

NWS Climate Information and Tools for Decision Support Services

CDPW, State College, MD, July 11, 2013

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NOAA Next Generation Strategic Plan



NOAA'S MISSION: SCIENCE, SERVICE & STEWARDSHIP

To understand and predict changes in climate, weather, oceans, and coasts,
To share that knowledge and information with others, and
To conserve and manage coastal and marine ecosystems and resources



NWS Strategic Plan



Mission

Provide weather, water, and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy

Vision

A Weather-Ready Nation: Society is Prepared for and Responds to Weather-Dependent Events

Weather-Ready Nation GOALS

Goal 1. Improve weather decision services for events that threaten lives and livelihood

Goal 2. Deliver a broad suite of improved water forecasting services to support management of the Nation's water supply

Goal 3. Enhance climate services to help communities, businesses, and governments understand and adapt to climate-related risks

Goal 4. Improve sector-relevant information in support of economic productivity

Goal 5. Enable integrated environmental forecast services supporting healthy communities and ecosystems

Goal 6. Sustain a highly-skilled, professional workforce equipped with the training, tools, and infrastructure to meet our mission

Building a Weather-Ready Nation

Becoming a Weather-Ready Nation is about building community resilience in the face of increasing vulnerability to extreme weather.



NOAA's NWS is

- Moving from product services to decision support services
- Improving technology to track and forecast storms with longer lead times
- Expanding its dissemination efforts to achieve far-reaching national preparedness for weather events

Building a WRN - Roadmap

Flexible response to meet contingencies



- **Provide superior decision support and foundational information services**
 - *NWS uses unique, local relationships with Core Partners to help them to **better prepare our communities** for extraordinary events*
- **Invest in Science and Technology**
 - *NWS uses **state-of-the-art technology** and **cutting-edge science** to provide the best service possible*
- **Empower our workforce**
 - *Workforce is trained and equipped to meet America's evolving needs*
 - ***Emergency Response Specialists (ERS)** are accessible on-site and through remote technologies to provide **Impact-based Decision Support Services (IDSS)***



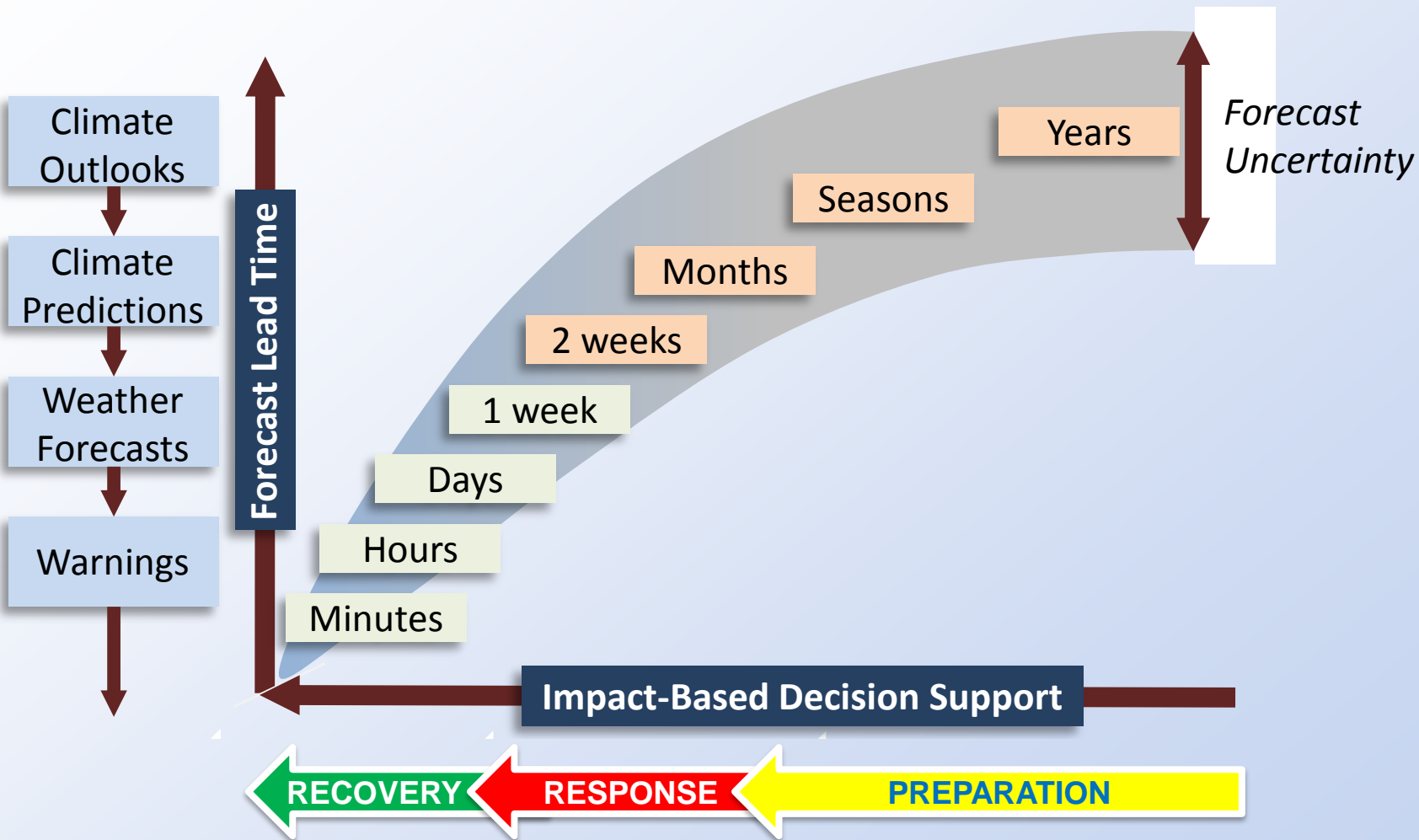
Impact-Based Decision Support Services (IDSS)



