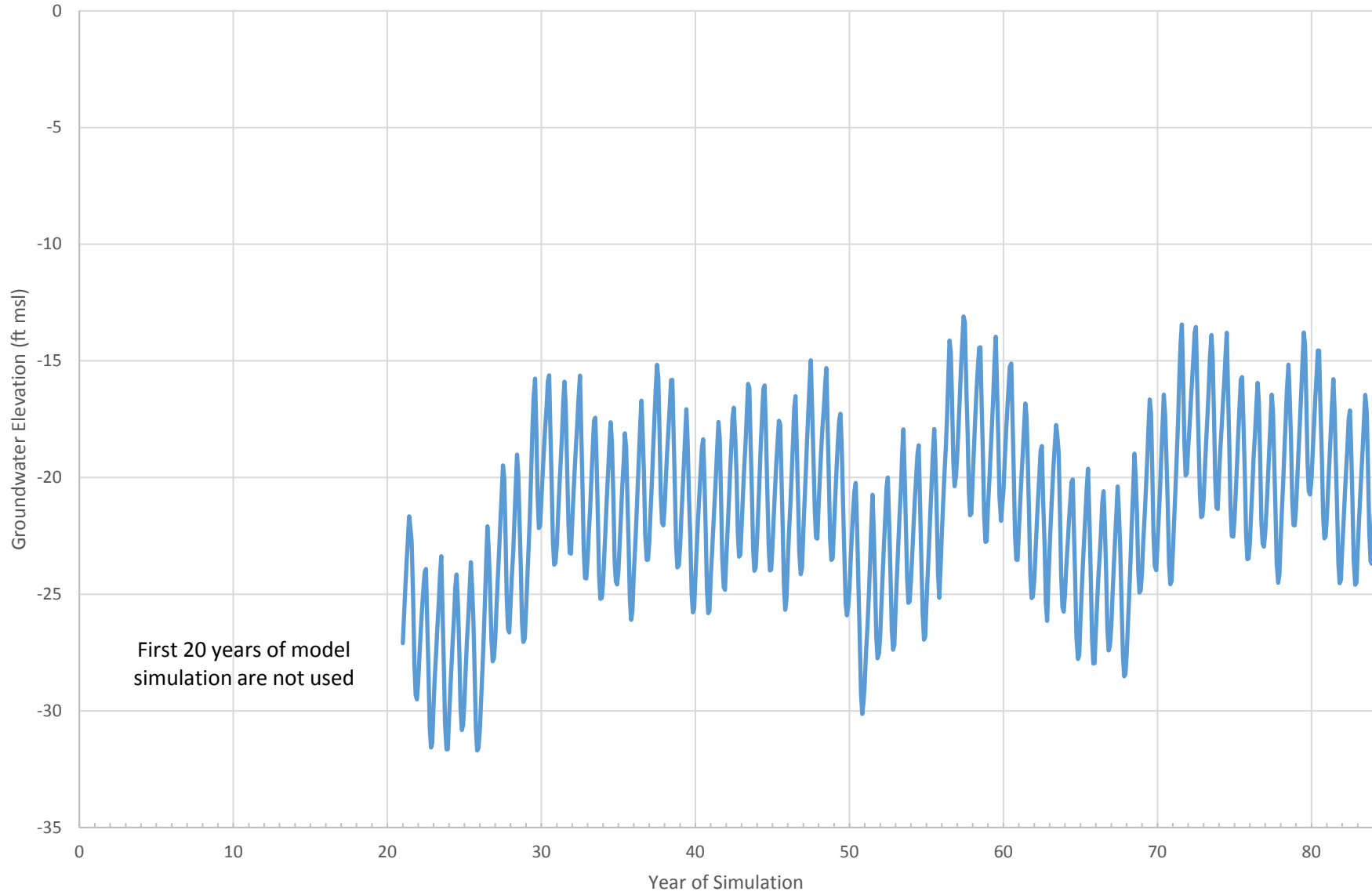
# Polygon 198

— Future Conditions Baseline Simulation



# Polygon 210

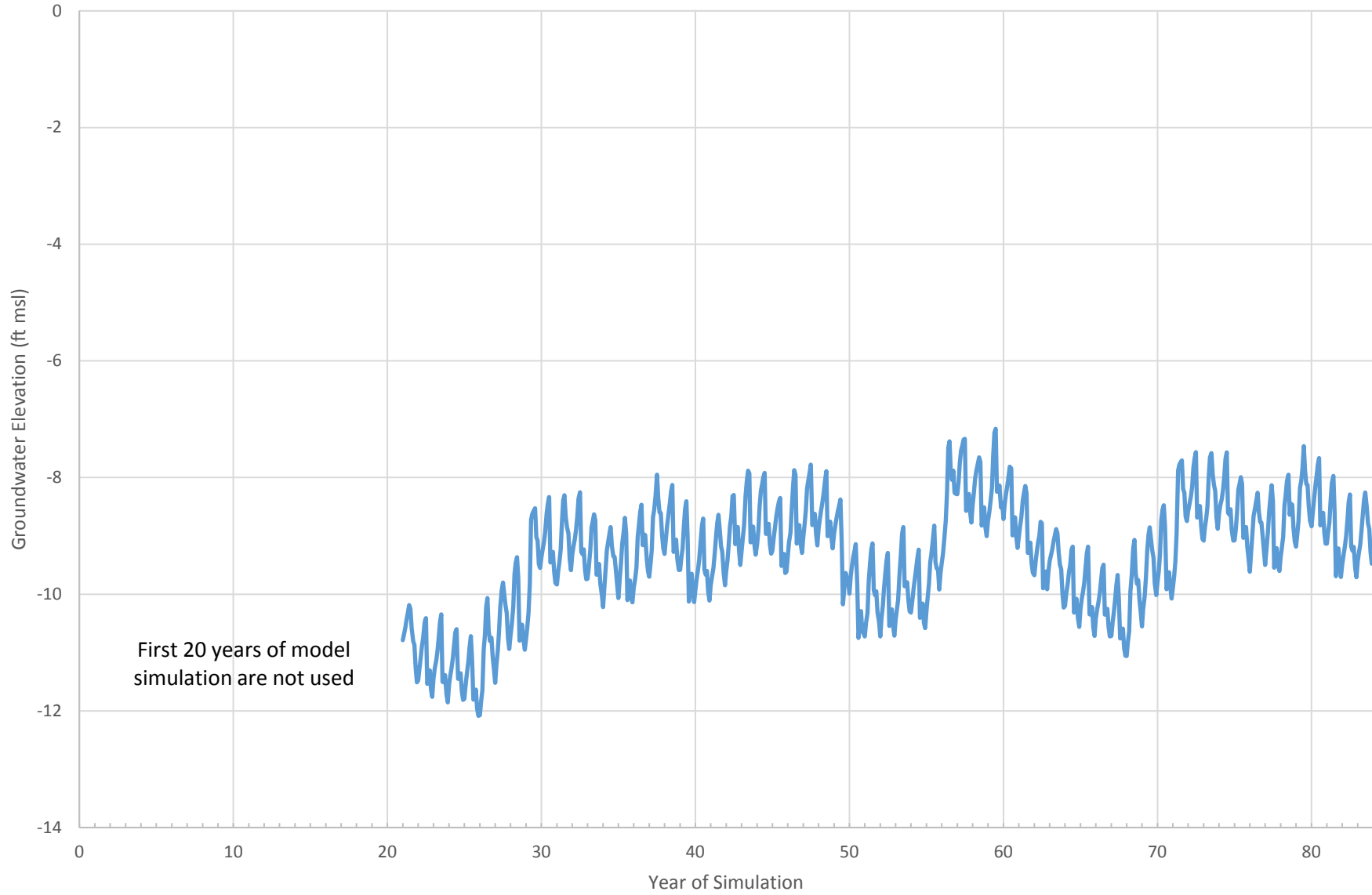
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

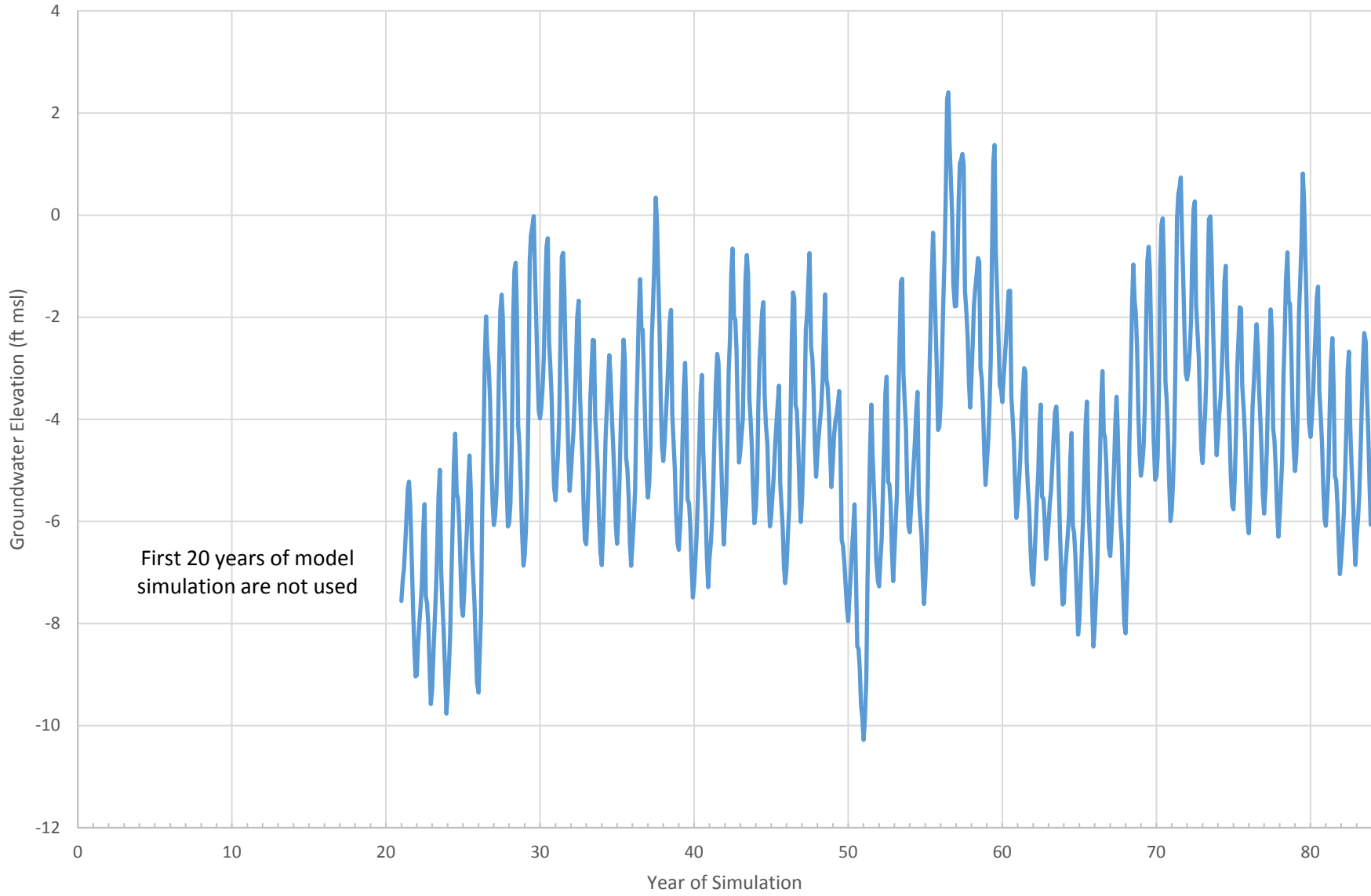
# Polygon 213

— Future Conditions Baseline Simulation



# Polygon 217

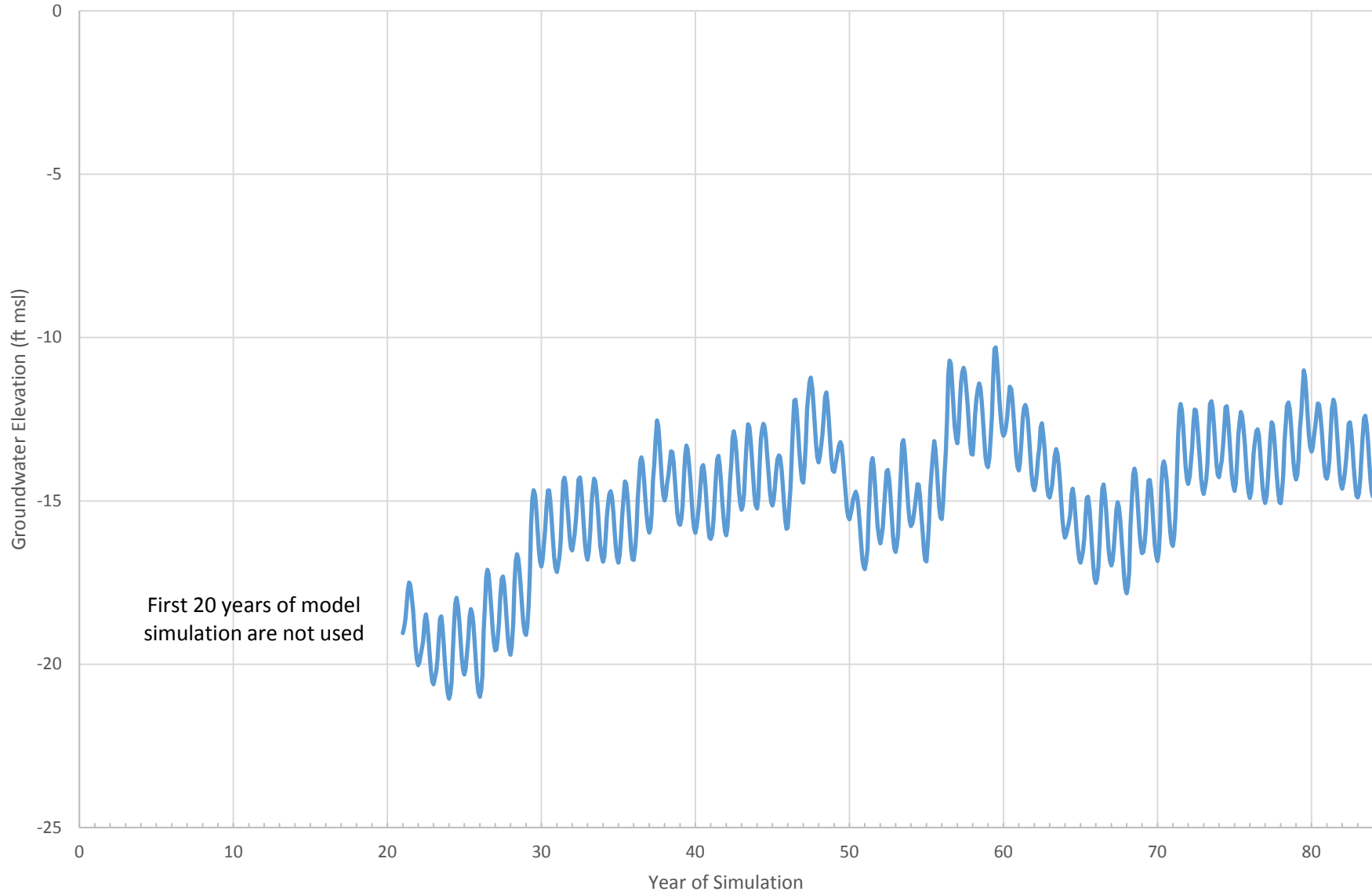
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

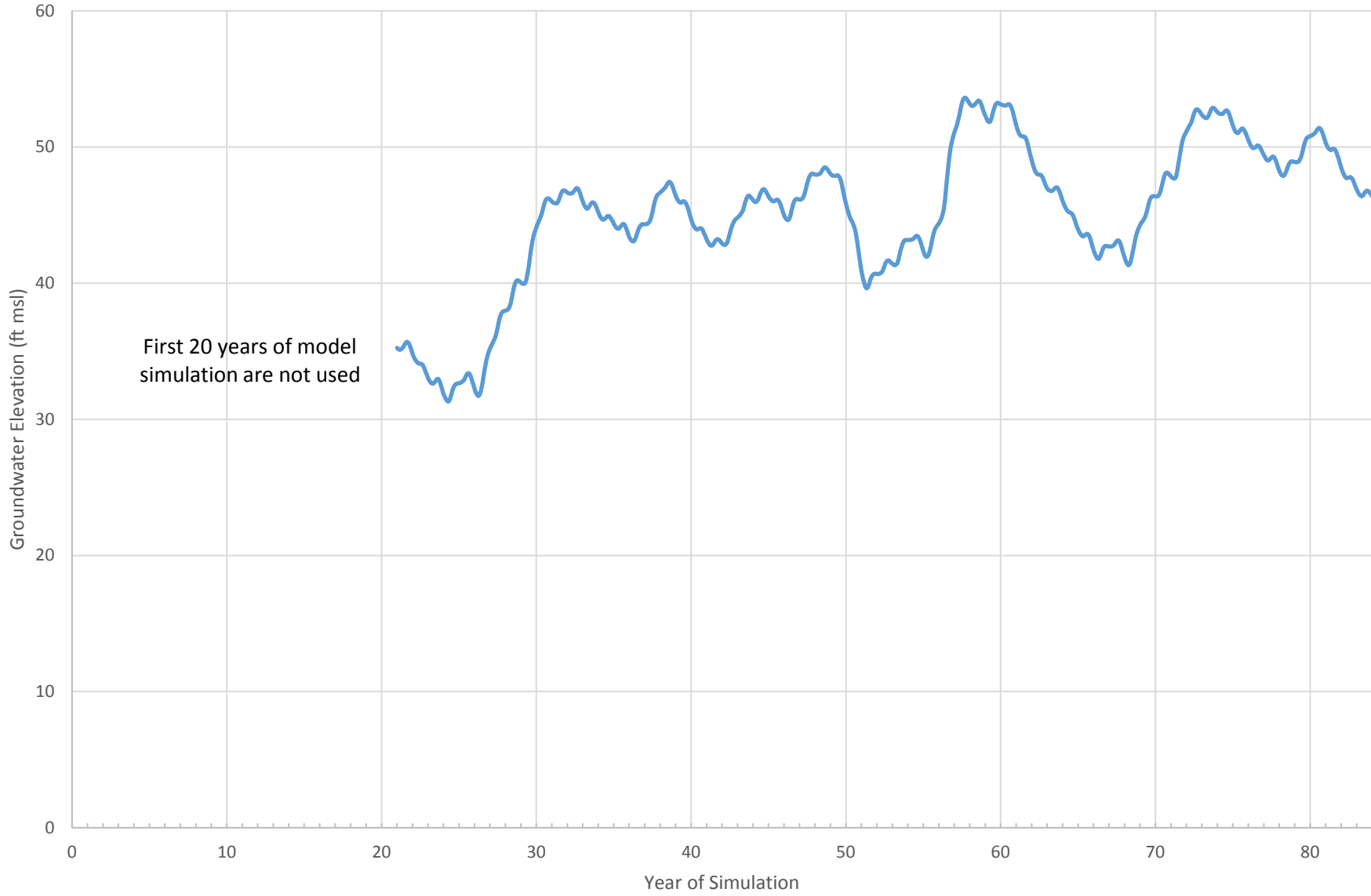
# Polygon 221

— Future Conditions Baseline Simulation



# Polygon 224

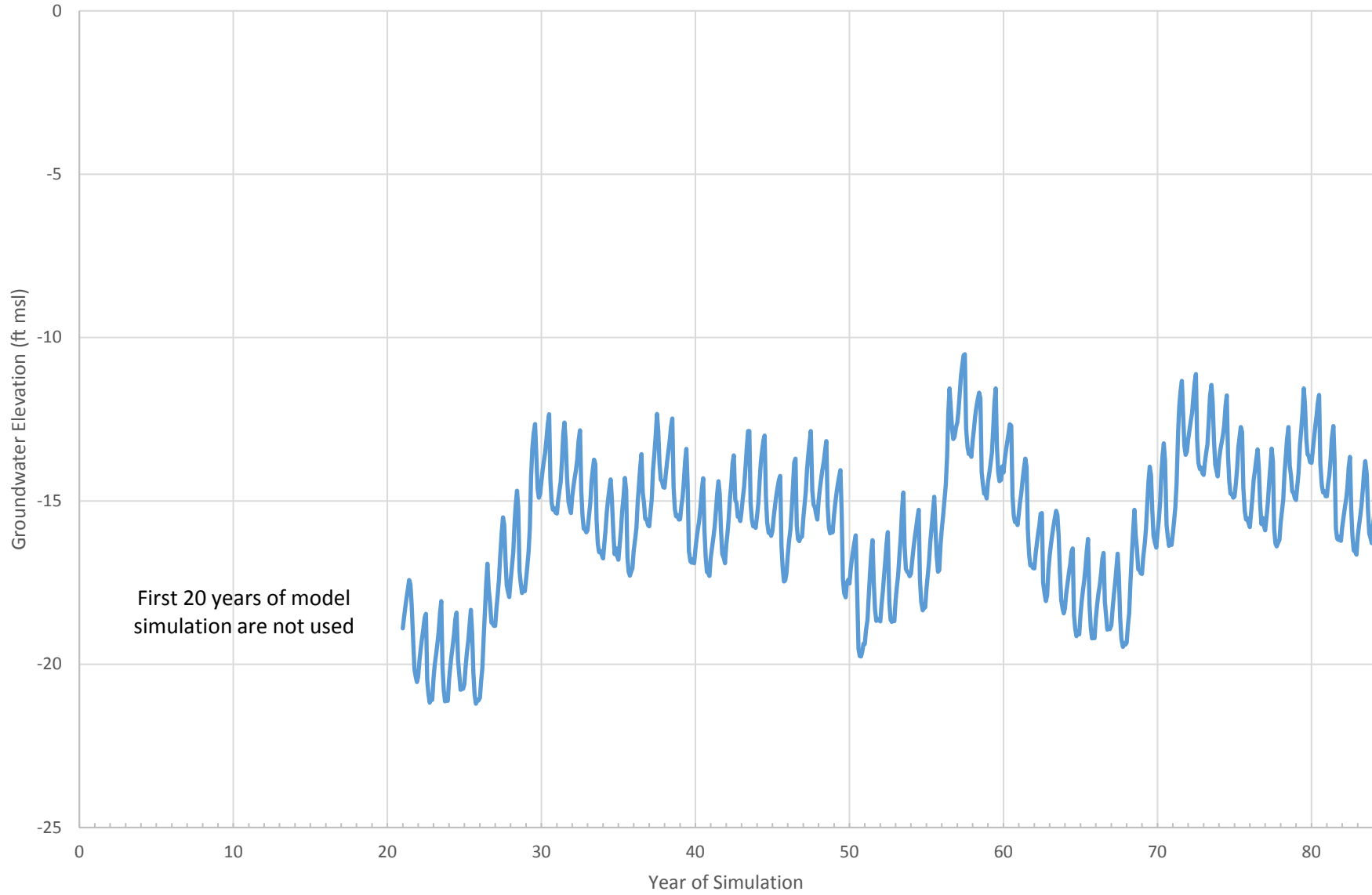
— Future Conditions Baseline Simulation





# Polygon 233

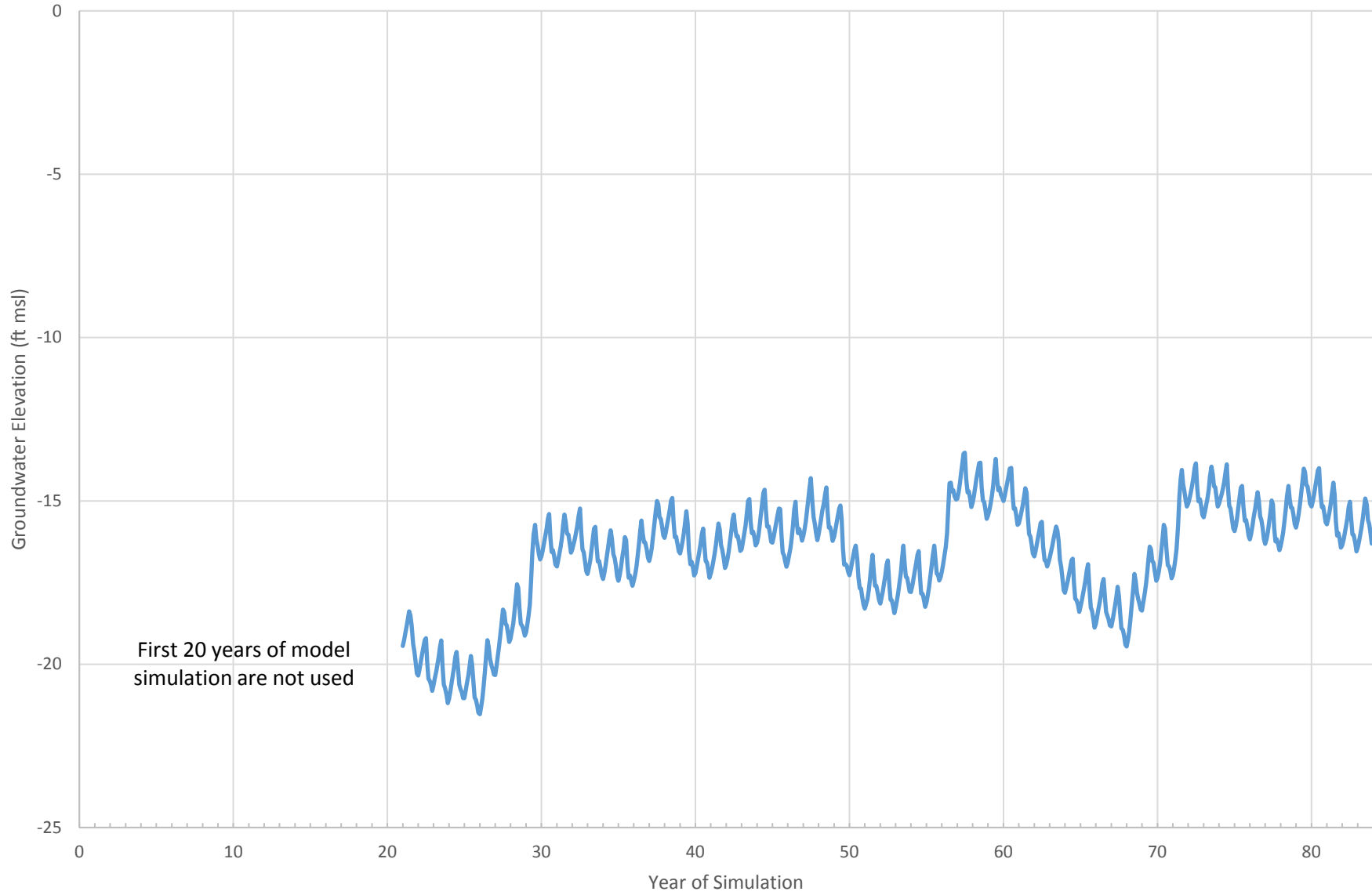
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 237

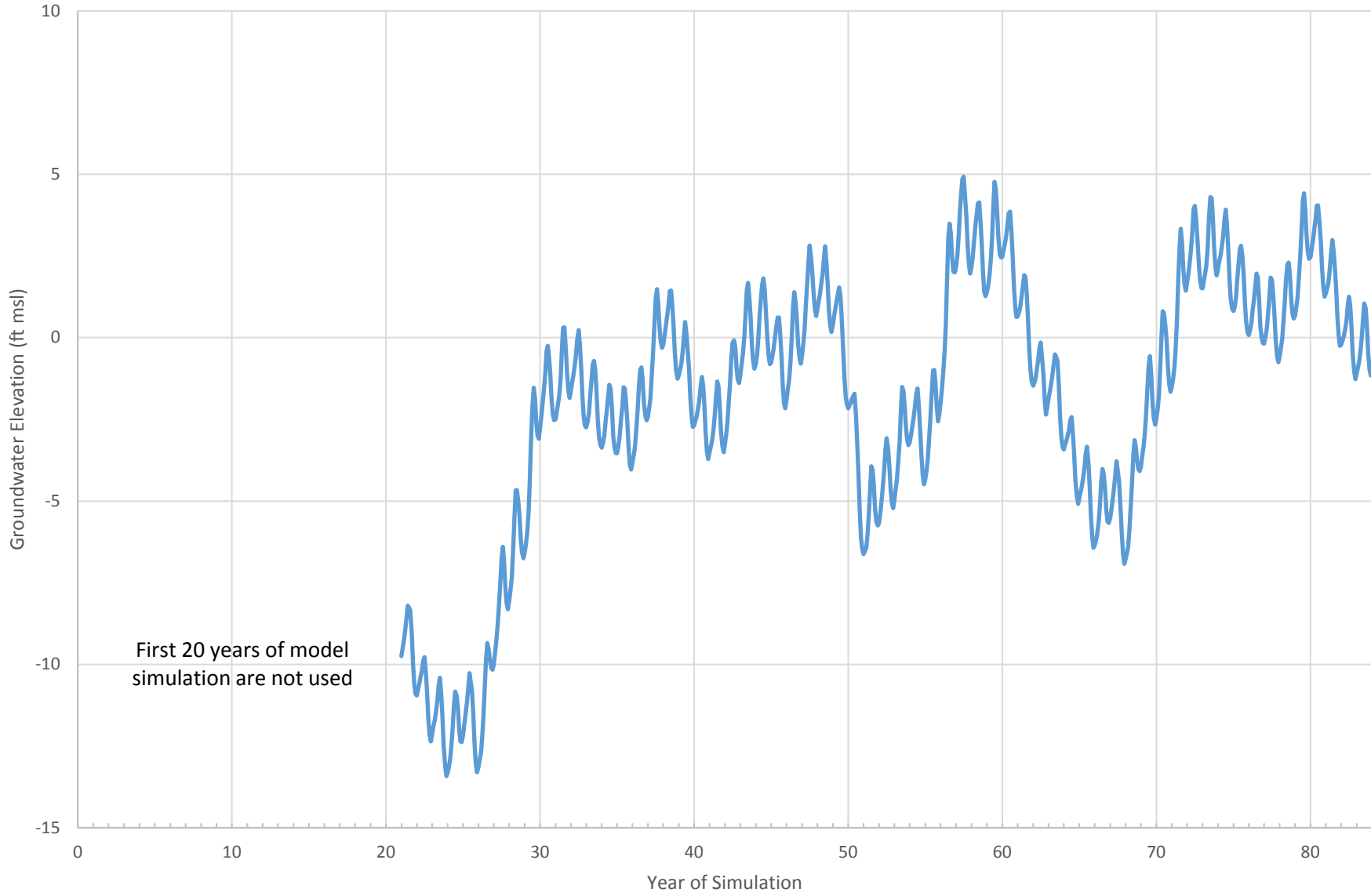
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 245

