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KOGVIEW

A 'user-friendly' interface to
Kansas **O**il and **G**as production data, charts, and maps
through an 'Arc**View**' applications project

by

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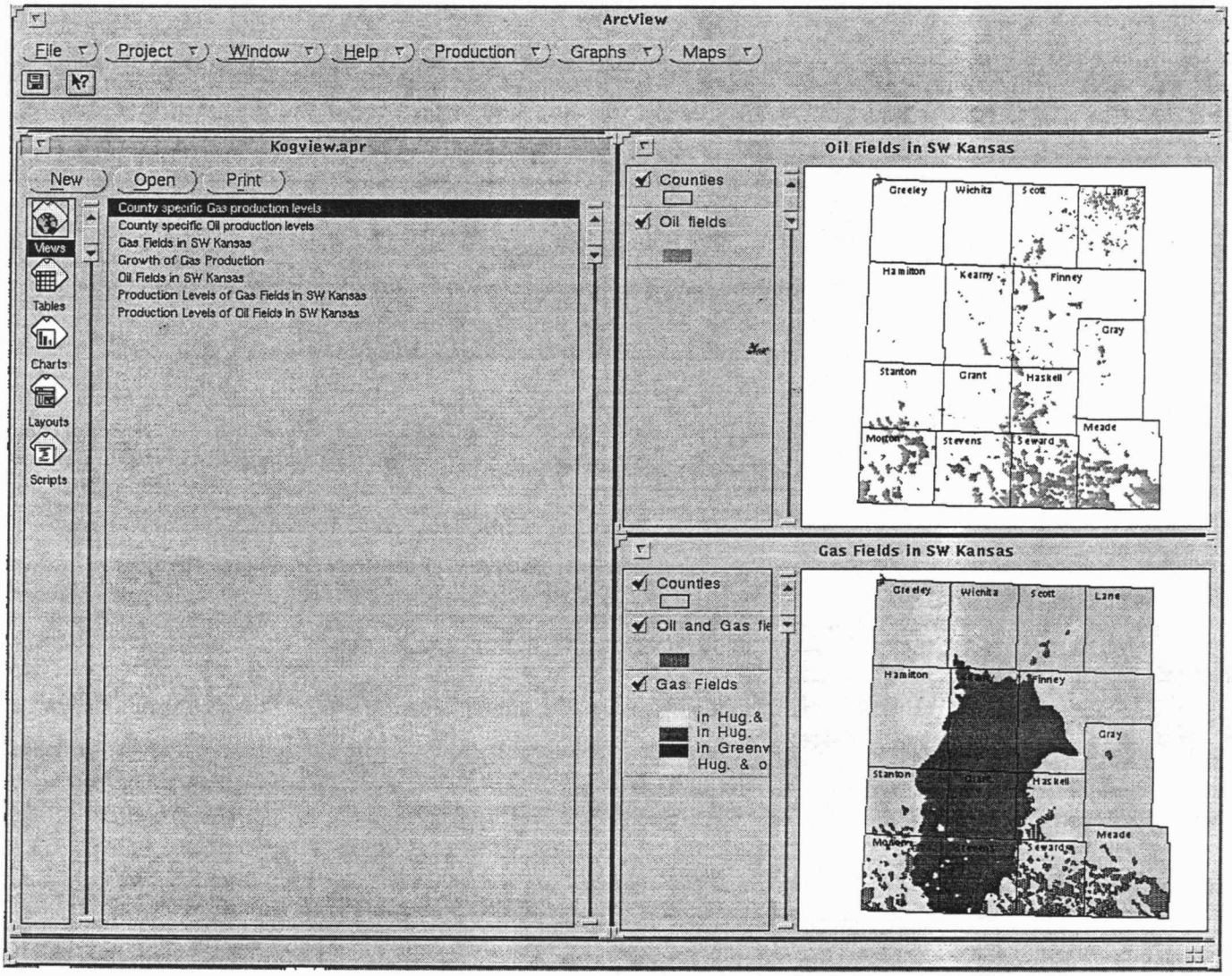
KOGVIEW



A 'user-friendly' interface to
Kansas **O**il and **G**as production data, charts, and maps
through an 'Arc**View**' applications project.

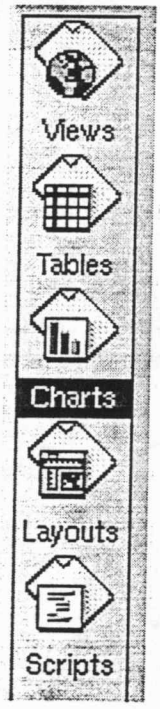
Introduction:

The primary objective of this project is to interface the spatial oil and gas data pertaining to Kansas with the lease production data. The initial version is restricted to southwest Kansas. ARCVIEW provides a user-friendly platform for linking spatial and production data. It allows the user to perform queries and simple statistical operations on databases.

Following is the list of types of information that can be retrieved:

- through graphical access on the oil/gas field views, information pertaining to it.
    * field_id
    * production information
    * horizon information
- production information at lease, field and county level
- production history at the field and county level. (plots of annual/cumulative production vs. time)
- views (i.e., color coded maps) of production levels for fields or county subdivisions of fields

The options available after opening the project are:



6 predesigned views

23 predefined tables

31 scripts

Examples of tables and scripts are attached.