Helping America make better preparedness and response decisions in the face of weather and climate events

- NWS provides relevant information and interpretative services to enable core partners' decisions when weather, water, or **climate** has a direct impact on the protection of lives and livelihoods*
- Additional forecast information on the **climate** scale (at least a year into the future) will also be included to facilitate IDSS on **seasonal projections** of weather such as hurricanes, severe weather, winter weather, and flooding*

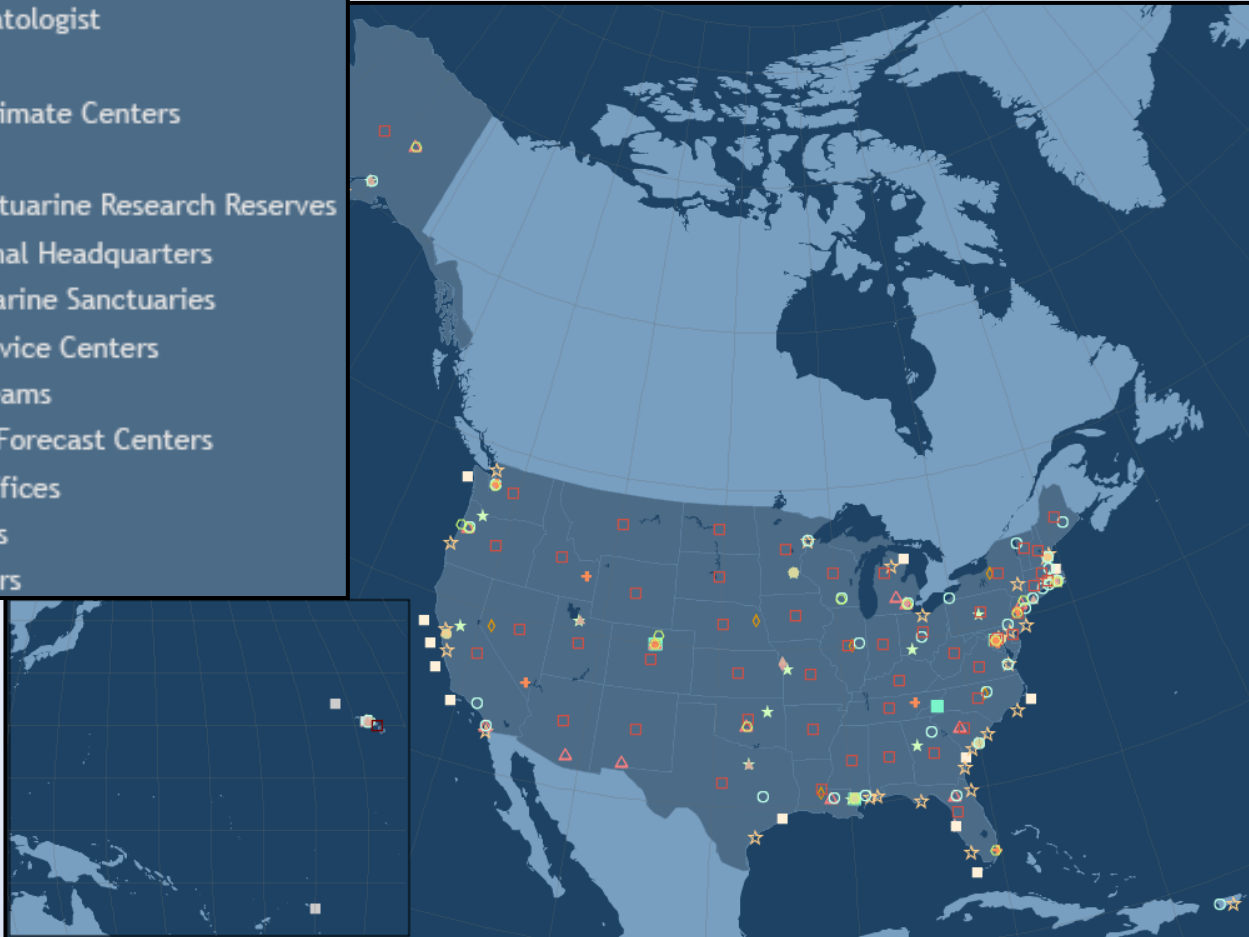
Climate - Weather Linkage



Regional and Local Focus of IDSS

NOAA works nationally and internationally, but most climate decisions are local or regional, and NOAA is structured to have multiple entry points at regional, state, and local levels.

- Cooperative Institutes
- State Climatologist
- Sea Grant
- ◇ Regional Climate Centers
- △ RISA
- ☆ National Estuarine Research Reserves
- ▲ NWS Regional Headquarters
- National Marine Sanctuaries
- Coastal Service Centers
- ◆ Regional Teams
- ★ NWS River Forecast Centers
- Program Offices
- + Lab Centers
- Data Centers





NWS Climate Services

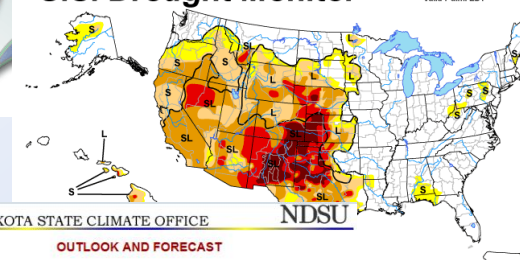


- Ensure climate quality of weather records
 - Applying 10 Principles of Climate Monitoring
 - CoCoRaHS coordination in WFO
 - Network of Networks
- Climate Product Development and Delivery
 - Coordination on State Climate Extremes and other questions
 - Local and national products delivery
 - WFO / SC office coordination on services
- Developing common knowledge of climate information applications
 - Climate Prediction Application Science Workshop
 - Climate Diagnostics and Prediction Workshop
- Use of common tools for consistency of climate services
 - ACIS (xmACIS, SCACIS, NOWData)
 - LCAT
- Information exchange