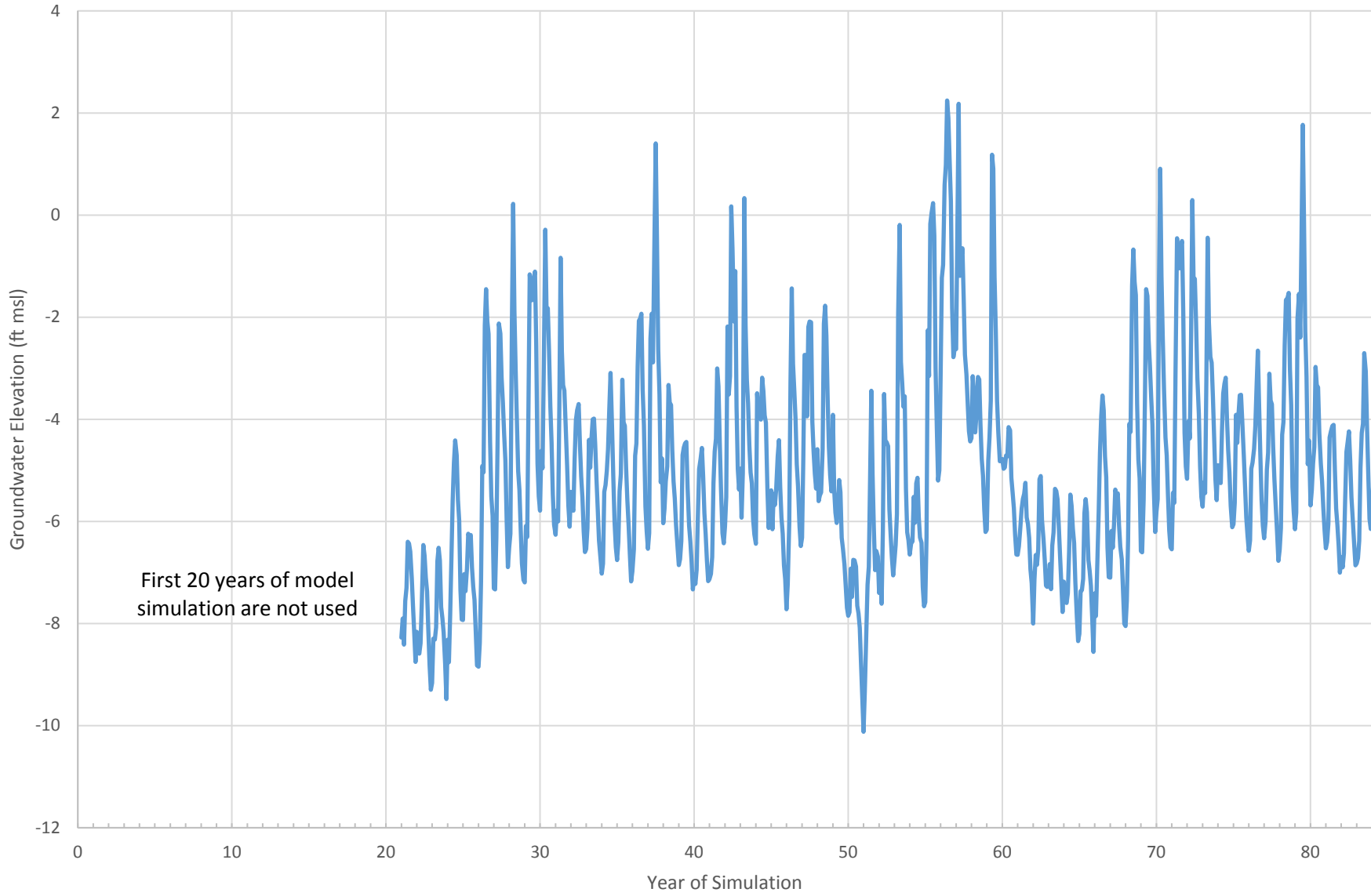
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 247

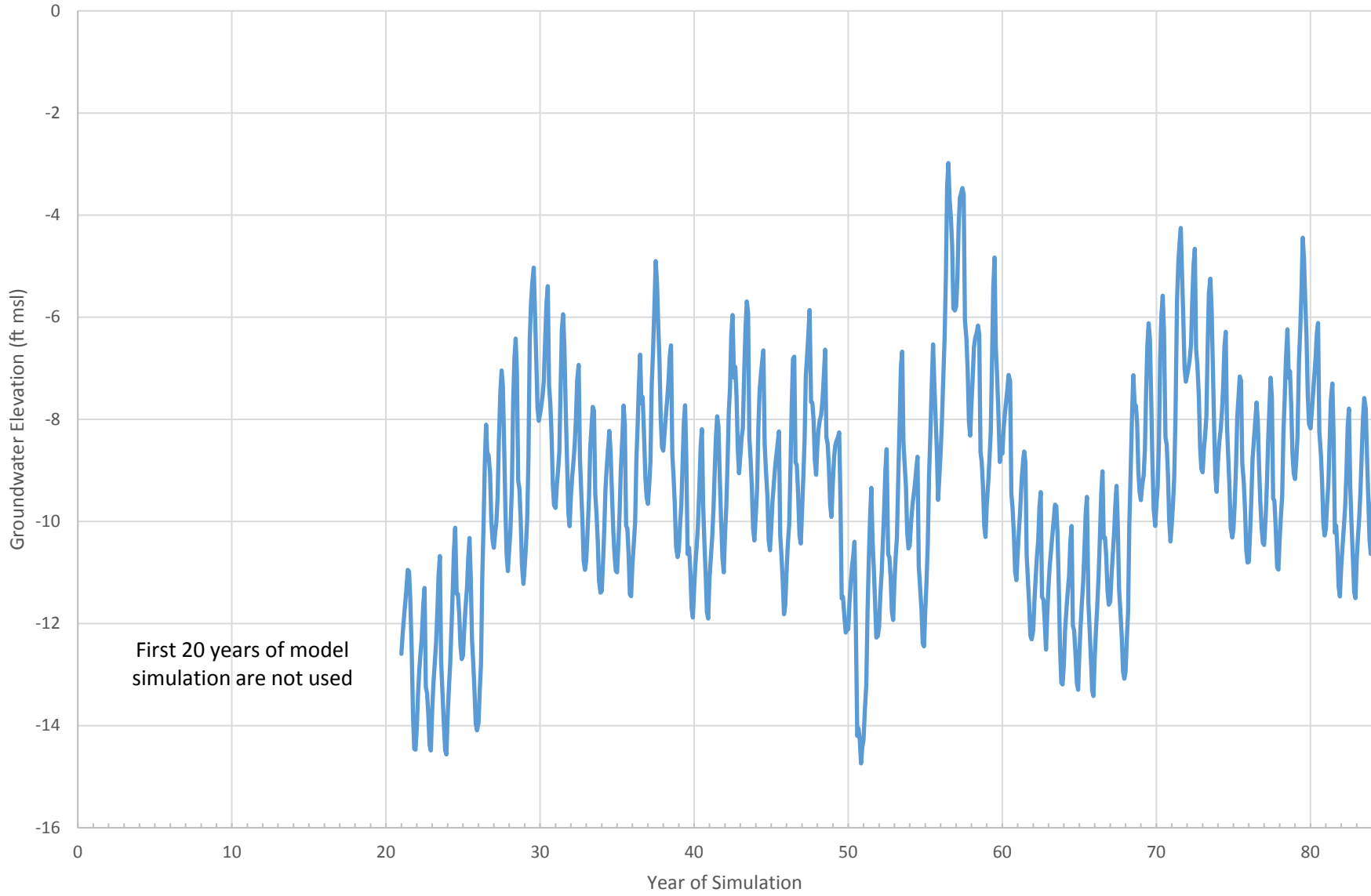
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

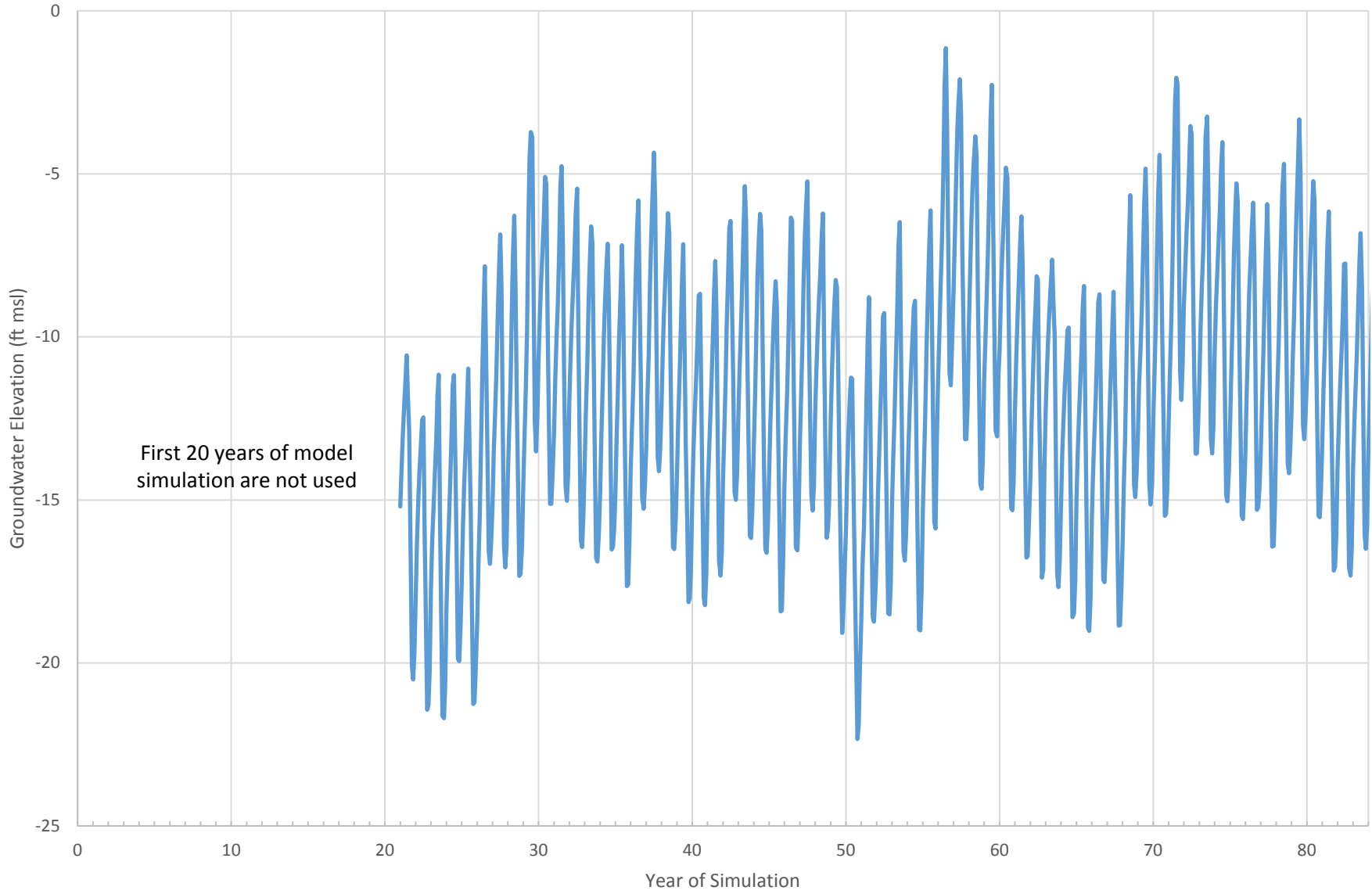
# Polygon 250

— Future Conditions Baseline Simulation



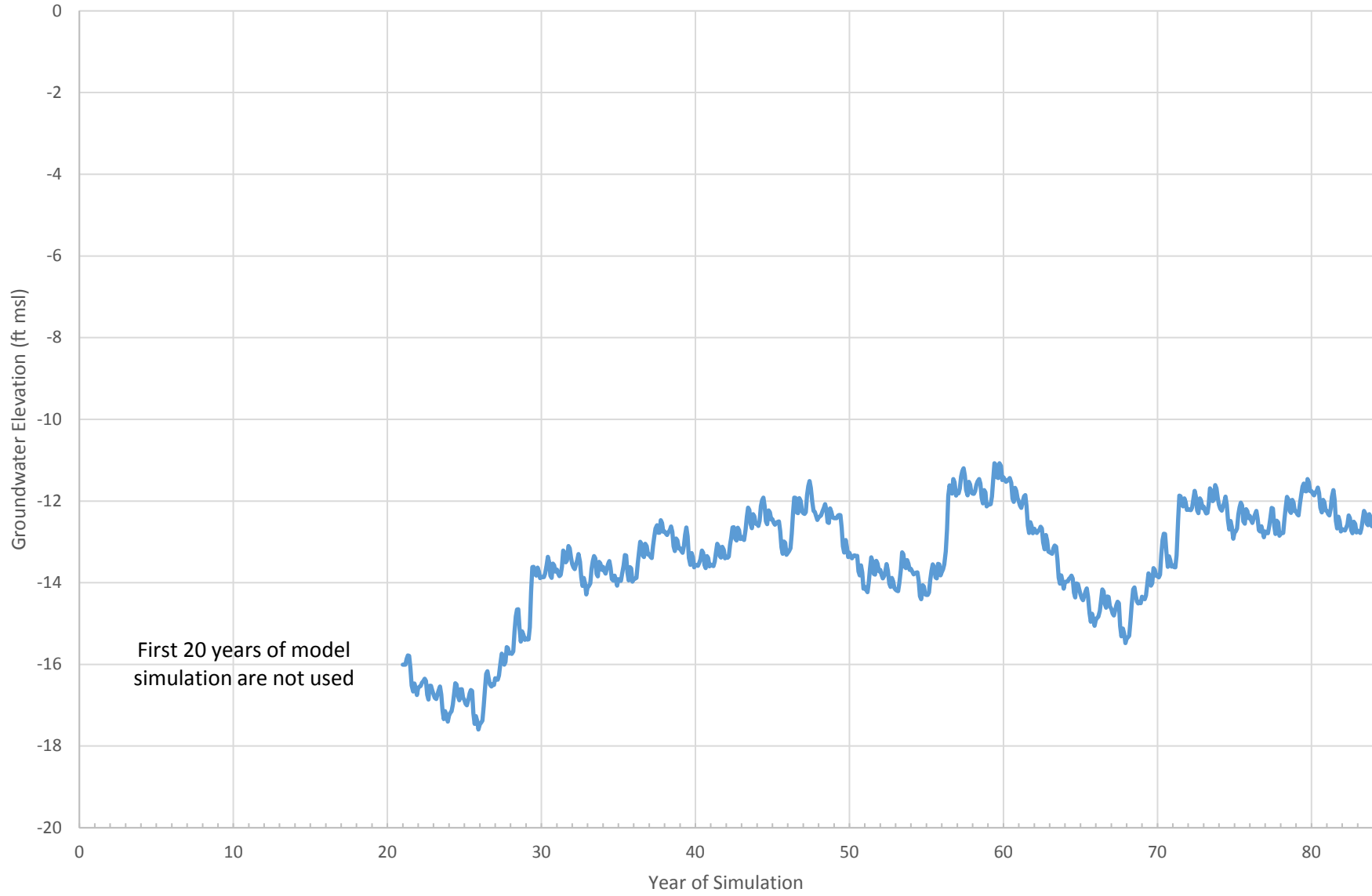
# Polygon 252

— Future Conditions Baseline Simulation



# Polygon 255

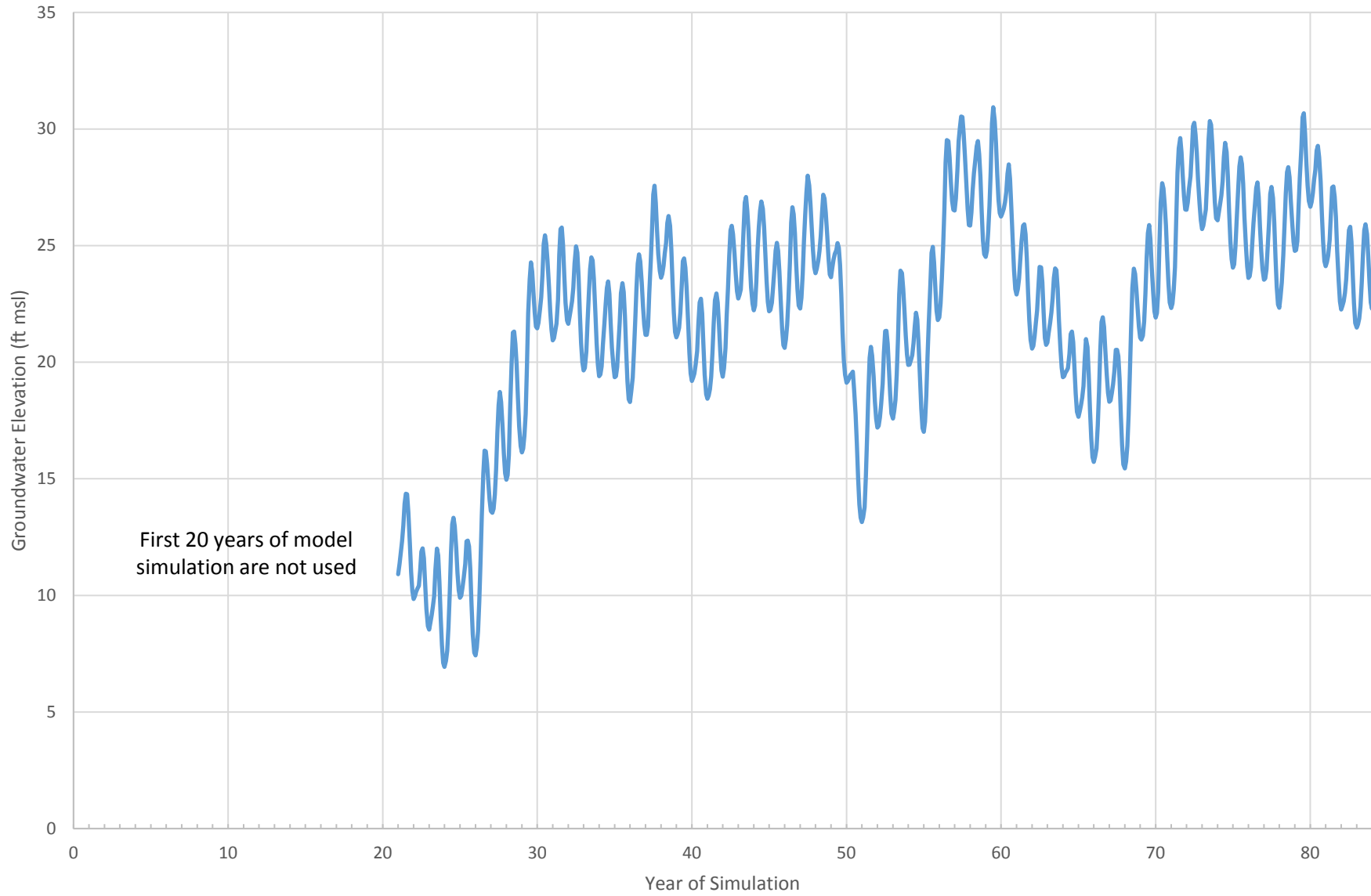
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 258

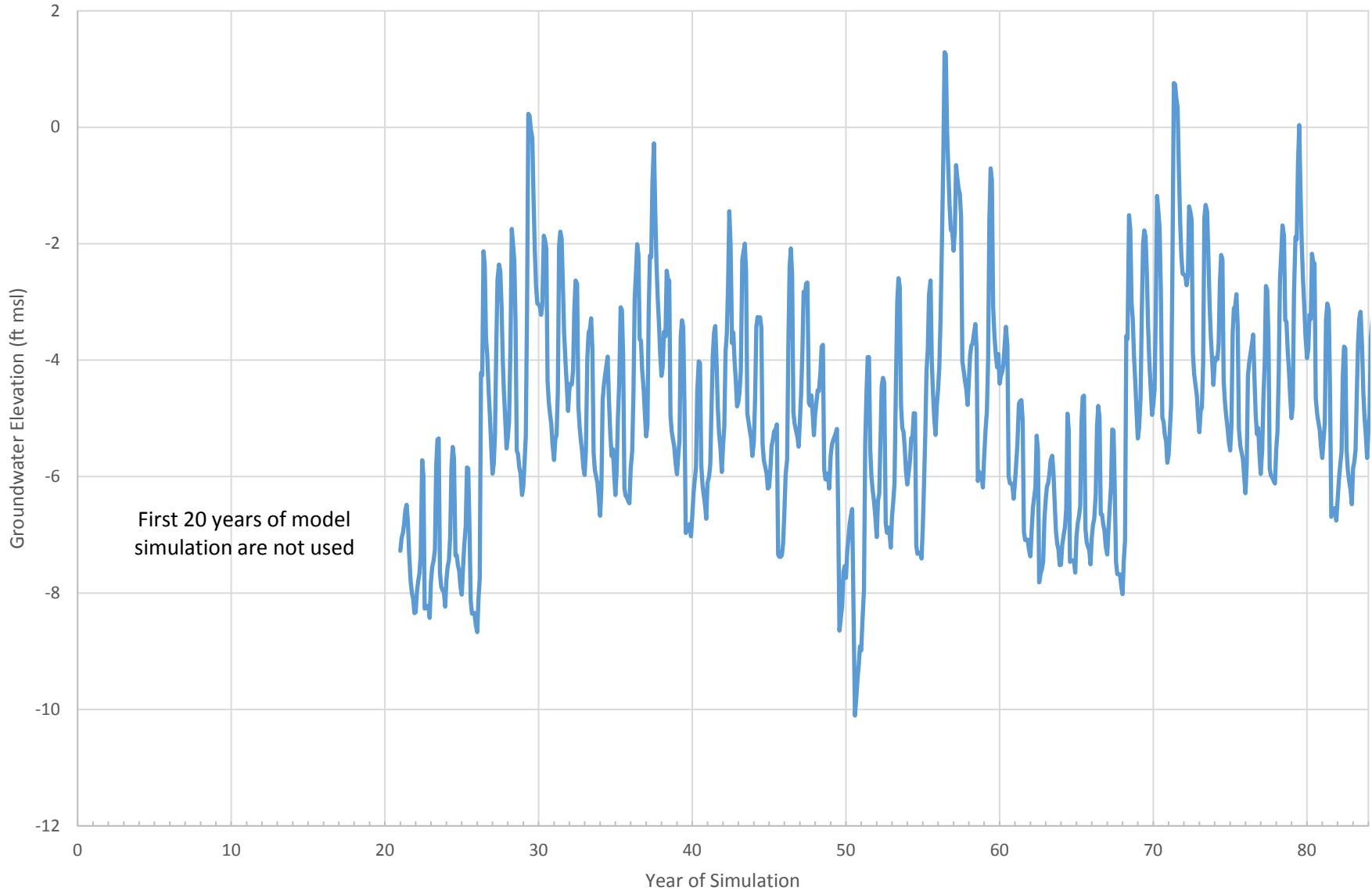
— Future Conditions Baseline Simulation





# Polygon 260

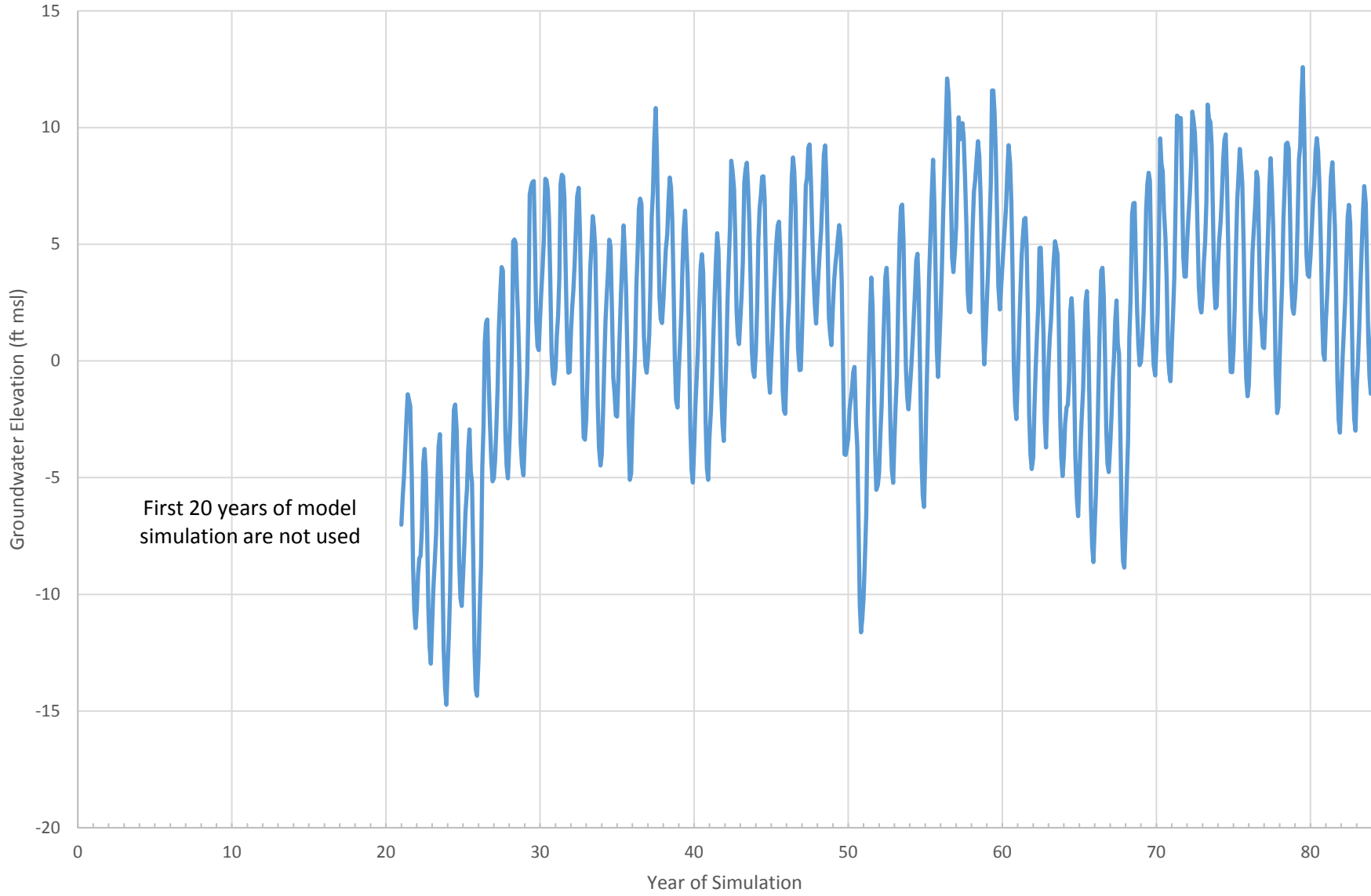
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 264