An example of a sample script is included. However, for more information about the scripts the user may contact the developers of this project.

How to use:

When the project is initially opened, the main project window (kogview.apr) is the active window. The menu and tool buttons appropriate to the project are displayed at the top of the screen.

The user may toggle between different options available (views, tables, charts, layouts and scripts) by clicking the left mouse button on the appropriate icon. Clicking on the view/table/chart name has the effect of making the appropriate menu/tools options visible. To switch to the project menu options it is necessary to click on the project name in the main window. The usual windows options viz. close, restore, maximize and minimize are still applicable and the user may use them freely.

Following are the custom made menu and tool options designed specifically for this project.

Project: under this option three menu options are available. 1. production 2. graphs 3. maps. A detailed description of these menu options follows.

1. Production: There are four options available under this menu item.

   a. County gas lease production information : User has to select a county. A table of production by lease is created consisting of all the leases in that particular county. Further screening of the data is also possible if the user decides to select a particular gas field in the county. Remember though that there is a possibility that the field may not entirely lie in the county, in which case only the lease pertaining to the given county are taken into account. Note that annual production is reported in all the tables created.

   b. County oil lease production information: same as above.

   c. Field gas production by lease: This option allows the user to create tables of annual production data by lease after specifying a particular field name. The user is prompted for a range of years of interest. Unlike the previous options this option takes into account all the leases in the field.

   d. Field oil production by lease: same as above.

2. Graphs:

   The menu options under this category allow the user to create charts (plots) of oil/gas production as a function of time. The user is given an option to choose between annual or cumulative production. The user is prompted for a range of years of interest. At the user's discretion a chart may be saved as a postscript file. The following options are available in this category:

   a. County production history (oil/gas): with this option the user may chart production for a single county or may choose to compare two or more counties or all counties.

b. Field oil production history: same as above except that this applies to the individual oil fields in southwestern Kansas.

c. Field gas production history: same as above.

3. Maps:

This menu item is intended for allowing the users to create maps depicting the horizons, production levels and the growth of gas production pertaining to southwestern Kansas. There are six options available under this category.

a. Horizon location: The user is requested to select a particular horizon which is eventually displayed as a layout. The layout can be saved or printed as a postscript file.

b. Oil production levels by fields: This allows the user to create maps of annual production levels by fields. The user is prompted for a year. The map is color coded according to the amount of annual production in that particular year. One may choose to change the color scheme by clicking on the color palette button. Note that presently the option to create a layout from the view is not built in. Therefore, the users are requested to print the view as a postscript file.

c. Gas production levels by fields: same as above.

d. County specific oil production levels: The difference between this option and the ones mentioned above is that this takes into consideration the oil production pertaining to the leases that are part of a particular county. Note that a field may be "shared" by more than one county.

f. County specific gas production levels: same as above.

g. Growth of gas production: This allows the user to get an idea f how the gas leases developed over a period of time in southwestern Kansas. The user is prompted for a range of years. A prefabricated grid consisting of approximately 1 square mile cells is then color mapped according to the earliest year of production from a gas well located in a particular cell. The user may choose the spud year or the completion year for this purpose. The available databases differ in the extent to which spud year dates or completion dates were reported. Note that the completion year may be the same as or later than the spud year. By selecting different ranges of years for this map various aspects of gas production development can be illustrated.

Some useful buttons:

View : under this option there are a number of buttons which are of significance. We have listed the most relevant ones:

(red diamond) : This is a custom made tool. Clicking on this brings up a cursor that allows the user to query for information regarding fields displayed on the views titled: 'Oil fields of SW Kansas' and 'Gas fields of SW Kansas.' When this tool is activated, the cursor becomes a pointer for selecting fields in the appropriate view. Clicking the cursor on a field brings up general information about the field and in the case of gas fields, which may overlap, other fields in the same geographic location. The user is then prompted for further information. At this stage one may choose to quit or go further.

(zoom in) This allows the user to create a rectangle on a view. The portion of the view enclosed in the rectangle is enlarged.

(zoom out) Opposite of the above.

(binoculars) This is another custom made tool. Clicking on this allows the user to highlight a particular field on the views mentioned earlier.

