

SUPPORTING AG-WEATHER DECISIONS IN DELAWARE

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CENTER FOR ENVIRONMENTAL MONITORING AND ANALYSIS | [HTTP://WWW.CEMA.UDEL.EDU](http://www.cema.udel.edu)



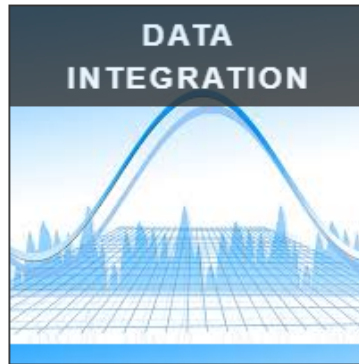


OVERVIEW

- BASIC ABOUT CEMA
 - TWO EXAMPLES OF DECISION SUPPORT SYSTEMS
 - IRRIGATION SCHEDULING
 - PLANT DISEASE RISK
 - FINDING A BETTER WAY COLLECTIVELY
- 

CEMA & CLIMATE OFFICES

OUR MISSION TO DELAWARE:



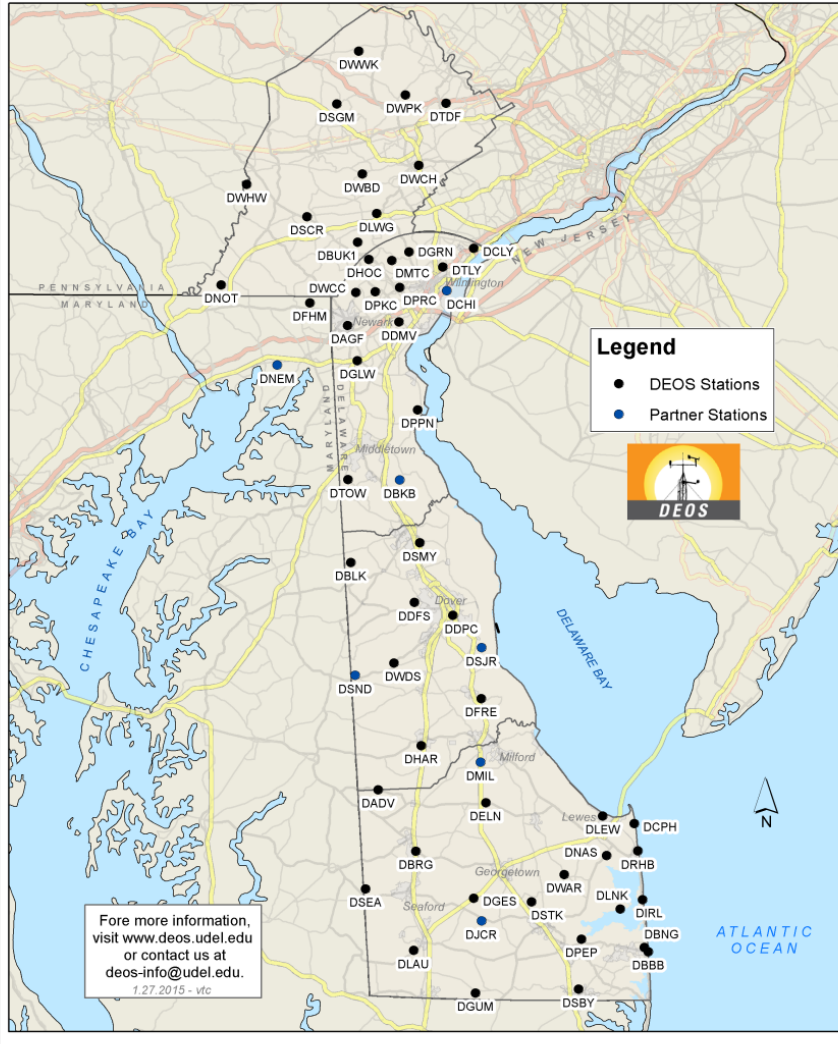
STATE CLIMATE OFFICES (SCO'S):

