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# Wales Coastal Flooding Review Project 7 Part A Report Recommendation 37

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## 1. Context

Following the coastal flooding of late December 2013 and early January 2014, the Minister for Natural Resources asked Natural Resources Wales (NRW) to review the coastal flooding events. The Review was to be delivered in two phases and in collaboration with Risk Management Authorities in Wales. Phase 2 of this Review identified 47 Recommendations to improve Wales' resilience to coastal flooding.

Thirty of the Recommendations were packaged into ten Projects to reflect common technical themes, with the remaining seventeen addressed individually. The 10 Projects are listed below:

- Project 1 – Flood Forecasting and Coastal Design
- Project 2 – Flood Warning and Forecasting
- Project 3 – Community Resilience
- Project 4 – Operational Response
- Project 5 – Coastal Defences
- Project 6 – National Coastal Defence Dataset and Inspection
- Project 7 – Skills and Capacity Audit and Roles and Responsibilities**
- Project 8 – Review of Coastal Groups
- Project 9 – Coastal Adaptation
- Project 10 – Infrastructure Resilience

This report has been produced to fulfil the needs of Recommendation 37 which forms the first half of Project 7. Recommendation 37 identify the needs to assess the skills and capacity of Risk Management Authorities (RMAs) which are as defined under the Flood & Water Management Act 2010 section 6 (13):

- the Environment Agency or Natural Resources Wales
- A lead local flood authority,
- An internal drainage board (now part of NRW in Wales)
- A water company, and
- A highway authority

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*There needs to be an assessment of the skills and capacity of risk management authorities to determine what gaps exist, so these can be addressed to ensure continued effective delivery of coastal flood and erosion risk management.*

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This report summarises the results of the audit and provides several options on how the skills and capacity gap could be addressed to meet present day flood risk management needs and future challenges. This report has been produced by the Welsh Local Government Association, with Natural Resources Wales contributing data and information for the sections regarding Natural Resources Wales.

## 2. Methodology

The assessment was undertaken in the form of an online survey and data collection. The survey was primarily aimed at RMAs practitioners in the public sector who are developing and delivering flood risk management (FRM). While the Delivery Plan focusses mostly on coastal RMAs it was agreed to also extend the survey to inland authorities to allow for a pan Wales perspective.

The survey however was not extended to Operation Delivery and Response Staff, Emergency Planners and additional resources drawn in as and when needed.

Lead officers were asked to circulate the survey to all relevant employees involved in FRM or to provide a collective response ensuring that all skills were captured thus reflecting the true picture within each organisation.

The survey comprised of 21 questions divided into 4 sections:

- *General questions on each organisation*
- *Standard skills and expertise specific to flood risk management*
- *Skills and expertise specific to coastal risk management*
- *Wider skills*

For section 2, 3 and 4, respondents were asked to rate their level of confidence in the skills using the following 5 options:

<i>AWARE</i>	Performs with a generally low level of capability. May only need an awareness of this capability or may be gaining experience to operate at a higher level.
<i>BASIC</i>	Performs with a moderate level of capability. Will not be applying on a regular basis, though may be contributing to the associated process.
<i>CAPABLE</i>	Performs with a good level of capability. Can cope with standard problems / common situations, is capable at day to day application
<i>DISTINGUISHED</i>	Performs with a high level of capability. Copes with unusual / non-standard problems and issues, is aware of alternative options and approaches to situations. Can guide or advise others in this area and is able to look ahead and anticipate future needs.
<i>EXPERT</i>	Performs with an exceptional level of capability and shows advanced application in any context. Develops innovative approaches, stretches others thinking and challenges them to excel by setting exceptional standards

To help with their answers, respondents were also encouraged to consider if their current knowledge in these technical areas was sufficient and often used to help with the following:

- *Ability to challenge and question proposed designs and suggestions*
- *Advises and influences design and specification of schemes using your expertise*
- *Ability to suggest alternative and adequate solutions*
- *Provides technical input into projects*

The format of the survey helped identify which skills were currently undertaken in-house, which ones were contracted externally and if further training was required in specific areas.

### 3. Local Authority Survey results

The survey was completed by 44 respondents from Lead Local Flood Authorities (LLFAs), plus one consolidated response from Natural Resources Wales (NRW) covering their full FRM function. All 22 LLFAs responded to the survey and responses varied from 1 to 5 per authority. Comments on the NRW position are included separately in Section 4 of this report. This section covers the Local Authority responses.

#### 3.1 Capacity within Local Government

77 individuals are currently employed across the 22 LLFAs to deliver Flood risk management functions. In addition, LLFAs have operations delivery staff who will inspect, maintain assets and respond to emergencies.

LLFAs can also draw in additional services for specific projects such as Procurement, HR, Legal, Communications, and Project Delivery and Finance as and when necessary. However, the level of extra resources available will greatly vary depending on internal capacity and expertise. It was also noted that LLFAs and NRW could not offer apprenticeships anymore.

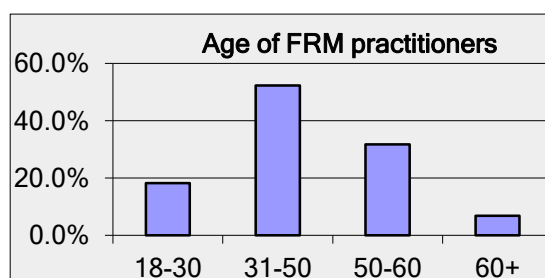
Of the 77 individuals who undertake FRM duties, 58 are permanent full-time, 10 on fixed term contract (revenue grant funded), 5 secondment (revenue grant funded) and 4 part-time.

