



# Weapon Danger Zone Tool

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*"Innovative Solutions ... Proven Results"*





# Topics

- Background
- WdZ Definitions
- General Concepts
- Applications
- Deployment Strategy
- Road Ahead



# What is the WDZ Tool

- Desktop and Web Application that produces and manages safety footprints for air to ground weapons training.
- ArcGIS 9.2 - desktop
- ArcGIS Server 9.2 - web
- Utilizes and produces SDSFIE standard data
- Integrates with the Range Managers Toolkit (RMTK) for ground based weapons
- GOTS



# What is the WDZ Tool

- Initial Tool will use the legacy footprints from previous application (SafeRange)
- Ultimate Tool will interactively create footprints for each request.



# WDZ Background



- OSD Sub Groups on GIS and Aviation Safety
- Services teamed up to develop common requirements and define differences
- Collaborative effort – All Services
  - Contribute funding
  - Participate in Configuration Management Working Group
  - Contractually led by the Air Force



# WDZ Background



GEOGRAPHIC  
INFORMATION  
SERVICES, INC

- Development Contract Awarded to CSR and GISi
- CSR providing the aircraft weapons domain expertise
- GISi providing the GIS development and Range Managers Toolkit expertise

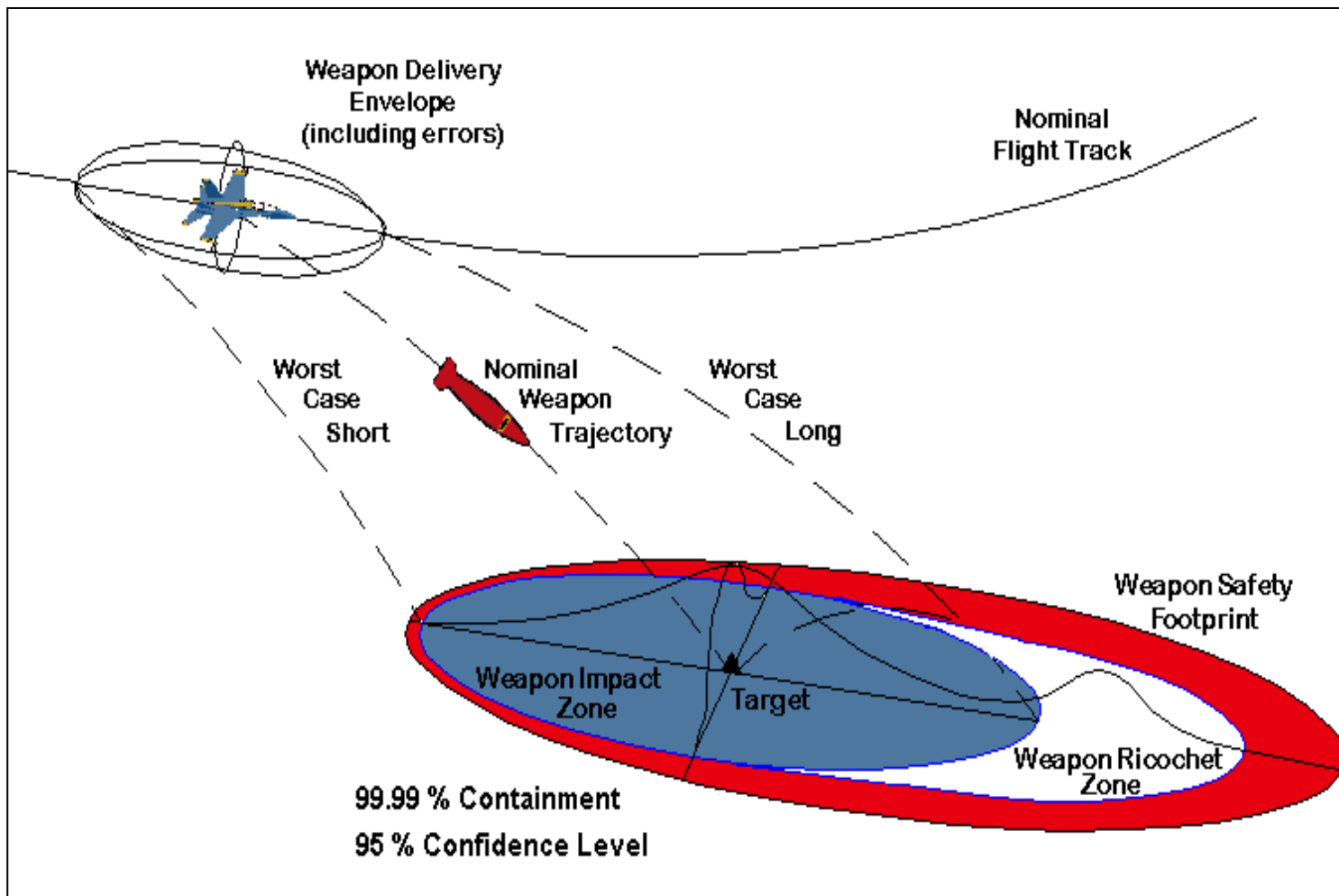


# WDZ Definition

- The Weapons Danger Zone (WDZ) encompasses the ground and airspace for lateral and vertical containment of projectiles, fragments, debris, and components resulting from the firing, launching, and/or detonation of aviation delivered ordnance.
- This three-dimensional zone accounts for weapon accuracy, failures, ricochets, and broaches/porpoising of a specific weapon/munition type delivered by a specific aircraft type.
- WDZs represent the minimum safety requirements designed for aviation weapons training on DOD ranges.



# Weapon Danger Zone







# Weapon Danger Zone Area

## Containment

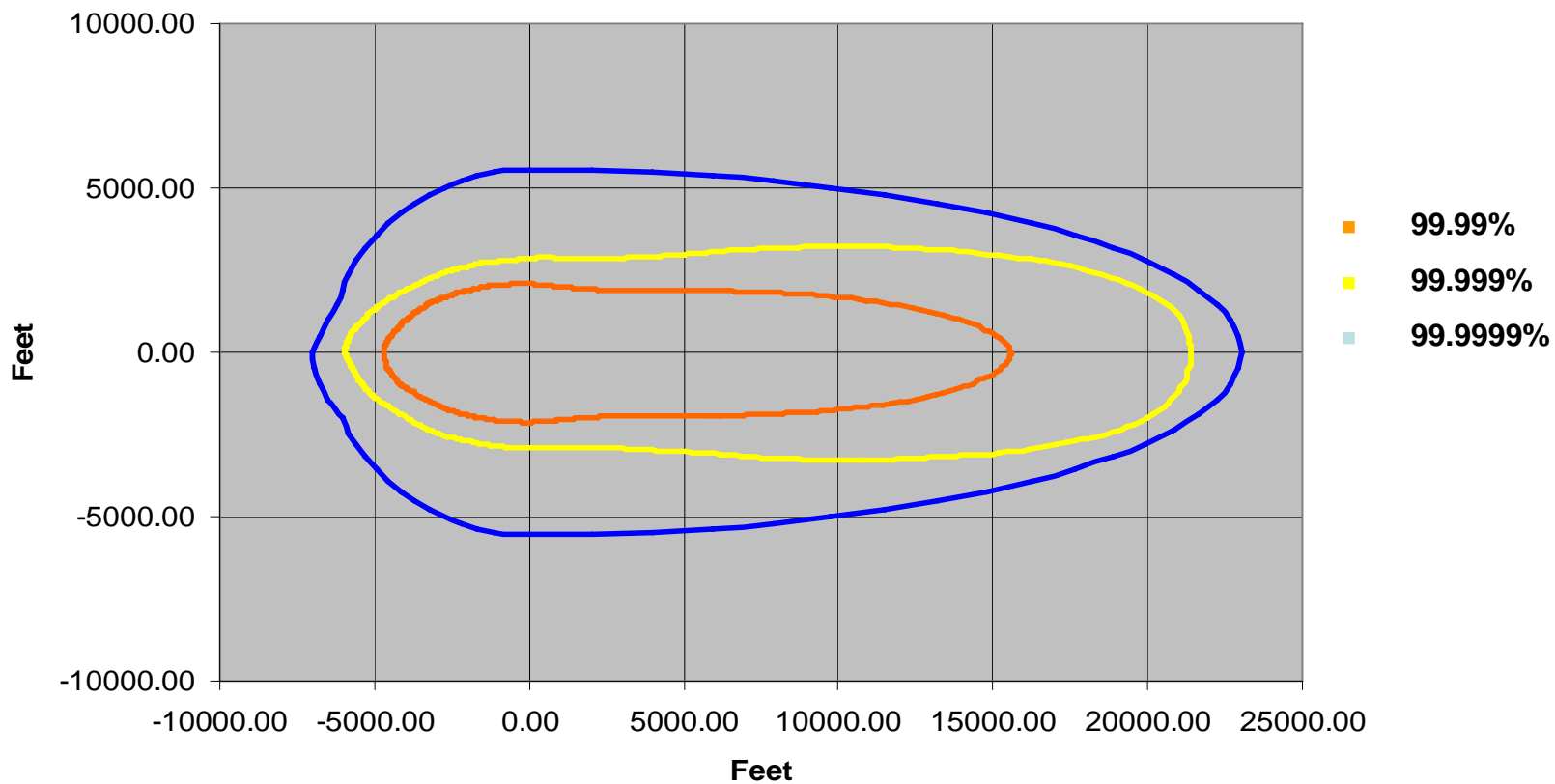
**A specific area drawn about a target based on weapon containment within that area:**