- FUNCTION LIKE EXTENSION, BUT FOR CLIMATE INFORMATION
- HAVE BEEN DOING CLIMATE OUTREACH, BEFORE CLIMATE OUTREACH WAS “COOL”
- EVERY STATE IN NORTHEAST HUB REGION HAS A STATE CLIMATOLOGIST, EXCEPT MASSACHUSETTS
- PROFESSIONALLY ASSOCIATION: AMERICAN ASSOCIATION OF STATE CLIMATOLOGISTS (WWW.STATECLIMATE.ORG)



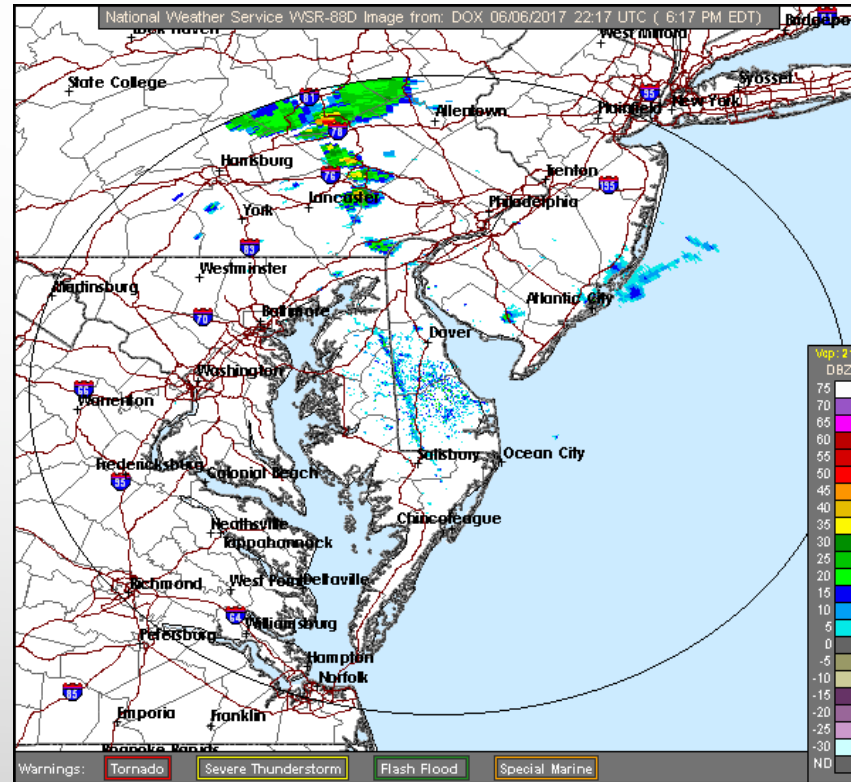
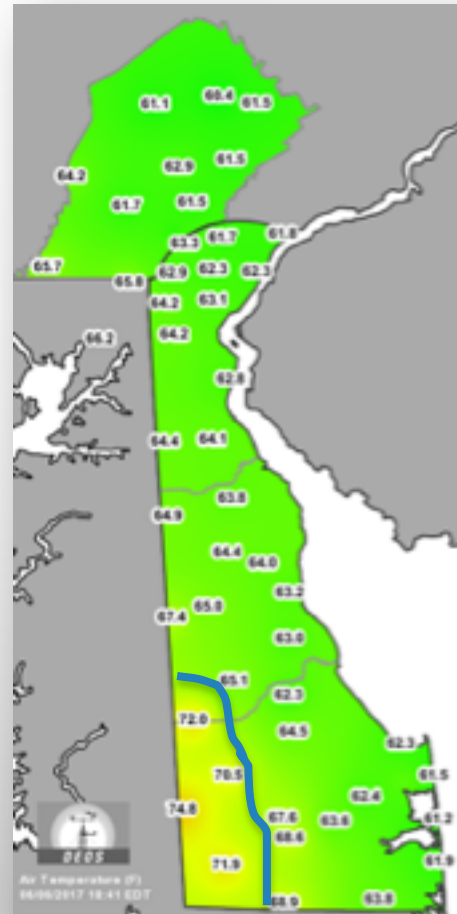
THE DEOS NETWORK