6 LLFAs deliver their FRM functions with only 2 full time employees while 1 has a team of 7 (5 permanent and 2 grant funded). The majority of LLFAs have however teams of 3 or 4.

The main FRM duties within local government will focus on the following areas:

- *Delivering statutory duties (Flood & Water Management Act, Flood Risk Regulations, Land Drainage Act + others)*
- *managing flood risk assets*
- *Advising planners, developers and enforcement*
- *Understanding local flood risk*
- *Increasing local flood awareness*

It is important to note in the case of LLFAs that following the implementation of the Flood and Water Management Act, 2010 (FWMA, 2010) FRM duties have been passed on existing services (mostly Highways and Land Drainage). As such, the majority of permanent full-time and part-time positions are not solely dealing with FRM nor have they been specifically created for this purpose. For example, some employees spend 2 days a week on FRM duties and the rest on highways duties.

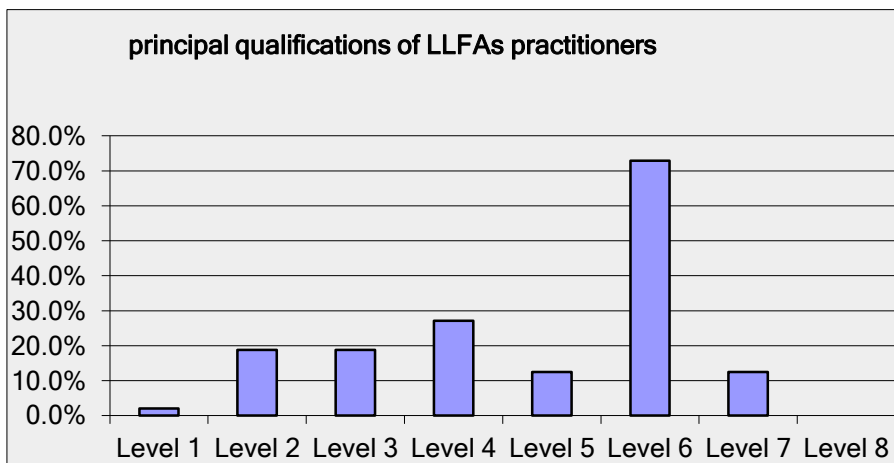


Graph 1 - Age of LLFAs practitioners 1

To add to the current capacity shortage within local government, the majority of FRM practitioners are aged between 31-50 (54.2%) and the next highest age bracket being 51-60 years old with 15 practitioners. 3 practitioners are over 60 years of age and only 8 between 18-30 as highlighted in Graph 1.

Furthermore, the results highlight that LLFAs expect to lose up to 15 posts (20% of current capacity) over the next 3 years through retirement and end of contract while only looking to employ 9 staff (6 within Conwy only as part of a department re-structure).

The majority of vacant positions are currently not being replaced and further cuts to Welsh Government revenue funding support could exacerbate the situation both within NRW and LLFAs.



Graph 2 - Qualification of respondents based on the UK National Qualifications and Credit Framework

### 3.2 Key qualifications and experience

The experience and qualifications of FCERM practitioners will vary from one organisation to another.

The majority of local government respondents are educated to level 6 of the UK National Qualifications and Credit Framework (see graph 2). The range of degrees varies greatly but the majority of local government employees dealing with flood risk have an engineering (mostly civil) background and 5 respondents have a level 7 qualification (list of FRM practitioners' highest qualification is available in appendix 1). 12 of these practitioners have an Incorporated or Chartered Engineer status and a further 7 are working towards it.

Amid their qualifications, the experience in flood risk management of practitioners within local government varies greatly as highlighted in Table 1 below: 25% of respondents (13) have between 0-3 years of experience, and another 27.3% between 10-20 years while 16.7% of respondents have over 20 years of experience.

It is worth noting that due to constant re-structuring within local government, the experience of FRM practitioners is broad and not specific to flood risk management. As such, respondents with 0-3 years' experience in FRM may have over 10 years' experience within Highways, land Drainage or other related areas. This clearly shows the adaptability of practitioners and that certain skills are transferable for general flood risk management duties.

Table 1 - Years of experience of respondents

Indicate how many years of FRM experience you possess.		
Answer Options	Response Percent	Response Count
0-3 years	25.0%	11
3-5 years	18.2%	8
5-10 years	11.4%	5
10-20 years	27.3%	12
20+ years	18.2%	8

### 3.2.1 General technical Skills

This section summarises the findings of sections 2 and 3 of the survey. The questions helped determine which skills were currently used by RMAs and evaluate their level of expertise and confidence in applying those skills. The overall aim of the sections was to identify where extra training is required.

The first set of questions focussed mostly on the strategic aspect of the work which is more relevant to those developing FRM and internal policies (see table 2). Overall, respondents showed a good level of understanding with the majority of them being placed either in the capable or distinguished category.

The findings however identify a gap in knowledge of funding mechanisms. The questions were not explicit enough to establish if this lack of knowledge is related to the FCERM Grant application process, other WG funding streams or the ability to identify and apply for other funding sources.