- **Containment is selectable:**
  - **99.99%** (1 in 1:10,000 probability)
  - **99.999%** (1 in 1:100,000 probability)
  - **99.9999%** (1 in 1:1,000,000 probability)



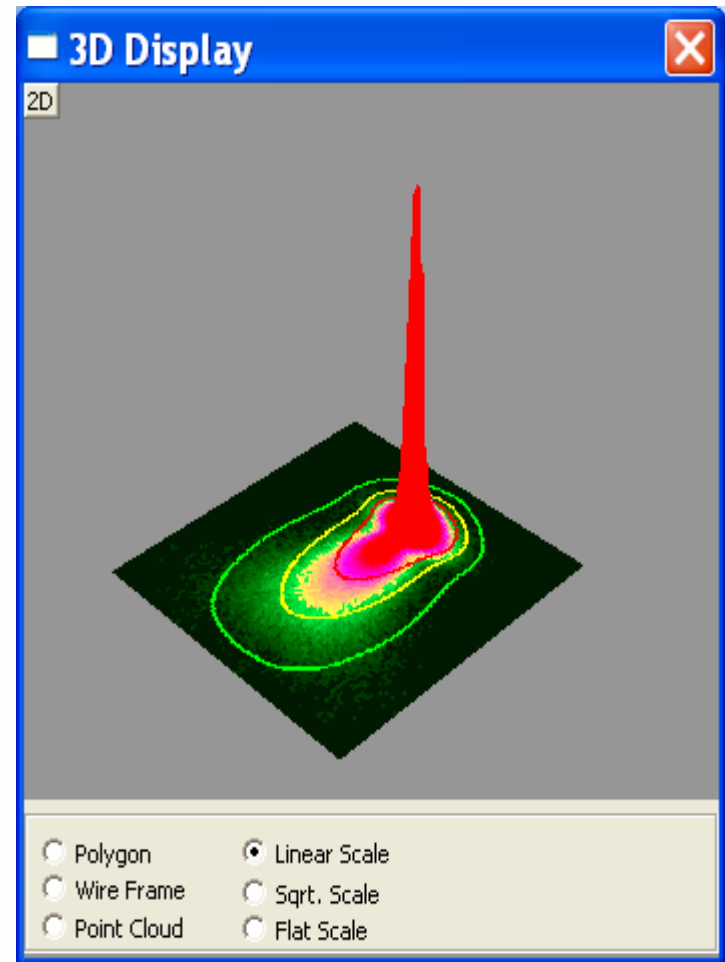
# WDZ Containment

## WDZ Selectable Containment





# WDZ Generation





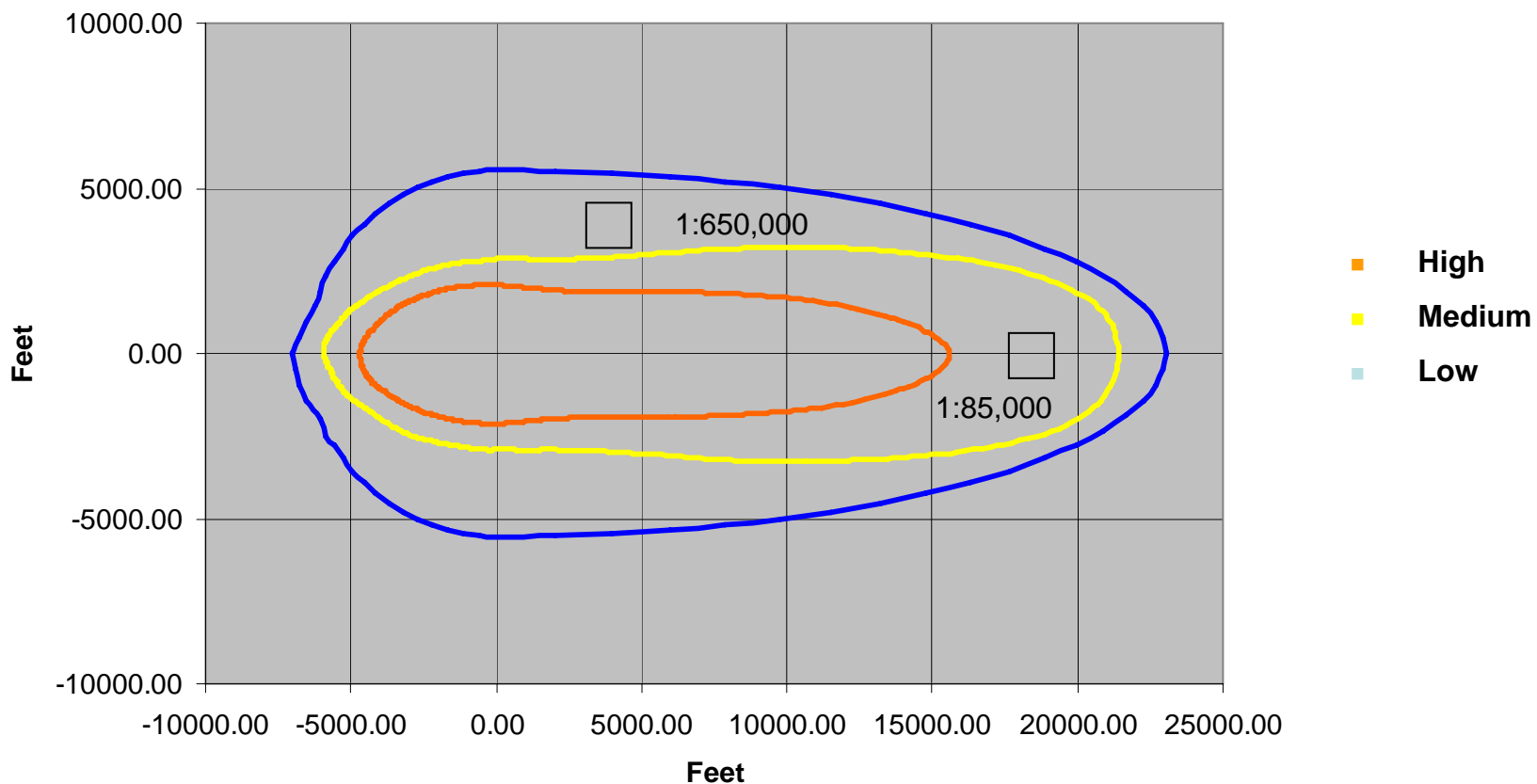
# Risk Determination

- Areas of Critical Concern (ACC)
- Risk – exposure to the chance of injury or loss
- “Mission Essential Personnel” may be authorized inside a WDZ
- To determine risk, you must know:
  - **Location** – where within the WDZ?
  - **Size** – how large is the risk area?
    - JTAC / TACP / OP
  - **Vulnerability** – how is the risk area protected?
    - Open / Tank / Bunker