The Delaware Environmental Observing System (DEOS)
Station Network



- FOUNDED IN 2003 (OPERATIONAL IN 2004)
- PRIMARILY FUNDED THROUGH STATE PARTNERS
- STATE CLIMATE OFFICE AFFILIATED
- 1 OF 3 STATE MESONETS IN NORTHEAST REGION
 - NEW JERSEY AND NEW YORK
 - PENNSYLVANIA COMING SOON!
- 57 REAL-TIME WEATHER STATIONS
 - 44 IN DELAWARE
 - 11 IN PENNSYLVANIA
 - 2 IN MARYLAND
- 17 REAL-TIME POND/LAKE MONITORING STATIONS

HIGH DENSITY PROVIDES GOOD, LOCAL DATA



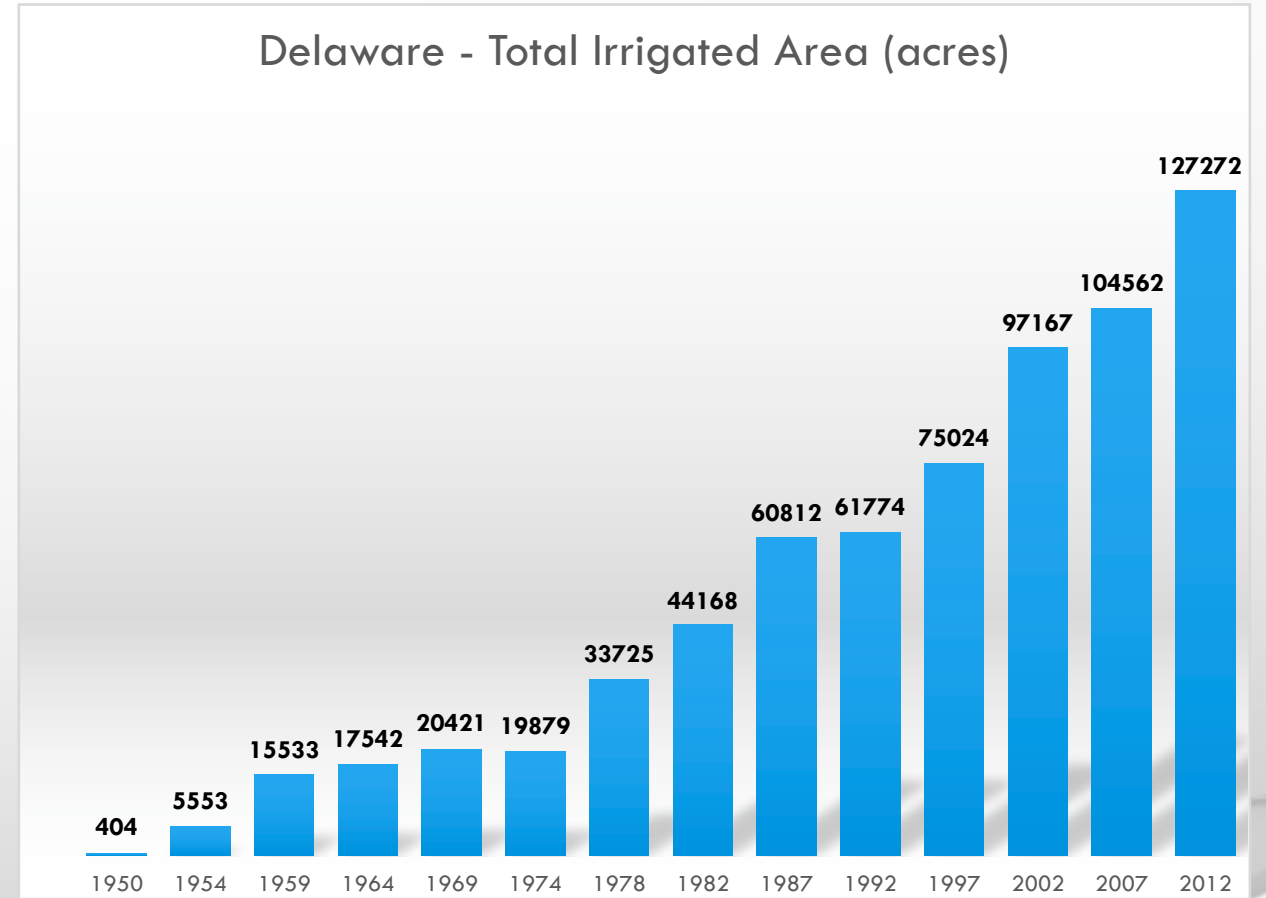
The background features a light gray gradient with several realistic water droplets of various sizes scattered in the corners. The droplets have highlights and shadows, giving them a three-dimensional appearance.