Table 2 - Policy and Management

Policy and Management: Rate your level of confidence for each of the skills below using the guidance set out on previous page.						
Answer Options	aware	basic	capable	distinguished	expert	Response Count
Knowledge of relevant EU and UK legislation	3	5	26	10	0	44
Strategic Policy development	8	9	20	6	1	44
Strategic overview (interaction with other areas)	7	9	20	5	1	42
Understanding of Planning process	3	5	25	9	1	43
Understanding of risk and hazard	1	3	21	17	1	43
<b>Knowledge of different funding mechanisms</b>	<b>5</b>	<b>17</b>	<b>16</b>	<b>4</b>	<b>1</b>	<b>43</b>
project management	2	5	23	10	3	43

### 3.2.2 General technical skills

The level of expertise in the use of various software and modelling across all LLFAs varies greatly. The majority of respondents score in the basic or capable category while only a small number are in the distinguished or expert category. Again this could be due to their current position not requiring them to have extensive ICT and modelling knowledge. Over the last 12 months the WLGA provided GIS training to over 20 local authorities' employees to raise their level of expertise in this area.

We then assessed the knowledge level of respondents on other skills specific to FRM. These ranged from hard to soft engineering principles, hydrology and hydraulics to land drainage and flood risk principles. Respondents were also assessed on schemes related skills including Flood Consequence Assessment (FCA), Environmental Impact Assessment (EIA) to culvert design.

Again, the majority of responses fell in the basic and capable categories in most of these areas apart from land drainage, flood risk and engineering principles which scored higher with respectively 45.5% and 36.4% of respondents falling in the distinguished / expert categories.

The findings also indicate that for skills with a low level of expertise, LAs contracted the work to external consultants. Although 73 respondents (across all areas) indicated that they would like further training in these areas, it is not clear whether or not they would in the future undertake these tasks in house rather than contract externally. Surprisingly, even with a good level of knowledge across all local authorities, 43% of them indicated that they relied on consultants to produce EIAs and FCAs. This could be due to a lack of resources and the fact that LLFAs usually review developers' assessments rather than having to produce these.

### 3.2.3 Coastal Specific Skills

This section which focusses on coastal risk management was completed by 30 LLFAs practitioners.

Respondents indicated a good level of understanding in general software and GIS based skills but there was a significant gap in coastal specific modelling: *coastal flood modelling, wave & near shore wave modelling and forecasting and swell forecasting* (see table 3) with the majority of respondents being only *aware*. It is worth noting that these specific skills are not used on a daily basis and the cost associated with purchasing these software and training staff is not an economically viable option for most LLFAs which explains why most of them will turn to external contractors for this type of work.

Table 3 - Software and modelling

Rate your skill level using the following: Software and Modelling							
Answer Options	Aware	Basic	Capable	Distinguished	Expert	In-house	Contracted
ICT databases	1	10	15	6	1	12	2
GIS and mapping	3	14	10	4	3	13	2
Coastal flood modelling	21	7	2	0	0	0	12
Waves and near shore wave modelling	21	8	1	0	0	0	12
Forecasting and swell forecasting	22	8	0	1	0	0	12

This trend was further highlighted when respondents were asked to rate their level of expertise and understanding in topics related to coastal processes and management and assessing near shore conditions. The majority of practitioners scored in the basic or aware categories. There was however a better understanding of coastal structures and engineering principles with the majority being in the basic to capable bracket.



4 Respondents indicated a high level of expertise and understanding in coastal processes and management while 2 indicated their proficiency in coastal structures and engineering. The respondents belong to 4 coastal authorities: Pembrokeshire, Monmouthshire, Neath-Port Talbot and the Vale of Glamorgan. However, 2 of those coastal experts are expected to retire in the near future while a third one is grant funded through WG Environment Grant. We could therefore in the short term lose 3 out of 4 coastal experts.

#### 3.2.4 Project Management and Contract Delivery

Project management and delivery is a big part of today's practitioners' role which was highlighted by the level of expertise from respondents in this area. The majority classed themselves as capable with a higher level of expertise in schemes design and contract management. There was however a distinct gap in cost benefit analysis, and identification of funding sources and writing funding bid. This was further highlighted by the number of authorities relying on external contractors to undertake this specific work as well as PARs.

NRW and several LLFAs have Project delivery Teams or consultancies available within their organisation to develop and project manage capital schemes. However, the level of technical expertise within these teams vary and only certain aspects of capital projects can be delivered in-house. Furthermore, Prince 2 principles are often used by these Project Teams to deliver capital schemes which has been highlighted by practitioners as resource extensive and sometimes *exaggerated* especially for smaller schemes.

A high number of respondents indicated that they would benefit from further training in cost benefit analysis, PARs and identifying and writing funding bids.

#### 3.2.5 Wider skills

New legislation coming into force means that the role of FRM practitioners has evolved with an emphasis on sustainable principles, the use of natural processes, greener and more sustainable methods and the delivery of multi benefits.

The survey therefore assessed the current level of understanding on some of the softer skills (see table 4) necessary to ensure practitioners are able to identify and include multi benefits and alternative solutions as part of their decision making.