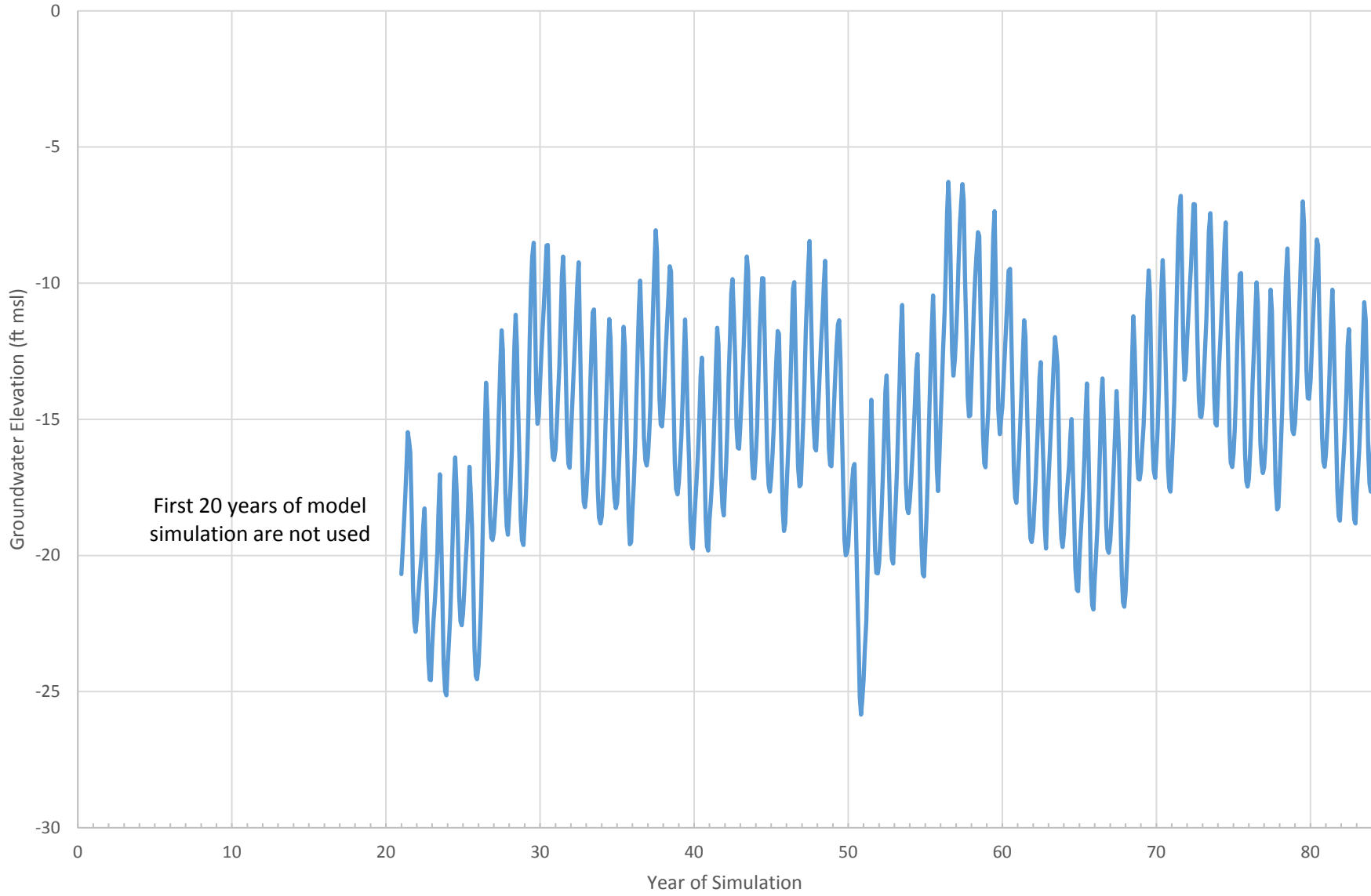
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

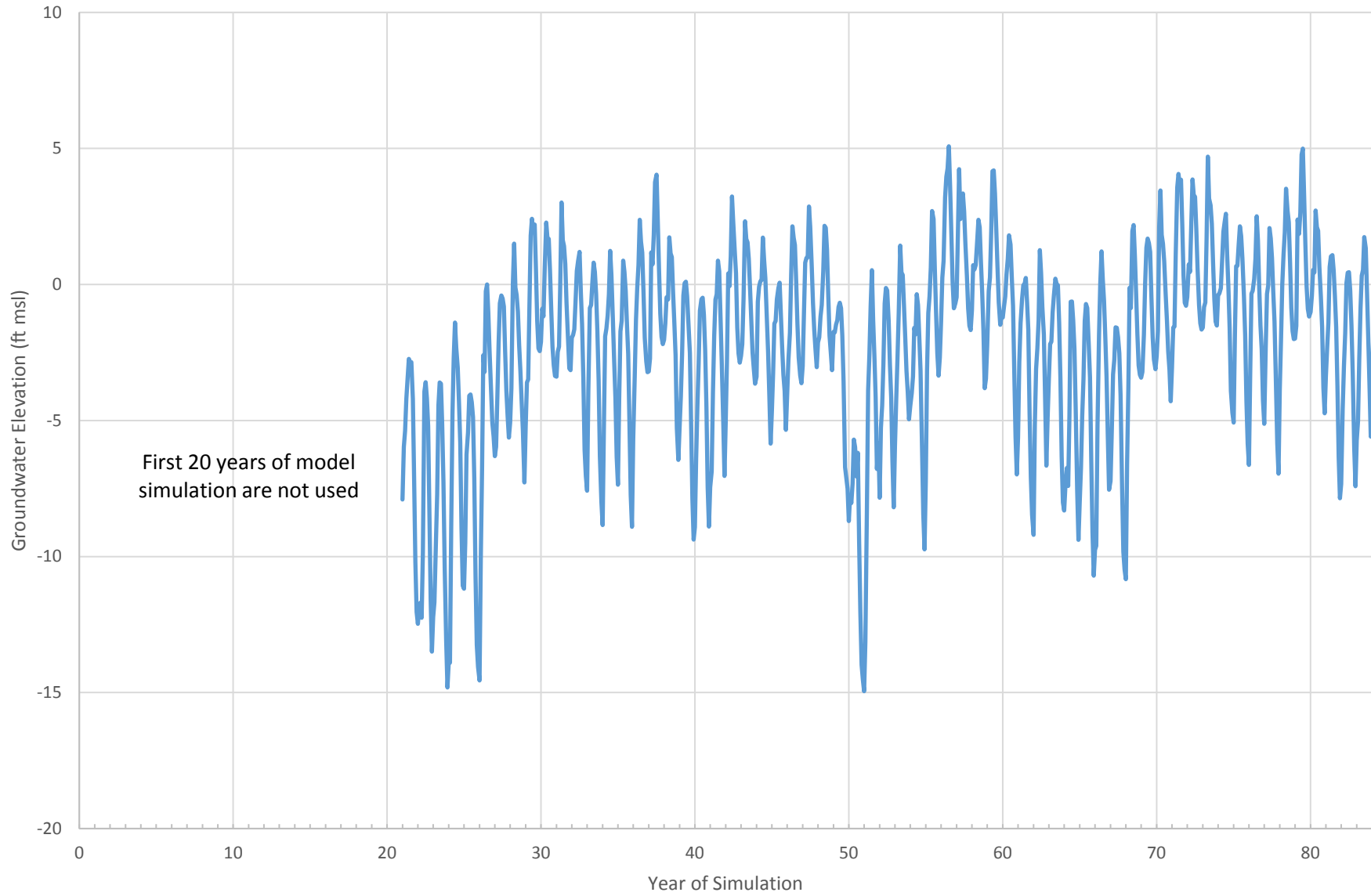
# Polygon 278

— Future Conditions Baseline Simulation



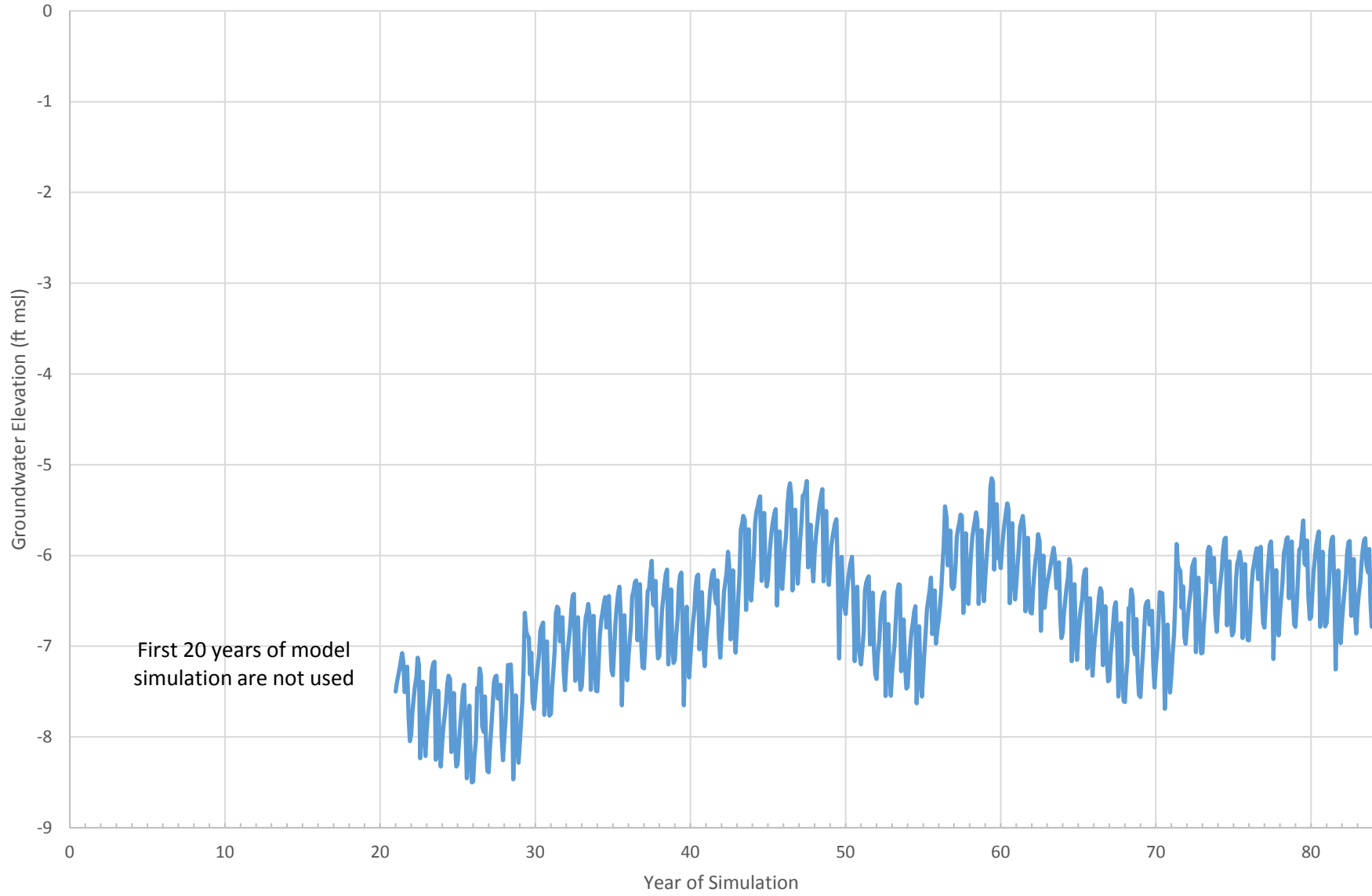
# Polygon 280

— Future Conditions Baseline Simulation



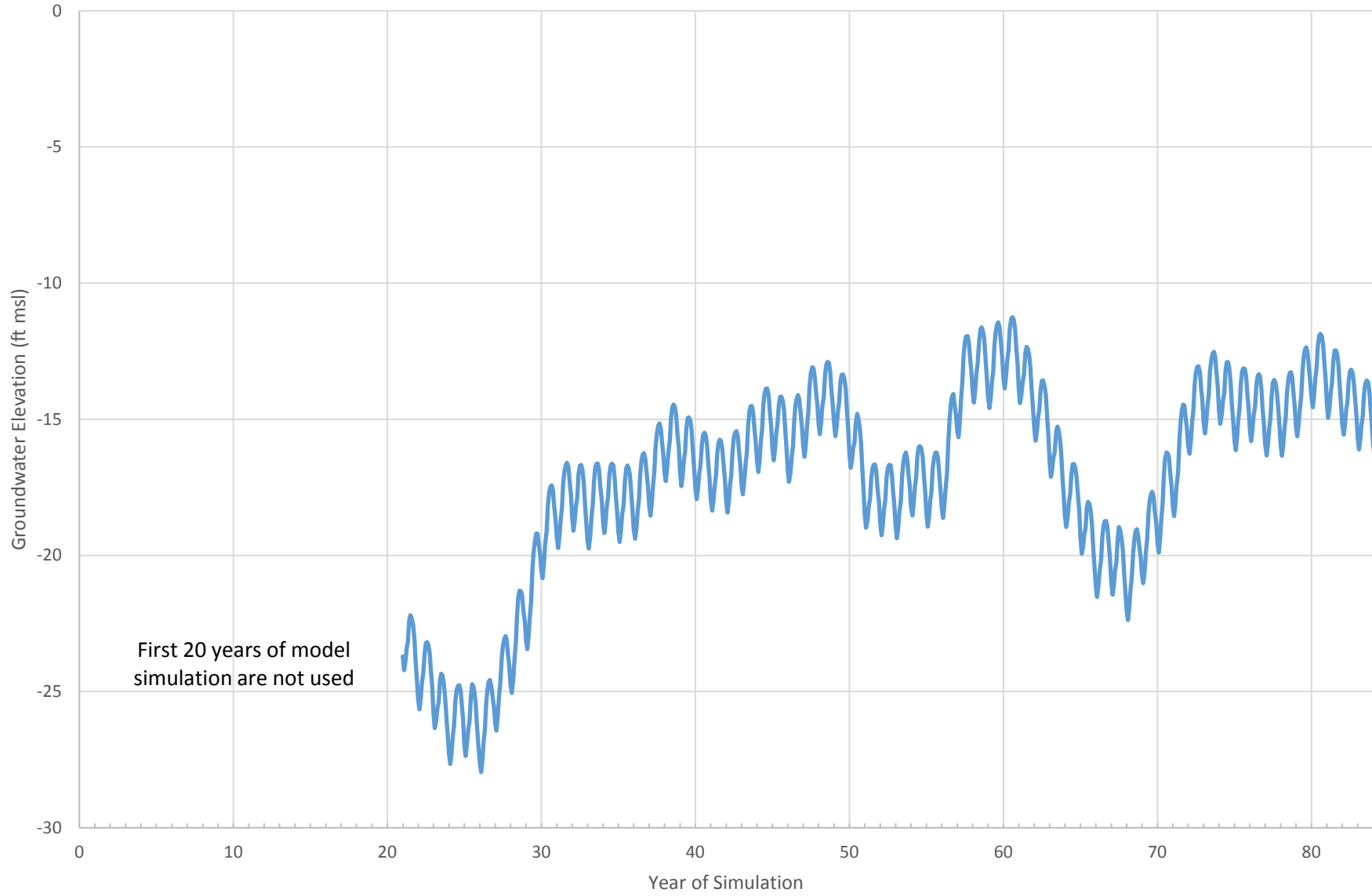
# Polygon 282

— Future Conditions Baseline Simulation



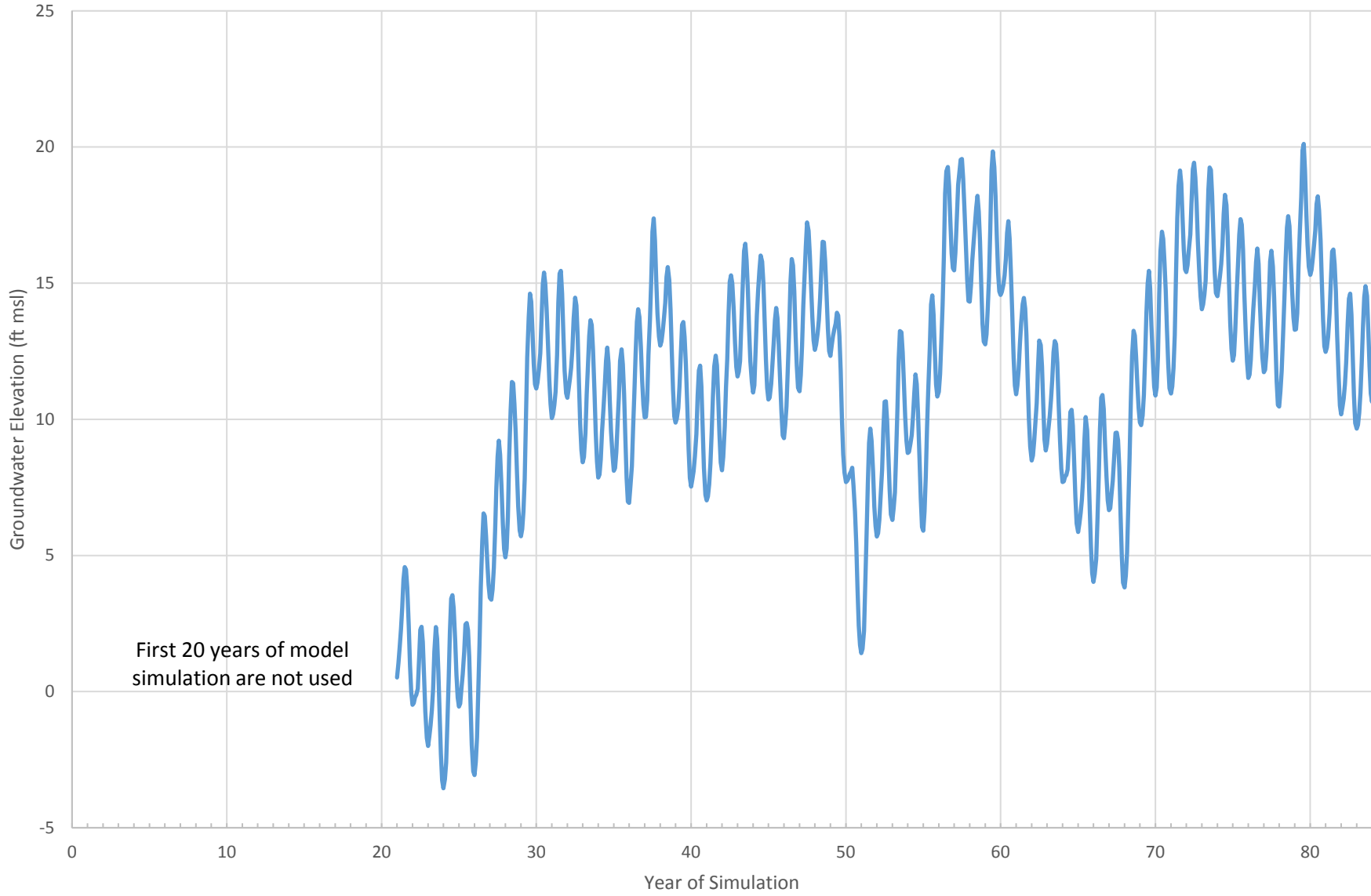
# Polygon 287

— Future Conditions Baseline Simulation



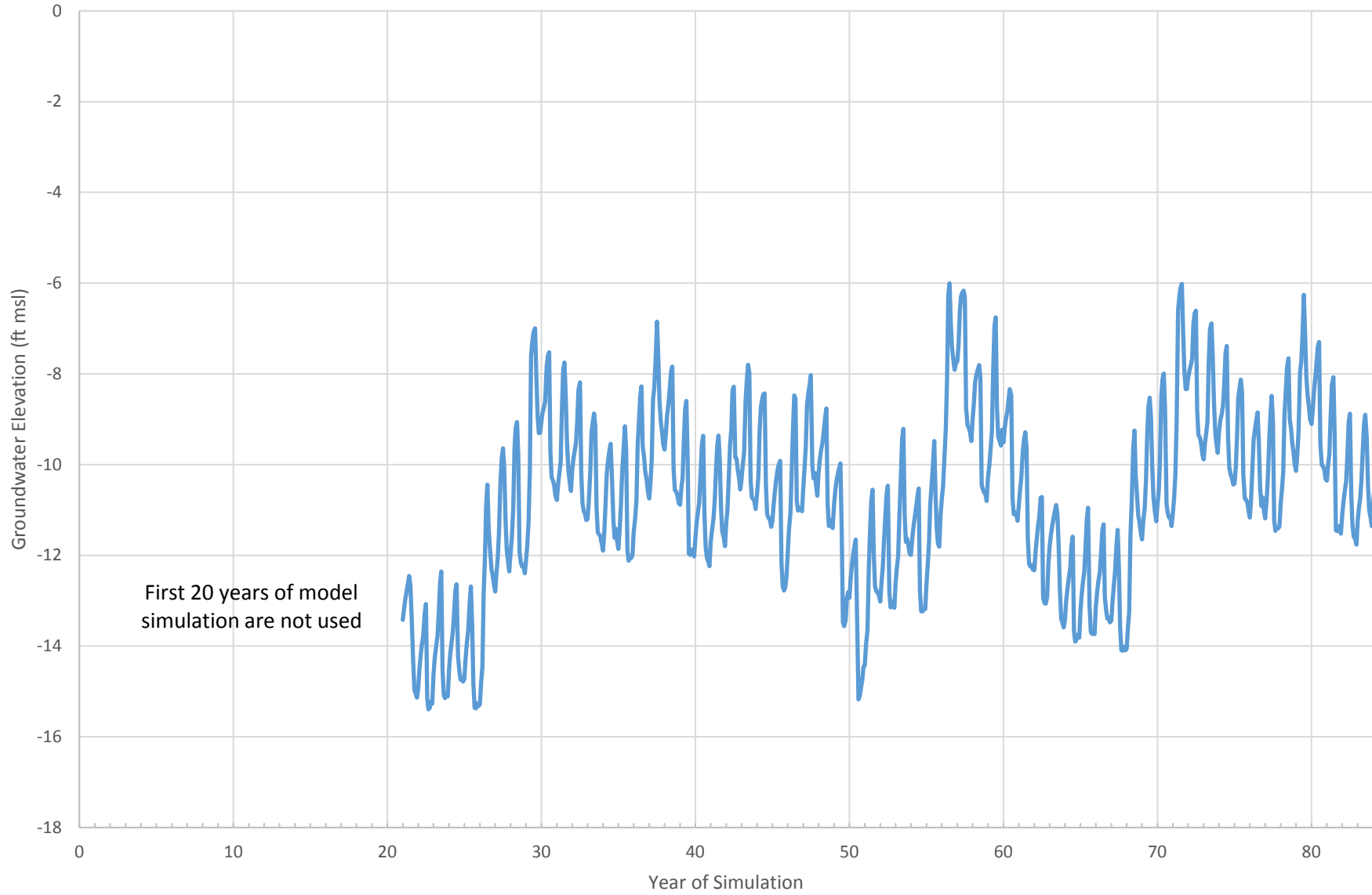
# Polygon 291

— Future Conditions Baseline Simulation



# Polygon 292

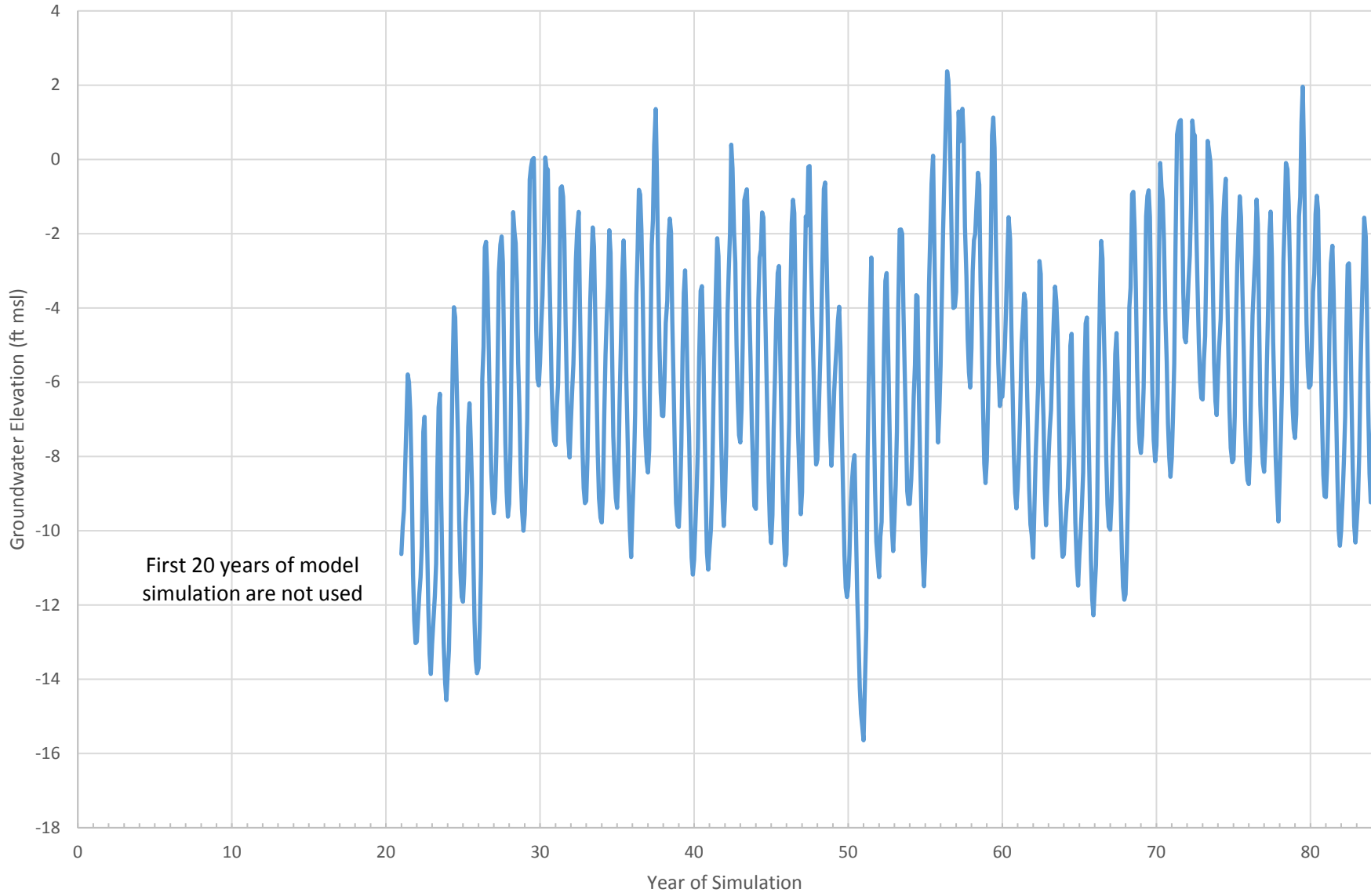
— Future Conditions Baseline Simulation





# Polygon 298

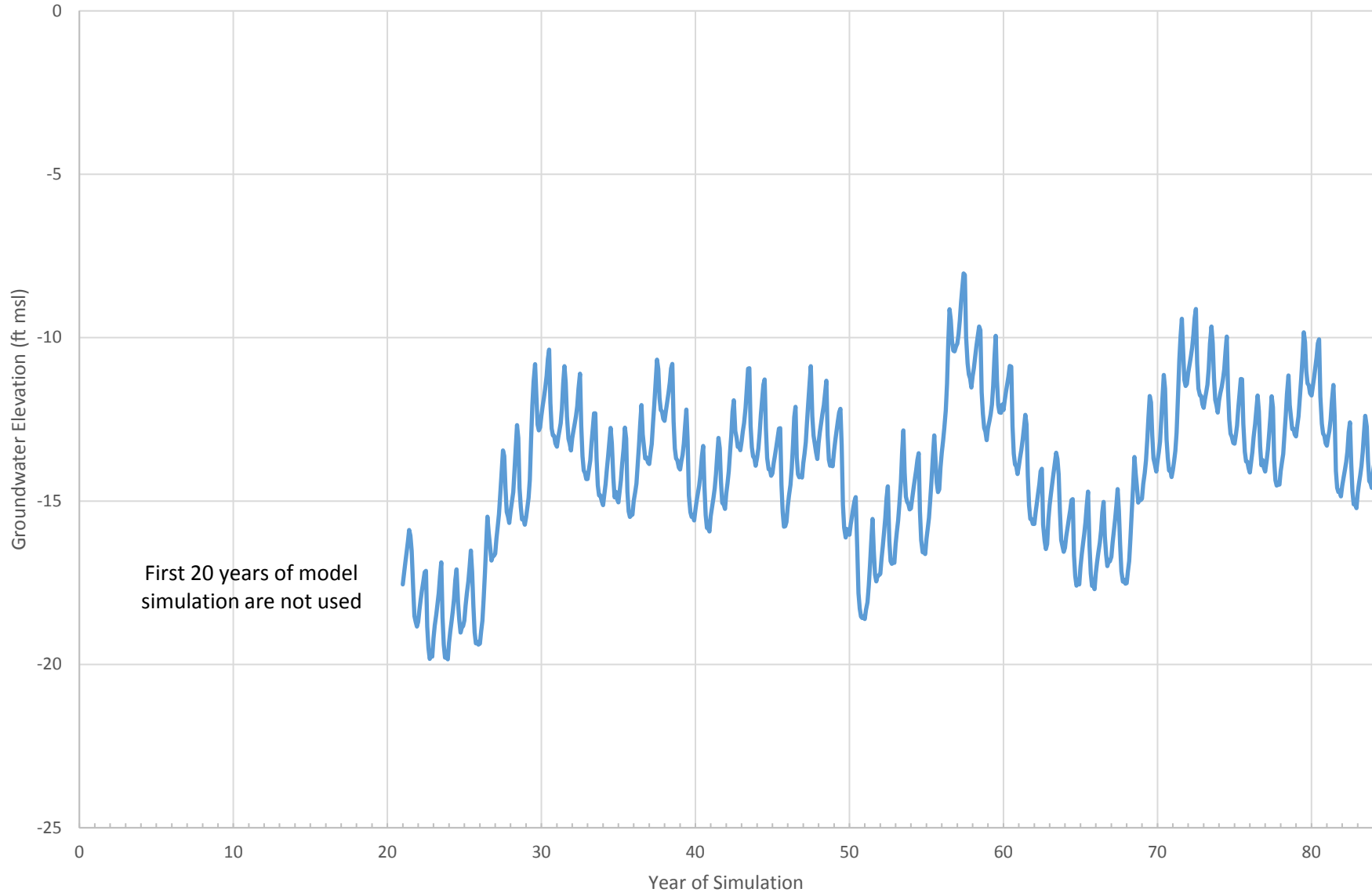
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