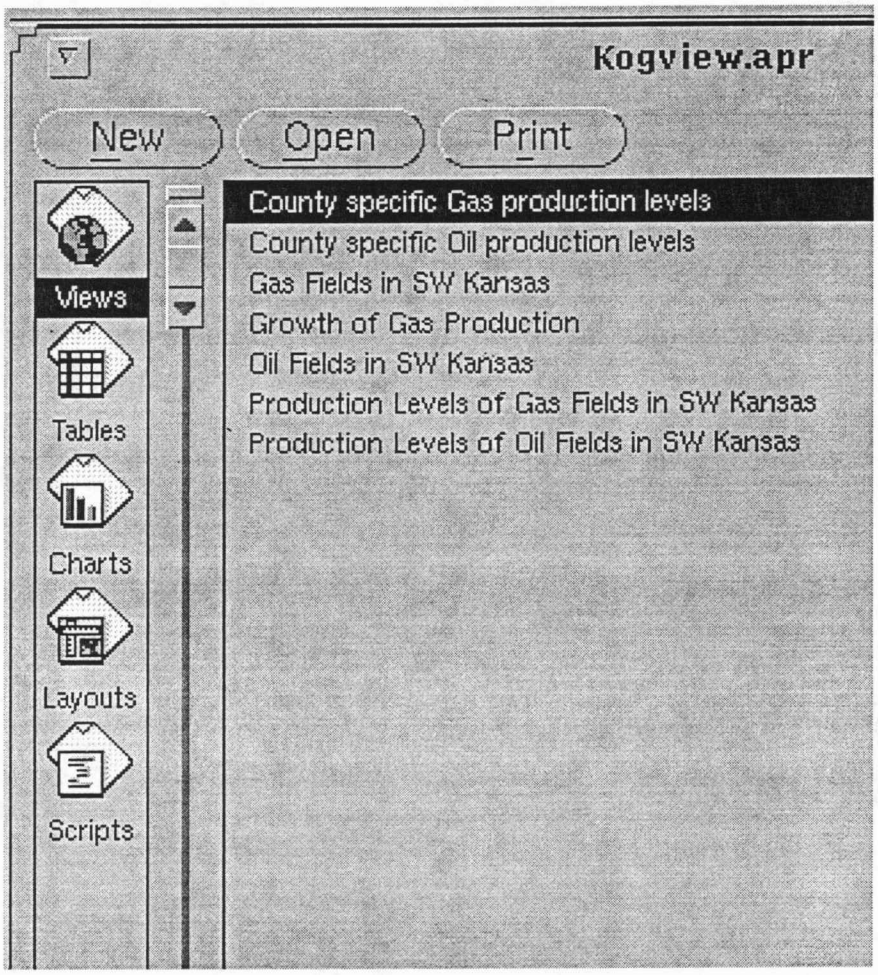
(color palette) If the user is not satisfied with the color scheme, clicking on this tool brings up a color palette which allows to change the color scheme.

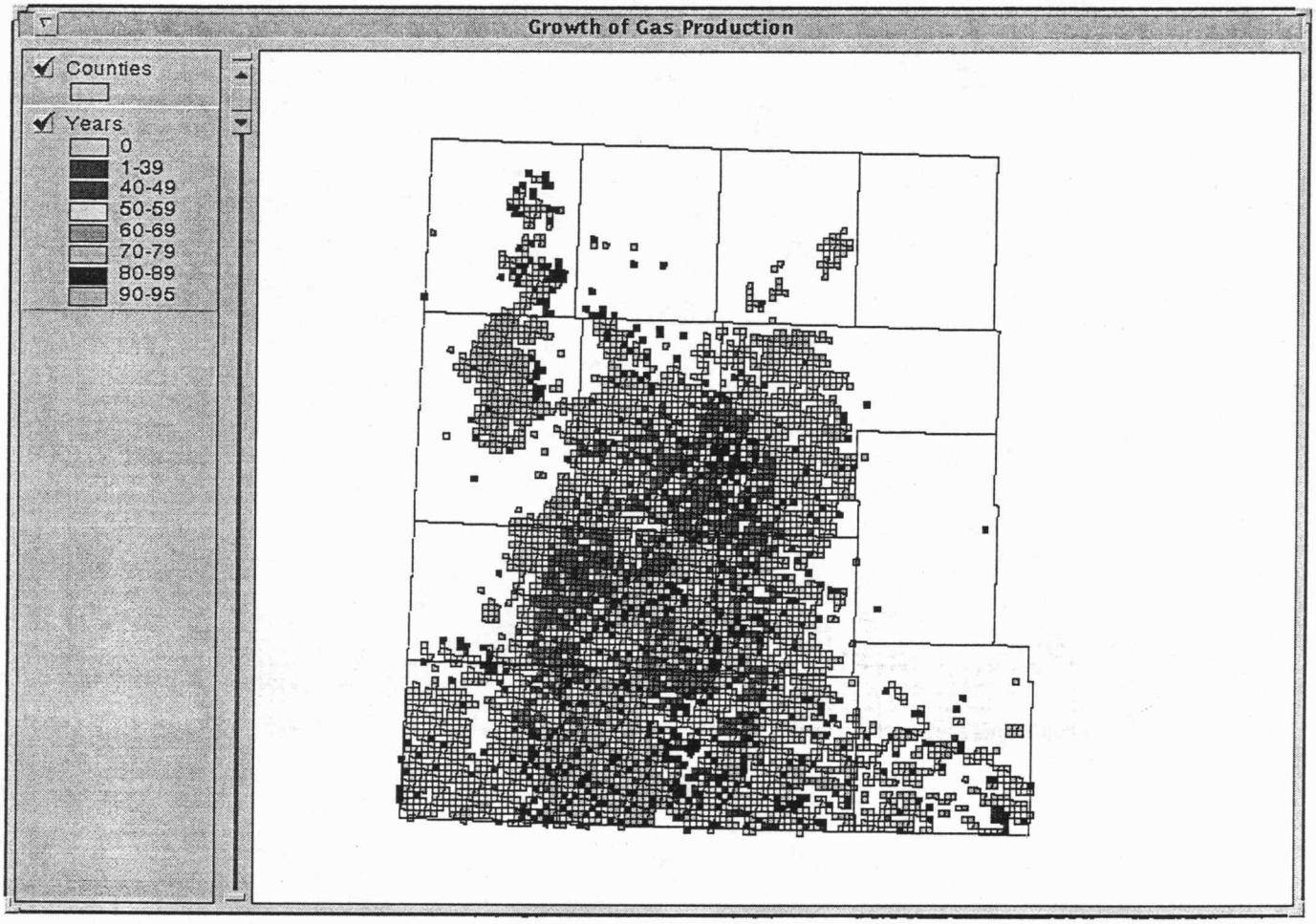
(hand) Grabs the view and allows to drag the display in the direction the cursor is moved.