LLFAs practitioners did not score very high in this area and some of the biggest gaps in knowledge were around Welsh Government Paying for Ecosystems Services Programme and identify suitable sites for natural FRM. Overall, results were again in the basic and capable categories. 1 LLFA indicated a high level of expertise in stakeholder engagement and another one on climate change risk assessment and adaptation.

Table 4 - Wider environmental skills

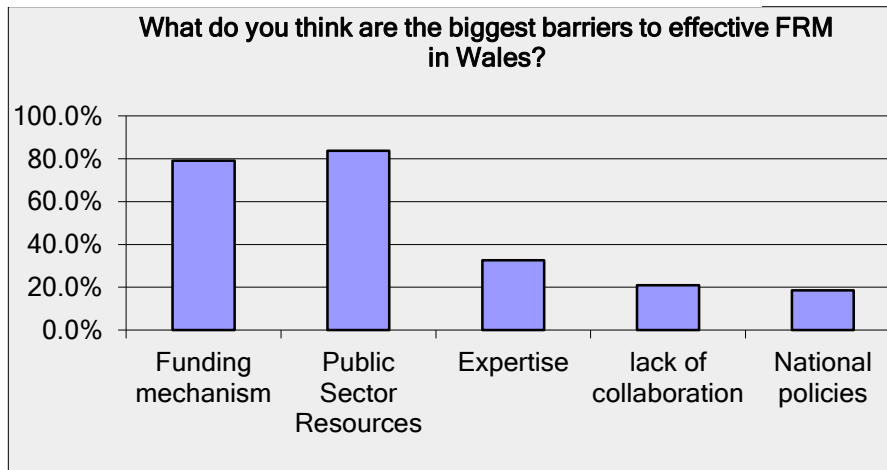
Indicate your level of knowledge and understanding in the following areas.								
Answer Options	Aware	Basic	Capable	Distinguished	Expert	require more training	N/A	Response Count
Awareness and understanding of current plans and	4	9	18	10	1	6	1	43
Paying for ecosystem services programme	16	13	5	0	0	13	7	42
WFD and WFD Assessment	9	20	12	0	0	14	1	41
Integrated Catchment Management	12	18	12	0	0	14	1	43
Identifying suitable sites for natural FRM	14	16	15	0	0	16	1	43
Working with natural processes for sustainable FRM	10	19	15	0	0	16	1	43
Sustainable Development principles and its	6	13	18	7	0	7	1	43
SuDs Principles and design	3	7	26	7	0	10	1	42
Climate change risk assessment and adaptation	8	21	10	4	1	12	2	43
Assessing multi-benefits	12	15	15	1	0	16	2	43
Stakeholder engagement	10	11	15	6	1	12	2	43

## 4. Barriers to effective Flood Risk Management

For the last question local authority respondents were asked to identify what they perceive to be the biggest barriers to the delivery of effective flood risk management. 5 key areas were suggested and respondents were also given the opportunity to further expand on other factors.

As highlighted in the graph below, the majority of respondents indicated that the 2 biggest barriers were resources in the public sector (36 responses) followed by funding mechanism with 35 responses.

Graph 3 - Current barriers for effective FRM



Respondents also indicated that services like flood risk management and emergency planning continue to suffer with a diminution of corporate voice and corporate understanding limiting the engagement of senior management and leadership. In the wider context, flood risk management continues to suffer from *the forgotten risk syndrome*

## 5. Natural Resources Wales Perspective

### 5.1 Overall staff numbers

NRW has approximately 145 flood risk management staff involved with planning and delivering day-to-day FRM activities in both local area and national Wales-wide teams.

There are also approximately 140 additional operational staff who plan or do field work to maintain assets, including during incidents. These staff are not 100% on FRM activities and may do other operational work within NRW's remit – but the bulk of their work is on FRM.

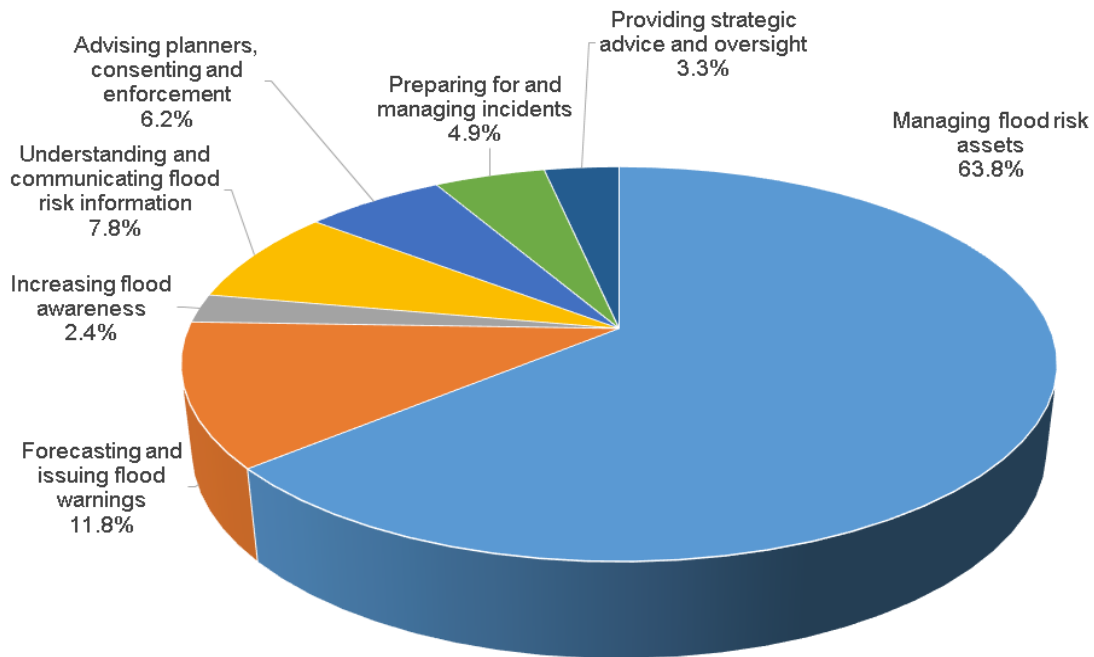
In addition, the delivery of FRM services in NRW is supported by resources in enabling teams such as procurement, finance, estates, legal, communications and HR. It also draws on resources in other technical teams such as Hydrometry and telemetry, hydrology, biodiversity and natural resources management. These are not included in the 285 FTE figure. NRW also has a 24/7 incident management and response system that draws on staff from all across the organisation. This means that during flood incidents, staff from a non-flood teams will also be involved, and these are not included in the figures.

