

Planbureau voor de Leefomgeving

Hoe open is de Waddenzee? Een indicator voor de openheid van het Waddenlandschap

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### **Bijlage 1. Access VBA-code voor het maken van barrièrebestanden.**

Onderstaande module is ontwikkeld in Microsoft Access 2002, met gebruikmaking van de Microsoft DAO 3.6 Object Library.

De functie MaakBarrierebestand heeft de volgende argumenten:

- naam van zichtpunt of run;
- x-coördinaat zichtpunt;
- y-coördinaat zichtpunt;
- straal rond zichtpunt (zichtbaar gebied);
- grootte van gridcel van het resulterende barrierebestand;
- ten hoogste 10 tabellen (dan wel selecties uit tabellen), met voor elke tabel:
  - tabelnaam;
  - naam van veld met hoogte-getal,
  - grootte van gridcel in de tabel;
  - type van hoogte-getal: NAP of hoogte t.o.v. maaiveld;
  - vermenigvuldigingsfactor voor het omrekenen van eenheden (bijvoorbeeld van m naar cm).

Hieronder volgt de VBA-code.

Option Compare Database

Option Explicit

Const ValueTypeNAP = 1

Const ValueTypeObjectHeight = 2

Const maxtabel As Integer = 11

Const dirpath As String = "G:\Openheid\"

Function MaakBarriereBestanden()

' Waddenzee

```
MaakBarriereBestand "wzvp1", 122500, 555000, 25000, 5, _
    "ahn_25", "Value", 25, 1, _
    "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
    "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
    "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
    "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
    "NoordNL_platform_5", "Value", 5, 2, 100, _
    "NoordNL_windturb_5", "Value", 5, 2, 100
```

```
MaakBarriereBestand "wzvp3", 150000, 587500, 25000, 5, _
    "ahn_25", "Value", 25, 1, _
    "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
    "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
    "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
    "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
    "NoordNL_platform_5", "Value", 5, 2, 100, _
    "NoordNL_windturb_5", "Value", 5, 2, 100
```

```
MaakBarriereBestand "wzvp5", 190000, 603500, 25000, 5, _
    "ahn_25", "Value", 25, 1, _
    "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
    "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
    "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
    "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
    "NoordNL_platform_5", "Value", 5, 2, 100, _
```

```

        "NoordNL_windturb_5", "Value", 5, 2, 100
MaakBarriereBestand "wzvp7", 230000, 611000, 25000, 5, _
        "ahn_25", "Value", 25, 1, _
        "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
        "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
        "NoordNL_platform_5", "Value", 5, 2, 100, _
        "NoordNL_windturb_5", "Value", 5, 2, 100
MaakBarriereBestand "wzvp9", 259000, 599000, 25000, 5, _
        "ahn_25", "Value", 25, 1, _
        "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
        "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
        "NoordNL_platform_5", "Value", 5, 2, 100, _
        "NoordNL_windturb_5", "Value", 5, 2, 100

```

' Scenario Windturbines Afsluitdijk

```

MaakBarriereBestand "wzvp1s", 122500, 555000, 25000, 5, _
        "ahn_25", "Value", 25, 1, _
        "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
        "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
        "NoordNL_platform_5", "Value", 5, 2, 100, _
        "Selecteer windturbines scenario Afsluitdijk", "Value", 5, 2, 100
MaakBarriereBestand "wzvp3s", 150000, 587500, 25000, 5, _
        "ahn_25", "Value", 25, 1, _
        "Selecteer Hoogte Bos", "Hoogte", 5, 2, 100, _
        "Selecteer Hoogte Wonen Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Werken Totaal", "Hoogte", 5, 1, 100, _
        "Selecteer Hoogte Infrastructuur Totaal", "Hoogte", 5, 1, 100, _
        "NoordNL_platform_5", "Value", 5, 2, 100, _
        "Selecteer windturbines scenario Afsluitdijk", "Value", 5, 2, 100