unselects the selected (highlighted) features of an active view.

There are a number of other options available. One is advised to experiment with them freely. They are easy to use.

Note: From time to time the user may encounter the "Yes - No - Cancel" dialogue boxes. Clicking on the cancel option has the effect of exiting the program. We have tried to ensure this majority of the cases. However, there may be still some instances where this may not be so. Please bring to our attention if you notice this. Also, if you find any bugs or implementation problems do let us know. Users feedback is greatly appreciated. All the postscript files created will be located in the users home directory.

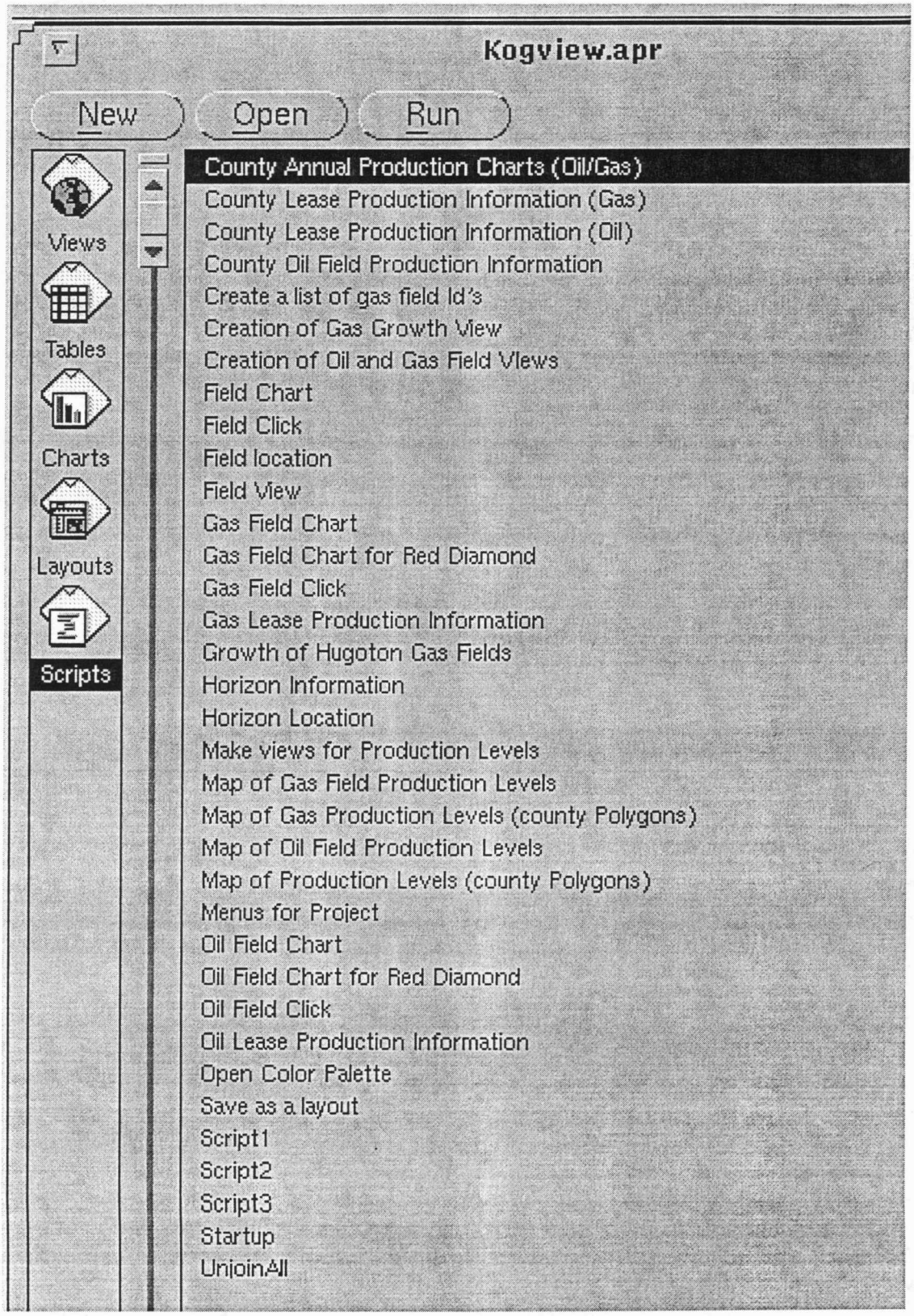

Kogview.apr
New
Open
Print
Views
Tables
Charts
Layouts
Scripts
County specific Gas production levels
County specific Oil production levels
Gas Fields in SW Kansas
Growth of Gas Production
Oil Fields in SW Kansas
Production Levels of Gas Fields in SW Kansas
Production Levels of Oil Fields in SW Kansas