The main functions of the approx. 285 FTE that is directly involved with FRM can be based around 7 key areas:

- *Managing flood risk assets:*
- *Forecasting and issuing Flood Warnings*
- *Increasing flood awareness*
- *Understanding and communicating flood risk*
- *Advising Planners, consenting and enforcement*
- *Preparing for and managing incidents*
- *Providing strategic advice and oversight*

The figure below gives a split on where the FTE effort is centred against these 7 activities. It can be seen from this that the majority by far goes on asset management. This includes all aspects, from inspection, to maintenance, to planning capital works, and operation of assets during flood events. This plot also shows the limited resources that are present in certain activities, showing a dependence on key staff.

Pie Chart 1 - FTEs per FRM activity (%)



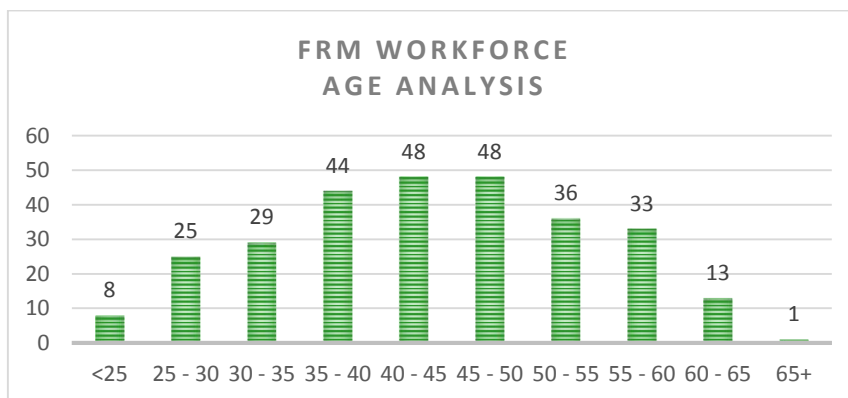
NRW supports staff development, including professional development. Within the FRM contingent, there are several Chartered or Incorporated Engineers or Environmentalists, and members of professional institutions such as Institution of Civil Engineers and Chartered Institution of Water and Environmental Management.

Entry level staff are expected as a minimum to be qualified in engineering or earth based science and demonstrates an aptitude to learn and progress. There is also an emphasis on personal development and staff with 4 years' experience will be expected to work towards Incorporated Engineer status of a relevant professional body.

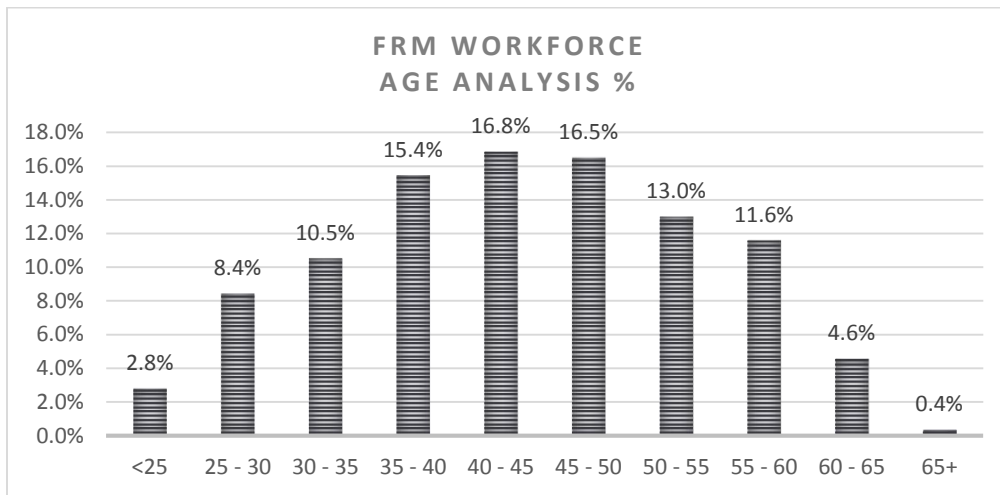
#### 4.2 Age profile and length of service

The figures below shows the age distribution of the FRM workforce, by numbers and by percentage.

