No Adverse Impact Floodplain Mgmt., Natural & Beneficial Functions of Floodplains, and the Cost of Community Services: Not All Lands are Suitable for All Purposes
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OPSI – Fire & Rescue, EMT, Recreation Technician,

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Ohio K-12 Sub Teacher Certificate,
etc., etc., etc.
What is Emergency Management?

Emergency Management = implement procedures to

• Reduce,
• Eliminate,
• Minimize, or
• Manage

the impact of

• Emergencies,
• Disasters, or
• Other Events

on our Citizens and Communities.
Emergency Management is a resource or a tool for our FIRST RESPONDERS (Fire/Rescue, EMS, Law Enforcement, etc.) to enhance the SCENE or INCIDENT STABILIZATION, LIFE SAFETY, and PROPERTY CONSERVATION of our Citizens and Communities in Emergencies, Disasters, and Special Events.
BACK TO THE BASICS:

Four Phases of Emergency Management

1) MITIGATION

2) PREPAREDNESS

3) RESPONSE

4) RECOVERY
1) MITIGATION (pre event)

Actions taken to Eliminate (Prevention) or Reduce the degree of LONG TERM RISK to HUMAN LIFE and PROPERTY (including Pets and Livestock) from any type of HAZARD.
MITIGATION

Examples:

• Building Codes
• Public Education
• Risk Area Mapping
• Insurance
• Tax Incentives

• TORNADO SHELTERS
• FLOOD & WEATHER WARNING SYSTEMS
• Etc.
Monolithic Dome Tornado/Severe Weather Community Shelters at Mobile Home Parks in Licking County
The Monolithic Dome Tornado / Severe Weather Community Shelters are located to ensure rapid occupancy in an emergency.
OPEN DOME by Gary Clark (Monolithic Domes) - Residents of Summit Ridge Estates, a manufactured home development in Licking County, Pataskala, Ohio, don’t worry too much about storms these days now that they have a their Monolithic Dome Storm Shelter / Community Center.
2) PREPAREDNESS (pre event)

An Activity taken in Advance of an EMERGENCY or EVENT that Facilitates the Implementation of a COORDINATED RESPONSE.
PREPAREDNESS

Examples:

• Hazard Identification
• Emergency Exercises
• Emergency Operations Plans
• Emergency Broadcast Systems/Sirens
  • Advisory, Watch, Warning
  • “Trigger Points”
• Continuity of Government
• Etc.
3) RESPONSE (during event)

Action taken immediately Before, During, or After an EMERGENCY occurs, which Secures the Scene, SAVES LIVES, Minimizes Property Damage, and enhances the Effectiveness of Recovery.
RESPONSE

Examples:

• FIRE/RESCUE/EMS
• ACTION STEPS

• Implement the EOP
• Activate the EOC

• Evacuation or Shelter in Place
• Etc.
4) RECOVERY (post event)

Short Term Activity to return vital Life Supporting Systems to Minimum Operating Standards, and Long Term Activity to return the Community to Safe and Normal Levels of Activity.
Examples:

- Debris Management
- Damage Assessment
- Decontamination
- Disaster Assistance
- Temporary Housing
- Counseling
- Reconstruction
- Etc.
Summary:

Back to the Basics:
4 Phases of Emergency Management

1) Mitigation
2) Preparedness
3) Response
4) Recovery
FLOOD WARNING SYSTEM
Augmentation and Enhancement

River Gauges and Rainfall Gauges
improve our ability to
predict and forecast flooding by measuring

RIVER RISE:
  Rate
  Extent
  Depth

RAINFALL:
  Duration
  Intensity
  Location
  Amount

Also: monitor water quality parameters
(DO, pH, temperatures, etc.), sediment loads, etc.
SE Corner of Staddens Bridge, Madison Twp., Licking River

SE Corner of Ridgely Tract Rd., Union Twp., South Fork Licking River

Two Existing Stream Gauges prior to October 2007
USGS employees Al Dillenburg and Sandy Coen collect data to calibrate the Stream Gauges.
Interstate 70 and SR 79
FLOODING AHEAD
TURN AROUND
DON'T DROWN