U.S. Drought Monitor

June 18, 2013
Valid 7 a.m. EDT



NORTH DAKOTA STATE CLIMATE OFFICE **NDSU**

OUTLOOK AND FORECAST

NWS Suite of Official Forecasts

based Thursday, June 20, 2013
16, National Drought Mitigation Center

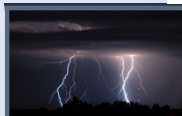
0-5 Days 3-7 Days 6-10 Days 8-14 Days 1 Month 3 Month North Dakota Local 3 Month

NOAA DEVILS LAKE DECISION SUPPORT SYSTEM

Weather.gov Forecast

Current Status

Recognized by the American Association of State Climatologists



11th Annual CPASW
Climate Prediction Applications
Science Workshop
April 23–25, 2013 Logan, UT



LCAT
Local Climate Analysis Tool

Welcome Marinal

Home LCAT Learn Logout Admin

Learn. Do. Share



LCAT

nws.weather.gov/lcat/

LCAT uses principles of Artificial Intelligence to connect humans with computing capability to apply data and scientific techniques

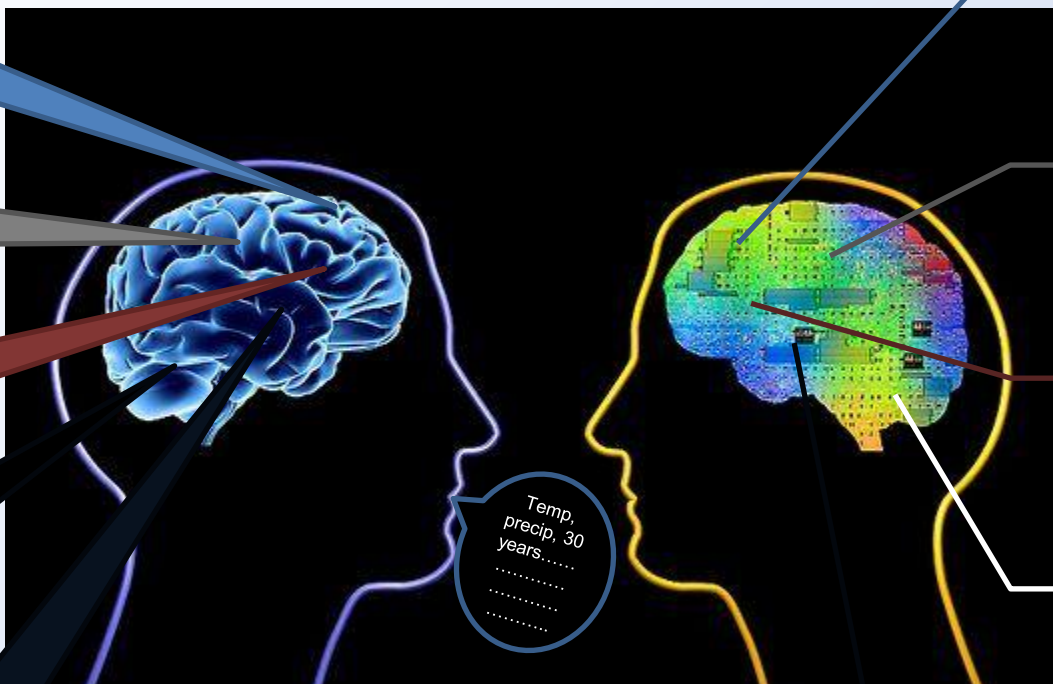
How is the temperature in my town changing?

Should we expect floods during La Nina events?

How severe is the drought in my region this year?

Which climate model performs best in my region?

What are the projections for climate in my region?



Data: Homogenized station maximum temperature

Analysis: best practices for trend; rate of change

Output: statistics, plots, metadata

Data: Homogenized precipitation and river flow

Analysis: composites, risk assessment

Output: statistics, plots, metadata

Data: Drought indices

Analysis: time series analysis

Output: statistics, plots, metadata

Data: Reanalysis and GCM fields

Analysis: downscaling, sensitivity tests

Output: statistics, plots, metadata

Data: GCM outputs

Analysis: downscaling

Output: statistics, plots, metadata



LCAT



nws.weather.gov/lcat/

LCAT Local Climate Analysis Tool

Welcome Marina!