Graph 4 - FRM Workforce Age Analysis



Graph 5 - FRM Workforce Age Analysis %



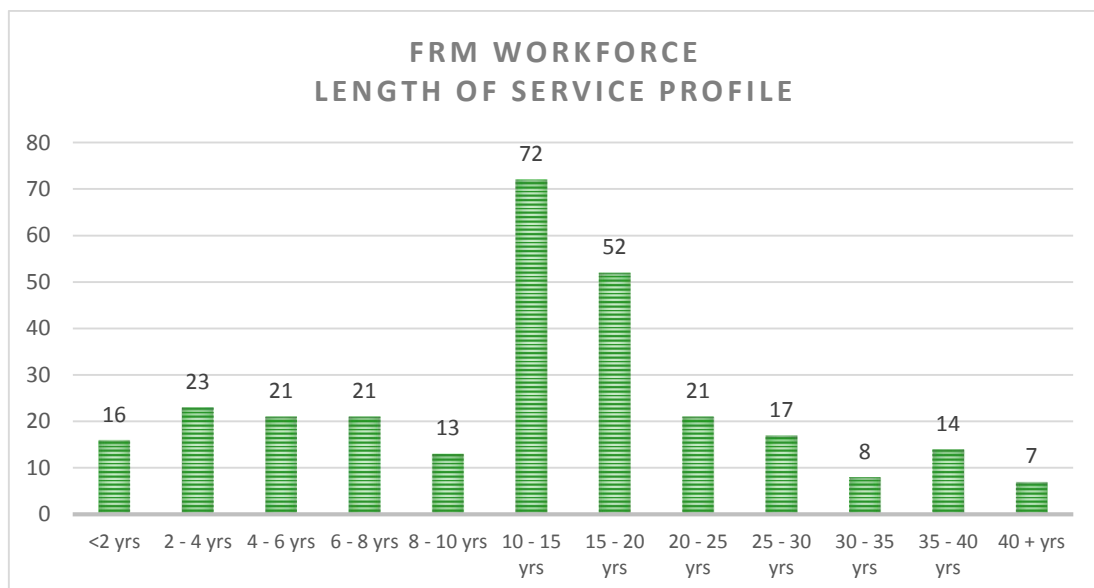
HR colleagues in NRW advise that this age distribution is fairly typical for a public service organisation, but it shows a significant element of an aging workforce (more pronounced than in similar organisations). This could lead to considerable workforce challenges in the future such as loss of skills with a high percent of workforce approaching retirement, and other issues such as sickness absence or absence for informal caring responsibilities.

One of the key indicators for assessing the level of impact and challenge of an aging workforce is the percentage of staff aged 50+. Within FRM 34.6% are aged 50+. This is considered to be a very high percentage.

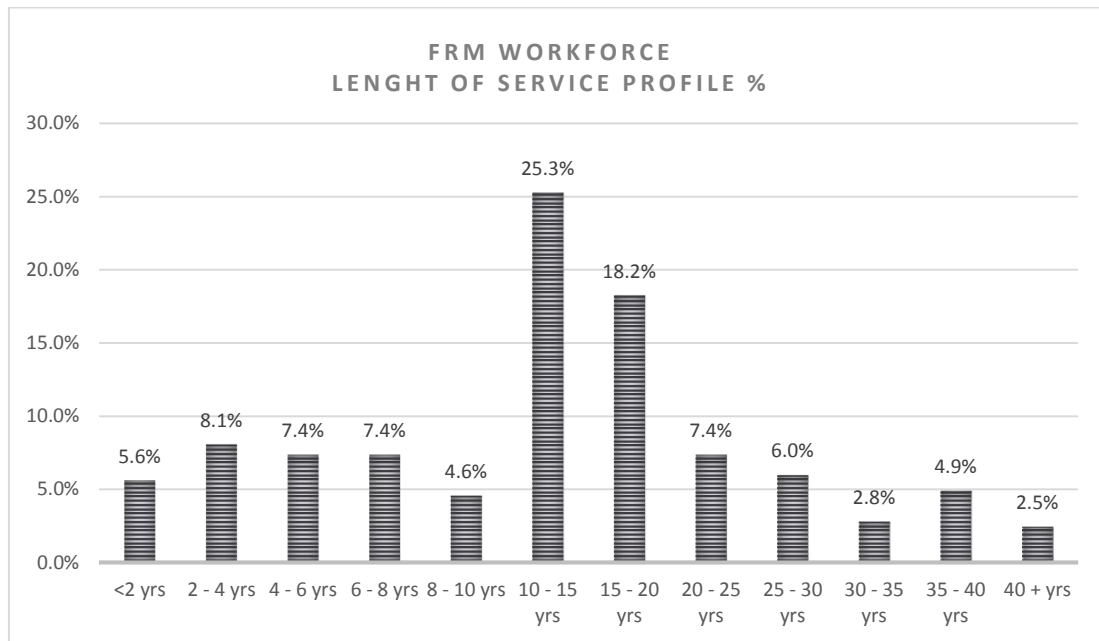
Another key indicator for assessing the impact and challenge of an aging workforce is the percentage drop in number of staff aged 45-50 to the number aged 60-65. Within FRM there is a 73% drop between staff numbers aged 40-45 and those aged 60-65. Again, this is considered to be a very high percentage.

