Mosquito Treatment Application & Notification System

County of Santa Clara
In recent years, Vector Control District has migrated to a GPS enabled database application that tracks and stores all mosquito treatment locations. The data is stored as SQL Server spatial data type. Last year, over 8800 treatments were applied throughout the County.
Problem:

When Vector Control District issues treatments within county parks, Park Rangers need to be notified to ensure authorized applications and respond to public inquiries. Currently, this process was handled through incident emails, phone calls, etc.
Solution

An automation script will send report notifications to the Santa Clara County (SCC) Parks and Recreation Department staff, triggered by SCC Vector Control District mosquito treatment.
Data Ecosystem: Field > Cloud > On Premise

Iconyx Summit Application Suite

SUMMIT: ARCHITECTURE

- Synchronise Field Activities
- Management: Set business rules
- Report & Schedule
- Manage from any connected PC
- Export

*Icons and logos used: Bing, Excel, and a laptop. The architecture diagram illustrates the flow of data from field activities to cloud management and on-premise export.*
Data

Source Data Extraction, Transformation, and Loading (ETL) handled by CEPA-IS staff

- Locations and Attributes of Pesticide Application (SQL Server Native Geography Type - Points)
- Tracking Table of Notification Made (SQL Server Table)
- County Parks Polygon
# Locations and Attributes of Treatment Applications

## Tracking Table of Notifications

<table>
<thead>
<tr>
<th>DocID</th>
<th>ObjectID</th>
<th>NotificationDate</th>
<th>Record of Treatments Falling within Santa Clara County Park that were Notified.</th>
</tr>
</thead>
<tbody>
<tr>
<td>324439601</td>
<td>6557</td>
<td>2017-08-03 14:52:38.000</td>
<td>Record of Treatments Falling within Santa Clara County Park that were Notified.</td>
</tr>
<tr>
<td>324435741</td>
<td>6558</td>
<td>2017-08-03 14:58:39.000</td>
<td>Record of Treatments Falling within Santa Clara County Park that were Notified.</td>
</tr>
<tr>
<td>334422524</td>
<td>6559</td>
<td>2017-08-03 15:06:20.000</td>
<td>Record of Treatments Falling within Santa Clara County Park that were Notified.</td>
</tr>
<tr>
<td>345933181</td>
<td>6560</td>
<td>2017-08-03 15:06:20.000</td>
<td>Record of Treatments Falling within Santa Clara County Park that were Notified.</td>
</tr>
<tr>
<td>345935031</td>
<td>6561</td>
<td>2017-08-03 15:06:20.000</td>
<td>Record of Treatments Falling within Santa Clara County Park that were Notified.</td>
</tr>
<tr>
<td>345937951</td>
<td>6562</td>
<td>2017-08-03 15:06:20.000</td>
<td>Record of Treatments Falling within Santa Clara County Park that were Notified.</td>
</tr>
</tbody>
</table>
Technology Selection

Esri and Microsoft Stack

ArcGIS®

Python

SQL Server

Windows Server
FROM = "VectorInfo@xxx.xxx.org"
TO = "vcd-vpansparks@xxx.xxx.org"
SUBJECT = "VCD Mosquito Treatment Notification"

#Initial email message body: From, To, and Subject field.
for sendFile in fileList:
    msg = MIMEText()  # Initialize message with plain text content
    msg['From'] = FROM
    msg['To'] = TO
    msg['Subject'] = SUBJECT
    attach_file_path = sendFile
    #print ("check")
    #print (attach_file_path)
    #Construct header of the attachment
    part = MIMEBase('application', 'octet-stream')
    part.set_payload(open(attach_file_path, 'rb').read())
    encoders.encode_base64(part)
    part.add_header('Content-Disposition', 'attachment; filename="file"')
    #Add attachment field to the email message body
    msg.attach(part)
### Santa Clara County Vector Control District
#### Mosquito Treatment Notification

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>12/19/2017</td>
</tr>
<tr>
<td>Park Name</td>
<td>Uvas Creek Park Preserve</td>
</tr>
<tr>
<td>Coordinate</td>
<td>-121.589572, 37.988089</td>
</tr>
<tr>
<td>Area</td>
<td>15 Square feet</td>
</tr>
<tr>
<td>Habitat</td>
<td>Catch basin</td>
</tr>
<tr>
<td>Application ID</td>
<td>35676270</td>
</tr>
<tr>
<td>Product</td>
<td>Vectoars 1245</td>
</tr>
<tr>
<td>EPA Reg. No.</td>
<td>170048-38</td>
</tr>
<tr>
<td>Amount</td>
<td>0.000044 Gallons</td>
</tr>
<tr>
<td>Method</td>
<td>Ground</td>
</tr>
</tbody>
</table>

### Santa Clara County Vector Control District
#### Mosquito Treatment Notification

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>6/13/2017</td>
</tr>
<tr>
<td>Park Name</td>
<td>Santa Teresa</td>
</tr>
<tr>
<td>Coordinate</td>
<td>-121.801688, 37.375606</td>
</tr>
<tr>
<td>Area</td>
<td>19000 Square feet</td>
</tr>
<tr>
<td>Habitat</td>
<td>Creek</td>
</tr>
<tr>
<td>Application ID</td>
<td>35445136</td>
</tr>
<tr>
<td>Product</td>
<td>Vectoars G</td>
</tr>
<tr>
<td>EPA Reg. No.</td>
<td>170049-10</td>
</tr>
<tr>
<td>Amount</td>
<td>4.50000 Pounds</td>
</tr>
<tr>
<td>Method</td>
<td>Ground</td>
</tr>
</tbody>
</table>

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**VCD Mosquito Treatment Notification at 2018-06-22.**

[Download PDF](#)
Outcomes & Values

1. Efficiency and Process Integrity
2. Accountability and Quality Assurance
3. Increased Interdepartmental Information Sharing
4. Modularity and Reusability
5. Collaboration
Lessons Learned

Technical:

- Bug related with Python 2.7 caused a problem that task does not run without a server account logged on.
- Hard to estimate the number of maps in one email; currently one attachment per email. This is to prevent file size from becoming too large to send over the email.
Next Step

- We need to upgrade to ArcGIS Pro and Python 3.x :-)
- Review typical volumes of the notification per day.
The team

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