```

End Function

```

Function MaakBarriereBestand(RunName As String, xView As Long, yView As Long, Straal As Long, CellSize As Long, _
    HBaseTabel As String, VeldNaamBase As String, CellSizeBase As Long, Multiplication As Double, _
    Optional HTabel1 As String = "", Optional VeldNaam1 As String = "", Optional CellSize1 As Long, Optional ValueType1 As Integer, Optional
Multiplication1 As Double, _
    Optional HTabel2 As String = "", Optional VeldNaam2 As String = "", Optional CellSize2 As Long, Optional ValueType2 As Integer, Optional
Multiplication2 As Double, _
    Optional HTabel3 As String = "", Optional VeldNaam3 As String = "", Optional CellSize3 As Long, Optional ValueType3 As Integer, Optional
Multiplication3 As Double, _
    Optional HTabel4 As String = "", Optional VeldNaam4 As String = "", Optional CellSize4 As Long, Optional ValueType4 As Integer, Optional
Multiplication4 As Double, _
    Optional HTabel5 As String = "", Optional VeldNaam5 As String = "", Optional CellSize5 As Long, Optional ValueType5 As Integer, Optional
Multiplication5 As Double, _
    Optional HTabel6 As String = "", Optional VeldNaam6 As String = "", Optional CellSize6 As Long, Optional ValueType6 As Integer, Optional
Multiplication6 As Double, _
    Optional HTabel7 As String = "", Optional VeldNaam7 As String = "", Optional CellSize7 As Long, Optional ValueType7 As Integer, Optional
Multiplication7 As Double, _
    Optional HTabel8 As String = "", Optional VeldNaam8 As String = "", Optional CellSize8 As Long, Optional ValueType8 As Integer, Optional
Multiplication8 As Double, _
    Optional HTabel9 As String = "", Optional VeldNaam9 As String = "", Optional CellSize9 As Long, Optional ValueType9 As Integer, Optional
Multiplication9 As Double, _
    Optional HTabel10 As String = "", Optional VeldNaam10 As String = "", Optional CellSize10 As Long, Optional ValueType10 As Integer, Optional
Multiplication10 As Double)
    Dim sql As String
    Dim HResTabelSet As dao.Recordset, CodeResTabelSet As dao.Recordset, CodesTabelSet As dao.Recordset
    Dim HRecSet As dao.Recordset
    ' Hoogte in meters; berekeningen in centimeters
    Dim HBaseArray() As Integer, HArray() As Integer, CodeArray() As Byte, ArraySize As Long
    Dim XMin As Long, XMax As Long
    Dim YMin As Long, YMax As Long
    Dim i As Long, j As Long
    Dim iTabel As Integer, nTabel As Integer
    Dim IndexX as integer, IndexY as integer
    Dim TabelNaam(maxtabel) As String, CellSizeTabel(maxtabel) As Integer, VeldNaam(maxtabel), ValueType(maxtabel) As Integer,
MultiplicationTabel(maxtabel) As Double
    Dim FileNum As Long
    Dim HResTabelNaam As String, CodeResTabelNaam As String, CodesTabelNaam As String