The figures below show the length of service of the workforce.

Graph 6 - FRM Workforce Length of Service Profile



Graph 7 - FRM Workforce Length of Service profile %



This shows that 67% have over 10 years' experience with NRW or previous organisations, and 24% have over 20 years' experience with NRW. This is a lot of accumulated experience.

The age profile data suggests that NRW has many staff who join the organisation and stay a long time. There is therefore a strong probability that the distribution of age will go more and more to the right as people stay on, and in time there will be an issue of people leaving with lots of experience lost. This will be compounded if squeezed budgets mean limits on recruitment when people leave.

There is a concentration of specific skills in a limited pool of people, and so resilience and succession planning in these areas is especially worrisome. This includes areas such as flood forecasting (especially coastal), and in policy and strategy development areas.

There is also an issue of capacity, especially as revenue budgets get squeezed and reduced. This means loss of staff, whilst there is an expectation to deliver as much, if not more. An example of this is real limits on capacity of teams to take on senior user roles for key capital projects. Reductions in revenue also mean that maintenance activities need to reduce, increasing the flood risk.

## 6. Conclusions

Flood risk management within local government has evolved since the implementation of the Flood & Water Management Act and the Flood Risk Regulations. However, consecutive budget cuts and a forced shift in priorities have led local authorities to deliver flood risk management with diminishing resources and increasing pressures. The same applies to NRW, where more and more is expected with less and less budget provision.

The Welsh Government FCERM Revenue Grant has to a certain extent enabled LLFAs to build-up their capacity and expertise in this field but unfortunately the short-term commitment of this funding and changes in grant format coupled with local authorities having to find huge savings has meant that resources have had to be kept to a minimum, shared between services and this has hindered their efforts to become more resilient.

There are currently around 77 individuals employed to deliver Flood risk management across 22 local authorities. In the short-term (next 3 years) up to 15 posts could be lost. Nine jobs *could* be created but anticipated further funding and budget cuts in this period may impact on plans. The same financial pressure affects NRW's capacity and while its current staff numbers may look healthy, some difficult decisions are taking place internally. Overall, then, as budgets are reducing in real terms all RMAs are being expected to deliver the same level of service but with diminishing resources and, with expected further cuts, this will probably not be possible anymore.

In terms of skills, this audit highlighted that a lot of the general skills used by practitioners are transferable and have been gained principally through qualifications in engineering or environmental science and years of experience in highways or land drainage. Although highly resourceful, practitioners in local government are required to become generalists rather than specialists due to the lack of resources and the need to cover several areas of work simultaneously. This was further emphasised with the majority of respondents scoring in the *basic* and *capable* categories throughout the survey and very few in the higher categories. In NRW, in some areas of activity there is a huge reliance on a very limited pool of people. Coupled with an aging workforce, this presents real challenges around resilience and succession planning.

The audit highlighted a gap in knowledge and understanding in LLFAs of the different funding mechanisms. However, the questions were not targeted enough to establish if this lack of knowledge was related to the FCERM grants or the ability to identify and apply for other funding sources. Responses from individuals not directly involved in grant applications may have inadvertently skewed the figures.

The results also highlight skills gaps in some of the more technical areas, namely scheme design, fluvial and coastal specific modelling. Although these skills are necessary for effective FRM and capital projects, most local authorities could not justify investing in specific software and employing or training staff for occasional use which re-enforced the overall findings.

The respondents showed a strong knowledge in contract and project management which is a big part of their role but again the lack of resources and technical expertise meant that they had to rely heavily on external consultants for some aspects of project management including schemes designs and project appraisal reports. It was also highlighted that current project management tools were often not tailored for small / medium scale flood related schemes but more specific to multi-million pounds programmes.

Big gaps in the level of expertise and the way FRM is delivered across the 22 authorities have also been identified. Potential mergers of local authorities could benefit some authorities while others could lose out.

Priorities can shift amongst authorities and we need to ensure that the ability to deliver efficient FRM is not lost in some cases.

Capacity and skills issues have made the public sector heavily reliant on external consultants to undertake large parts of their work. This trend is unfortunately not economically sound and in the long term will deplete the public sector of their expertise.

It is apparent that only providing training to practitioners to *'fill in the knowledge gap'* is not going to reverse the current trend but merely turn practitioners into knowledgeable clients although this approach is necessary to enable practitioners to challenge contractors' proposals and ensure best use of public monies. Flood risk management is a long-term issue currently being tackled with a short-term solution. To ensure long-term planning, succession and resilience Risk Management Authorities and Welsh Government need to look at a more sustainable approach to flood risk management.