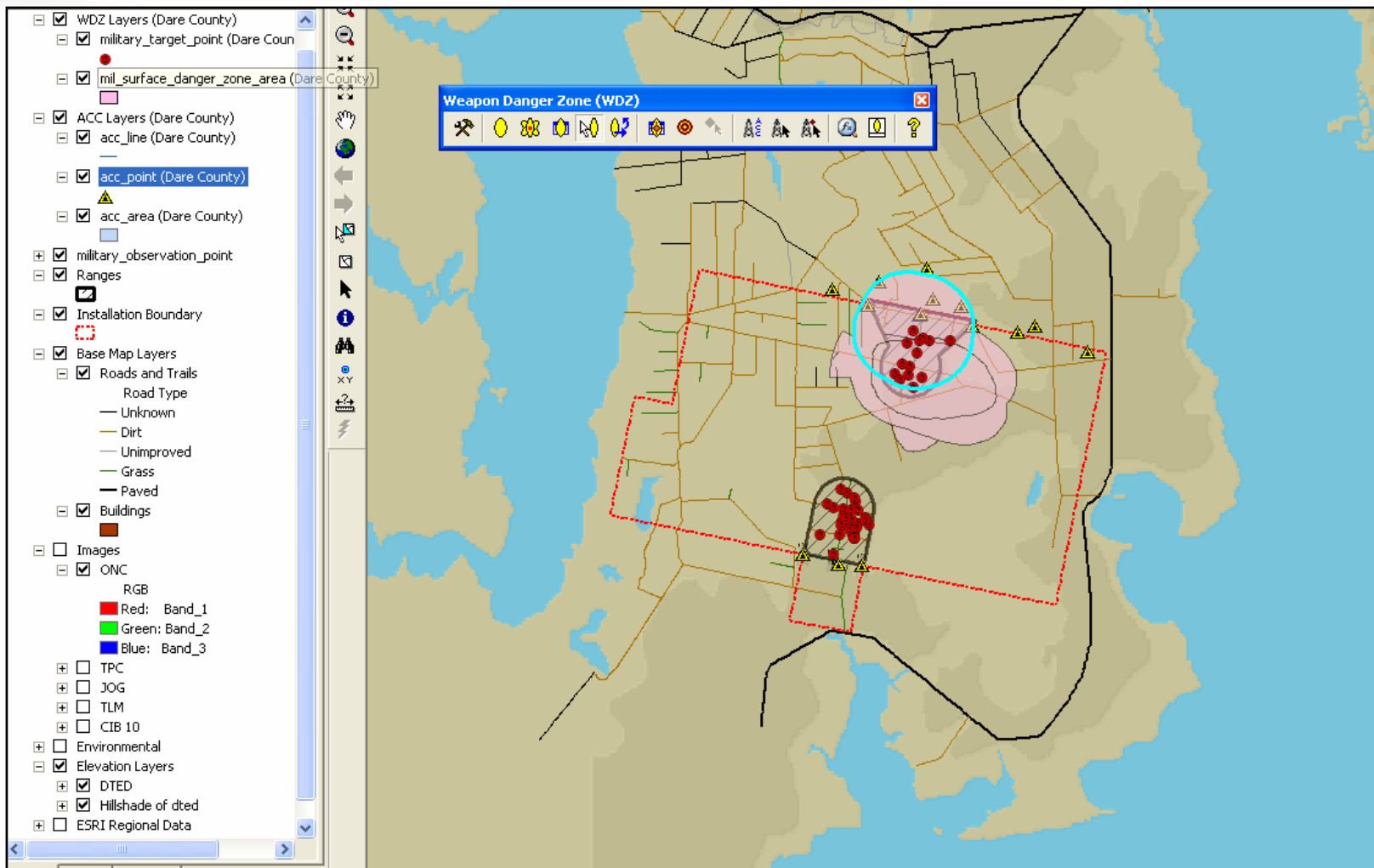
# WDZ Risk Containment

## WDZ Risk Identification




















# Desktop Wdz Toolbar





# Desktop WZD Toolbar

-  Setup – Configure tool for specific installation and data set
-  WZD Generator, wizard for creating single WZD's
-  Batch WZD Generator, Create multiple WZD's at one time
-  WZD Manager – Control Viewing, Delete, Combine WZD's
-  Select WZD – Selects specific WZD's to start other operations (Print)
-  Move / Rotate WZD – Slide side to side or rotate around target to reposition WZD
-  Target Manager – Create, Edit, Delete targets and attributes about targets
-  Create Target – Create targets on map or enter coordinates
-  Select Target – Select existing Target, tool used by other components
-  ACC Manager – Create, Edit, Delete ACC's and attributes for ACC's
-  Create ACC From Feature – Creates ACC from existing Map feature
-  Create ACC From Graphic – Create ACC by map click
-  Risk Analysis – Wizard for performing Risk Analysis
-  WZD Print – Creates map output of WZD with parameters
-  WZD Help – WZD Help System



# WDZ Generator Workflow

Dare County WDZ Demo.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:184,775

Layer: WDZ Layers (Dare County)

500

Weapon Danger Zone (WDZ)

Layers

- WDZ Layers (Dare County)

Create WDZ Features

General

Service: United States Navy

Aircraft: F/A-18

Weapon: 2.75in (MK66)

Event: High Altitude Rocket

Inert  Live

<< Previous Next >> Create Save Cancel

FSRT Regional Data

Display Source Selection





# WDZ Generator Workflow

Dare County WDZ Demo.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:184,775

Layer: WDZ Layers (Dare County)

500

Layers

- WDZ Layers (Dare County)

Weapon Danger Zone (WDZ)

Create WDZ Features

Event

	Minimum	Maximum
Airspeed (kph)	500	650
Altitude (ft)	5000	15000
Release Angle (deg)	-35	-35
Slant Range (ft)		

<< Previous    Next >>    Create    Save    Cancel

Display Source Selection

C.



# WDZ Generator Workflow

Dare County WDZ Demo.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:184,775

Layer: WDZ Layers (Dare County)

500

Layers

- WDZ Layers (Dare County)

Weapon Danger Zone (WDZ)