Home LCAT Learn Logout Admin

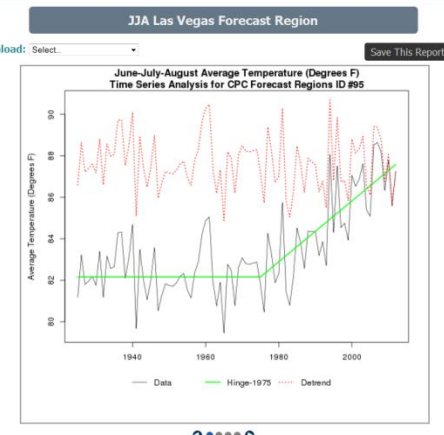
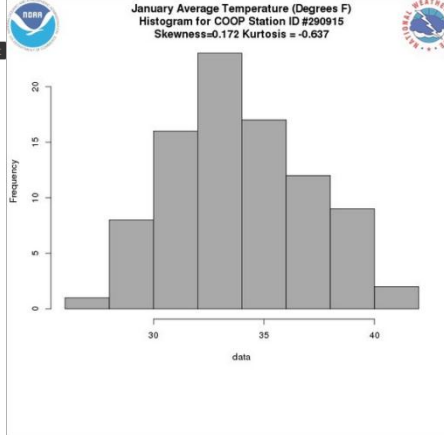
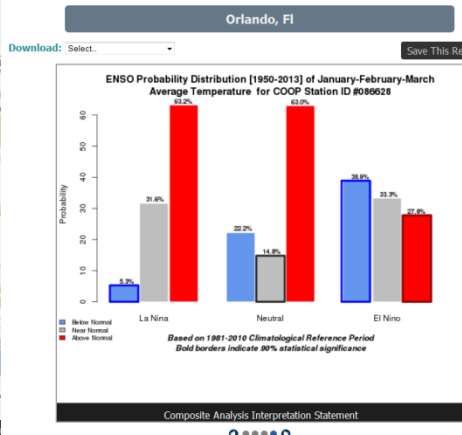
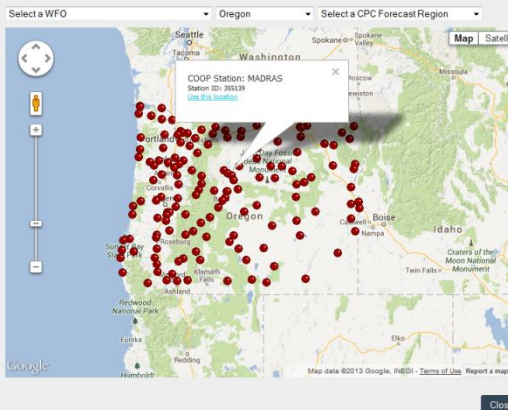
Do

- Local Climate Change Studies
- Local Climate Variability Studies
- Correlation Studies



Learn. Do. Share

Select Location by Click





ACIS/xmACIS/NOWData



National Weather Service Climate - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.weather.gov/climate/xmacis.php?wfo=riw

weather.gov

National Weather Service Forecast Office
Western and Central Wyoming

Home News Organization Search for: [] NWS All NOAA Go

Observed Weather Climate Locations Climate Prediction Climate Resources Local Data/Records Astronomical NOWData

Local forecast by "City, St"
City, St [] Go

Current Hazards
Watches/Warnings
Outlooks
U.S. Hazards
Hurricane Info
Safety Rules
Reports
eSpotter
Current Conditions
Observations
Satellite Images
Rivers & Lakes
AHPs
Road & Travel
Radar Imagery
Local Radar
Nationwide
Experimental RIW
Ridge Radar
Forecasts
Local Area
Aviation

NOWData - NOAA Online Weather Data

1. Product »
 Daily data for a month
 Daily almanac
 Monthly avgs/totals
 Monthly occurrences
 Monthly extremes
 Daily extremes
 Daily/monthly normals
 Record extremes
 First/Last dates