WHEN FLOODED
TURN AROUND
DON'T DROWN
Granville Stream Gauge, on Raccoon Creek,
NE Corner of CR 539A bridge
Granville Village

Water Treatment Plant
Flood of January 1959 in Granville
City of Newark
Water Treatment Plant
North Fork Licking River

Critical Facility

Stream Gauge
City of Newark
North Fork Licking River, at the confluence of the South Fork Licking, which forms the Licking River
USGS Stream Gauges and a network of Rain Fall Gauges provide data to the **National Weather Service (NWS)** and Ohio River Forecast Center In Wilmington OH.

This enhancement of Stream Gauges greatly increases the efficiency and accuracy of the NWS **FLOOD ADVISORIES, WATCHES, and WARNINGS**.

The FLOOD FORECASTS provide **“TRIGGER POINTS”** that are relayed to our **Licking County Homeland Security/Emergency Management/911 Center**.

This information initiates local and county **“ACTION STEPS”** by various **Public Safety Services** and **other agencies and entities** to better respond and:

- Secure the Scene, SAVE LIVES, Protect Property
FUNDING for the enhancement of the Flood Warning System Stream Gauge and Rain Fall Gauge Project was provided by:

Cost Share Grants with **USGS**
(Installation, as well as Operations and Maintenance)
**NRCS**
**ODOT**

**Licking County Commissioners**
**Licking County Planning Dept. Fees**
**City of Newark**
**Village of Granville**
**Granville Township**
**Denison University**

**Muskingum Watershed Conservancy District (MWCD)**
GOALS

BUCKEYE LAKE AREA

These forecast points aid in the flood warning process for residents along the South Fork Licking River and into the Village of Buckeye Lake.

It also enhances flood warning and activates established “Trigger Points” for ACTION STEPS for flood response actions and also detours along the I 70 / SR 79 corridor in the Buckeye Lake region (ODOT, Villages, Schools, LC HS/EMA/911 Center, etc.).
Buckeye Lake Area **ACTION STEPS** include:

1) ODOT – “**PLAYBOOK**” for rerouting traffic due to I 70 & SR 79 flooding at South Fork Licking River

2) **Evacuate or Shelter in Place** – Mobile Home Parks and Other Residents

3) **Property Protection** – move vehicles from the area, move possessions to higher floors in homes, pets & livestock, etc.
GOALS

GRANVILLE AREA

This station provides continuous “real time” data, along with supporting a stage flow relationship from USGS, and a site specific Flood Forecast from NWS.

Establish “Trigger Points” for ACTION STEPS tied to Flood Forecasts to protect various at risk facilities at various flood levels, including the Village Water Treatment Plant, the Power Plant for Denison University, Grocery Store, Gas Station, Lumber Company, etc.
Granville Area **ACTION STEPS** include:

1) **Protect CRITICAL FACILITIES:**
Village Water Treatment Plant, the Power Plant for Denison University, Grocery Store, Gas Station, Lumber Company, etc.

2) **Property Protection** – move vehicles, possessions, pets & livestock, etc.
GOALS

City of Newark

Establish an automated data and USGS Stage/Flow relationship to an existing “high water” forecast point along the North Fork Licking River (near the confluence with South Fork Licking River), to replace a manual gauge. *(Flood Warning “Trigger Points” for a flood prone neighborhood area).*

Establish an additional gauge upstream to aid in flood control responsibilities and assist with discharge data for the forecast point down stream, and also benefit the more efficient operations of the Newark Water Treatment Plant.
Newark Area **ACTION STEPS** include:

1) Evacuate or Shelter in Place for Flood Prone Neighborhoods (ex: Little Texas, etc.)

2) Protect CRITICAL FACILITIES – Water Plant

3) Install Flood Gates in Levee on South Fork Licking River – National Drive, South Second Street, etc.