IRRIGATION SCHEDULING

[HTTP://DIMS.DEOS.UDEL.EDU](http://dms.deos.udel.edu)

IRRIGATION IN DELAWARE

- ~ 35% OF DELAWARE CROPLAND IS IRRIGATED TODAY (MOSTLY CORN & SOYBEAN)
- HIGHLY VARIABLE SUMMERTIME PRECIPITATION IS COMMON IN DELAWARE
- VERY SANDY SOILS WITH LOW WATER-HOLDING CAPACITIES, PARTICULARLY IN SUSSEX COUNTY
- IRRIGATION PROVIDES “INSURANCE” AGAINST PROLONGED DRY AND/OR HOT PERIODS AT THE HEIGHT OF THE GROWING SEASON



A satellite map of a coastal region, likely the Chesapeake Bay area, showing a dense network of waterways and surrounding land. The map is overlaid with numerous data points represented by circles. A large cluster of white circles is located in the upper-left quadrant, while a larger, more dispersed cluster of blue circles covers the central and lower-right areas. A single prominent red circle is located in the lower-middle section of the land area. The year '2012' is printed in large white font in the upper-right quadrant of the map.

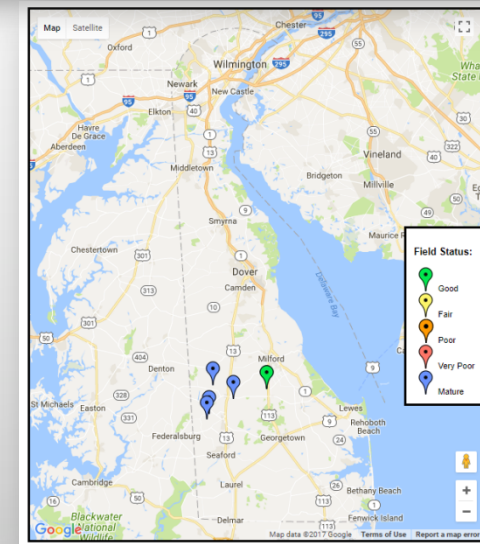
2012

Image Landsat / Copernicus

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

DELAWARE IRRIGATION MANAGEMENT SYSTEM (DIMS)

- FUNDED BY USDA NRCS AND DNREC
- LAUNCHED IN 2012
- PROVIDES ESTIMATES OF CROP WATER AVAILABILITY AT FIELD SCALE USING FAO-56 METHOD
- WEB-BASED TOOL
- AUTOMATICALLY DETERMINES WEATHER AND SOIL DATA BASED ON FARMER PROVIDED FIELD LOCATION
- MINIMAL INPUT FROM FARMER: FIELD NAME, LOCATION, CROP TYPE, AND EMERGENCE DATE.
- SERVES APPROXIMATELY 100-120 FIELDS A YEAR
- MOSTLY USED FOR FIELD CORN AND SOYBEAN, BUT SOME CUCUMBERS AND LIMA BEANS ALSO.