2. Location »
 Casper Area
 Lander Area
 Afton, WY
 Bondurant, WY
 Boulder Rearing, WY
 Boysen Dam, WY
 Clark 3 Ne, WY
 Cody, WY
 Cora, WY
 Dubois, WY

3. Variable »
 Max Temperature
 Min Temperature
 Avg Temperature
 Precipitation
 Snowfall
 Snow Depth
 Heating Degree Days
 Cooling Degree Days
 Growing Degree Days

4. Month »
 Entire Year
 January
 February
 March
 April

6. View »
 Highest
 Lowest

Product Description:
 RECORD EXTREMES - finds the top ten extreme values (highest or lowest) for any day during the station's period of record. Searches can be restricted to a month or season, if desired. Spring=Mar-May; Summer=Jun-Aug; Fall=Sep-Nov; Winter=Dec-Feb. Additional stations are available from the Regional Climate Centers and the National Climatic Data Center.

[- NCDC Map Services -](#)
[- Common questions -](#)
[- Submit a question/comment -](#)

Powered by **ACIS**
 NOAA Regional Climate Centers

Pilot Projects

- **NWS Operations Center (NOC)**
 - *NWS Headquarters, Silver Spring, MD*
- **Regional Operations Center (ROC)**
 - *Southern Region Headquarters, Fort Worth, TX*





Pilot Projects

- **IDSS in a Coastal Environment** WFO New Orleans, LA
 - *Supporting operation of 7 major ports and river transportation, outdoor activities (Navy Week, Super Bowl, Mardi Gras, etc.), clean up and recovery of HAZMATs incidents*
 - *Providing planning and operations support, training emergency managers*
 - *Local climate data and forecasts guide advance preparedness with weather information updates minimizing the potential impacts*
- **Integrated Environmental Studies** WFO Tampa, FL
 - *Provide operational decision support services for emergency responders*
 - *Local climatological data of extreme weather events and climate outlooks guide decisions on timing of algal bloom, environmental conditions for oysters and shellfish, citrus growing and vegetable farming, freshwater availability*
- **Mesoscale Meteorology Science to Ops.** Charleston, WV
 - *Prototype operational applications of emerging mesoscale meteorology and modeling research, deploy enhanced web-based geospatial display of mesoscale forecasts, exploit emerging storm-scale model capabilities to improve severe local storm and flash flood warnings*
 - *Local climatology information of storms and severe weather events will guide advance planning and preparations*

Examples

- Ecosystem DSS: Algal blooms and red tide are frequently discharge of fresh water from rivers into the Gulf of Mexico.**
 - Climate products: used in combination with ENSO condition composites to provide input or DSS with regard to increase the occurrence of these algal blooms and red tide months in probabilities of above/below normal precipitation in the river.*
- Ecosystem DSS: Drought and resultant decreased stream flow in Louisiana, Mississippi, Alabama, and Florida results in decreased salinity in the Gulf of Mexico. In turn, this leads to increased salinity levels where oysters develop.**
 - Climate products: used in combination with ENSO condition composites to provide input or DSS with regard to the likelihood of flow months in advance.*
- Ecosystem DSS: Abnormally cold outbreaks near the coast can result in fish kills and some ponds and lakes in Florida.**
 - Climate products: segregate ENSO conditions where events are more apt to occur. These can result in stress in these shallow waters.*
- Agriculture DSS: The Florida peninsula is a major source of vegetables grown in the United States. 11% of US grapefruit production comes from the USA with 11% of the fresh market value. Production is valued at \$1.145B.**
 - Climate products: correlating ENSO conditions with probabilities for extreme wet or dry and drought during the growing season will be extremely valuable.*



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Support

- **Training modules**
- **Online guidance**
- **Dynamic interpretations**
- **Help documents**

We use “3H” approach:

- **Head** – provide scientifically-sound information
- **Hand** – provide application examples, guidance
- **Heart** – show compassion / make it easy