4) Property Protection – move vehicles, possessions, pets & livestock, etc.
CHALLENGES

Complexity of the various watersheds for data collection and flood forecasting,

including the quick reacting Raccoon Creek,

the slower reacting Licking River below the confluence of the North Fork and the South Fork,

and the “wild card” influence of Buckeye Lake on the South Fork Licking River and the I 70 corridor.
SUMMARY

Our ongoing **Flood Warning System** capabilities improvements helps:

- Secure the Scene, SAVE LIVES, Protect Property
- Improve our CRS Classification, and thus flood insurance discounts for our property owners,
- Ties in well with our overall **Natural Hazards Mitigation Strategy**, and thus enhance grant funding opportunities,
- Provide **partnership opportunities** with other agencies and entities.
WHAT IS
NO ADVERSE IMPACT
FLOODPLAIN MANAGEMENT ?? ??

Philosophy/Concept/Policy/Strategy of
Land Use Mgmt. -
Property Owner Actions (Public or Private)
Does NOT Adversely Impact Property and
the Rights of Others
ALL Potential Impacts of Proposed Land Use
Changes or Development MUST be Determined.

Also, ALL Properties the have the Potential to be
Impacted by Land Use Changes Must be Identified.
Potentially Impacted Property Owners Need Notified

**MITIGATION** Options to Ameliorate the Deleterious Impacts of Land Use CHANGES must be

EVALUATED
PRIORITIZED
IMPLEMENTED

to Insure **NO ADVERSE IMPACTS** on the many Functions of **FLOODPLAINS**, as well as any Flood Impacts on Neighboring Properties
NO ADVERSE IMPACT – Development or Land Use Changes that could impact FLOOD DAMAGES to Other Properties of the Community. Allowable if IMPACTS of Development are MITIGATED or ACCOUNTED FOR with Appropriate Community Planning.
IMPORTANT CONSIDERATIONS:

Prevention of Harm to Property Owners

Increased COSTS to the Tax Paying Public
For RESPONSE and RECOVERY Actions
Consistent with ASFPM Mission:

NO ADVERSE IMPACT FLOODPLAIN MGMT.
Seeks to MITIGATE the:

LOSSES
COSTS
HUMAN SUFFERING

Protect the
NATURAL and BENEFICIAL FUNCTIONS
which are typically difficult to account for
and thus undervalued.
Current Floodplain Mgmt. Philosophy and Many Community Floodplain Regulations Tend to **INCREASE RISK** to **PEOPLE** and **PROPERTY** by:

Promoting more Intensive Land Use or Developments within **KNOWN RISK** or **HAZARD AREAS**

Ignoring Changing **Land Use** Conditions
Ignoring **Adverse Impacts** to Existing Property by **Land Use** Changes in the Community

Discounting or **Undervaluing** the True Benefits of **Natural Floodplain Functions**
Remember:

The **FLOODPLAIN RISK** or **HAZARD AREA** of TODAY is not typically the **FLOODPLAIN RISK OR HAZARD AREA** of TOMORROW, due to:

**CHANGING LAND USES**

**DEVELOPMENTS** within a Community and the Associated **Watershed**
If you live in the Floodplain, you are going to get your SHOES wet.
WHAT ARE THE COSTS OF COMMUNITY SERVICES?

Focus on How Various Types of Land USE Affects Local Gov’t. TAXATION and SPENDING within a given COMMUNITY.
Analysis of **TAXATION RECEIPTS** and **DISBURSEMENTS** Determine whether Various Forms of **LAND USE**: 

**RESIDENTIAL**
**COMMERCIAL / INDUSTRIAL**
**AGRICULTURE / FORESTRY**
**OPEN SPACE**

Contribute or Detract from Local Community Gov’t. **Budgets**
Typically, many Communities seek to attract Business, Commerce, Industry, and Residential Development under the Assumption that Economic Growth would Raise the Tax Base and Generate Increased Revenues for Local Infrastructure and Services, including:

Roads
Schools / Teachers
FIRE / EMS / Law Enforcement.
But remember, Additional People and Property (Residential, Commercial / Industrial) REQUIRE Additional Public Safety Services, so ultimately, Does the INCREASED REVENUES Balance with the INCREASES DEMANDS for Infrastructure and Services ? ? ?
COST of COMMUNITY SERVICES (COCS) is typically expressed as a Ratio for each Land Use Category:

Residential
Commercial / Industrial
Agriculture / Forestry
Open Space / Green Space
COCS compares how many DOLLARS worth of Local Gov’t. Facilities (Roads, Bridges, Water, Sewer, Schools, etc.) and Services (Fire/EMS/LE, Teachers) are Demanded per DOLLAR Collected in TAXES PAID.
So, a COCS ratio of greater than 1.0 means that more than $1 is spent for public facilities and services for every $1 of taxes collected.
Virtually every COCS study indicates that for Residential Land, the COCS Ratio is substantially above 1.0, with averages ranging from 1.15 to 1.50.

So, $1.15 to $1.50 is spent on Residential Land PUBLIC FACILITIES and SERVICES for every $1.00 Collected in TAXES.
COCS ratios for Commercial / Industrial Lands range from 0.35 to 0.65, so $0.35 to $0.65 is spent for every $1.00 in Taxes Collected for this Land Use Type.

COCS ratios for Agriculture / Forestry / Open Space typically range from $0.30 to $0.50 in Public Facilities & Services SPENDING for each $1.00 of TAXES Collected.
Chart 9 – Cost of Government Services by Land Use Type
(Median Government Expenditure per Dollar Raised in Revenue)

<table>
<thead>
<tr>
<th>Type of Land Use</th>
<th>Government Expenditure per Revenue Dollar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial and Industrial</td>
<td>$0.29</td>
</tr>
<tr>
<td>Farm and Forest</td>
<td>$0.31</td>
</tr>
<tr>
<td>Residential</td>
<td>$1.11</td>
</tr>
</tbody>
</table>

Source: Farm and Information Center, Cost of Community Services Studies Fact Sheet
Basically, **Commercial / Industrial** and **Agriculture / Forestry / Open Space** Land Uses **SUBSIDIZE** Residential Land Uses in terms of **TAX MONEY SPENT** for **Facilities and Services** compared to **TAX REVENUE COLLECTED**.
SO, under our earlier premise that **NOT ALL LANDS ARE SUITABLE FOR ALL PURPOSES**, it becomes obvious that perhaps the Concept of **“highest and best use”** of Land for **Residential** Purposes may **NOT** be the Best Land Use for a Community after all, based on the **COCS** associated with conversion of **Farm Land / Forests/ Green Space** (including **FLOODPLAINS** and even other **Natural HAZARDS High RISK** areas) to **Homes (Residential)**.
WHY ARE ALL LANDS NOT SUITABLE FOR ALL PURPOSES ? ? ?
In particular, it makes little or no ECONOMICAL or ENVIRONMENTAL sense to Convert Productive Farms, Forests, and Recreational Areas, especially those located in Identified FLOOD HAZARD or RISK AREAS, to RESIDENTIAL Land Uses.
RESIDENTIAL LAND USE just does NOT typically Pay its Own Way, and may greatly Increase Community Costs for:

Mitigation
Preparedness
Response
Recovery

after FLOOD EVENTS (or other Natural Hazard Events).
Take the opportunity to reflect on YOUR Own Community, and How these Concepts and Principles can be used to Implement or Enhance Land Use Philosophy and Regulations to Allow for Growth and Development in Your Community that is SECURE & SUSTAINABLE, and PROTECTED from the ECONOMIC and ENVIRONMENTAL Burdens of Development in FLOOD PRONE (or Other Natural Hazard) Areas.
Summary

The Ultimate Mitigation Strategy & Tactic is to NOT put things at RISK of Known and Identified HAZARDS in the First Place, because NOT EVERYONE GETS A HELICOPTER RIDE.

“… with LIBERTY and JUSTICE for ALL.”
Many Thanks

Questions, Comments, Concerns ???

Prepare for the Worst, and Hope for the Best !!!
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