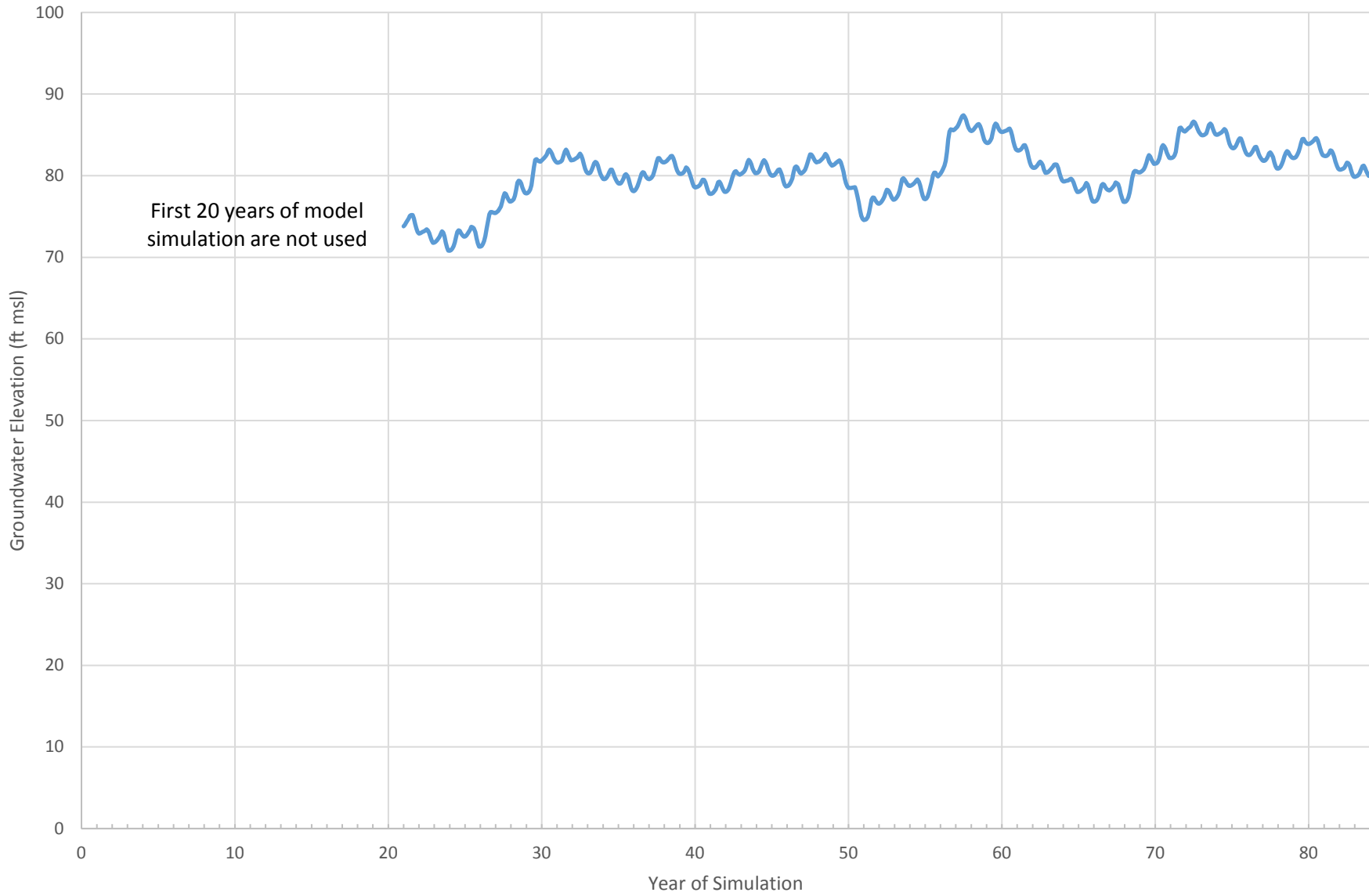
# Polygon 299

— Future Conditions Baseline Simulation



# Polygon 300

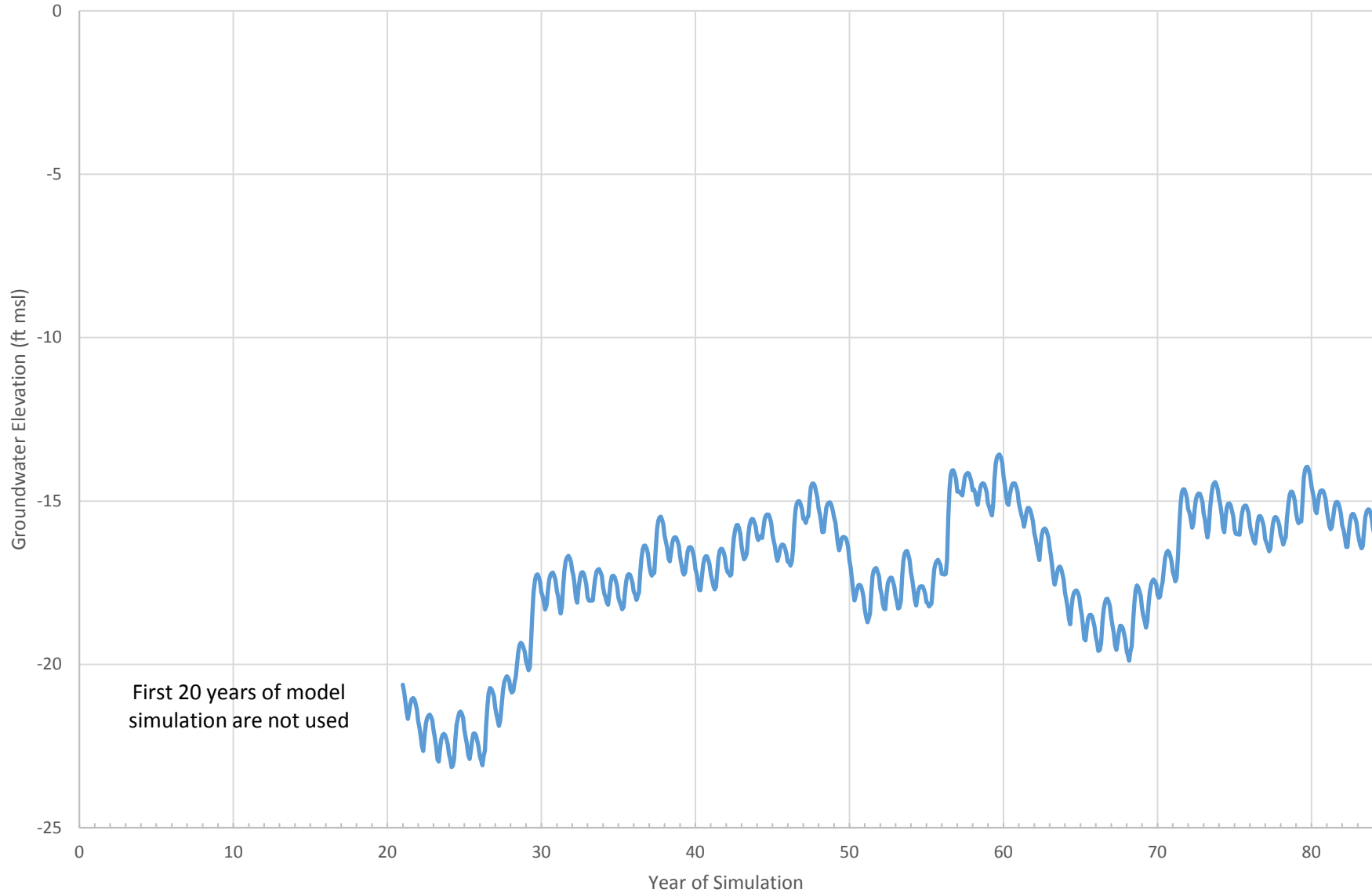
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

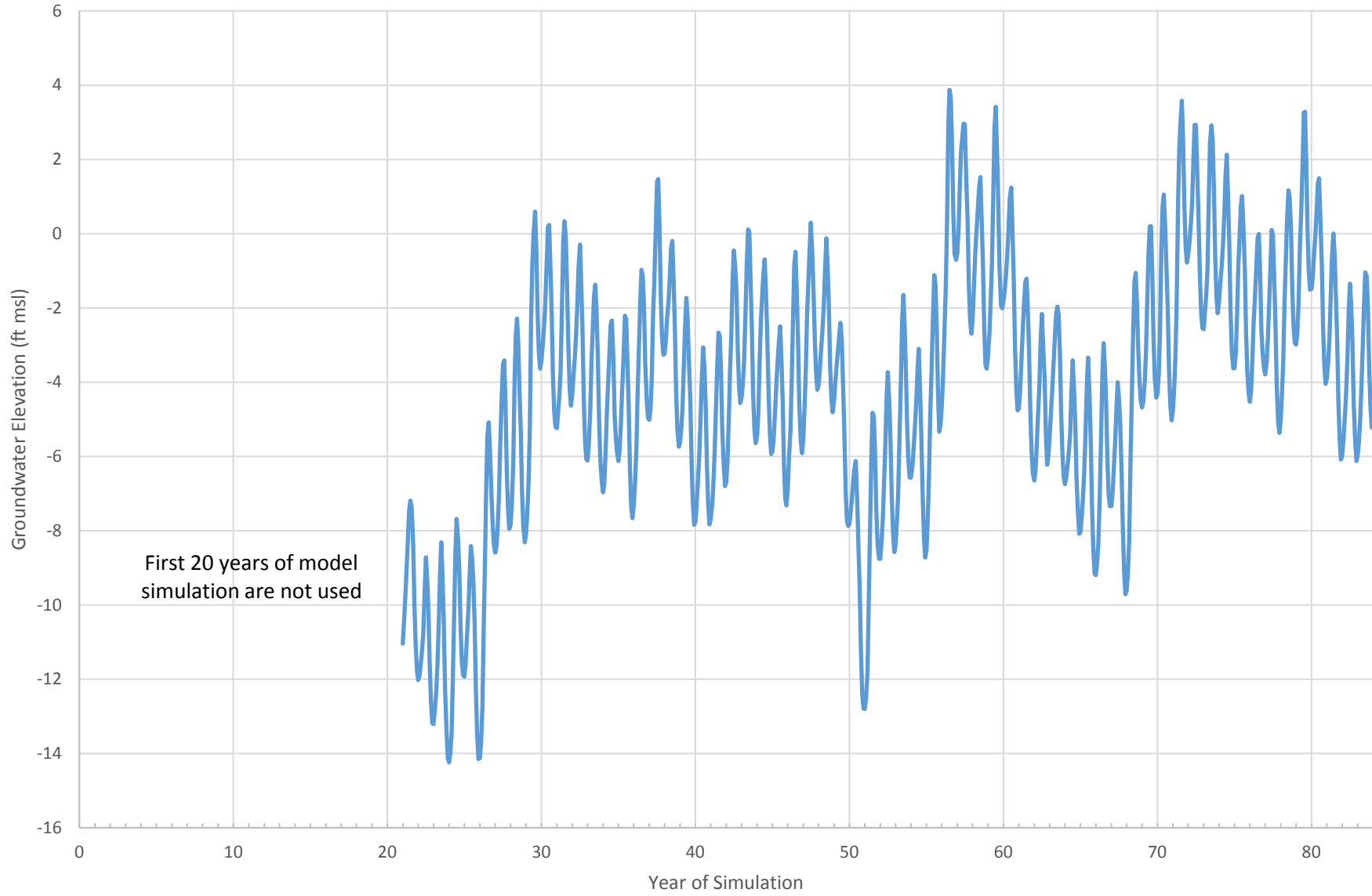
# Polygon 304

— Future Conditions Baseline Simulation



# Polygon 309

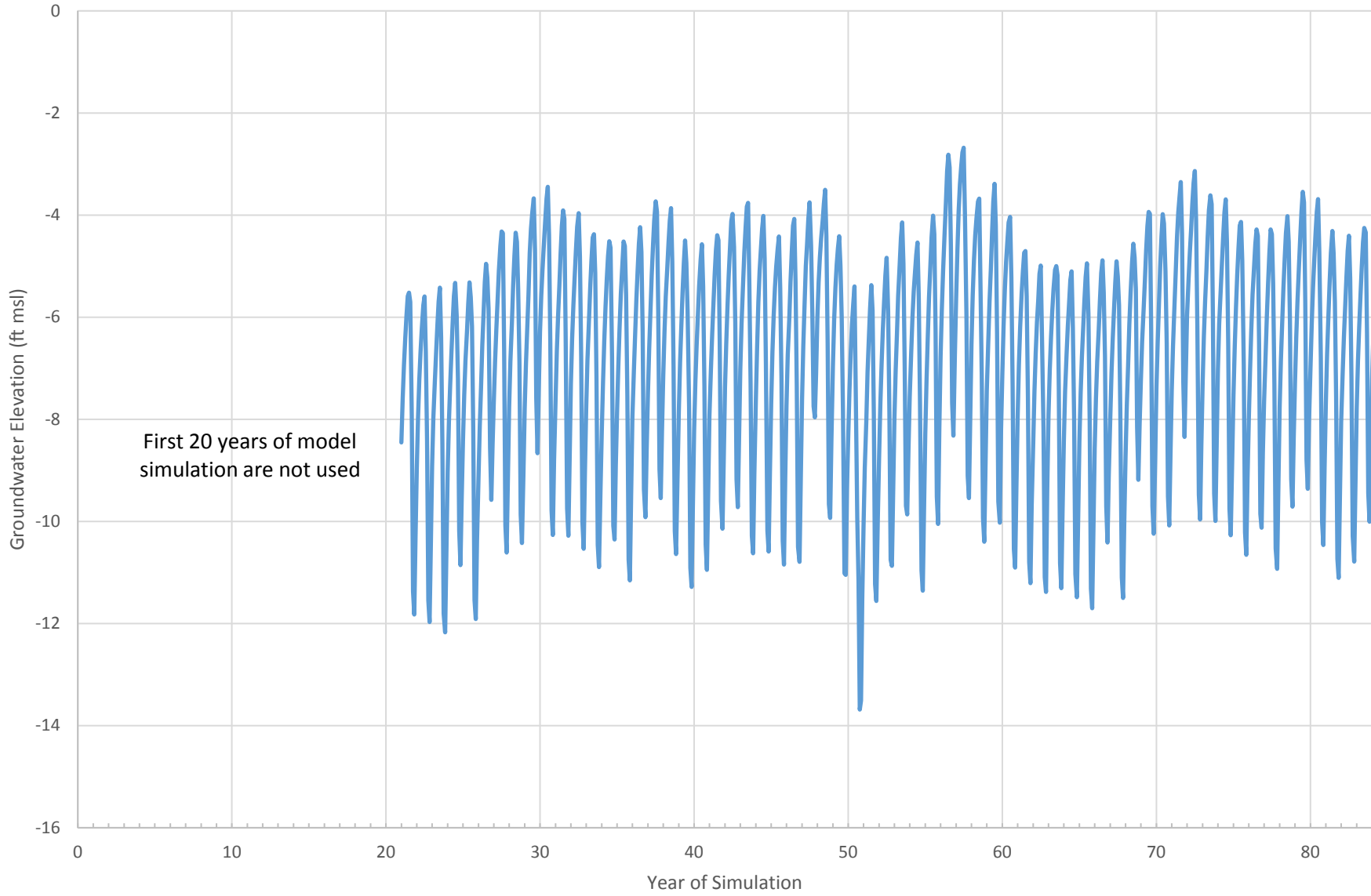
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

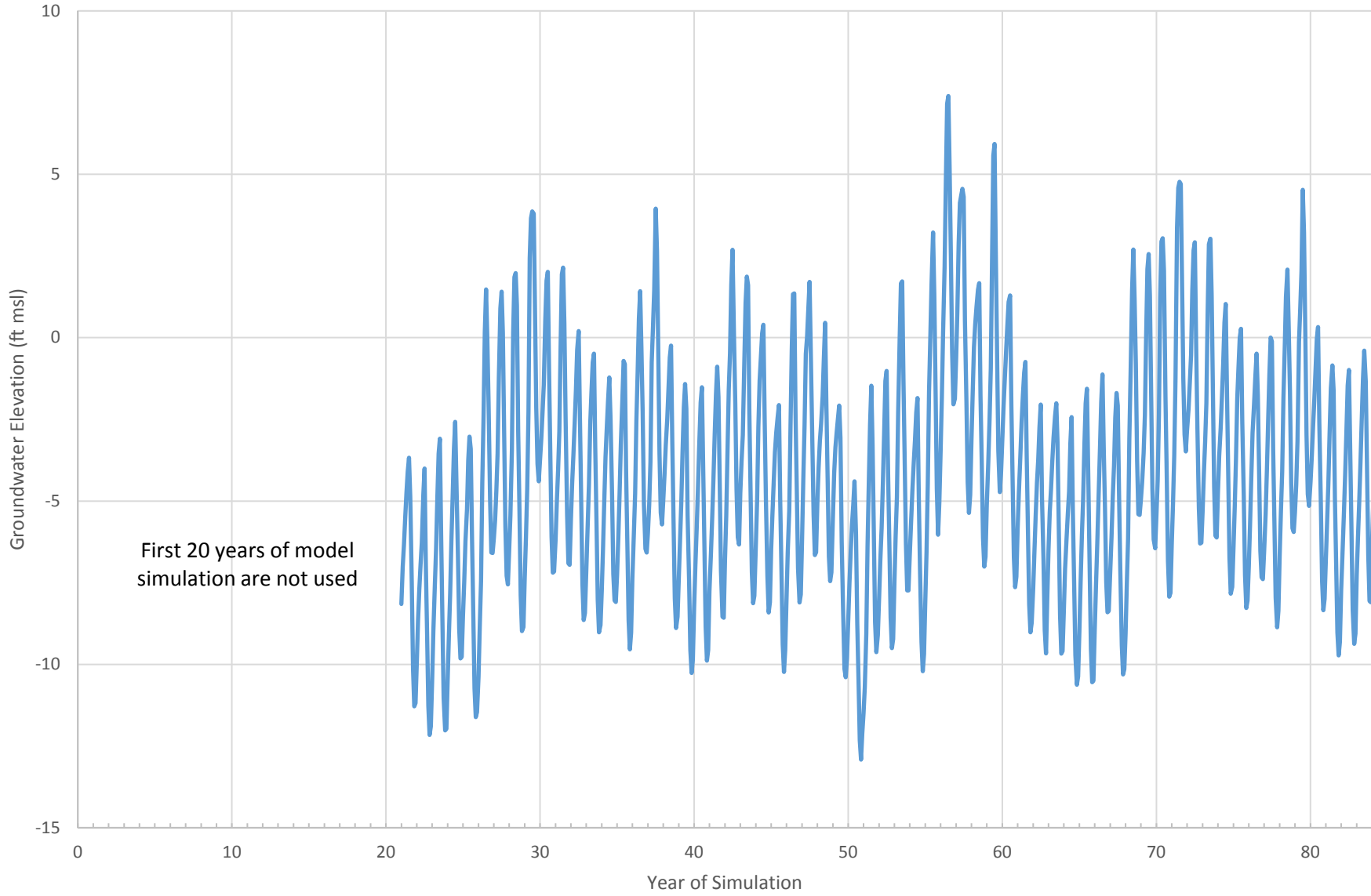
# Polygon 314

— Future Conditions Baseline Simulation



# Polygon 315

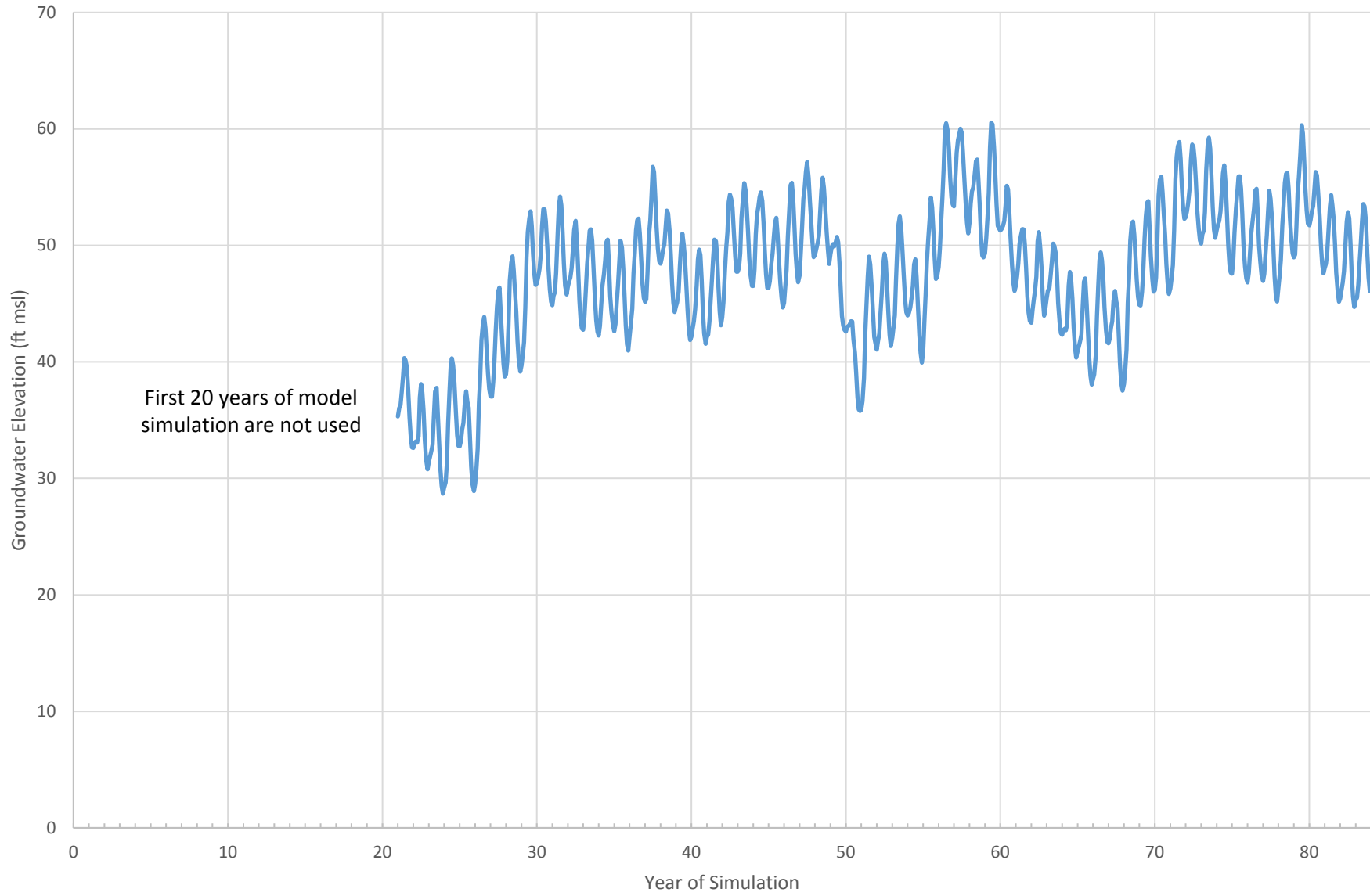
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 317