Create WDZ Features

Target

X Coordinate: 422856.80  
Y Coordinate: 3955340.73

Create

UTM Lat/Long MGRS

Target: PW\_Target01

Terrain Type: Armor Plate

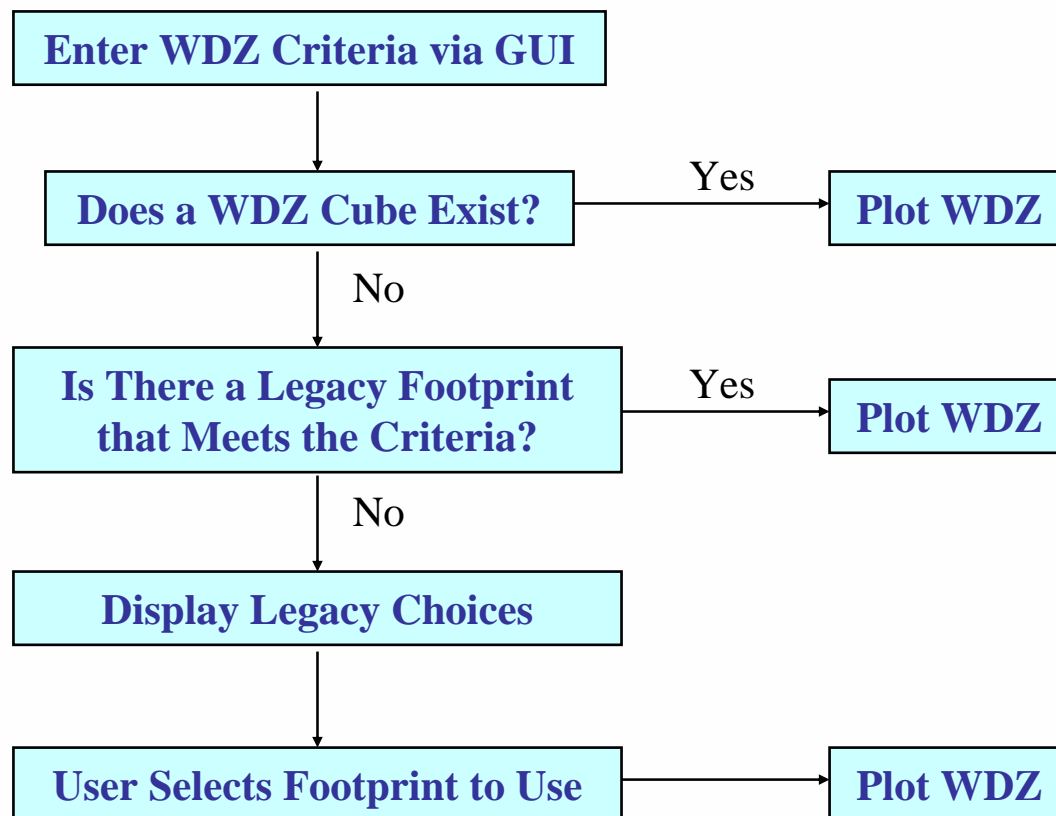
Target Type: Firm

Containment: 99.99%

Target Radius: 10

<< Previous Next >> Create Save Cancel

Display Source Selection





# WDZ Generator Workflow

Dare County WDZ Demo.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:184,775

SDZ Manager

Layer: WDZ Layers (Dare County)

100%

500

Weapon Danger Zone (WDZ)

Layers

WDZ Layers (Dare County)

Create WDZ Features

Orientation

Allow only one Run-In Heading

015

Allow a range of Run-In Headings

From: 0 To: 0

Create string of bombs

Number of bombs: [ ]

Spacing: [ ]

Bomb on target: [ ]

Refresh

<< Previous Next >> Create Save Cancel

Display Source Selection



# WDZ Generator Workflow

Dare County WDZ Demo.mxd - ArcMap - ArcInfo

File Edit View Insert Selection Tools Window Help

1:51,079

Layer: WDZ Layers (Dare County)

500

Weapon Danger Zone (WDZ)

Layers

- WDZ Layers (Dare County)

Create WDZ Features

Summary

WDZ Name: F18Rocket

Service: United States Navy

Aircraft: F/A-18

Weapon: 2.75in (MK66)

Event: High Altitude Rocket

Target: PW\_Target01

Terrain Type: Firm

Target Type: All

Target Radius: 0

Containment: 99.99%

Run-In Heading: 15

	Min	Max
Airspeed:	450	500
Altitude:	3500	6000
Dive Angle:	-45	-30
Slant Range:	0	0

<< Previous Next >> Undo Create Save Cancel

Display Source Selection



# WDZ Deployment Strategies

- Both desktop and web systems to be completed June 30<sup>th</sup>
- Working the CTO processes for each Service
- Each Service will be deploying Desktop and Web versions
  - Some users will use it everyday some occasionally
- CSR and GISi will train the trainers for each Service
- Each Service will have Tech POC with reachback
- Contracted to provide ongoing sustainment and engineering support



# WDZ Road Ahead – Ultimate Tool

- Build the data bases to be able to interactively produce footprints for any real release condition
- Adding GPS Guided weaponry
- Close the gap between the Desktop and Web tools functional components.
- Improve 3D Functionality



# Questions

## Contact Info

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