```

```
SysCmd acSysCmdInitMeter, "Maak Barriere Bestand (" & RunName & "): initialisatie", 1
```

```
HResTabelNaam = RunName & "_h"  
CodeResTabelNaam = RunName & "_c"  
CodesTabelNaam = RunName & "_codes"  
On Error Resume Next  
DoCmd.Close acTable, CodesTabelNaam  
DoCmd.DeleteObject acTable, CodesTabelNaam  
DoCmd.CopyObject , CodesTabelNaam, acTable, "Template Codes"  
On Error GoTo 0  
Set CodesTabelSet = CurrentDb.OpenRecordset(CodesTabelNaam)
```

```
If HTabel1 = "" Then  
    nTabel = 0  
ElseIf HTabel2 = "" Then  
    nTabel = 1  
ElseIf HTabel3 = "" Then  
    nTabel = 2  
ElseIf HTabel4 = "" Then  
    nTabel = 3  
ElseIf HTabel5 = "" Then  
    nTabel = 4  
ElseIf HTabel6 = "" Then  
    nTabel = 5  
ElseIf HTabel7 = "" Then  
    nTabel = 6  
ElseIf HTabel8 = "" Then  
    nTabel = 7  
ElseIf HTabel9 = "" Then  
    nTabel = 8  
ElseIf HTabel10 = "" Then  
    nTabel = 9  
Else  
    nTabel = 10  
End If
```

```
TabelNaam(1) = HTabel1: VeldNaam(1) = VeldNaam1: CellSizeTabel(1) = CellSize1: ValueType(1) = ValueType1: MultiplicationTabel(1) = Multiplication1  
TabelNaam(2) = HTabel2: VeldNaam(2) = VeldNaam2: CellSizeTabel(2) = CellSize2: ValueType(2) = ValueType2: MultiplicationTabel(2) = Multiplication2
```

```
TabelNaam(3) = HTabel3: VeldNaam(3) = VeldNaam3: CellSizeTabel(3) = CellSize3: ValueType(3) = ValueType3: MultiplicationTabel(3) = Multiplication3
TabelNaam(4) = HTabel4: VeldNaam(4) = VeldNaam4: CellSizeTabel(4) = CellSize4: ValueType(4) = ValueType4: MultiplicationTabel(4) = Multiplication4
TabelNaam(5) = HTabel5: VeldNaam(5) = VeldNaam5: CellSizeTabel(5) = CellSize5: ValueType(5) = ValueType5: MultiplicationTabel(5) = Multiplication5
TabelNaam(6) = HTabel6: VeldNaam(6) = VeldNaam6: CellSizeTabel(6) = CellSize6: ValueType(6) = ValueType6: MultiplicationTabel(6) = Multiplication6
TabelNaam(7) = HTabel7: VeldNaam(7) = VeldNaam7: CellSizeTabel(7) = CellSize7: ValueType(7) = ValueType7: MultiplicationTabel(7) = Multiplication7
TabelNaam(8) = HTabel8: VeldNaam(8) = VeldNaam8: CellSizeTabel(8) = CellSize8: ValueType(8) = ValueType8: MultiplicationTabel(8) = Multiplication8
TabelNaam(9) = HTabel9: VeldNaam(9) = VeldNaam9: CellSizeTabel(9) = CellSize9: ValueType(9) = ValueType9: MultiplicationTabel(9) = Multiplication9
TabelNaam(10) = HTabel10: VeldNaam(10) = VeldNaam10: CellSizeTabel(10) = CellSize10: ValueType(10) = ValueType10: MultiplicationTabel(10) = Multiplication10
```

```
ArraySize = 2 * Straal / CellSize
```

```
ReDim HBaseArray(ArraySize, ArraySize)
```

```
ReDim HArray(ArraySize, ArraySize)
```

```
ReDim CodeArray(ArraySize, ArraySize)
```

```
XMin = xView - Straal
```

```
XMax = xView + Straal
```

```
YMin = yView - Straal
```

```
YMax = yView + Straal
```

```
sql = "SELECT x, y, [" & VeldNaamBase & "] FROM [" & HBaseTabel & "] " & _
      "WHERE x>=" & XMin & " AND x<" & XMax & " AND Y>=" & YMin & " AND y<" & YMax
```

```
Set HRecSet = CurrentDb.OpenRecordset(sql)
```

```
SysCmd acSysCmdInitMeter, "Maak Barriere Bestand (" & RunName & "): vullen basisdata", AantalRecords(HRecSet)
```

```
DoEvents
```

```
While Not HRecSet.EOF
```

```
For i = 1 To CellSizeBase / CellSize
```

```
IndexX = ((HRecSet!x - XMin) / CellSize) + i
```

```
For j = 1 To CellSizeBase / CellSize
```

```
IndexY = ((HRecSet!y - YMin) / CellSize) + j
```

```
HBaseArray(IndexX, IndexY) = HRecSet(VeldNaamBase) * Multiplication
```

```
HArray( IndexX, IndexY ) = HRecSet(VeldNaamBase) * Multiplication
```

```
CodeArray( IndexX, IndexY ) = 0
```

```
Next j
```

```
Next i
```

```
HRecSet.MoveNext
```

```
SysCmd acSysCmdUpdateMeter, HRecSet.AbsolutePosition + 1
```

```
DoEvents
```

```

Wend
HRecSet.Close
CodesTabelSet.AddNew
CodesTabelSet!Nummer = 0
CodesTabelSet!Omschrijving = HBaseTabel
CodesTabelSet.Update

For iTabel = 1 To nTabel
  SysCmd acSysCmdInitMeter, "Maak Barriere Bestand (" & RunName & "): selecteren data (" & iTabel & "):", 1
  DoEvents
  sql = "SELECT x, y, [" & VeldNaam(iTabel) & "] FROM [" & TabelNaam(iTabel) & "]" & _
    "WHERE x>=" & XMin & " AND x<" & XMax & " AND Y>=" & YMin & " AND y<" & YMax
  Set HRecSet = CurrentDb.OpenRecordset(sql)
  SysCmd acSysCmdInitMeter, "Maak Barriere Bestand (" & RunName & "): vullen data (" & iTabel & "):", AantalRecords(HRecSet)
  DoEvents
  While Not HRecSet.EOF
    For i = 1 To CellSizeTabel(iTabel) / CellSize
      IndexX = ((HRecSet!x - XMin) / CellSize) + i
      For j = 1 To CellSizeTabel(iTabel) / CellSize
        IndexY = ((HRecSet!y - YMin) / CellSize) + j
        If ValueType(iTabel) = ValueTypeNAP Then ' Hoogte in NAP: neem waarde over als groter dan huidige waarde
          If HRecSet(VeldNaam(iTabel)) * MultiplicationTabel(iTabel) > HArray(IndexX, IndexY) Then
            HArray( IndexX, IndexY ) = HRecSet(VeldNaam(iTabel)) * MultiplicationTabel(iTabel)
            CodeArray( IndexX, IndexY ) = iTabel
          End If
        Else ' ValueTypeObjectHeight: hoogte tov maaiveld, tel NAP in HBaseArray erbij op voor toetsen van hoogte
          If HBaseArray( IndexX, IndexY ) + HRecSet(VeldNaam(iTabel)) * MultiplicationTabel(iTabel) > HArray( IndexX, IndexY) Then
            HArray( IndexX, IndexY ) = HBaseArray( IndexX, IndexY ) + HRecSet(VeldNaam(iTabel)) * MultiplicationTabel(iTabel)
            CodeArray( IndexX, IndexY ) = iTabel
          End If
        End If
      Next j
    Next i
    HRecSet.MoveNext
    SysCmd acSysCmdUpdateMeter, HRecSet.AbsolutePosition + 1
    DoEvents
  Wend
HRecSet.Close