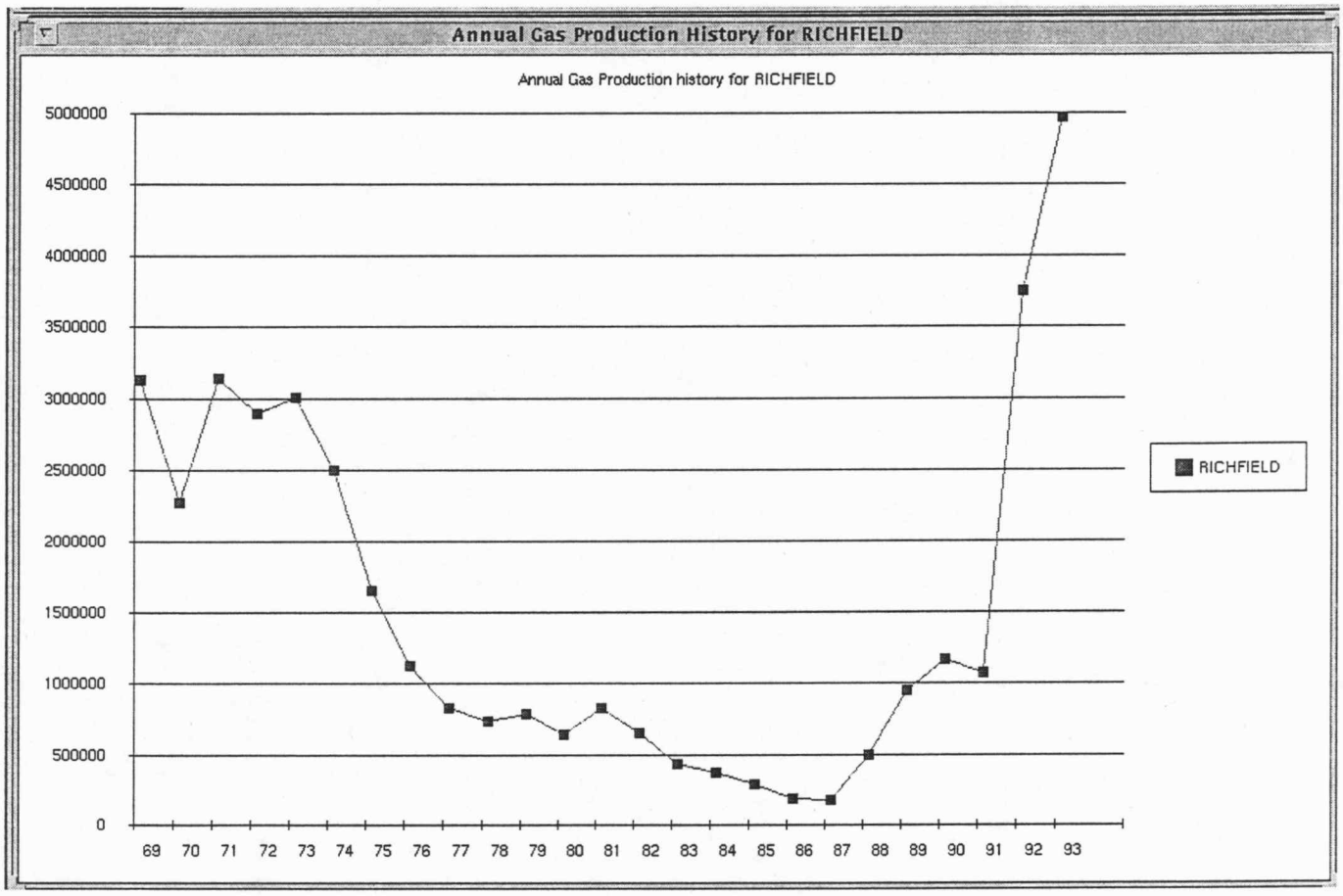

Growth of Gas Production
Counties
Years
0
1-39
40-49
50-59
60-69
70-79
80-89
90-95

Kogview.apr
New
Open
Add
Views
Tables
Charts
Layouts
Scripts
County Annual Gas Production Data
County Annual Oil Production Data
County Code Table
County Cumulative Gas Production Data
County Cumulative Oil Production Data
Field Data
Gas Code Table
Gas Code Table (bak)
Gas Field Data
Gas Field Production Data
Gas Field Production Data (Cumulative)
Gas Lease Names
Gas Lease Production Data
Growth information table
Horizon Data
Horizonlist
Lease Names
Oil Field Production Data
Oil Field Production Data (Cumulative)
Polygon Oil Production Data
Production Data
Well information Table