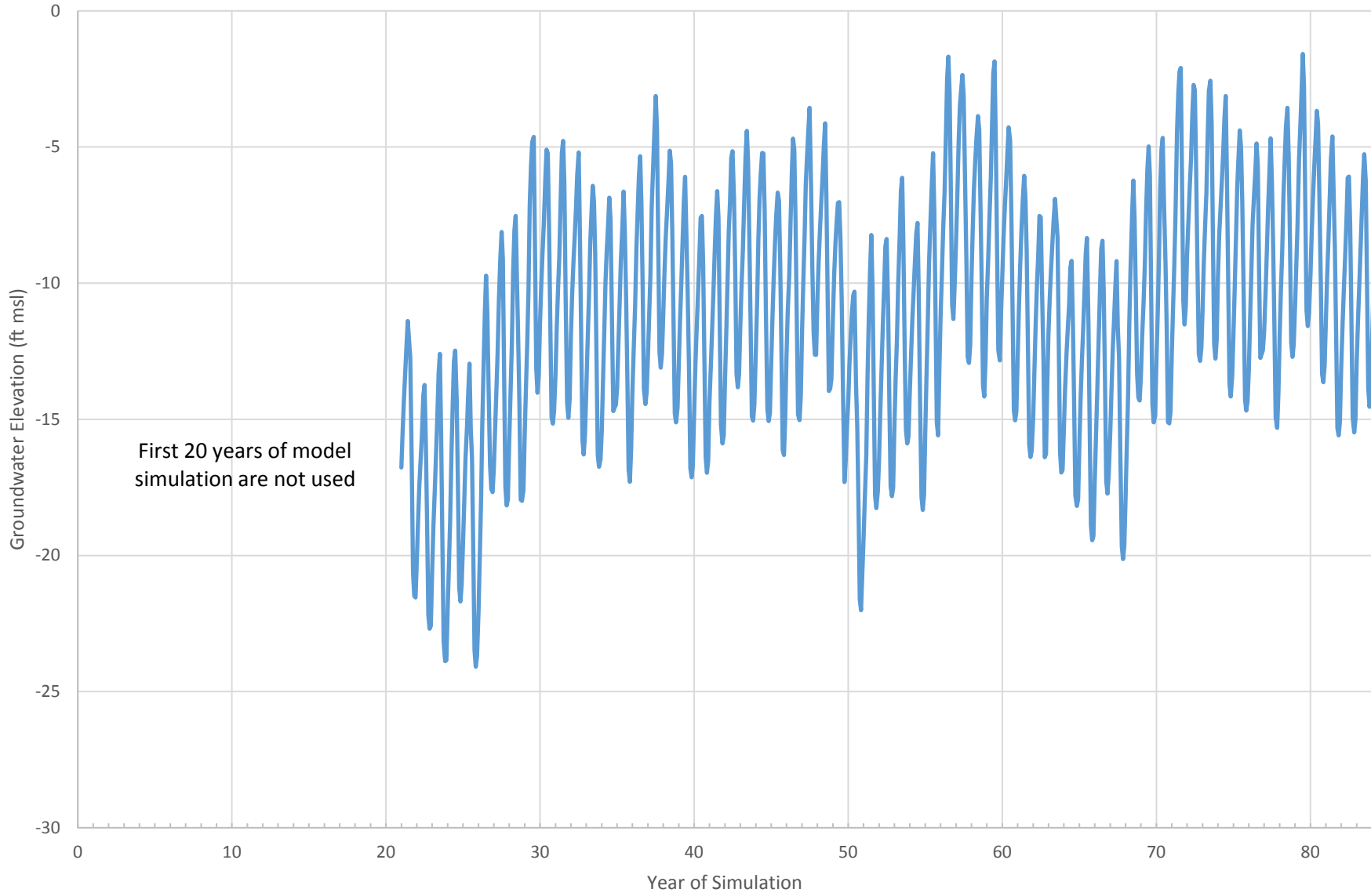
— Future Conditions Baseline Simulation





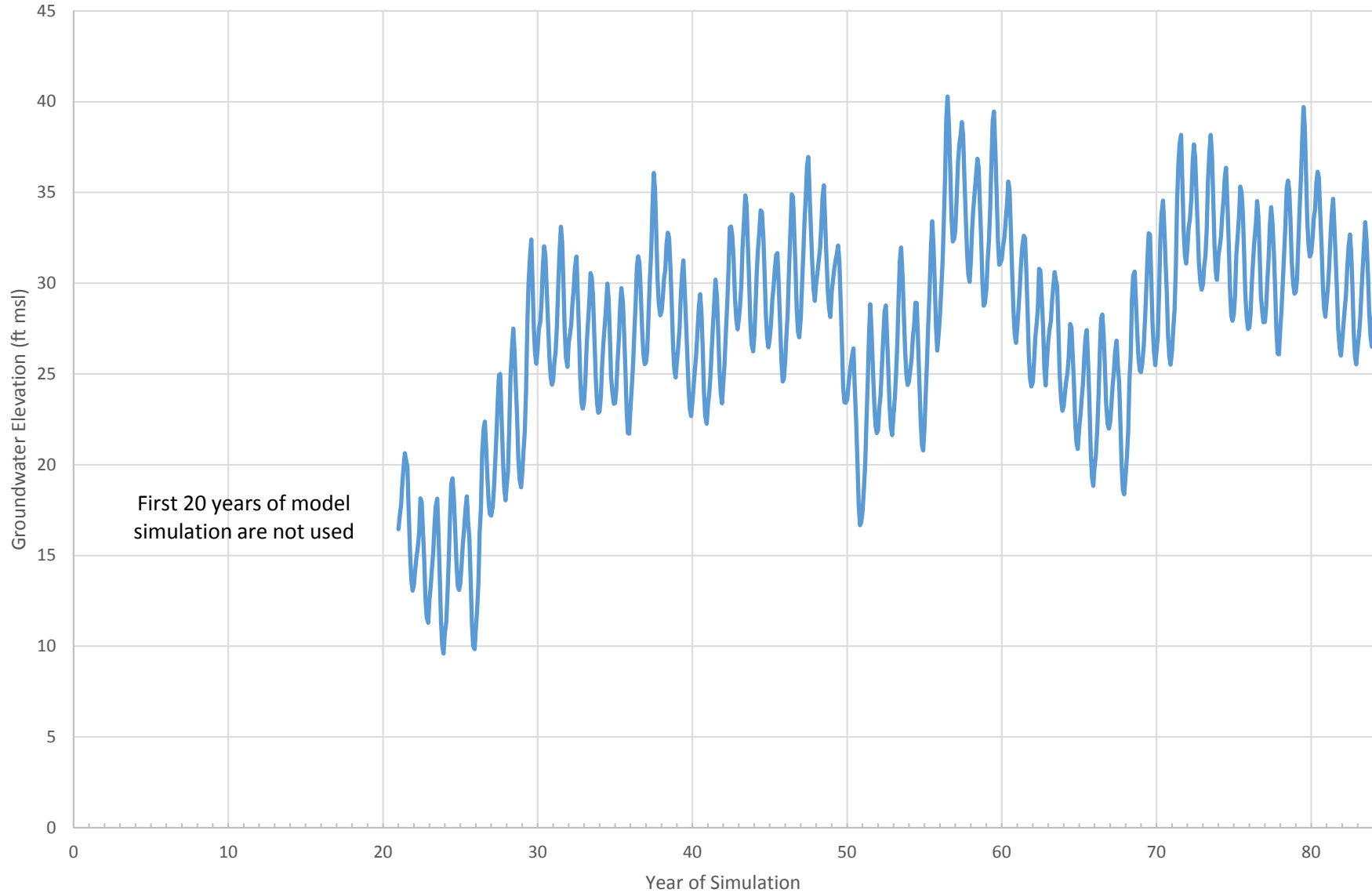
# Polygon 326

— Future Conditions Baseline Simulation



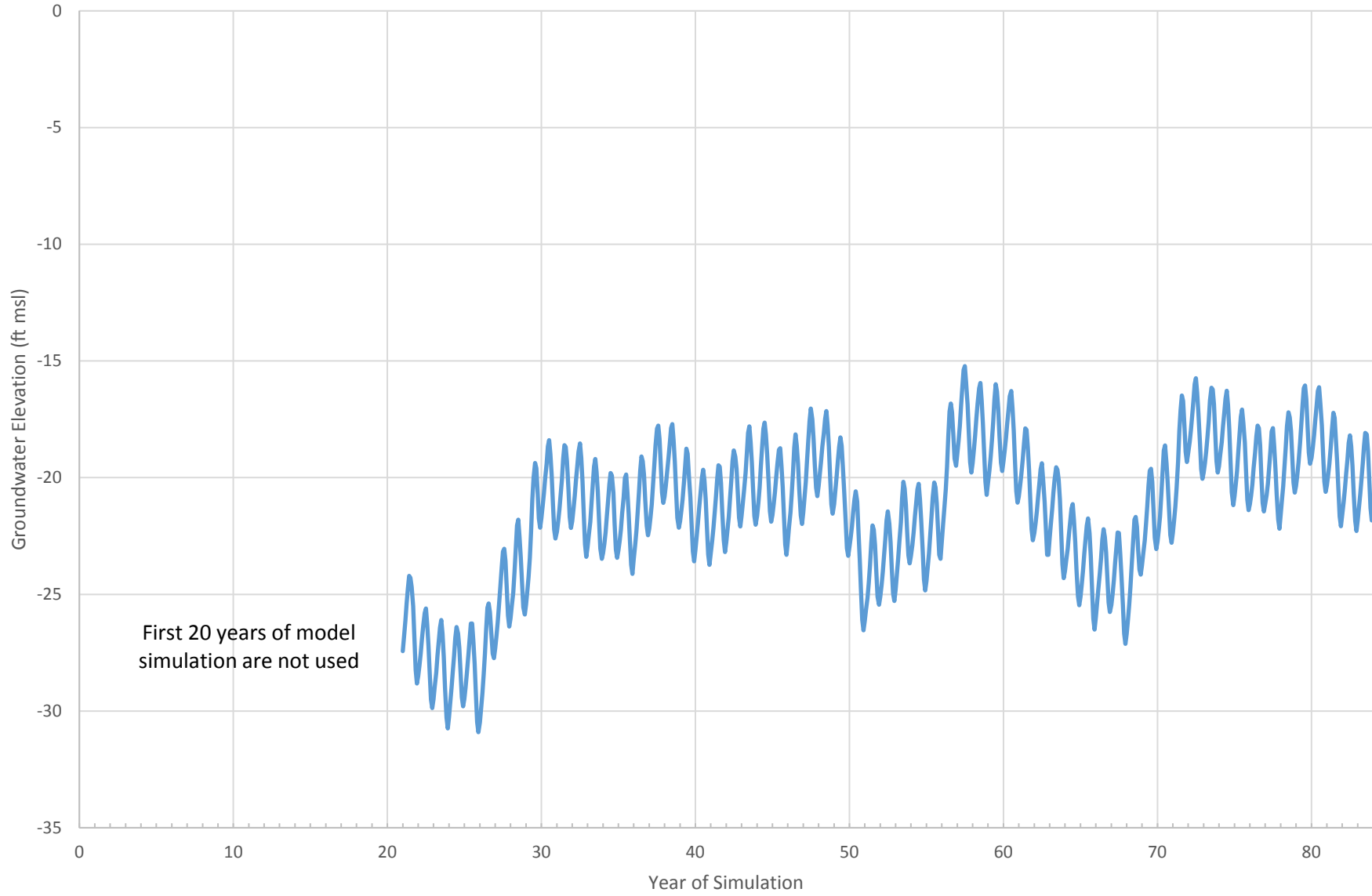
# Polygon 328

— Future Conditions Baseline Simulation



# Polygon 330

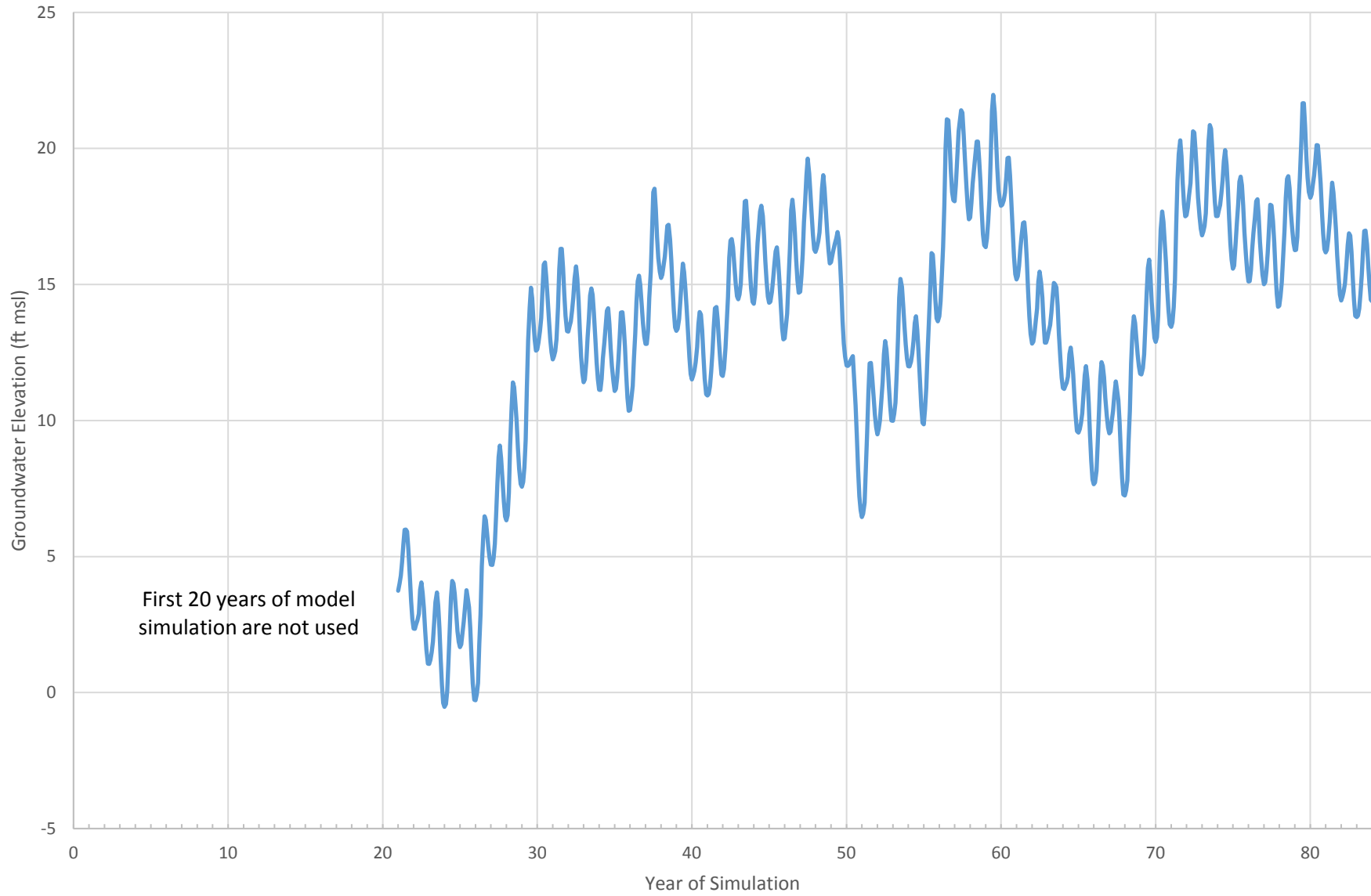
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

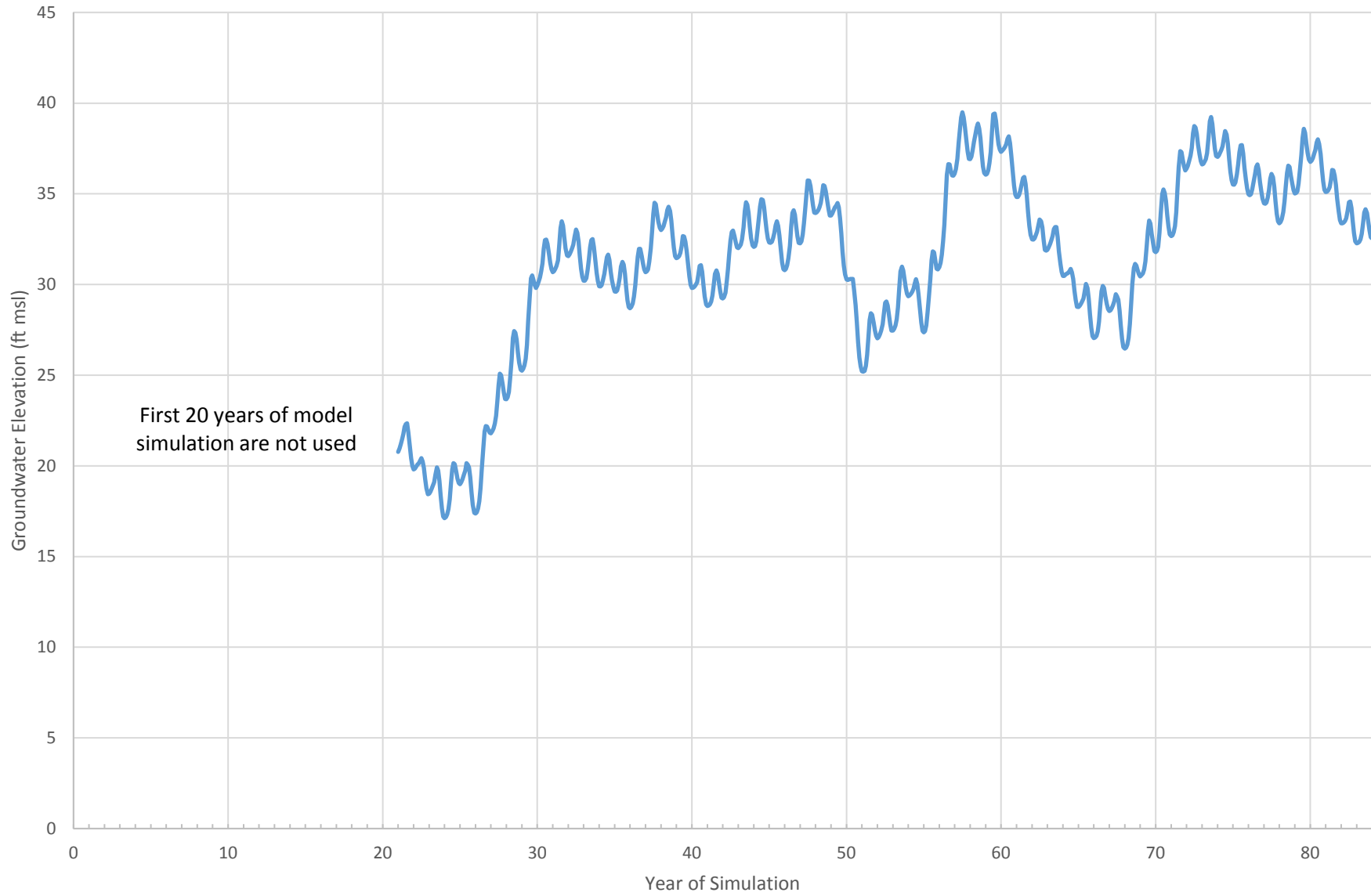
# Polygon 333

— Future Conditions Baseline Simulation



# Polygon 339

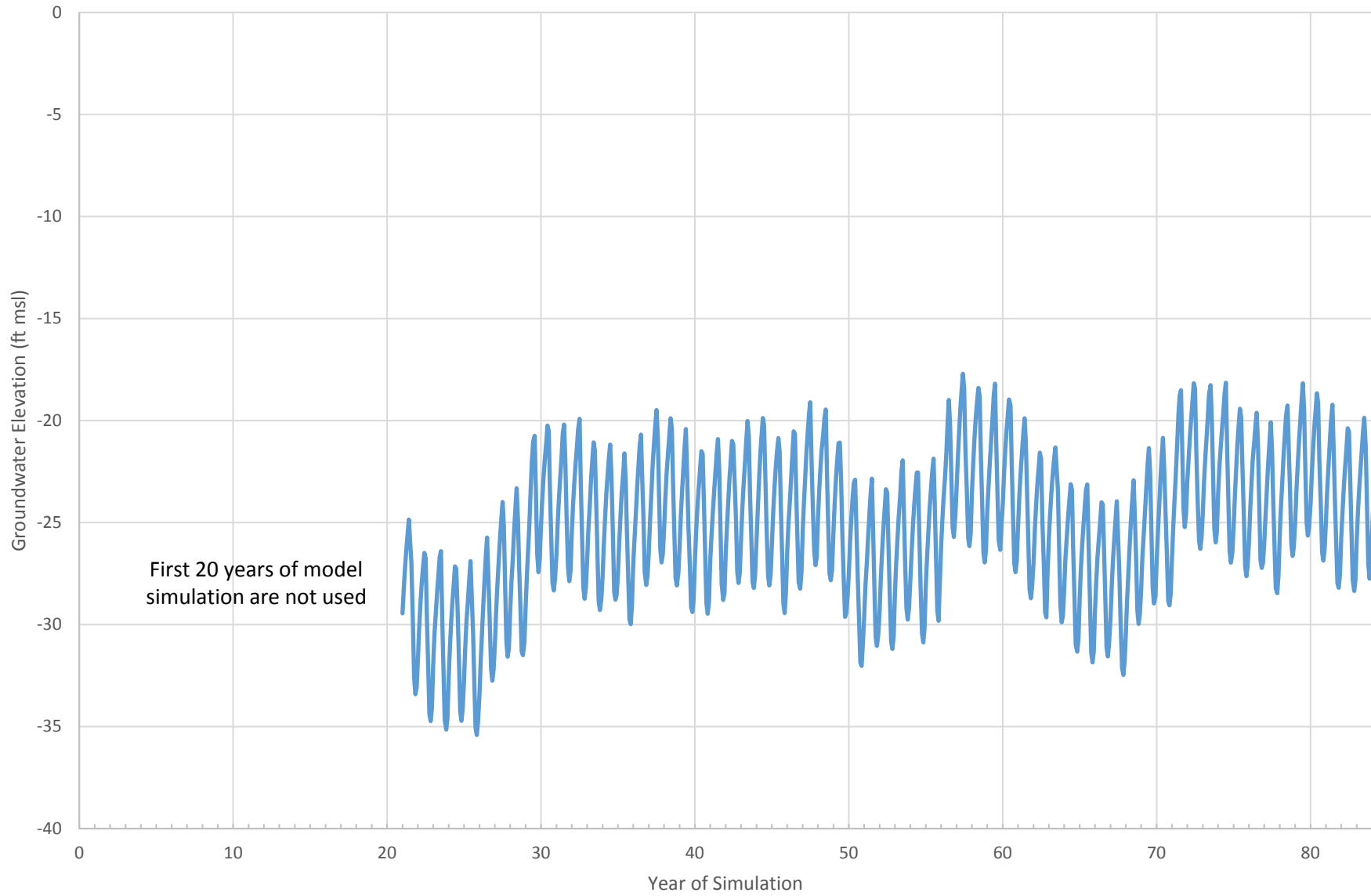
— Future Conditions Baseline Simulation



First 20 years of model simulation are not used

# Polygon 350

— Future Conditions Baseline Simulation



## Appendix C

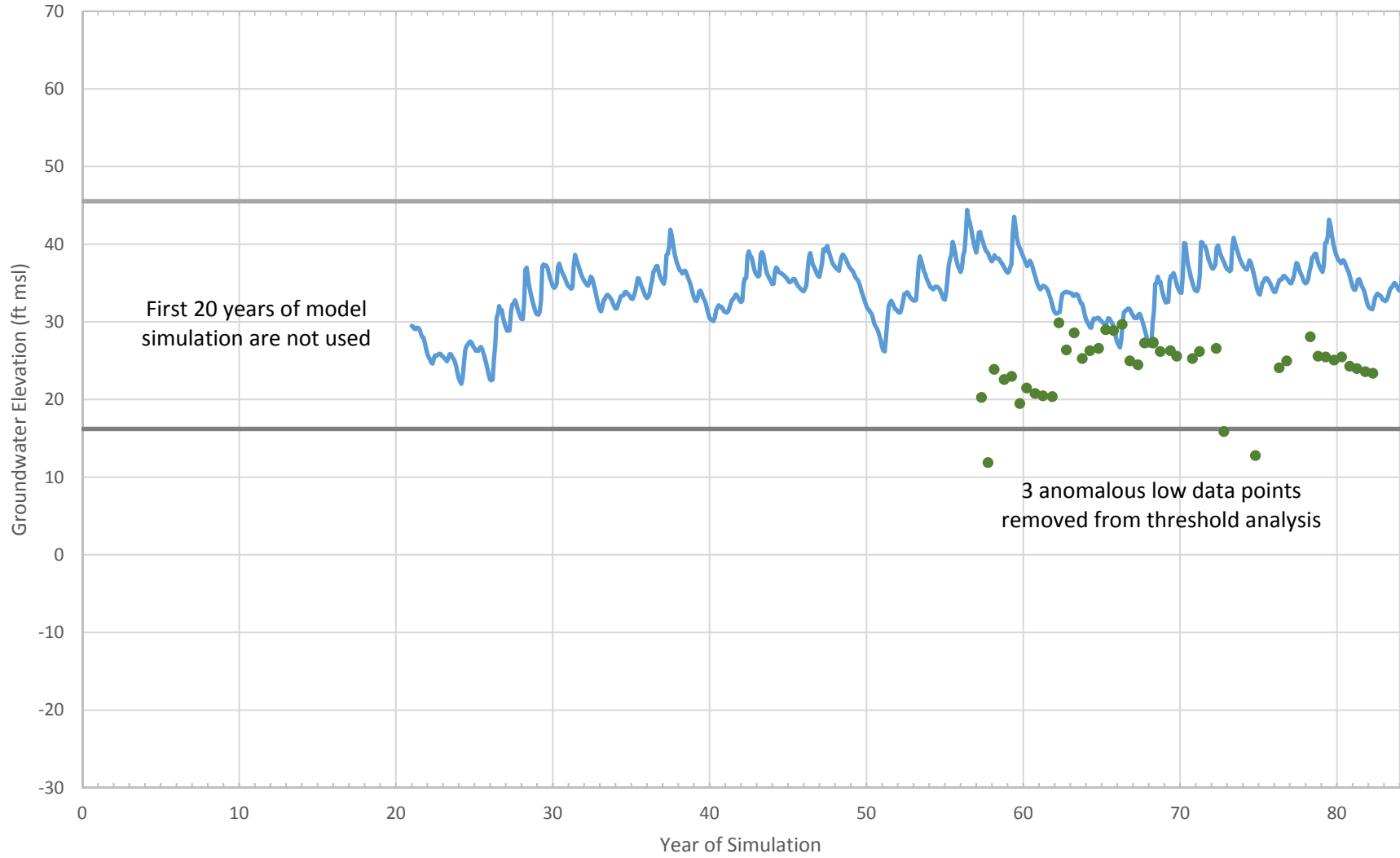
Bandwidths

# SCGA #24, Polygon 117

— Future Conditions Baseline Simulation   ● Historical Data   — Lower Threshold   — Upper Threshold

Date of Historical Data

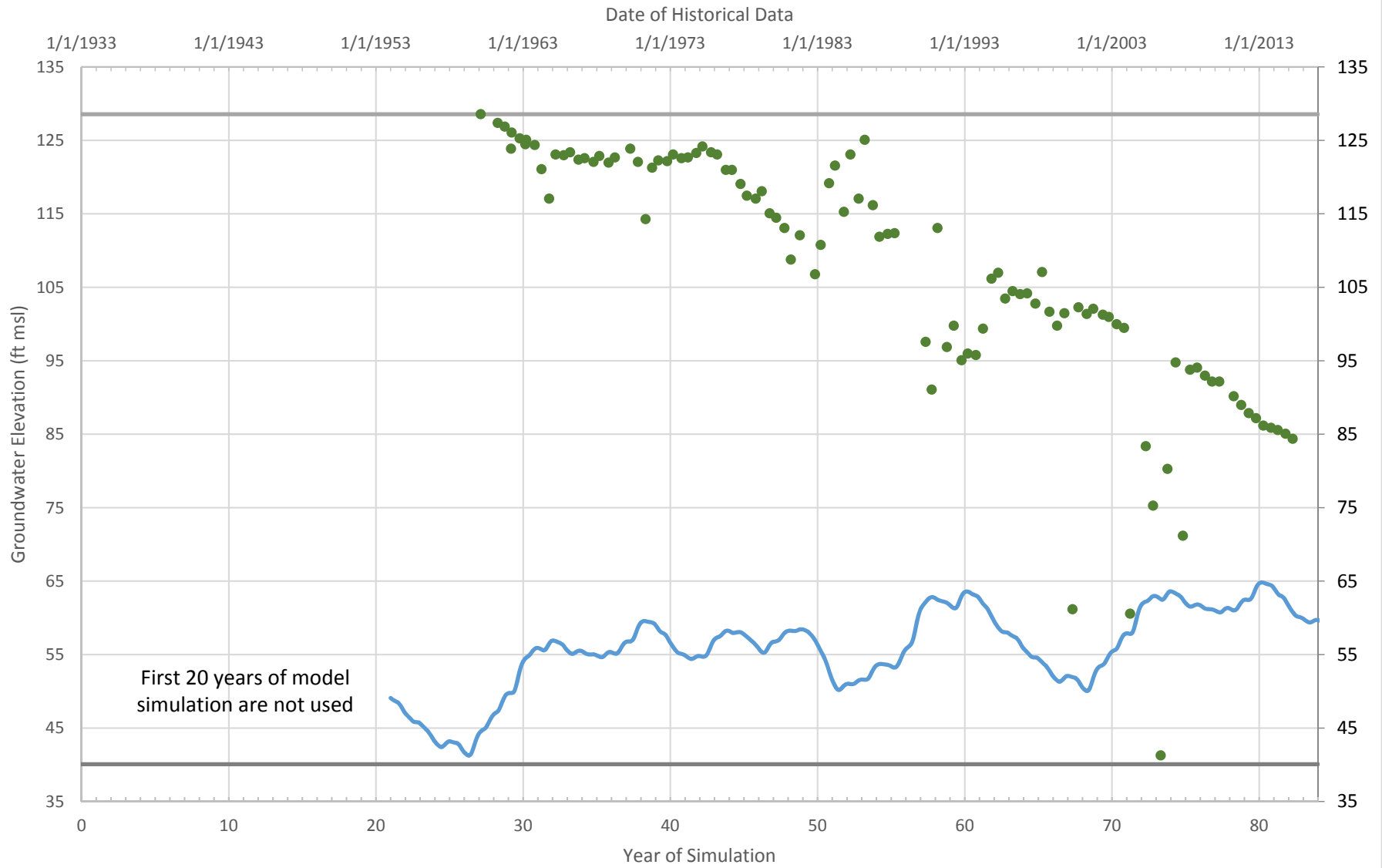
1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013





# SCGA #20, Polygon 131

— Future Conditions Baseline Simulation   ● Historical Data   — Lower Threshold   — Upper Threshold

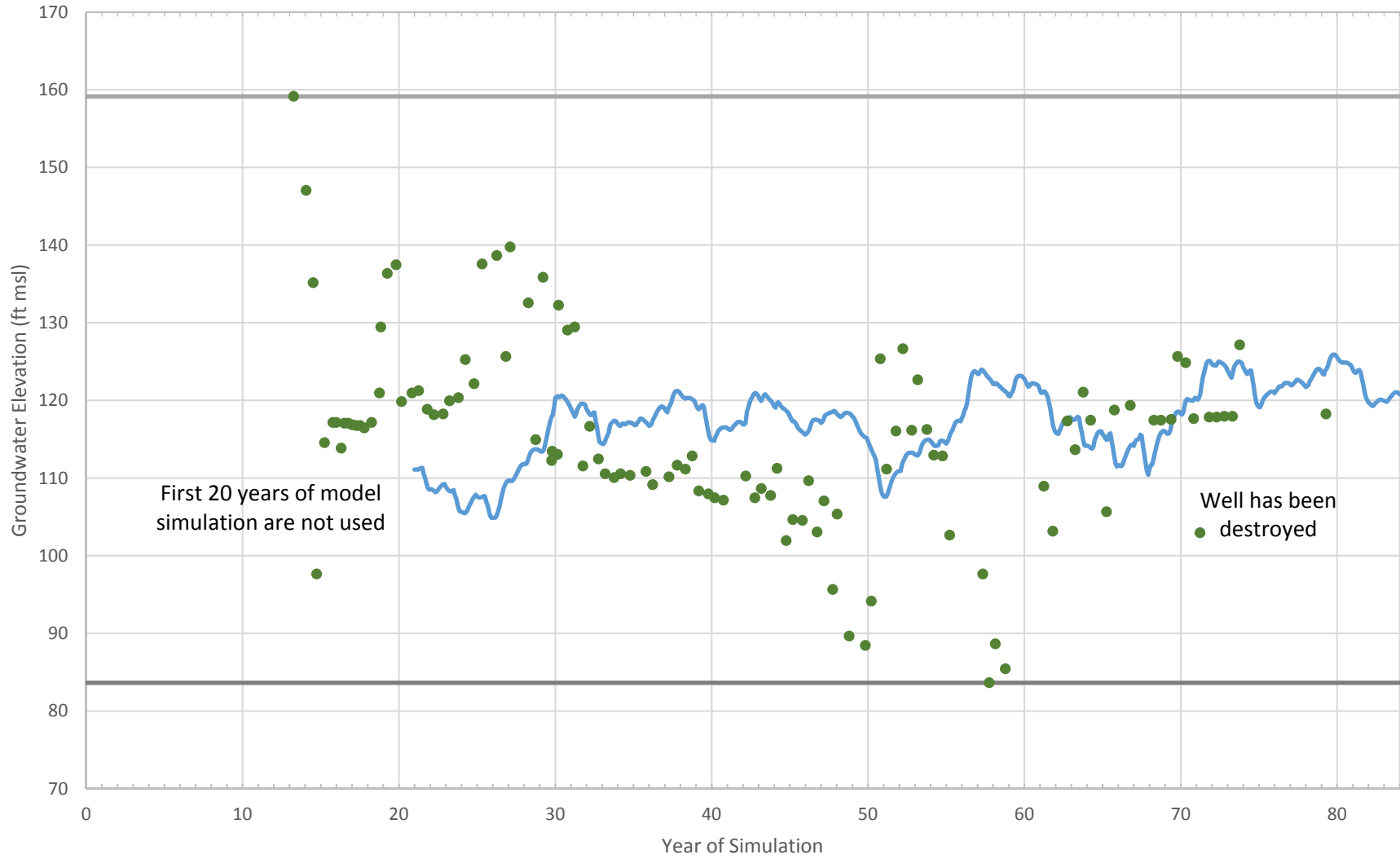


# SCGA #21, Polygon 132

— Future Conditions Baseline Simulation   ● Historical Data   — Lower Threshold   — Upper Threshold