```

```

CodesTabelSet.AddNew
CodesTabelSet!Nummer = iTabel
CodesTabelSet!Omschrijving = TabelNaam(iTabel)
CodesTabelSet.Update

Next iTabel

' Write ascii-grids; beperk uitput tot straal rond zichtpunt
SysCmd acSysCmdInitMeter, "Maak Barriere Bestand (" & RunName & "): schrijven resultaten h naar ascii-grid:", ArraySize
DoEvents
On Error Resume Next
Kill dirpath & HResTabelNaam & ".asc"
On Error GoTo 0
FileNum = FreeFile
Open dirpath & HResTabelNaam & ".asc" For Output As FileNum
Print #FileNum, "ncols    "; ArraySize
Print #FileNum, "nrows    "; ArraySize
Print #FileNum, "xllcorner "; XMin
Print #FileNum, "yllcorner "; YMin
Print #FileNum, "cellsize  "; CellSize
Print #FileNum, "NODATA_value  -99"
For j = ArraySize To 1 Step -1
  For i = 1 To ArraySize
    If (Abs(xView - (XMin + (i - 1) * CellSize)) ^ 2 + Abs(yView - (YMin + (j - 1) * CellSize)) ^ 2) ^ 0.5 <= Straal Then
      Print #FileNum, " " & CDbI(HArray(i, j) / 100);
    Else
      Print #FileNum, " -99";
    End If
  Next i
  Print #FileNum,
  SysCmd acSysCmdUpdateMeter, ArraySize - j + 1
  DoEvents
Next j
Close #FileNum

SysCmd acSysCmdInitMeter, "Maak Barriere Bestand (" & RunName & "): schrijven resultaten c naar ascii-grid:", ArraySize
DoEvents

```

```

On Error Resume Next
Kill dirpath & CodeResTabelNaam & ".asc"
On Error GoTo 0
FileNum = FreeFile
Open dirpath & CodeResTabelNaam & ".asc" For Output As FileNum
Print #FileNum, "ncols    "; ArraySize
Print #FileNum, "nrows    "; ArraySize
Print #FileNum, "xllcorner "; XMin
Print #FileNum, "yllcorner "; YMin
Print #FileNum, "cellsize  "; CellSize
Print #FileNum, "NODATA_value  -9"
For j = ArraySize To 1 Step -1
  For i = 1 To ArraySize
    If (Abs(xView - (XMin + (i - 1) * CellSize)) ^ 2 + Abs(yView - (YMin + (j - 1) * CellSize)) ^ 2) ^ 0.5 <= Straal Then
      Print #FileNum, " " & CodeArray(i, j);
    Else
      Print #FileNum, " -9";
    End If
  Next i
  Print #FileNum,
  SysCmd acSysCmdUpdateMeter, ArraySize - j + 1
  DoEvents
Next j
Close #FileNum

On Error Resume Next
Kill dirpath & RunName & "_codes.txt"
On Error GoTo 0
FileNum = FreeFile
Open dirpath & RunName & "_codes.txt" For Output As FileNum
Set CodesTabelSet = CurrentDb.OpenRecordset(CodesTabelNaam)
While Not CodesTabelSet.EOF
  Print #FileNum, CodesTabelSet!Nummer & "," & CodesTabelSet!Omschrijving
  CodesTabelSet.MoveNext
Wend
CodesTabelSet.Close
Close #FileNum
On Error Resume Next

```

```
Kill dirpath & RunName & "_vp.txt"  
On Error GoTo 0  
FileNum = FreeFile  
Open dirpath & RunName & "_vp.txt" For Output As FileNum  
Print #FileNum, "1, " & xView & ", " & yView  
Print #FileNum, "END"  
Close #FileNum  
SysCmd acSysCmdRemoveMeter  
'MsgBox "Klaar"  
End Function
```

```
Function AantalRecords(Myset As DAO.Recordset) As Long  
On Error Resume Next  
If Err > 0 Then  
    AantalRecords = 0  
Else  
    Myset.MoveLast  
    AantalRecords = Myset.RecordCount  
    Myset.MoveFirst  
End If  
End Function
```