PLANT DISEASE RISK

[HTTP://DIMS.DEOS.UDEL.EDU/LIMABEANRISK](http://dms.deos.udel.edu/limabeandrisk)

LIMA BEAN DISEASE RISK TOOL

- #2 PRODUCER IN THE U.S.
- ~ 15,000 ACRES GROWN/YEAR
- LIMA BEANS ARE THE CORNERSTONE OF VEGETABLE PRODUCTION INDUSTRY
- COLLABORATION WITH UD COLLEGE OF AG RESEARCHERS AND VEGETABLE EXTENSION
- USDA NIFA SCRI FUNDED PROJECT
- LAUNCHED IN 2017
 - PROVIDED DISEASE RISK FOR OVER 70 FIELDS FOR 3 MAJOR VEGETABLE PRODUCERS



LIMA BEAN DISEASE RISK TOOL

- FIELDS ARE DEFINED AND ASSOCIATED WITH INDIVIDUAL USERS/PRODUCERS
- DERIVED FROM TWO PRIMARY MODELS:
 - HYRE (1964): DISEASE HISTORY, AIR TEMPERATURE, RAINFALL
 - RANIERE (1952): DISEASE HISTORY, AIR TEMPERATURE, AND DEWPOINT HOURS
- RISK MODEL ACCOUNTS FOR:
 - CULTIVAR SUSCEPTIBILITY
 - FIELD DISEASE HISTORY
 - WEATHER CONDITIONS
- WEATHER INFORMATION DERIVED THROUGH INTERPOLATION OF DEOS MESONET DATA

LIMA BEAN DISEASE RISK TOOL

Delaware Downy Mildew Lima Bean Risk Tool

Welcome back, kbrinson

Growing Season: 2016 Select Different Growing Season: [2012]

Show [10] entries Search:

| Field Name | 5-day Avg. Max Temperature (°F) | 10-Day Rainfall Accumulation (in) | Accumulated Dew Point Hours | Hyre | Raniere | Risk |
|-------------------------|---------------------------------|-----------------------------------|-----------------------------|------|---------|-----------------|
| Test Field #4 | NaN | NaN | NaN | 0 | 0 | Not Susceptible |
| Test Limas 15 | 68.6 | 1.81 | 14 | 3 | 3 | Slight |
| Another Lima Bean Field | 67.7 | 1.29 | 1 | 3 | 2 | Slight |

Showing 1 to 3 of 3 entries Previous [1] Next

Note: Click on the row of a field for detailed data and seasonal graph.

Field Status Table

Controls

- Field Status
- User Settings
- Add Field
- Replant Field
- Modify Field
- Delete Field
- Logout