Annual Gas Production for field RICHFIELD

Lease Name	1969	1970	1971	1972	1973	1974	1975	19
BEAR	0	0	0	0	0	0	0	
DEAN	0	0	0	0	0	0	0	
MOORE 'C'	38268	59772	54104	65056	56849	82164	95818	
BOWKER	356795	48012	279721	122254	363231	422807	60718	
DANIEL	219861	191077	307222	475553	116733	1819	1500	
JENSEN	34818	25798	16509	16709	9506	20240	16177	
KANSAS UNIVERSITY	0	0	0	0	0	0	0	
LEMON	286614	7955	9284	0	0	0	0	
GOING	353648	99803	355610	236360	426847	182950	238398	
GOING	151209	73821	160885	132511	157494	178099	103010	
BOWKER	0	0	0	0	0	0	0	
KREY	148973	178761	157009	138683	142847	160751	47841	
CLARIDGE	1169	0	0	0	0	0	0	
MURPHY	161287	136253	136391	95124	106993	93115	55689	
RUTHERFORD	0	0	0	0	0	0	0	
JOHNS	324775	243574	300708	341174	321207	314233	261895	
MURPHY	63992	45699	35858	26253	9832	6220	20340	
HANKE	1687	0	0	0	0	0	0	
BOWKER	113576	170344	239734	173138	237124	191796	101693	
GOING	56076	68579	77831	59416	64501	83261	90339	
K U ENDWMNT	45403	36801	28020	13784	9803	13164	18194	
JOHNS	456680	610501	538428	466639	404320	360822	339150	
DEAN	320338	274701	88592	86760	102976	50961	786	
BOWKER HC	0	0	34293	65672	64307	4504	0	
BOWKER-GOIN	0	0	186827	287607	300451	76995	795	
BOWKER	0	0	133619	98461	66773	95121	86431	
DAVIS WALTER	0	0	0	0	51304	161929	113766	
JOHNS	0	0	0	0	0	0	0	
CROW	0	0	0	0	0	0	0	
HOFFMAN	0	0	0	0	0	0	0	
SINCLAIR	0	0	0	0	0	0	0	
SCHAPER	0	0	0	0	0	0	0	
WEATHERFORD 'B'	0	0	0	0	0	0	0	
SOUPISET	0	0	0	0	0	0	0	
HEINTZ 'A'	0	0	0	0	0	0	0	


Kogview.apr
New
Open
Run
Views
Tables
Charts
Layouts
Scripts
County Annual Production Charts (Oil/Gas)
County Lease Production Information (Gas)
County Lease Production Information (Oil)
County Oil Field Production Information
Create a list of gas field Id's
Creation of Gas Growth View
Creation of Oil and Gas Field Views
Field Chart
Field Click
Field location
Field View
Gas Field Chart
Gas Field Chart for Red Diamond
Gas Field Click
Gas Lease Production Information
Growth of Hugoton Gas Fields
Horizon Information
Horizon Location
Make views for Production Levels
Map of Gas Field Production Levels
Map of Gas Production Levels (county Polygons)
Map of Oil Field Production Levels
Map of Production Levels (county Polygons)
Menus for Project
Oil Field Chart
Oil Field Chart for Red Diamond
Oil Field Click
Oil Lease Production Information
Open Color Palette
Save as a layout
Script1
Script2
Script3
Startup
UnjoinAll