## 7. Recommendations

### Short-term options

- The level of knowledge in coastal related matters varies greatly across RMAs. **It is therefore recommended to deliver an initial round of foundation courses specific to coastal risk management to provide coastal practitioners with a *capable* understanding of coastal processes.** This is being addressed to an extent through the Coastal Review Delivery Plan: training courses are being arranged by NRW for nominated RMA staff in early 2016.
- Both NRW and LLFAs have identified the importance of project management skills for day to day activities, delivery of small to medium scale capital schemes and to part manage bigger schemes. Current Project Management qualifications similar to PRINCE 2 are not specifically tailored for FRM schemes and are often too onerous in terms of work load. **It is therefore suggested that RMAs use internal expertise to develop a suitable project management toolkit to help practitioners deliver capital schemes. Financial support for publication and training has been identified within the WLGA budget for 2016/17.**
- **Succession gaps, an ageing workforce and a high level of reliance on a small number of staff in specialist areas have been highlighted as major factors to consider for future resilience.** Staff development has to be embedded as part of daily working habits and RMAs need to have the right systems in place to ensure continuous development of existing and future employees. **It is therefore recommended to involve the current small numbers of specialist staff in establishing how we can ease their workload and impart their knowledge to others. Collaboration with other public bodies to determine if they have the skills and expertise that could be incorporated, and the expert knowledge be provided to, by or shared between other public bodies should be explored further. Consequently, there will be a need to ensure that what is determined and the systems put in place are not just a short term fix but enable the long term continuous development of existing and future employees which can also influence who and from where you recruit future employees.**
- **Apprenticeship has been identified as one of the more beneficial ways to build up the knowledge and experience of junior staff.** Unfortunately shortage of mentor staff and funding issues means that RMAs cannot offer these opportunities anymore. NRW (in Environment Agency days) invested



in further education staff development programmes, such as the River and Coastal Engineering foundation degree (£18k per student) and graduate diploma (£4.5k). These were good routes to give new recruits a good grounding in FRM or other technical areas. Unfortunately, these programmes are no longer being delivered in NRW.

The City and County of Swansea Lifelong Learning and Employment Training Service (LLETS) works in partnership with a number of training providers in Wales to deliver the Welsh Government's apprenticeship programme. It is funded by WG and the European Social Fund at minimal cost to Local Government and offer training to over 16s. Unfortunately none of the programmes focus on FRM.

**It is therefore recommended that the WG Flood Team, NRW and WLGA initiate discussions with the WG Apprenticeship Programme to allow RMAs to recruit and share apprentices. It is further recommended that RMAs develop with partner organisations training programmes similar to LLETS to train young apprentices. Also, the viability of further education staff development programmes for RMAs in Wales should be explored.**

- The audit identified a lack of understanding of current funding mechanisms amongst LLFAs practitioners. With the necessity to deliver multi-benefits, accessing different funding sources and changes to the FCERM funding and grant system **it is recommended that Welsh Government provide adequate information to LLFAs from all relevant areas to identify and help access different funding streams.** Generally, the integration between departments as to what and how to deliver on multiple benefits will provide a wider understanding of future ways of working between departments and also help identify match funding streams.
- During 2016 a succinct report should be produced and presented by the WLGA to the Executive of each authority as well as the WLGA Spokesperson for Environment and Regeneration and to the Natural Resources Wales Board to raise the profile of flood risk management and discuss further steps including succession and a more strategic approach to FRM.

#### Long-term options

- The audit highlighted some fundamental issues relating to the capacity within the public sector which will not be solved with training only. Further cuts to current revenue funding arrangements and the short-term nature of funding commitments are likely to exacerbate these matters further. It is not just capacity (staffing numbers) but also risks associated with ageing workforce and high degrees of dependency on key staff and limited resilience in key roles. It is therefore recommended that WG review its current revenue funding mechanism and look at longer-term commitments to enable forward planning amongst RMAs and longer-term resilience. This would be in line with the approach required under the Well-Being of Future Generations Act. DEFRA currently allocates a 6 year budget for capital FRM works, which enables longer-term planning.
- The audit highlighted different levels of resources and expertise amongst RMAs: several LLFAs have consultancies in place that are able to develop and manage small to medium scale capital projects and provide technical support while some others have not. If expertise is to be retained within the public sector and ensure that it is economically viable to invest in this area, it is recommended that **regional collaboration frameworks** be promoted and developed to enable RMAs to share or invest



in joint resources easily, to build up the public sector expertise and resilience and make savings where possible.

Appendix 1: List of highest qualification per respondent

Table 5 - List of highest qualification per respondent

Level 6	Level 7
1 - Physical Geography	
B Eng Civil Engineering	
B Sc Civil Engineering	
B.Eng (Hons) Civil Engineering	
BEng Civil Engineering	
BEng Civil Engineering	
Beng Civil Engineering	
BEng Material Engineering and Material Testing	
Beng. Hons Degree Civil Engineer	
BSc (Hons) civil engineering	MSc Civil and Structural Engineering
BSc (Hons) Civil Engineering	
BSc (Hons) Geology and Physical Geography	MSc Disaster Management for Environmental Hazards
Bsc 9hons) Civil and Construction Engineering	
BSc Civil engineering	
BSc Civil Engineering Portsmouth Polytechnic	
BSc Geography	
Bsc Hons Civil and Construction Engineering	
BSc Hons Civil Engineering	
BSc Hons: River & Coastal Engineering	
BSc(Hons) Environmental Geoscience	
Bsc(Hons) Surveying Rea Estate Management	
BSc(Hons) Surveying Real Estate Management	
BSc(Hons) Surveying Real Estate Management	
Building Maintenance and Management	
Civil and Environmental Engineering	
Civil Engineering	
Civil Engineering	
Civil Engineering	
Civil Engineering (BSc Hons)	
Environmental Science	Exploration Geophysics
Environmental Studies	
Leadership and Managemunt	
Ord Degree Civil Engineering	
Physical Geography	



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