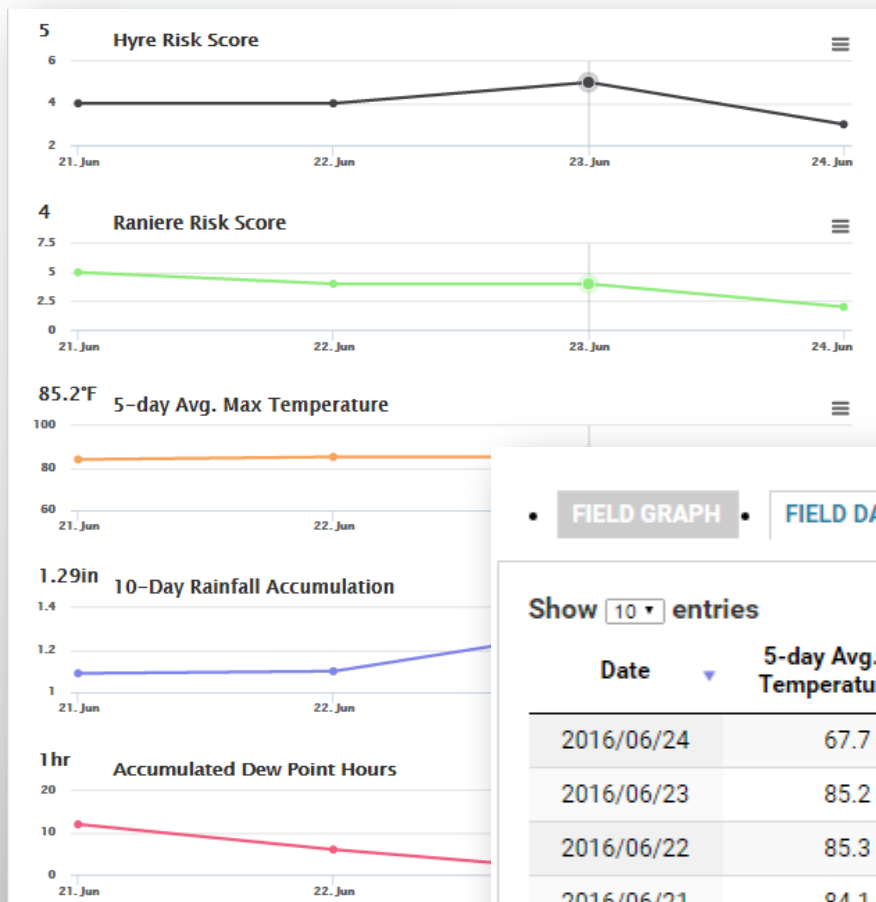
User Controls

LIMA BEAN RISK TOOL

Graphs and Data for the Users

- Risk Scores
- Base elements of risk models

Goal: Reduce production costs by reducing number of spray applications



Conditions for Another Lima Bean Field (Updated: 2016-06-29)

• FIELD GRAPH • FIELD DATA

Show 10 entries Search:

| Date | 5-day Avg. Max Temperature(°F) | 10-Day Rainfall Accumulation(in) | Accumulated Dew Point Hours | Hyre Score | Raniere Score |
|------------|--------------------------------|----------------------------------|-----------------------------|------------|---------------|
| 2016/06/24 | 67.7 | 1.29 | 1 | 3 | 2 |
| 2016/06/23 | 85.2 | 1.29 | 1 | 5 | 4 |
| 2016/06/22 | 85.3 | 1.10 | 6 | 4 | 4 |
| 2016/06/21 | 84.1 | 1.09 | 12 | 4 | 5 |

Showing 1 to 4 of 4 entries Previous 1 Next

The image features a light gray gradient background with several realistic water droplets of various sizes scattered in the corners. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text "SO NOW WHAT..." is centered in the middle of the page.

SO NOW WHAT...

DATA INTEGRATION

DEOS NETWORK DATA HAVE BEEN INTEGRATED INTO:

- PENN STATE UNIVERSITY WHEAT SCAB MODEL VIA PA STATE CLIMATE OFFICE
- NEWA (LIMITED) VIA NORTHEAST REGIONAL CLIMATE CENTER
- WHAT ABOUT OTHER EFFORTS IN OTHER REGIONS?



WHERE DO WE GO?

HOW MANY STOPS?



IS THERE A BETTER WAY?

- DECISION SUPPORT TOOLS ARE QUITE OFTEN DATA LIMITED, BUT USUALLY NOT FOR TECHNICAL REASONS.
- INSTITUTIONALLY LIMITED
- DATASETS FOR REGIONAL/NATIONAL PRODUCTS ARE READILY AVAILABLE FROM RELIABLE SOURCES (ACIS VIA THE RCC'S, NDFD/RTMA VIA NWS, ETC.)
- DUPLICATION OF EFFORTS
- THERE'S GOT TO BE A BETTER WAY.



HOW DO YOU ATTRIBUTE THE ORIGINAL DATA WHEN IT'S
BLENDED IN WITH "BIG DATA"?

DATA

WHERE DOES ~~FOOD~~ COME
FROM?



WHO PAYS FOR THE APPLICATIONS TO BE UPDATED AND MAINTAINED?



The image features a light gray background with a subtle gradient. In the top-left and bottom-right corners, there are clusters of realistic water droplets of various sizes, rendered with soft shadows and highlights to give them a three-dimensional appearance. The word "THANKS!" is centered in the middle of the page in a bold, black, sans-serif font.

THANKS!