Annual Gas Production History for RICHFIELD
Annual Gas Production history for RICHFIELD
5000000
4500000
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93
RICHFIELD

```
' ************************************************************
' This script brings up information pertaining to a field
' when the user clicks on a field in the view. This script is executed
' when the Red diamond button is used
' Author: Milind Raje
' Date: 8/2/95
' ************************************************************

theView = av.GetProject.FindDoc("Gas Fields in SW Kansas")
found = FALSE
p = theView.GetDisplay.ReturnUserPoint

    athemelist = theView.GetThemes
    for each thm in athemelist
     if(thm.GetName = "Gas Fields".AsString) then
       attributeTable2 = thm.GetFtab
       clickedRecords2 = thm.FindByPoint(p)

     end
     if(thm.GetName = "Oil and Gas fields".AsString) then
       attributeTable1 = thm.GetFtab
       clickedRecords1 = thm.FindByPoint(p)

     end
    end
    horizonVtab = av.GetProject.FindDoc("Horizon Data").GetVtab
    fieldVtab = av.GetProject.FindDoc("Gas Field Production Data").GetVtab
     field_info_not_found = TRUE

     abd_year = Nil

    code = 10
    tempstring = "Number of leases:".AsString

    for each record in clickedRecords2

      found = TRUE


            field_id2 = attributeTable2.ReturnValue(attributeTable2.
                                                    FindField("Gashug_new-id"),record)
            code = attributeTable2.ReturnValue(attributeTable2.FindField("Code"),record)
            if(field_id2 <> 0) then
              for each rec in fieldVtab
                field_id = fieldVtab.ReturnValue(fieldVtab.FindField("field_id"),rec)
                if(field_id = field_id2) then
                  field_info_not_found = FALSE
                  field_name = fieldVtab.ReturnValue(fieldVtab.FindField("field_name"),rec)
                  till_date = fieldVtab.ReturnValue(fieldVtab.FindField("Till_date"),rec)
                  for each ayear in 93 .. 69  by -1

                    ayear_prod = fieldVtab.ReturnValue(fieldVtab.
                                                       FindField(ayear.AsString),rec)
                    if(ayear = 93) then
                      if(ayear_prod > 0) then
                        break
                      end
                    end
                    if(ayear_prod > 0) then
                      abd_year = ayear
                        break
                    end
                  end

                  lease_count = fieldVtab.ReturnValue(fieldVtab.FindField("lease_count"),rec)
                  break
```

```
            end
          end
        end

 end

 for each record in clickedRecords1

   found = TRUE
     has_oil_and_gas = FALSE

       field_id1 = attributeTable1.ReturnValue(attributeTable1.
                                              FindField("Oghug-id"),record)
       if((field_id1 = 2107) or (field_id1 = 6236) or (field_id1 = 6359)) then
         msgbox.info("Sorry,Gas production data unavailable!","")
         exit
       end
        if(field_id1 <> 0) then
          has_oil_and_gas = TRUE
          tempstring = "Number of leases with gas:".AsString

          for each rec in fieldVtab
            field_id = fieldVtab.ReturnValue(fieldVtab.FindField("field_id"),rec)
            if(field_id = field_id1) then
              field_info_not_found = FALSE
              field_name = fieldVtab.ReturnValue(fieldVtab.FindField("field_name"),rec)
              till_date = fieldVtab.ReturnValue(fieldVtab.FindField("till_date"),rec)
              for each ayear in 93 .. 69 by -1
                ayear_prod = fieldVtab.ReturnValue(fieldVtab.
                                                   FindField(ayear.AsString),rec)

                 if(ayear = 93) then
                  if(ayear_prod > 0) then
                    break
                  end
                end
                if(ayear_prod > 0) then
                  abd_year = ayear
                   break
                end

                end

              lease_count = fieldVtab.ReturnValue(fieldVtab.FindField("lease_count"),rec)
              break
            end
          end
        end

 end
 if (not found) then
  System.Beep
  exit

end

 if( field_id1 = field_id2) then
   System.Beep
   exit
 end
afieldlist = List.Make
if(field_info_not_found) then
  msgbox.info("Sorry, data not available !","")
  exit
end
afieldList.Add(field_name)
```

```
till_date.SetFormat("dd")
extra_info = ""

 if((field_id2 <> 0)and(field_id1 = 0)) then
   if( code = 1) then
     extra_info = "Note:"++ field_name.AsString ++
                           "field lies within Panoma and Hugoton Gas Areas"
     afieldList.Add("HUGOTON GAS AREA".AsString)
     afieldList.Add("PANOMA GAS AREA".AsString)
   else
     if( code = 2) then
     afieldList.Add("HUGOTON GAS AREA".AsString)
       extra_info = "Note:"++ field_name.AsString ++
                             "field lies within Hugoton Gas Area"
     else

       if( code = 3) then

         extra_info = "Note:"++ field_name.AsString ++
                             "field lies within Greenwood Gas Area"
         afieldList.Add("GREENWOOD GAS AREA".AsString)
       end
     end
    end
  end

 if((field_id2 <> 0)and(field_id1 <> 0)) then
   if( code = 2) then
     extra_info = "Note:"++ field_name.AsString ++
                         "field lies within Panoma and Hugoton Gas Areas"
     afieldList.Add("HUGOTON GAS AREA".AsString)
     afieldList.Add("PANOMA GAS AREA".AsString)
   else
     if( code = 4) then
      if( field_id2 = 919) then
       extra_info = "Note:"++ field_name.AsString ++
                             "field lies within Greenwood Gas Area"
       afieldList.Add("GREENWOOD GAS AREA".AsString)
      else
       extra_info = "Note:"++ field_name.AsString ++