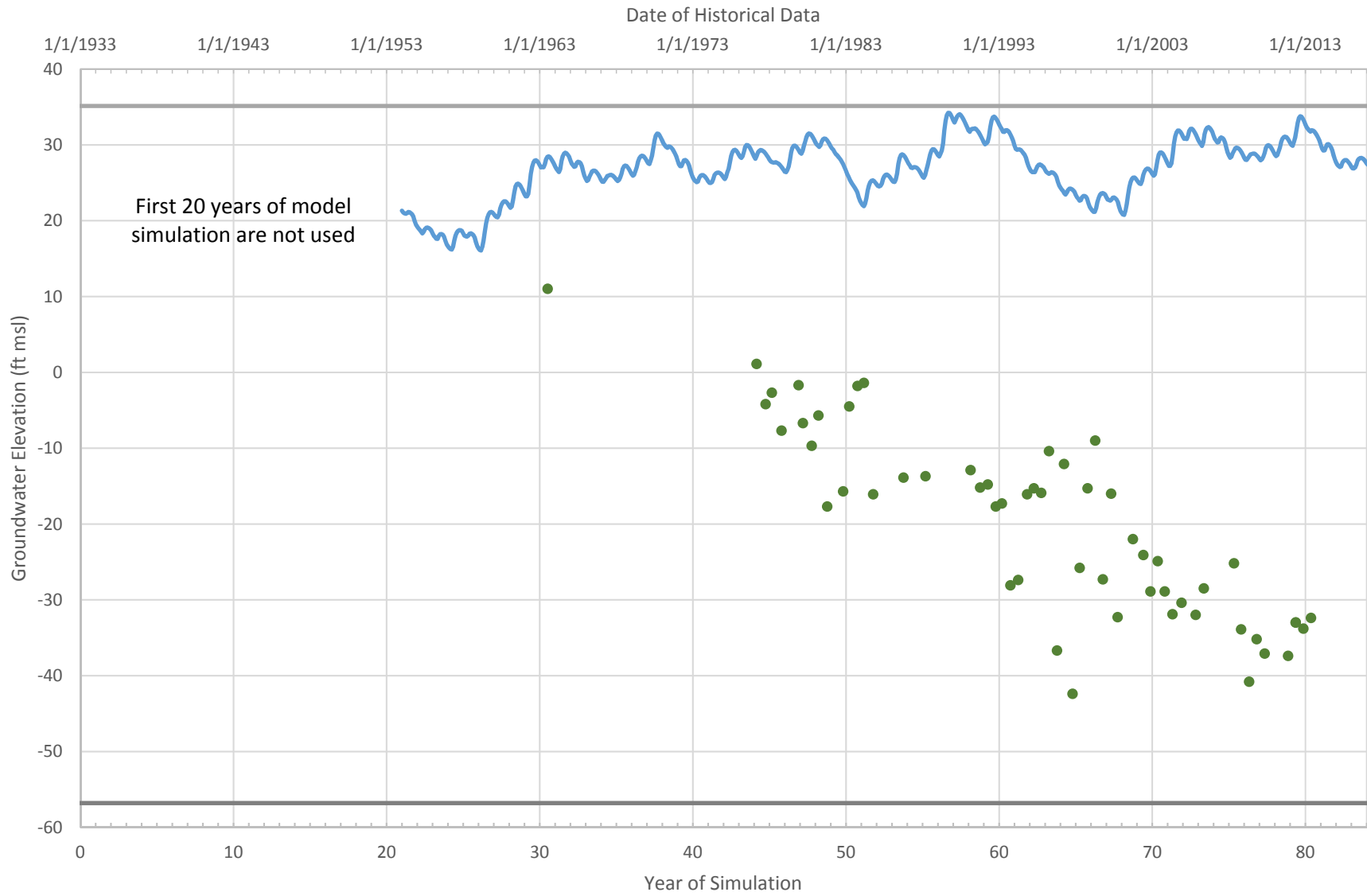
Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013



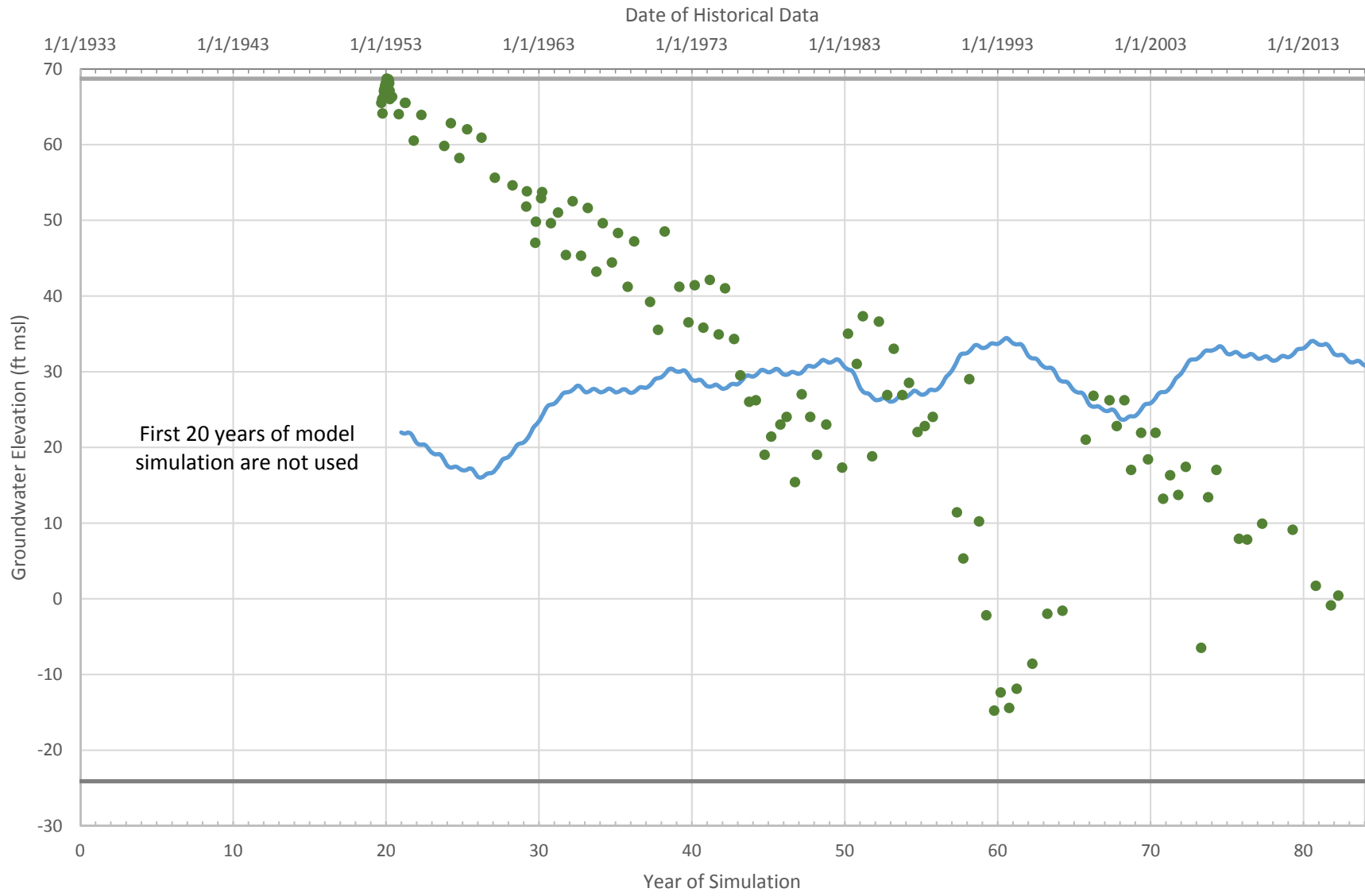
# SCGA #12, Polygon 135

— Future Conditions Baseline Simulation   ● Historical Data   — Lower Threshold   — Upper Threshold



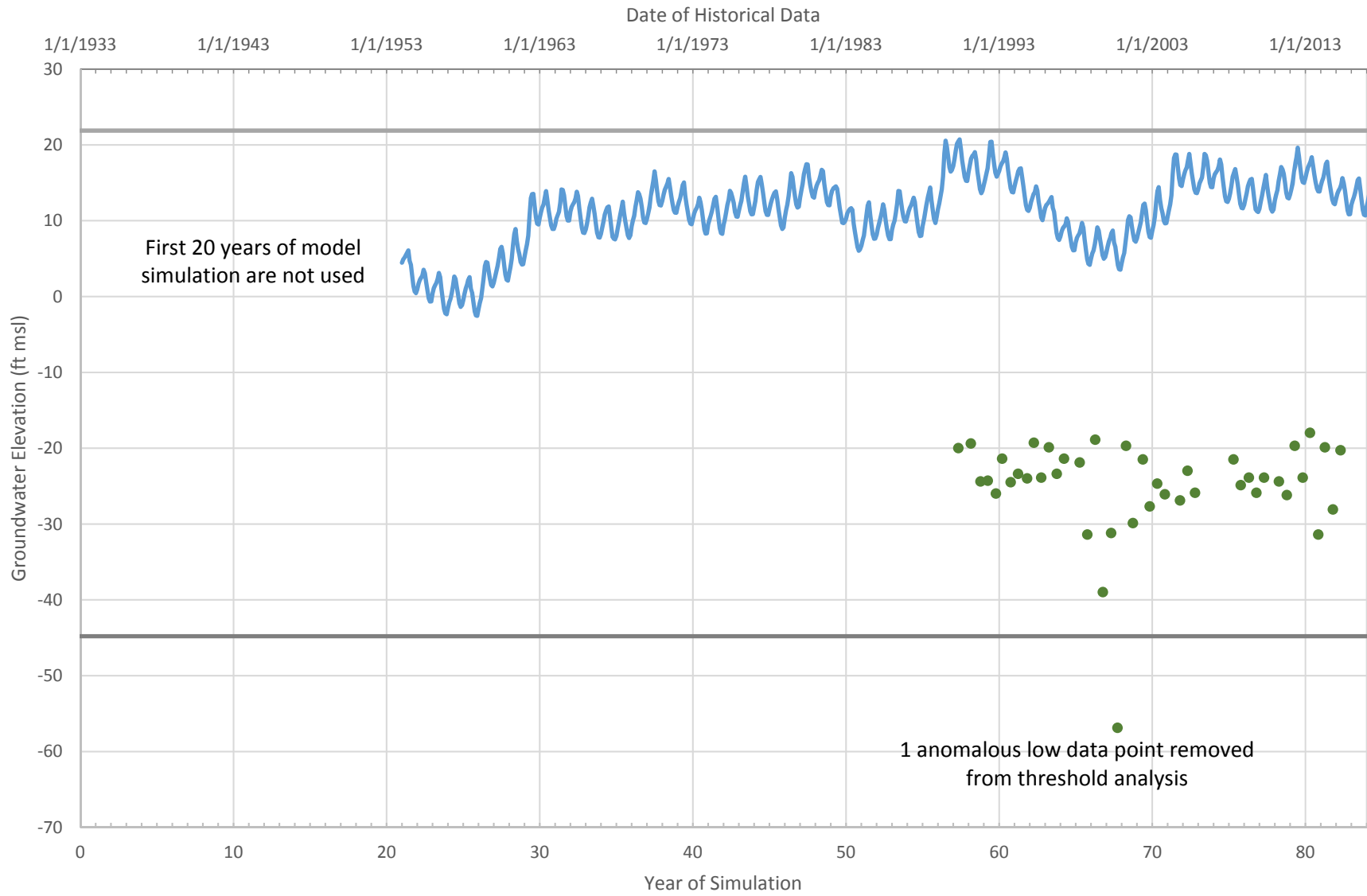
# SCGA #22, Polygon 152

— Future Conditions Baseline Simulation   ● Historical Data   — Lower Threshold   — Upper Threshold



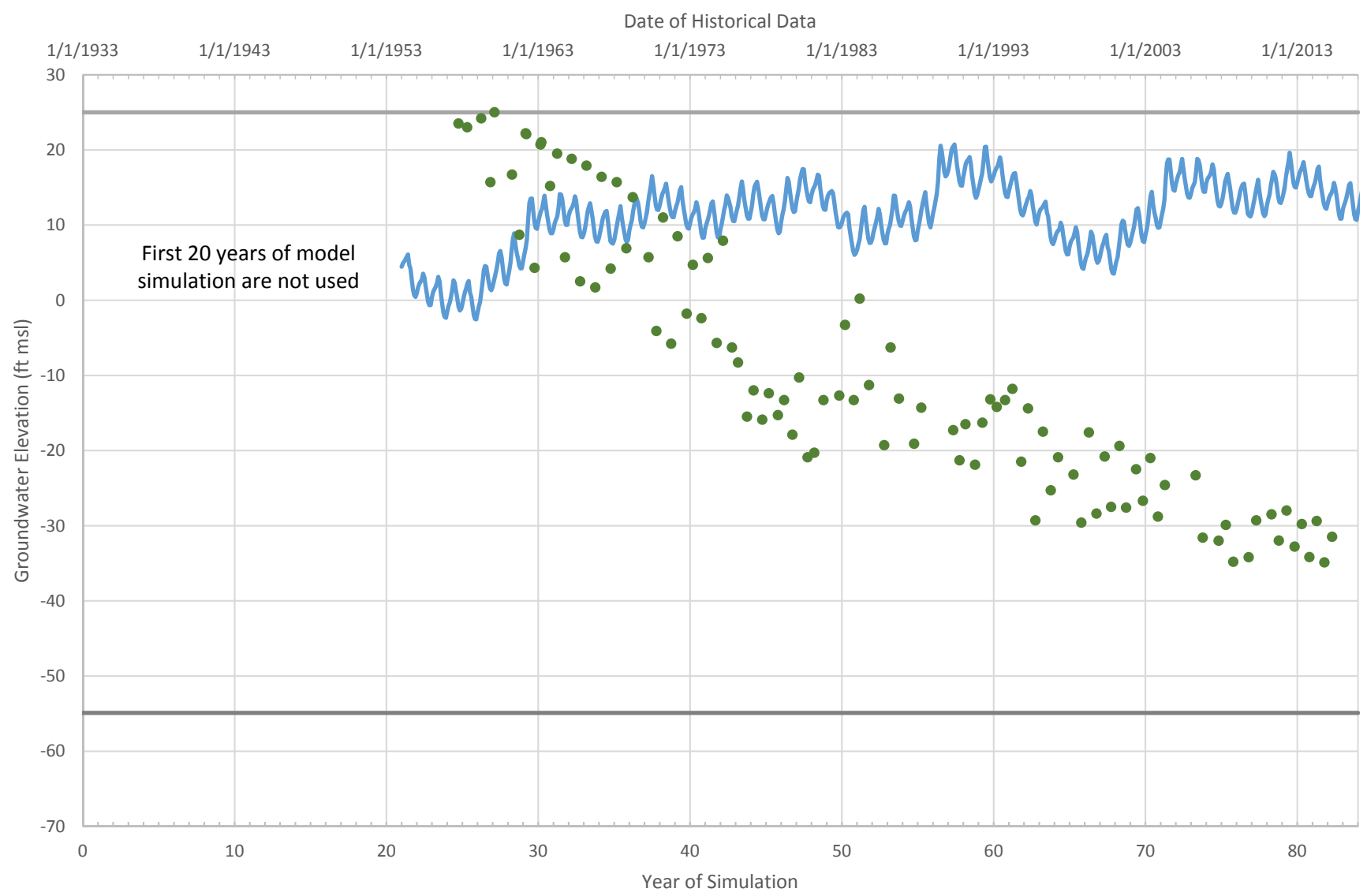
# SCGA #13, Polygon 153

— Future Conditions Baseline Simulation   ● SCGA #13   — Lower Threshold   — Upper Threshold



### SCGA #15, Polygon 153

— Future Conditions Baseline Simulation   ● SCGA #15   — Lower Threshold   — Upper Threshold

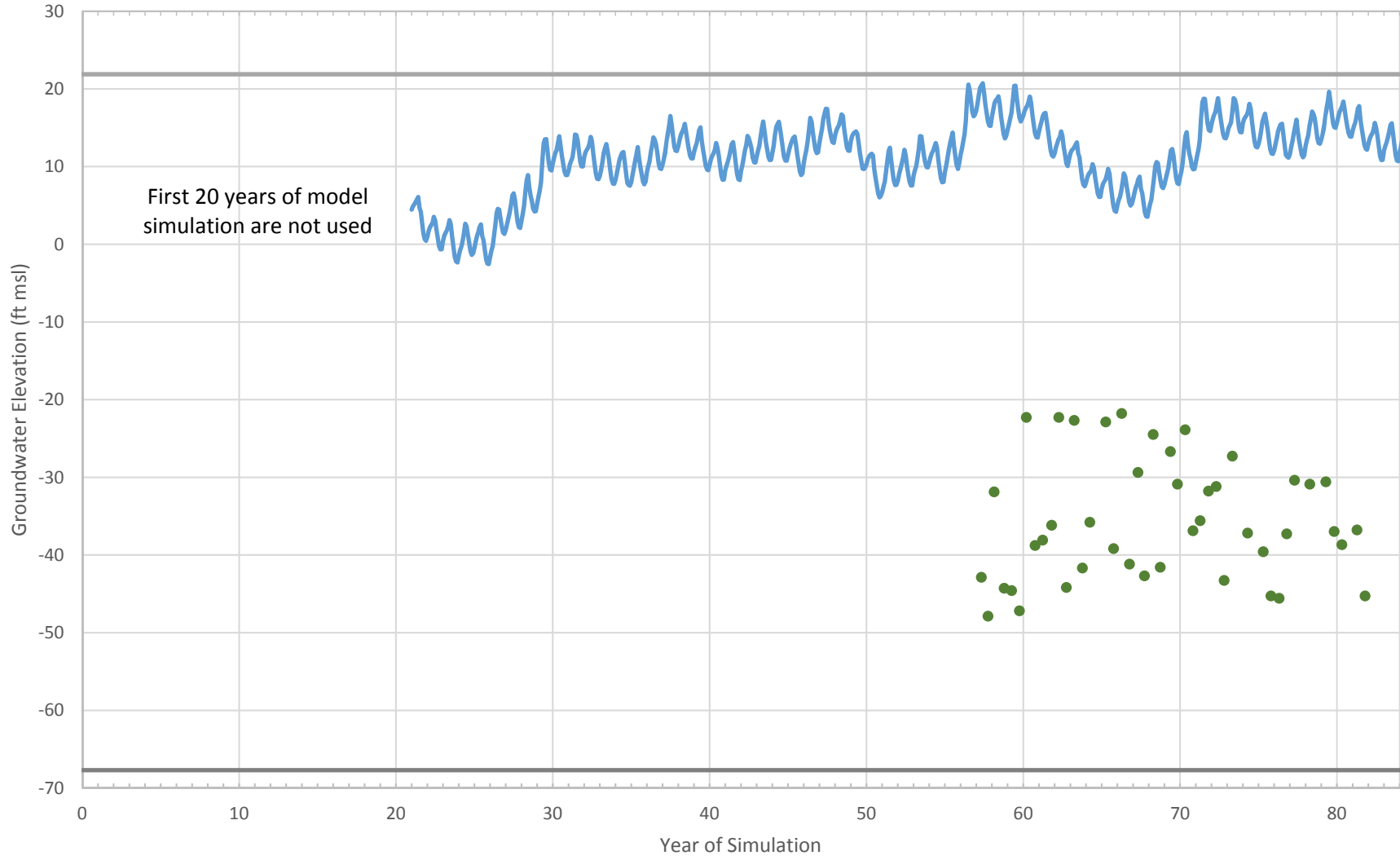


# SCGA #16, Polygon 153

— Future Conditions Baseline Simulation   ● SCGA #16   — Lower Threshold   — Upper Threshold

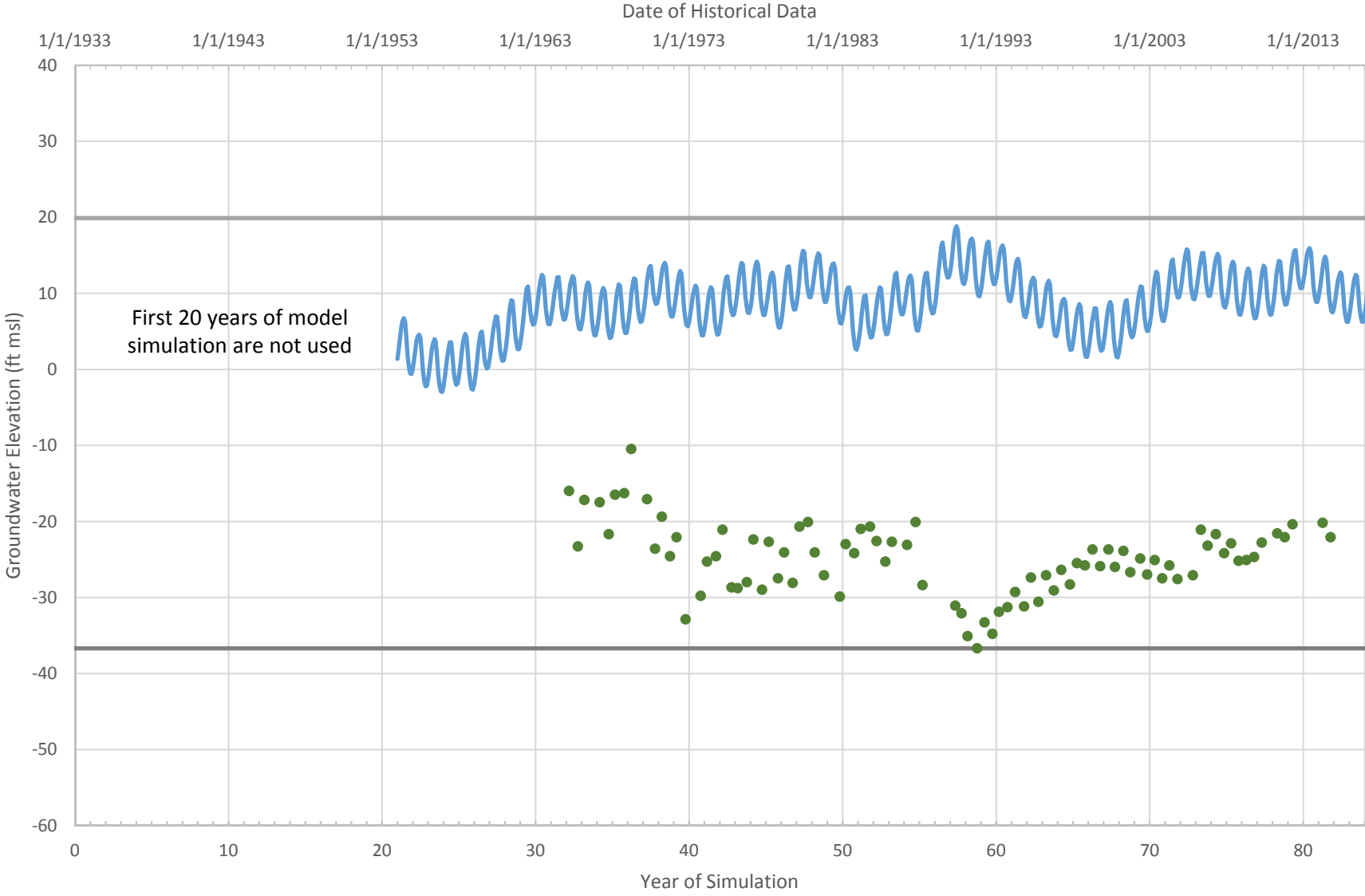
Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013



# SCGA # 17, Polygon 154

Future Conditions Baseline Simulation   SCGA #17   Lower Threshold   Upper Threshold



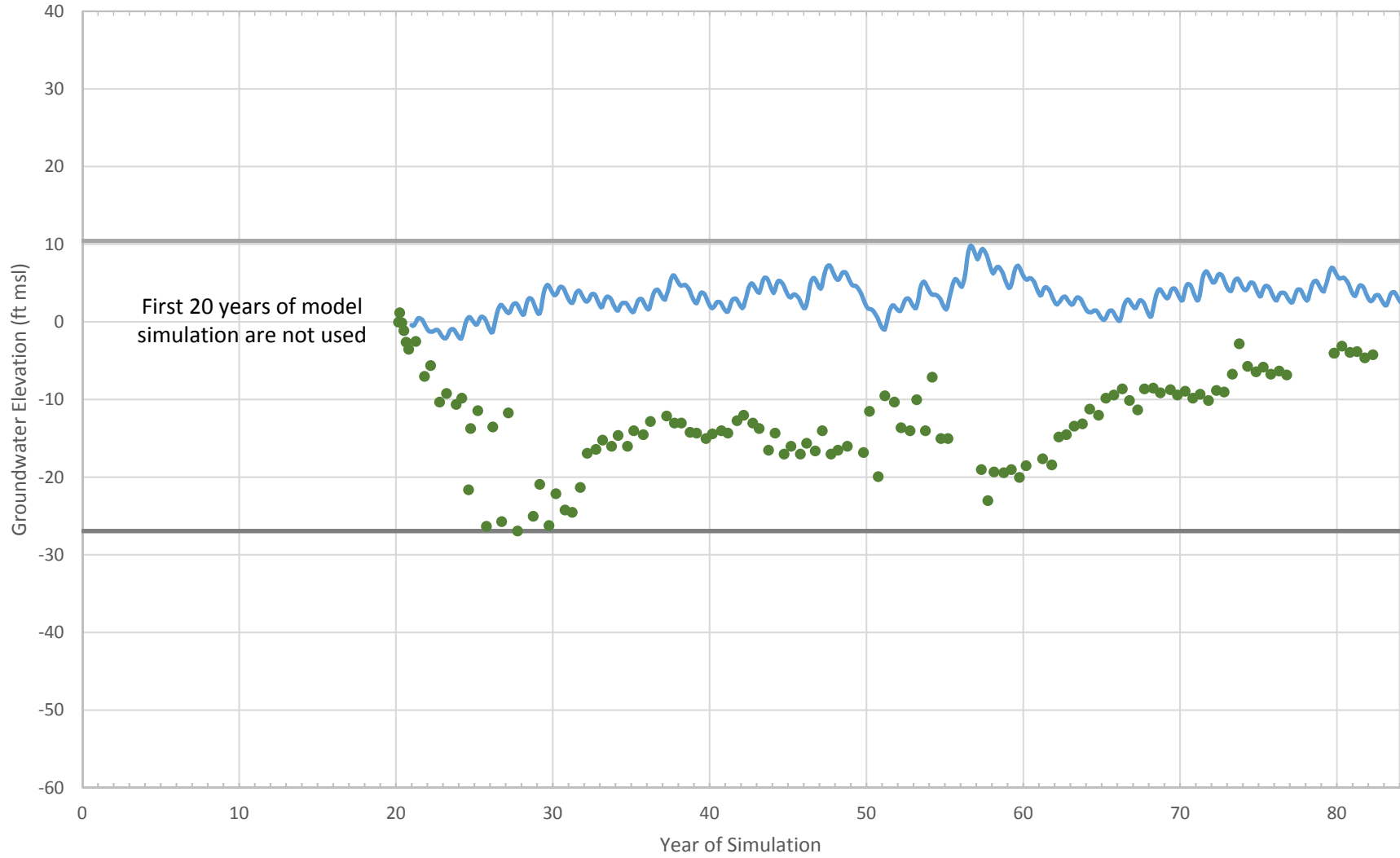


# SCGA #11, Polygon 156

— Future Conditions Baseline Simulation   ● SCGA #11   — Lower Threshold   — Upper Threshold

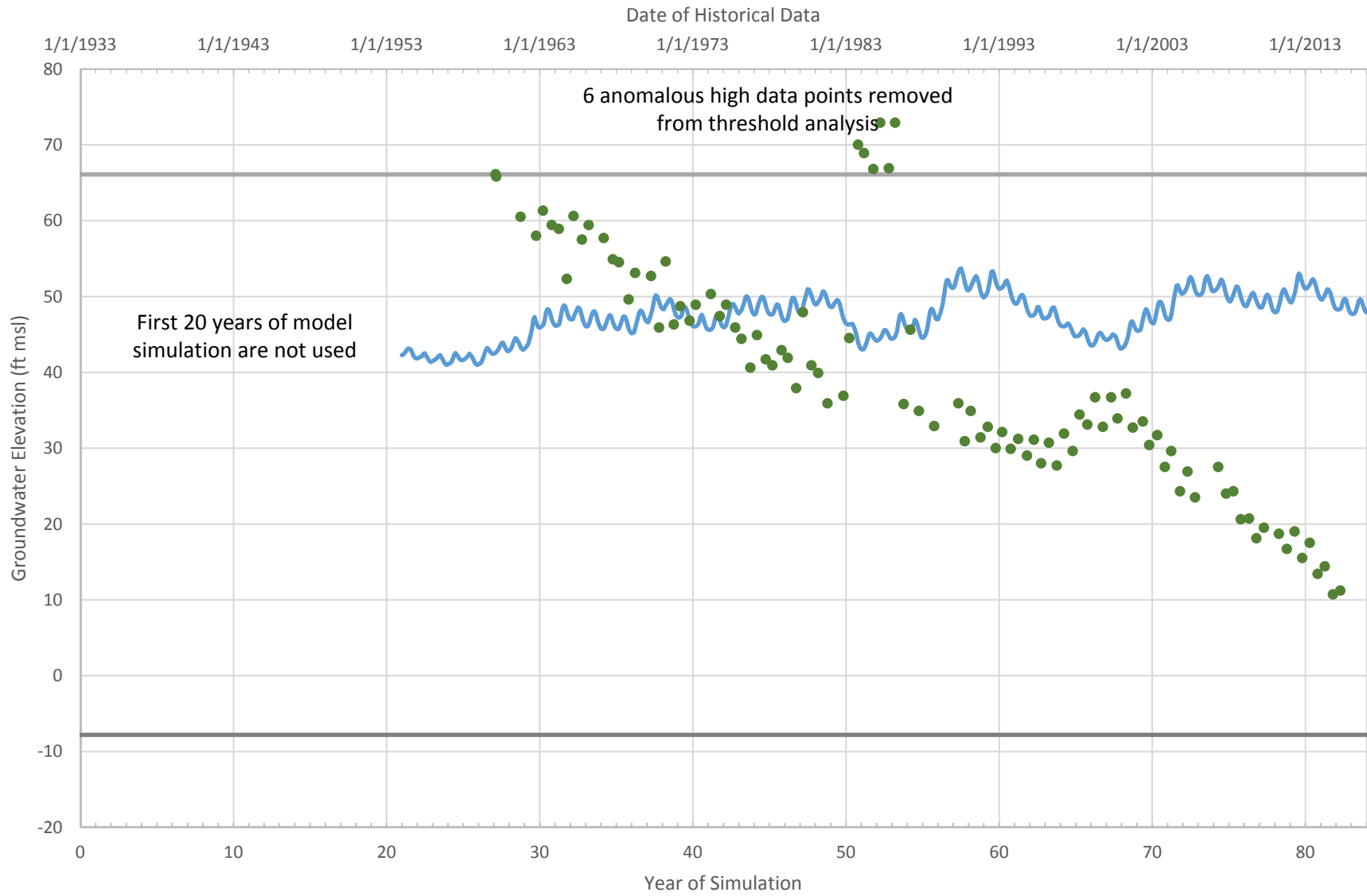
Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013



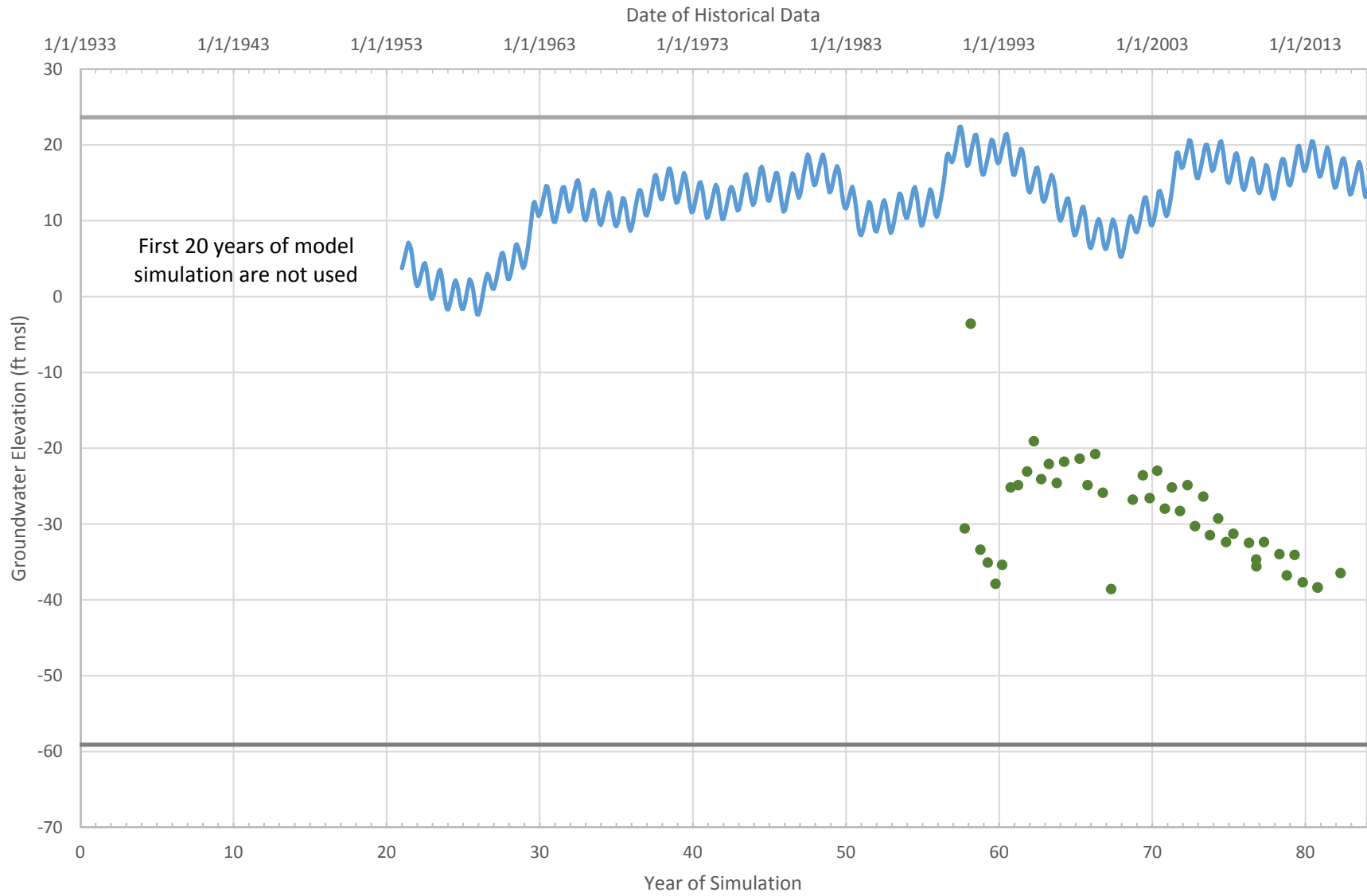
# SCGA #23, Polygon 167

— Future Conditions Baseline Simulation   ● SCGA #23   — Lower Threshold   — Upper Threshold



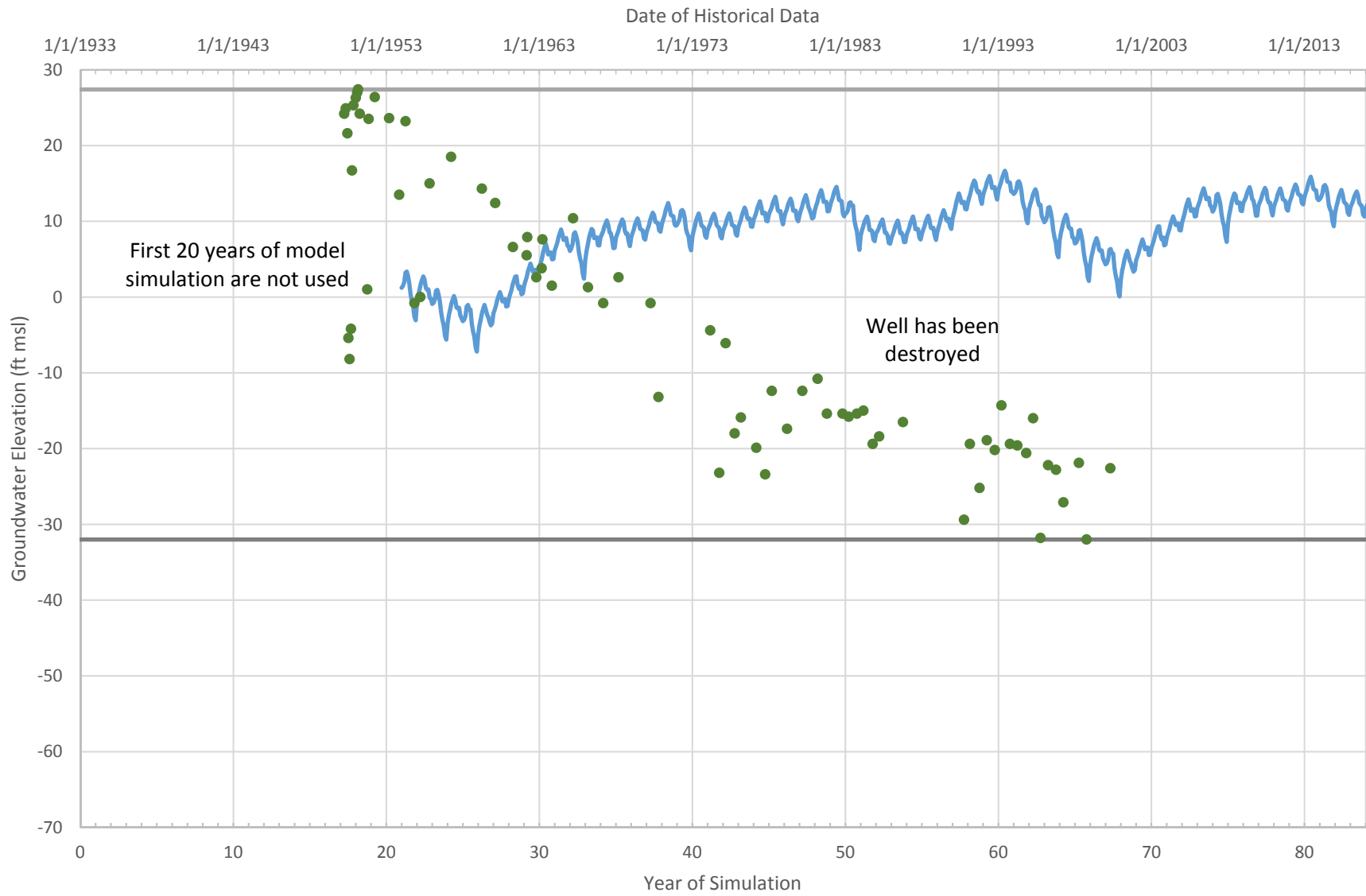
# SCGA #14, Polygon 169

— Future Conditions Baseline Simulation   ● SCGA #14   — Lower Threshold   — Upper Threshold



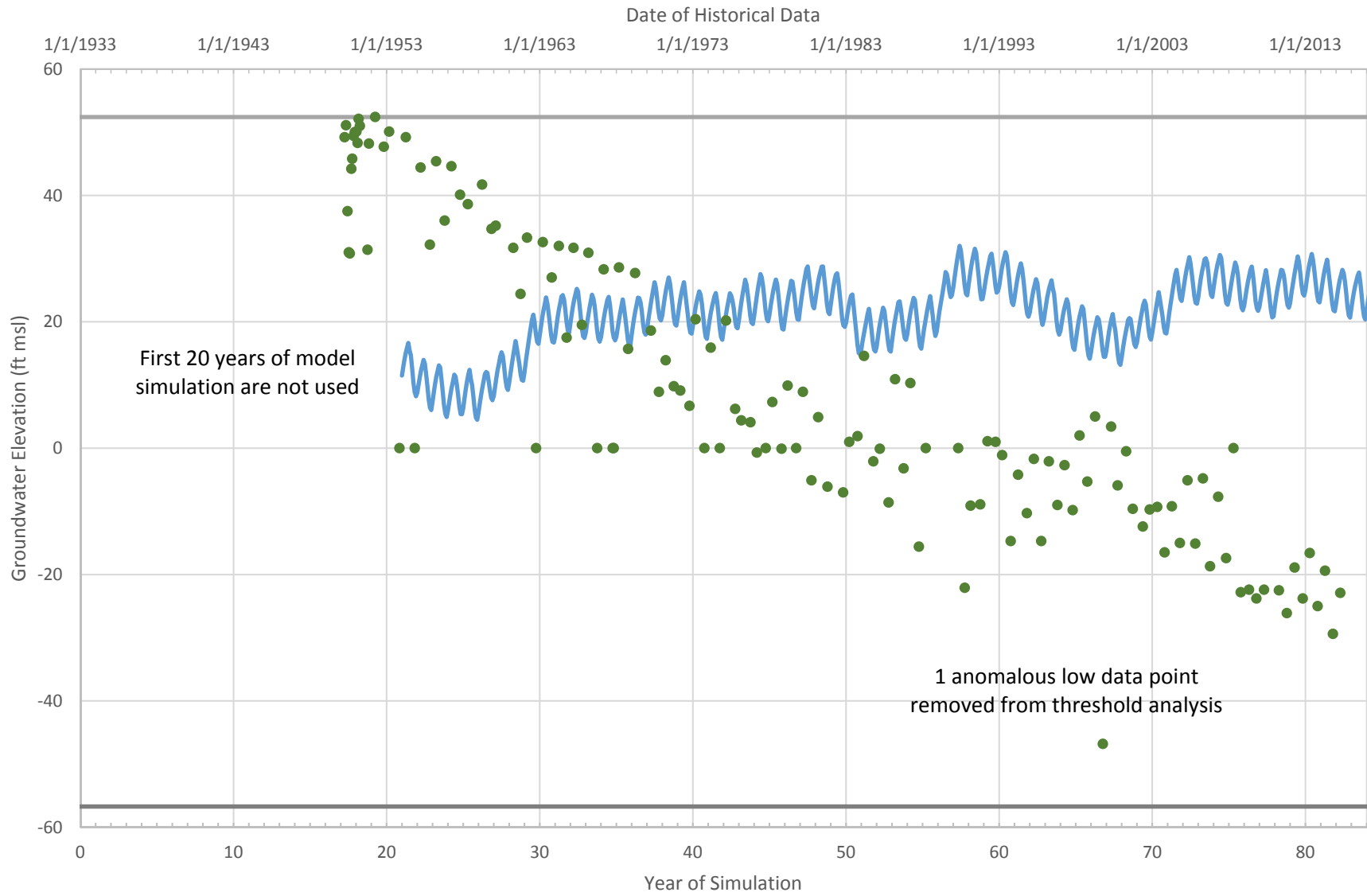
# SCGA #19, Polygon 169

— Future Conditions Baseline Simulation   ● SCGA #19   — Lower Threshold   — Upper Threshold



# SCGA #6, Polygon 170

— Future Conditions Baseline Simulation   ● SCGA #6   — Lower Threshold   — Upper Threshold

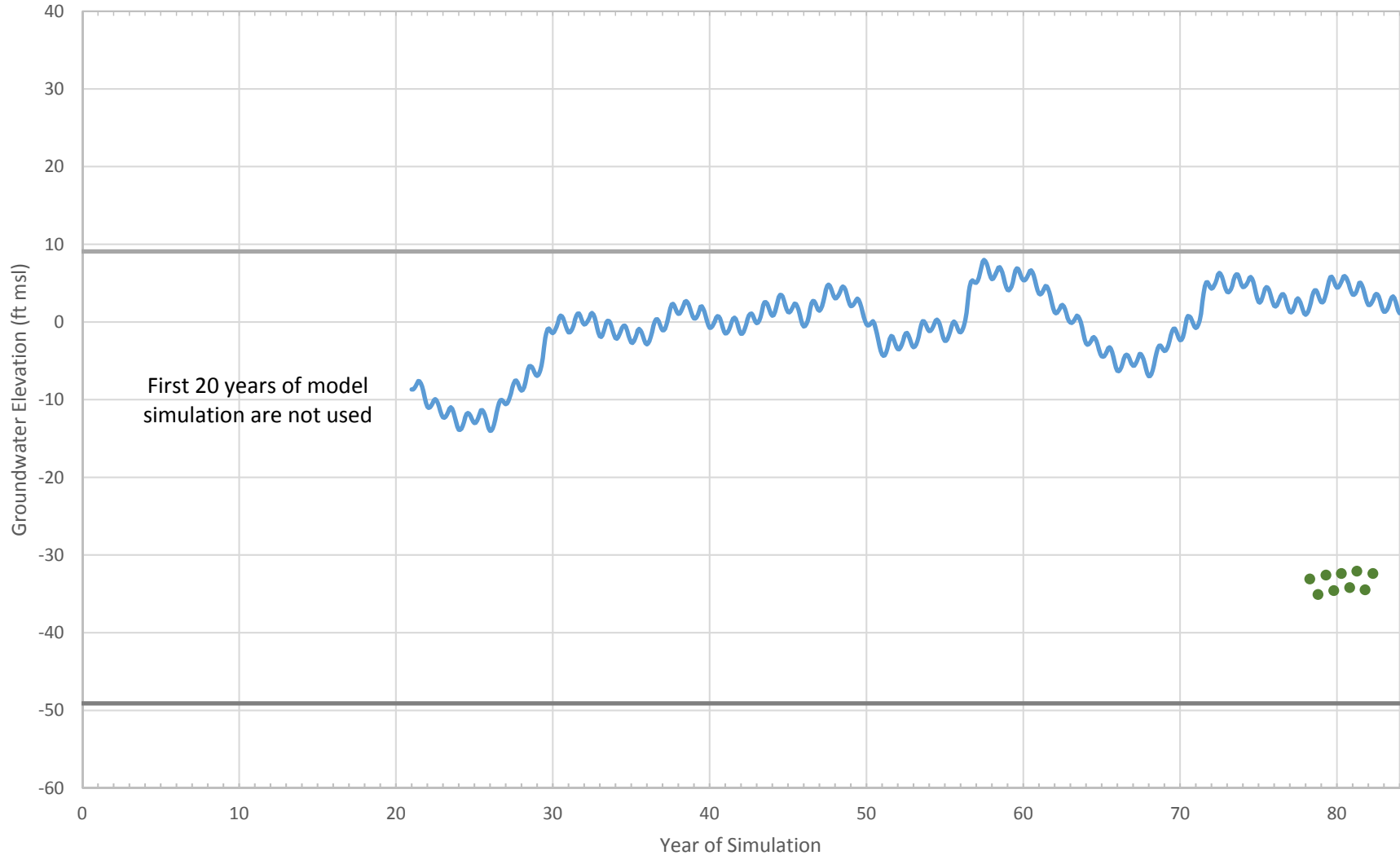


# SCGA #5, Polygon 171

— Future Conditions Baseline Simulation   ● SCGA #5   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

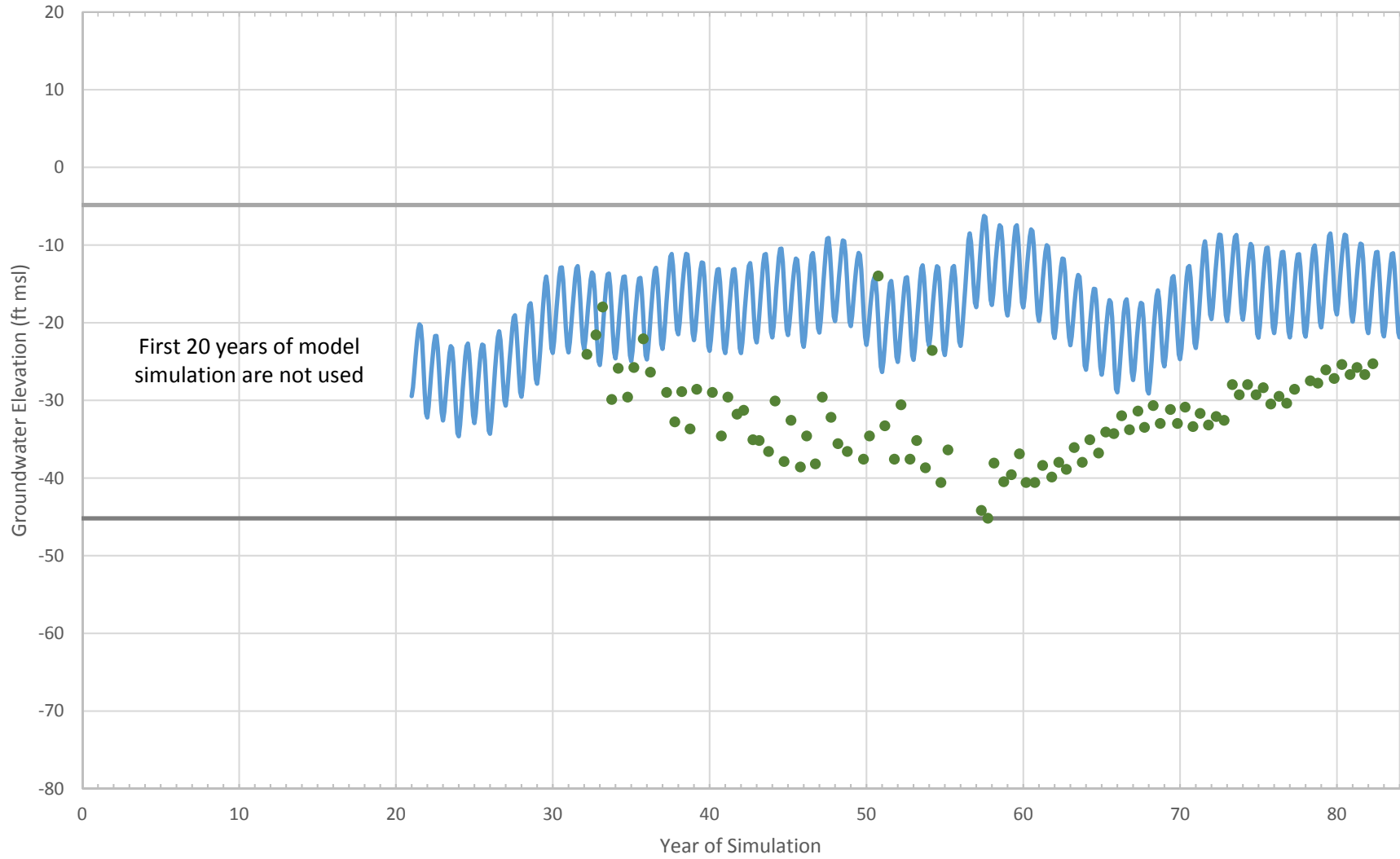


# SCGA #18, Polygon 172

— Future Conditions Baseline Simulation   ● SCGA #18   — Lower Threshold   — Upper Threshold

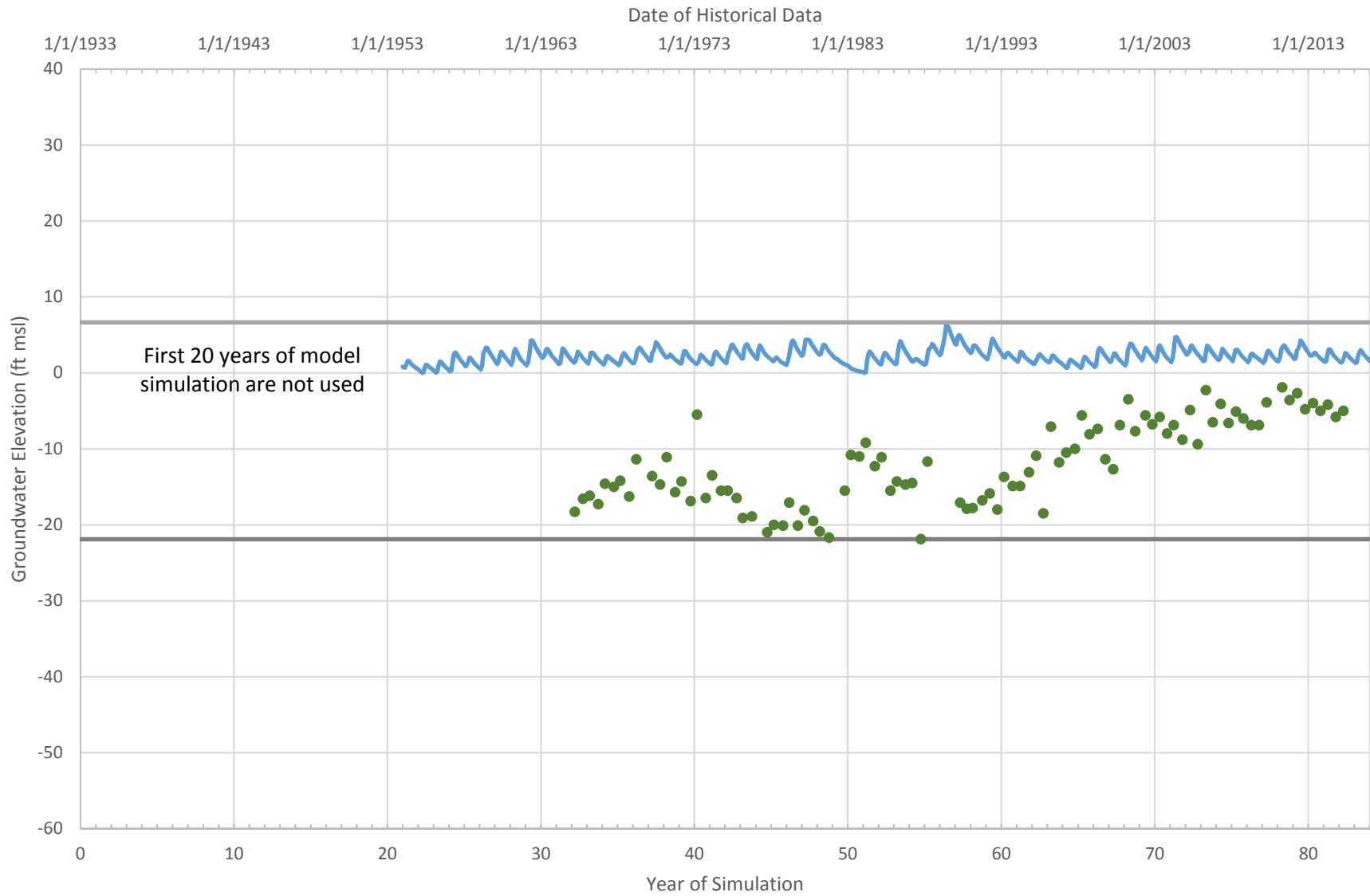
Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013



# SCGA #10, Polygon 176

— Future Conditions Baseline Simulation   ● SCGA #10   — Lower Threshold   — Upper Threshold



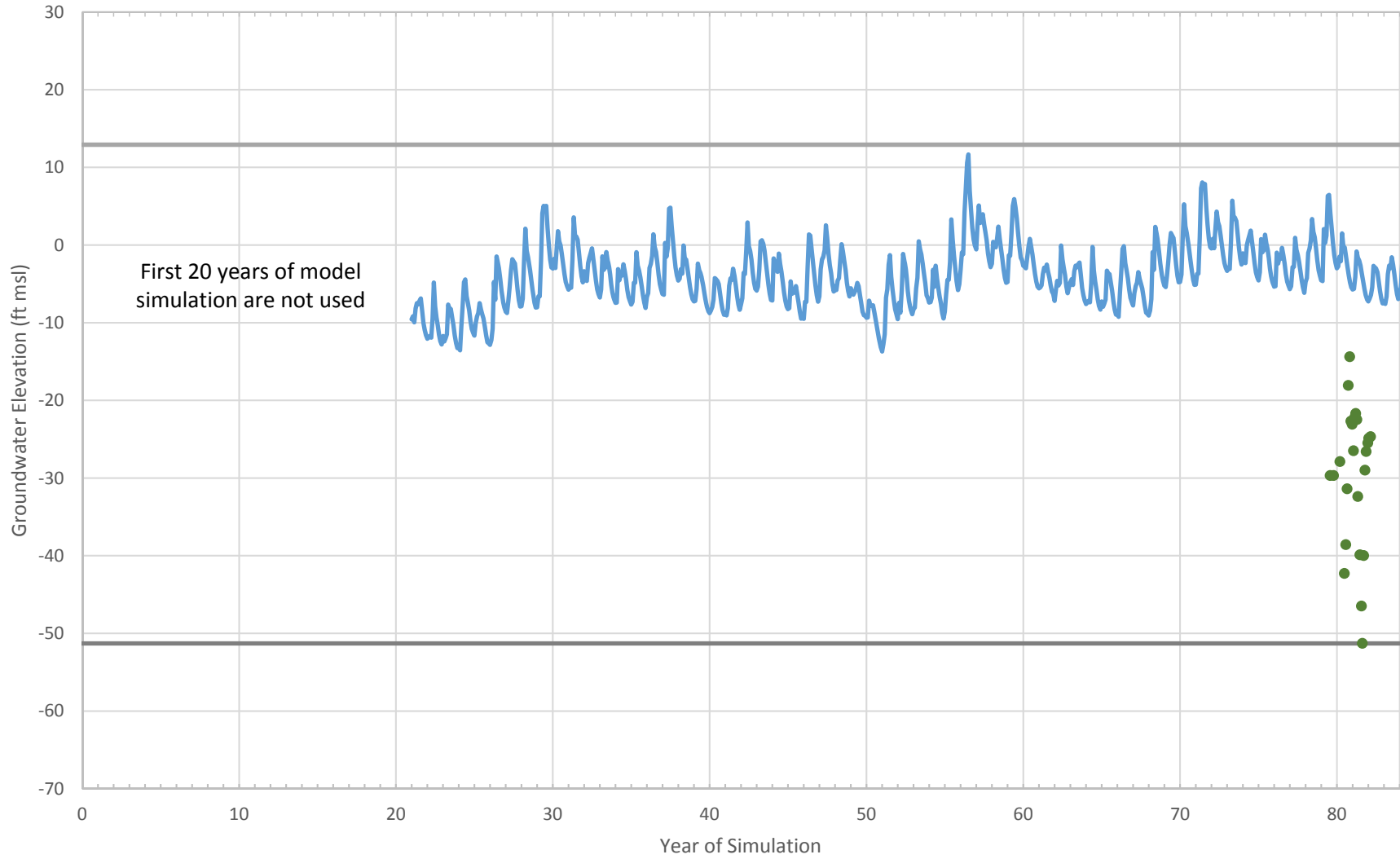


# SCGA #26, Polygon 201

— Future Conditions Baseline Simulation   ● SCGA #26   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