                             "field lies within Hugoton Gas Area"
       afieldList.Add("HUGOTON GAS AREA".AsString)
      end
     else
       if( code = 3) then
         extra_info = "Note:"++ field_name.AsString ++
                             "field lies within Greenwood Gas Area"
         afieldList.Add("GREENWOOD GAS AREA".AsString)
       end
     end
    end
  end

aString = "Field Name: " ++ field_name.AsString +NL+ "Field Id: " ++ field_id.AsString
           +NL+ "Cumulative Production through 1993: " ++ till_date.AsString++ "mcf" +NL+
           tempstring ++lease_count.AsString +NL+
           extra_info



  if(abd_year <> Nil) then
    aString = aString+NL+"Field abandoned in 19"+abd_year.AsString
  end
   if(has_oil_and_gas) then
     aString = aString+NL+"This field also has associated oil production"
```

```
  end

      hugString = "Field Name: HUGOTON GAS AREA" +NL+ "Field Id: 1144" + NL +
                  "Cumulative Production till date: 21043554304 mcf" +NL+
                  tempstring+" 6092"
      panString = "Field Name: PANOMA GAS AREA" +NL+ "Field Id: 1761" + NL +
                  "Cumulative Production till date: 20004801664 cu ft" +NL+
                  tempstring+" 2463"
      greenString = "Field Name: GREENWOOD GAS AREA" +NL+ "Field Id: 919" + NL +
                  "Cumulative Production till date: 1019780352 cu ft" +NL+
                  tempstring+" 316"

if(afieldlist.count = 2) then
  if(afieldlist.Get(1).AsString = "PANOMA GAS AREA".AsString) then
          aString = aString+NL+NL+panString
  else
    if(afieldlist.Get(1).AsString = "HUGOTON GAS AREA".AsString) then
          aString = aString+NL+NL+hugString
    else
      if(afieldlist.Get(1).AsString = "GREENWOOD GAS AREA".AsString) then
          aString = aString+NL+NL+greenString
      end
    end
   end
end

if(afieldlist.count = 3) then
  aString = aString+NL+NL+panString+NL+NL+hugString
end

msgbox.Report(aString,"General Information about the field")
theId = Field_id
toContinue = true
while(toContinue)

more = msgbox.YesNoCancel("Need additional information ?","","")
if(more = Nil) then
  exit
end

if(more) then
  thefield = msgbox.ChoiceAsString(afieldlist,"Choose the field","Field Selection")
   if(theField.AsString = "HUGOTON GAS AREA".AsString) then
       field_name = "HUGOTON GAS AREA"
       theId = 1144
    else
      if(theField.AsString = "PANOMA GAS AREA".AsString) then
           field_name = "PANOMA GAS AREA"
           theId = 1761
      else
        if(theField.AsString = "GREENWOOD GAS AREA".AsString) then
                field_name = "GREENWOOD GAS AREA"
                theId = 919
        else
          theId = Field_id
        end
      end
    end

  informationlist = { "Horizon Information", "Gas Production History","Lease Production"
  thetype = msgbox.ChoiceAsString(informationList,"Select the type of information",
                                  "Information Selection")
  if(thetype = Nil) then
    exit
  end
  if(thetype.AsString = "Gas Production History".AsString) then
```

```
          av.Run("Gas Field Chart for Red Diamond",thefield)
        else
           if(thetype.AsString = "Horizon Information".AsString) then
            infolist = List.Make
            infolist.Add(theId.AsString)
            infolist.Add(field_name.AsString)
            av.Run("Horizon Information", infolist)
          else
            av.Run("Gas Lease Production Information", theId)
          end
        end

      else
        exit
      end
      end
'endwhile

      exit
```

```
' ************************************************************************
' This script will let you choose the classification for the growth
' of Hugoton gas fields
' Author: Milind Raje
' Date: 8/25/95
' File Name: gasgrowth.ave
' ************************************************************************
attributeTable = av.GetProject.FindDoc("Growth of Gas Production").
                 GetThemes.Get(1).GetFtab

theTheme = av.GetProject.FindDoc("Growth of Gas Production").GetThemes.Get(1)

alist = { "Spud year","Completion year", "Number of Wells" }

aType = msgbox.ChoiceAsString(alist,"Select a type of classification",
                    "Classify")

if(aType.AsString = "Spud year".AsString) then
  aString = "Spud_year"

else
  if(aType.AsString = "Completion year".AsString) then
    aString = "Completion_year"

  else
    aString = "No_of_wells"
    increment = 1
  end
end

aNumber = msgbox.input("Enter the number of divisions","Divisions","3")
no_of_divisions = aNumber.AsNumber + 1

if(aType.AsString <> "No_of_wells".AsString ) then
   increment = 94/no_of_divisions
end
increment = increment.Truncate

afield = attributeTable.FindField(aString)
theTheme.GetLegend.SetField(afield)
theTheme.GetLegend.Quantile(attributeTable,afield,no_of_divisions)
theLegend = theTheme.GetLegend

  defaults = List.Make
  labels = List.Make

  defaults.Add("0".AsString)
  labels.Add("Range1".AsString)
  prev  = 0

  for each i in 2 .. no_of_divisions
    from = prev + 1
    to = from + increment
    prev = to
    if( i = no_of_divisions) then
      to = to + increment
    end
    defaults.Add(from.AsString + "-".AsString + to.AsString)
    labels.Add("Range".AsString + i.AsString)
  end

  rangeList = msgbox.multiInput("Enter the Range of Values for classification",
                                "Classification",labels,defaults)
  aClassificationList = theLegend.GetClassifications

  aClass = aClassificationList.Get(0)
```

```
  aClass.SetRangeString("0".AsString)
  aClass.SetLabel("0".AsString)
  i = 0

  for each aClass in aClassificationList
   if( i <> 0) then
   aClass.SetRangeString(rangeList.Get(i))
   aClass.SetLabel(rangeList.Get(i))
   end
   i = i + 1
  end
aColor = Color.Make
aColor.SetTransparent(true)
theLegend.GetSymbols.Get(0).SetColor(aColor)
av.GetProject.FindDoc("Growth of Gas Production").GetWin.Open
exit
```