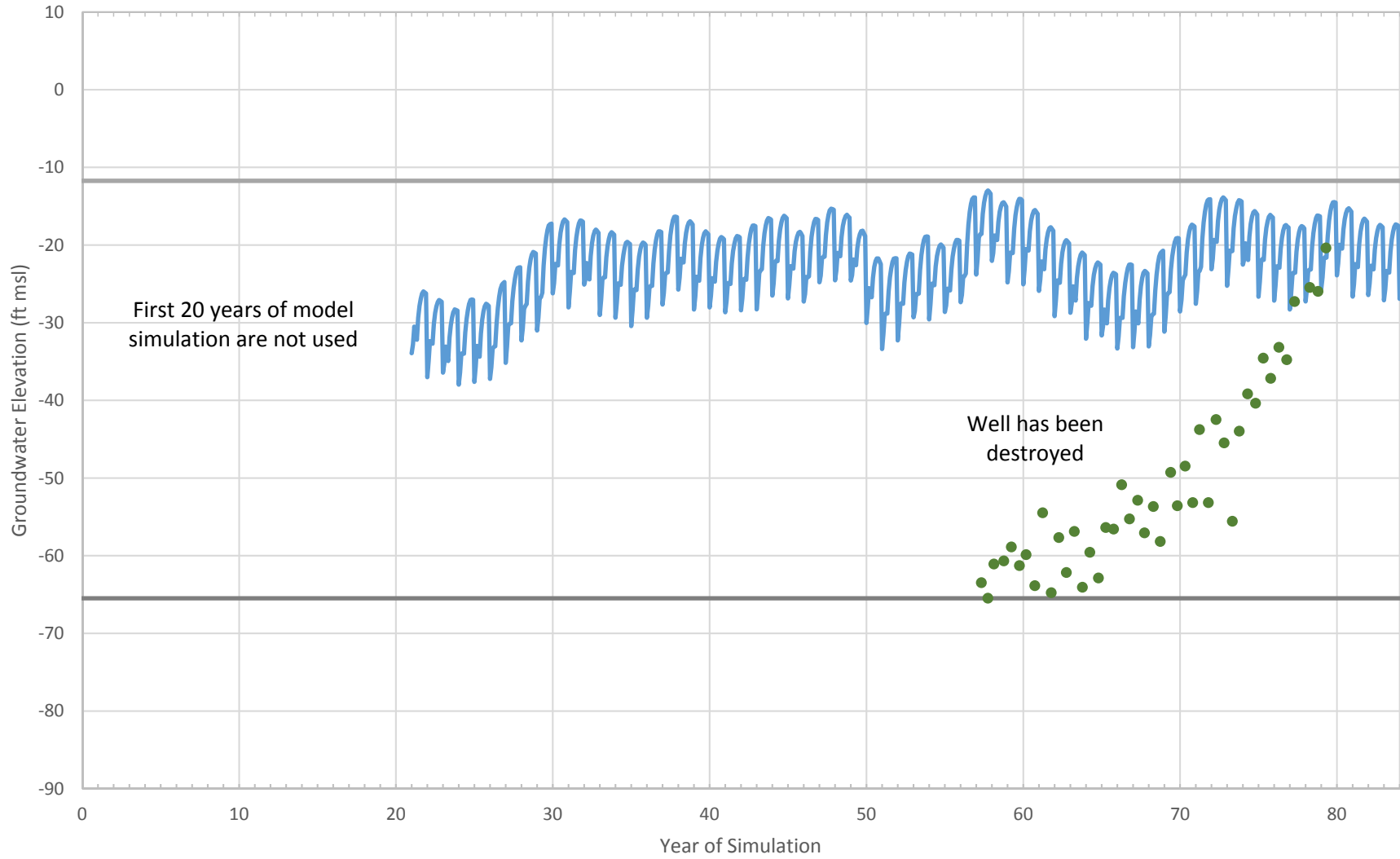


# SCGA #2, Polygon 223

— Future Conditions Baseline Simulation   ● SCGA #2   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

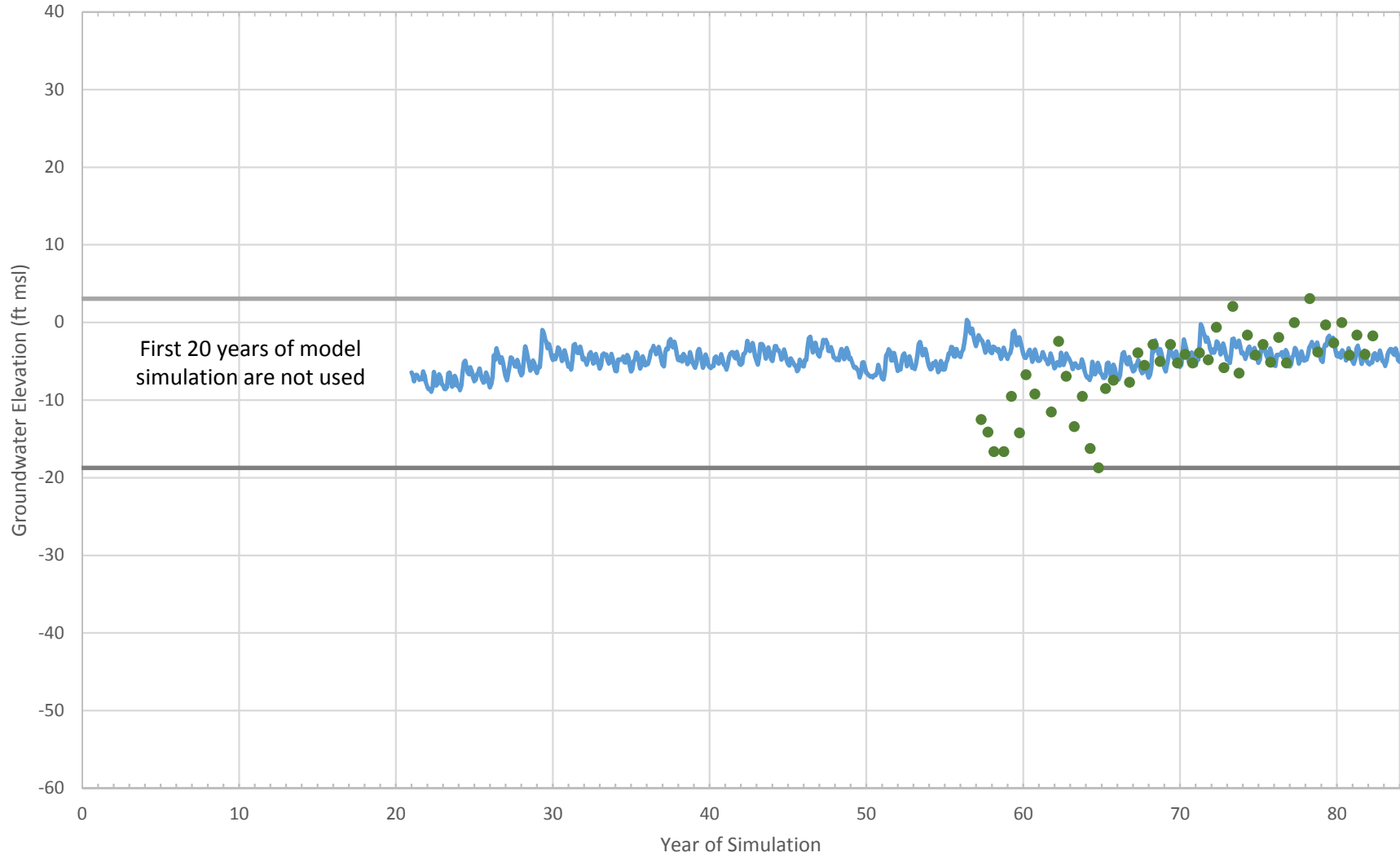


# SCGA #1, Polygon 281

— Future Conditions Baseline Simulation   ● SCGA #1   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

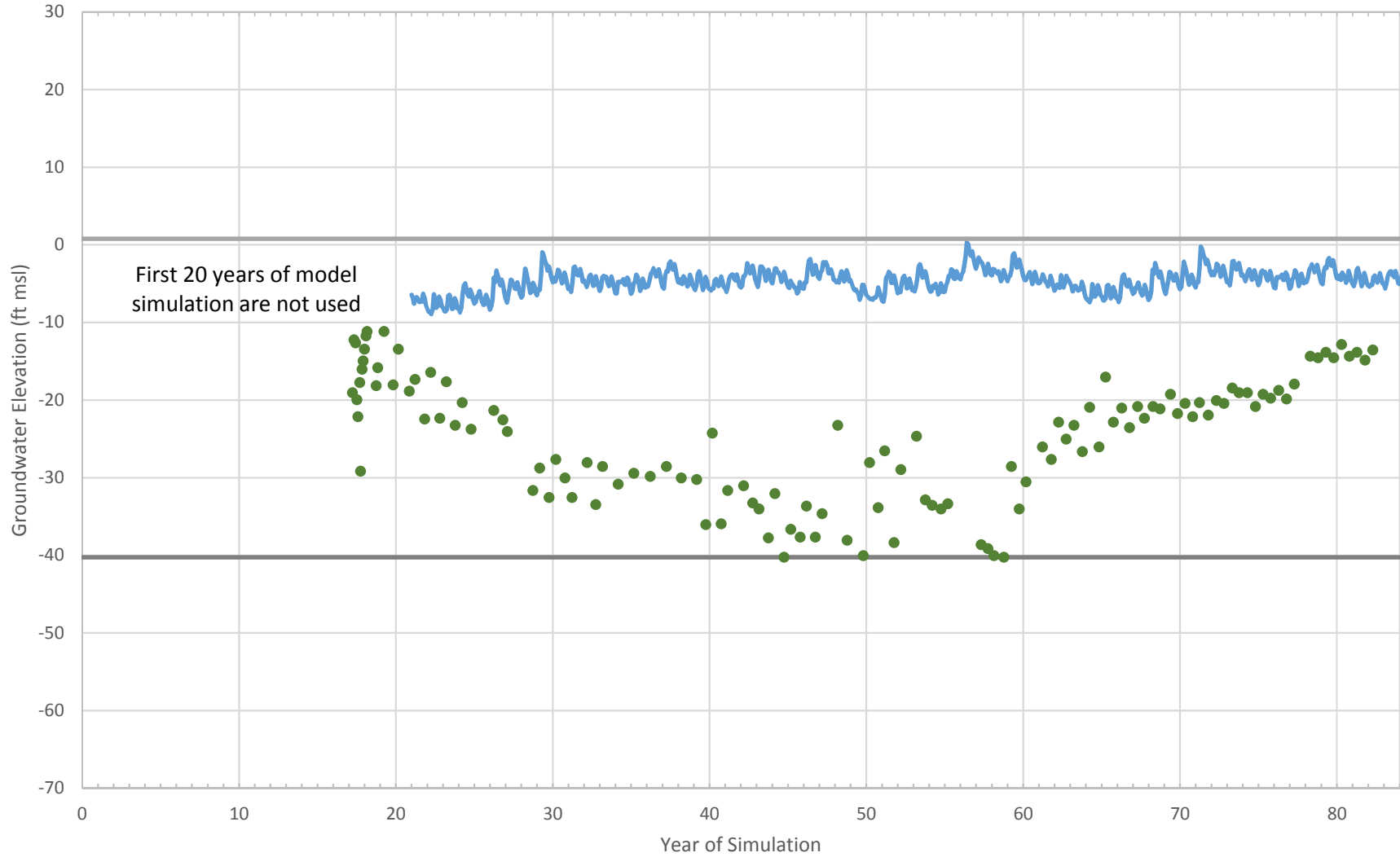


# SCGA #3, Polygon 281

— Future Conditions Baseline Simulation   ● SCGA #3   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

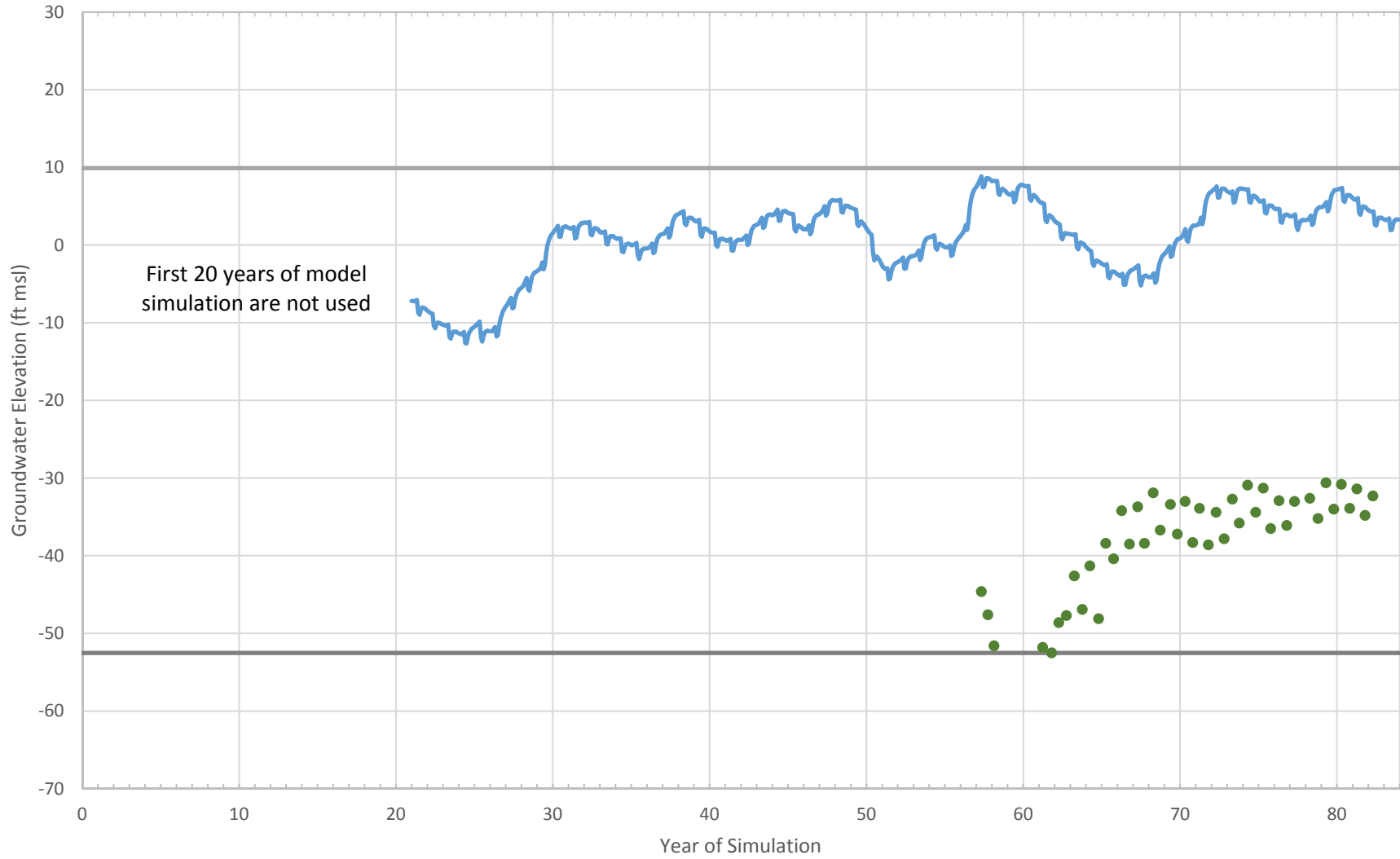


# SCGA #8, Polygon 294

— Future Conditions Baseline Simulation   ● SCGA #8   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

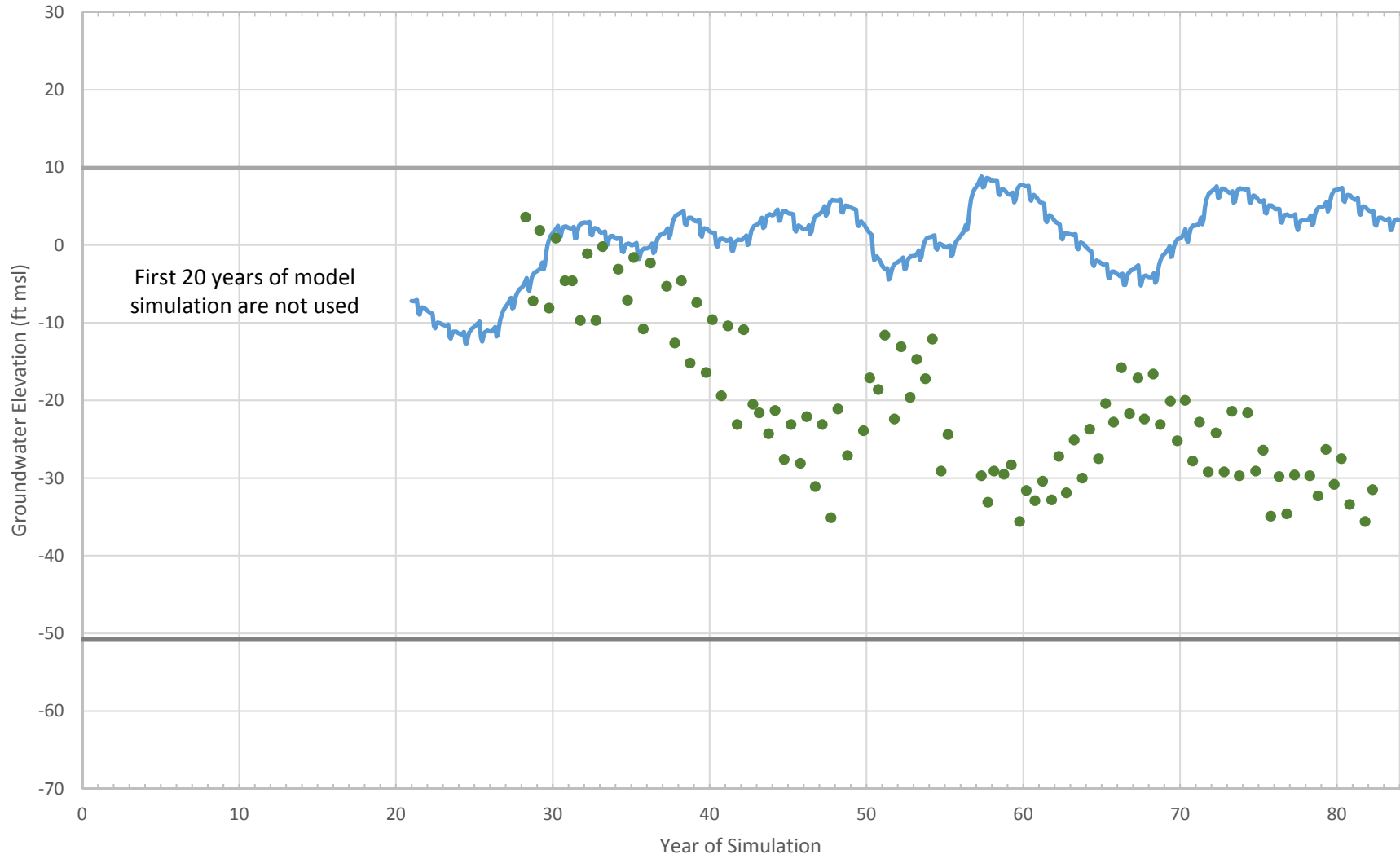


# SCGA #9, Polygon 294

— Future Conditions Baseline Simulation   ● SCGA #9   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

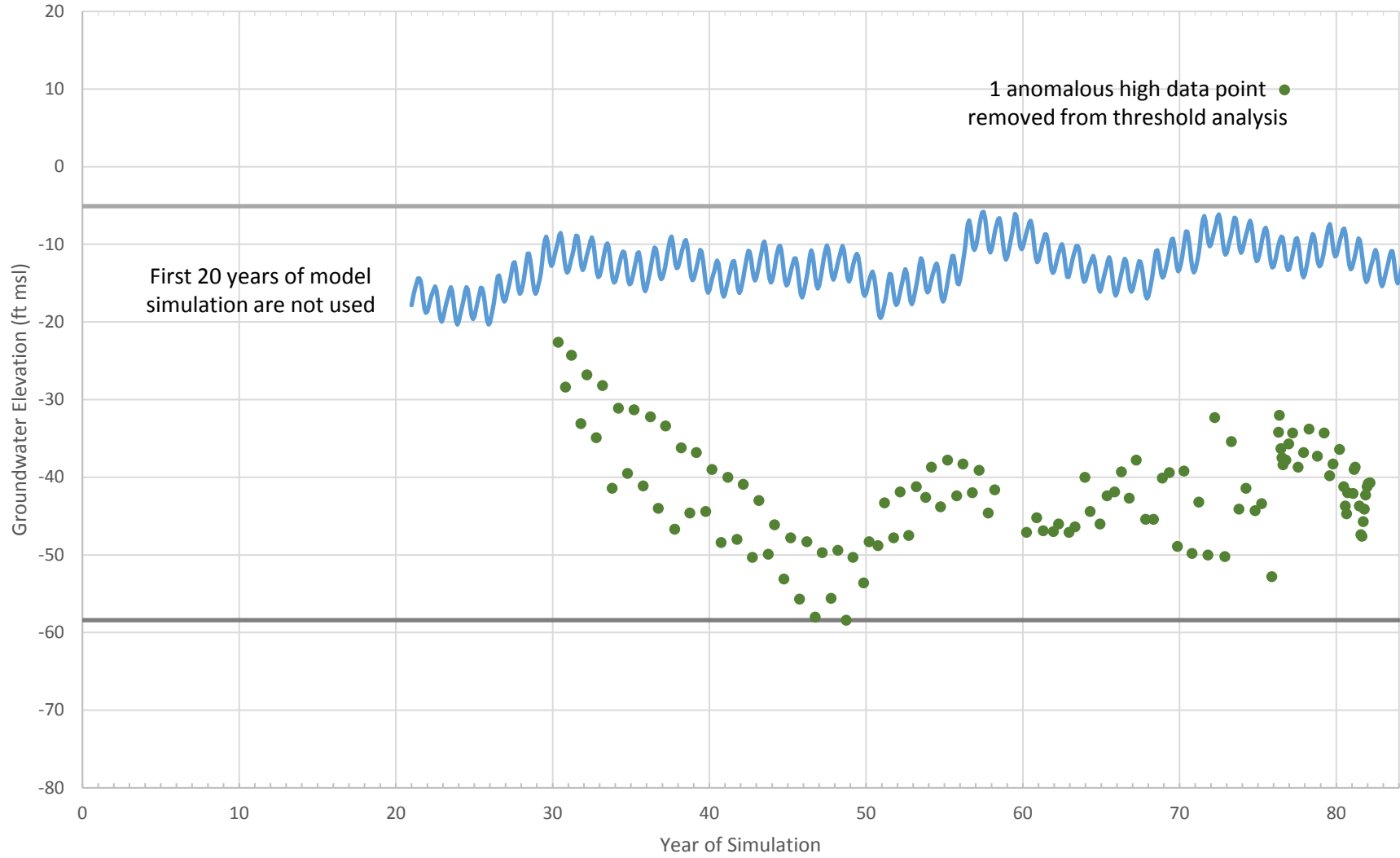


# SCGA #25, Polygon 295

— Future Conditions Baseline Simulation   ● SCGA #25   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

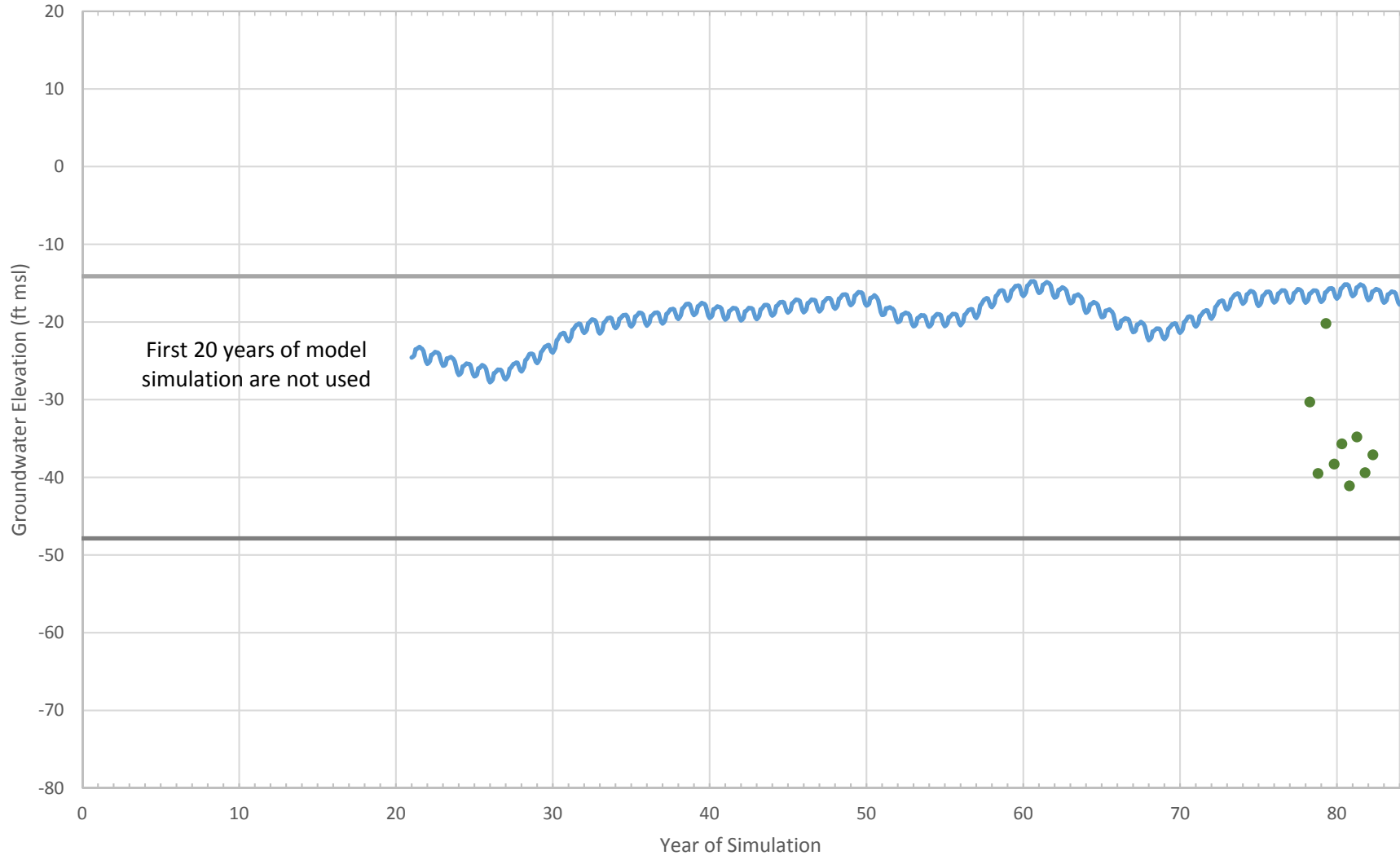


# SCGA #4, Polygon 336

— Future Conditions Baseline Simulation   ● SCGA #4   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013





# SCGA #7, Polygon 355

— Future Conditions Baseline Simulation   ● SCGA #7   — Lower Threshold   — Upper Threshold

Date of Historical Data

1/1/1933   1/1/1943   1/1/1953   1/1/1963   1/1/1973   1/1/1983   1/1/1993   1/1/2003   1/1/2013

